Cisco Catalyst 9500 Series Switches

Contents

Introduction

Reimagine, Reinforce, Redefine

The Catalyst 9500 Series, including the new 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 upto 12.8 Tbps 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 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 first Catalyst 9500X models includes non-blocking 100 Gigabit Ethernet Quad Small Form-Factor Pluggable (QSFP28) 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 technology2 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/SSO2), redundant platinum-rated power supplies, and fans, while supporting a wide array of optics. Catalyst 9500 Series switches provide operational choice of Cisco DNA 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 Digital Network Architecture (Cisco DNA) 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.

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.
- The Cisco Silicon One Q200 ASIC includes an 8GB on-chip High Bandwidth Memory (HBM), for deep packet buffers and route table expansion.
- Up to 12.8 Tbps switching capacity with 8 Bpps forwarding rate
- 80MB of dedicated low-latency buffer, with up to 8GB of HBM buffer
- Up to 28 nonblocking 40/100 Gigabit Ethernet QSFP28 ports
- Up to 8 nonblocking 40/100/200/400 Gigabit Ethernet QSFPDD ports
- Intel® 2.43-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[1] (e.g. with Cisco ThousandEyes Enterprise Agent).
- Hardware support for Precision Time Protocol (PTP, IEEE 1588v2)[1]with accurate clock synchronization and sub- microsecond accuracy, suitable for distribution and synchronization of time and frequency.
- Hardware support for line-rate 256-bit 802.1ae MACsec and WAN-MACsec[1] data encryption.
- Platinum-rated (90% efficient) 1500 Watt AC and/or DC power supplies.
- Field-replaceable fan-tray units, with an added flexibility to choose the direction of airflow.

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 routing (IPv4, IPv6, and multicast) tables and Layer 2 tables
- Up to 256,000 routing entries (IPv4/IPv6) for high-end campus core and aggregation deployments
- Up to 512,000 Flexible NetFlow (FNF) entries in hardware
- IPv6 support in hardware, providing wire-rate forwarding for IPv6 networks
- Dual-stack IPv4/IPv6 and dynamic hardware forwarding table allocations, for ease of IPv4-to-IPv6 migration
- Hardware support for Application Hosting (e.g. with Cisco ThousandEyes Enterprise Agent).
- 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 (90% efficient) AC and/pr DC power supplies
- Field-replaceable fan-tray units
- Meraki Cloud monitoring option

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.

- **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.
- **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
Resiliency and High Availability		
Software Maintenance Upgrade (SMU)	Yes	Yes
Cisco StackWise Virtual	Yes	No[2]
Stateful Switchover (SSO)	Yes (SVL)	No[2]
In-Service Software Upgrade (ISSU)	Yes (SVL)	No[2]
Graceful Insertion and Removal (GIR)	Yes	Yes
MKA High Availability	Yes	No[2]
Enterprise Security		
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[1]
Object-Group ACLs (IPv4/IPv6)	Yes	Yes

Model	Catalyst 9500	Catalyst 9500X
Enterprise QoS		
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)
IP Routing		
Routing Information Protocol version 2 (RIPv2), and next generation [RIPng]	Yes	Yes
Open Shortest Path First version 2 (OSPFv2), and OSPFv3	Yes	Yes
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
Protocol-Independent Multicast (PIM) Source-Specific Mode (PIM-SSM)	Yes	Yes
Bidirectional PIM BIDIR-PIM	Yes	No[2]
IPv6 routing	Yes	Yes
L3 Routed Sub-Interfaces	Yes	Yes
Multi-Protocol Label Switching (MPLS)		
MPLS L3 VPN	Yes	Yes
Ethernet over MPLS (EoMPLS)	Yes	Yes
Virtual Private LAN Service (VPLS)	Yes	No[2]
MPLS over GRE	Yes	No[2]
MPLS Traffic-Engineering (MPLS-TE)	Yes	No[2]

Model	Catalyst 9500	Catalyst 9500X
Ethernet VPN (EVPN)		
Virtual eXtensible LAN (VXLAN)	Yes	No[2]
L2 Virtual Network Interface (VNI)	Yes	No[2]
L3 Virtual Network Interface (VNI)	Yes	No[2]
Distributed Anycast Gateway	Yes	No[2]
EVPN Spine	Yes	No[2]
EVPN Border	Yes	No
EVPN Leaf	Yes	No[2]
Software-Defined Access (SD-Access)		
Virtual eXtensible LAN (VXLAN)	Yes	Yes
L2 Virtual Network Interace (VNI)	Yes	Yes
L3 Virtual Network Interace (VNI)	Yes	Yes
Distributed Anycast Gateway	Yes	Yes
SDA Control-Plane	Yes	Yes
SDA Border	Yes	Yes
SDA Edge	Yes	No
Flexible NetFlow (FNF)		
FNF IPv4 flow records	Yes	Yes[1] (software)
FNF IPv6 flow records	Yes	Yes[1] (software)
FNF sampler	Yes	Yes[1]
FNF data export	Yes	Yes[1]
NetFlow version 9 (NFv9) export	Yes	Yes[1]
IPFIX export	Yes	Yes[1]

Model	Catalyst 9500	Catalyst 9500X
Programmability		
NETCONF	Yes	Yes
RESTCONF	Yes	Yes
gNMI/gNOI	Yes	Yes
YANG Config models	Yes	Yes
YANG Oper models	Yes	Yes
ZTP/PTP	Yes	Yes
Smart Operations		
Bluetooth Ready	Yes	Yes[2]
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)
Meraki Cloud Monitoring	Yes	No

[1] C9500X models: minimum IOS XE software release 17.8.1

[2] C9500X models: feature is not available at FCS, but will be available in future software releases

Platform details

Switch models and configurations

All switches ship with the 650W/950W/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 28x40/100G QSFP28 ports + 8x40/100/200[1]/400G Gigabit Ethernet

Figure 2.
C9500-32C: Cisco Catalyst 9500 Series high-performance switch with 32x 100 Gigabit Ethernet

Figure 3.
C9500-32QC: Cisco Catalyst 9500 Series high-performance switch with 32x 40 or 16x100 Gigabit Ethernet

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

Figure 5.
C9500-24Y4C: Cisco Catalyst 9500 Series high-performance switch with 24x 1/10/25G Gigabit Ethernet + 4x 40/100G Uplink

Figure 6.
C9500-24Q: Cisco Catalyst 9500 Series switch with 24x 40G Gigabit Ethernet

Figure 7.
C9500-12Q: Cisco Catalyst 9500 Series switch with 12x 40G Gigabit Ethernet

Figure 8.
C9500-40X: Cisco Catalyst 9500 Series switch with 40x 1/10G Gigabit Ethernet

Figure 9.
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 configuration and port density

Model	Description	40G port density	100G port density	400G port density	10G port density with breakout cable	25G port density with breakout cable	50G port density with breakout cable	40G port density with breakout cable	100G port density with breakout cable
C9500X-28C8D	Cisco Catalyst 9500X with 28x100G + 8x400G Gigabit Ethernet	28	28	8	120[1]	120[1]	120[1]	60	60

[1] Roadmap. All numbers in the above table are for a single standalone switch.

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
C9500-32C	Cisco Catalyst 9500 Series high-performance 32-port 100 Gigabit Ethernet switch with QSFP28	48	–	–	32	32	96	96
C9500-32QC	Cisco Catalyst 9500 Series high-performance 32-port 40 Gigabit Ethernet switch with QSFP+	–	–	–	32	16	–	–
C9500-48Y4C	Cisco Catalyst 9500 Series high-performance 48-port 1/10/25G Gigabit Ethernet switch with SFP28	48	48	48	4	4	–	–
C9500-24Y4C	Cisco Catalyst 9500 Series high-performance 24-port 1/10/25G Gigabit Ethernet switch with SFP28	24	24	24	4	4	–	–
C9500-24Q	Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet switch with QSFP+	–	–	–	24	–	96	–

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
C9500-12Q	Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet switch with QSFP+	–	–	–	12	–	48	–
C9500-40X	Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet Switch with SFP/SFP+	40+8[1]	40+8[1]	–	2	–	8[1]	–
C9500-16X	Cisco Catalyst 9500 Series 16-port 1/10 Gigabit Ethernet switch with SFP/SFP+	16+8[1]	16+8[1]	–	2	–	8[1]	–

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

[1]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
C9500-NM-8X	Cisco Catalyst 9500 Series Network Module 8-port 1/10 Gigabit Ethernet with SFP/SFP+
C9500-NM-2Q	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
C9500-32C	No	No
C9500-32QC	No	No
C9500-48Y4C	No	No
C9500-24Y4C	No	No
C9500-24Q	No	No
C9500-12Q	No	No

Model	C9500-NM-8X	C9500-NM-2Q
C9500-40X	Yes	Yes
C9500-16X	Yes	Yes

Figures 9 and 10 show the available network modules

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

Figure 11.
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
C9500X-ACCKIT-19I=	Accessory Kit for Cisco Catalyst 9500X Switch - 19" rack mount[1]
C9500X-ACCKIT-23I=	Accessory Kit for Cisco Catalyst 9500X Switch - 23" rack mount[1]
C9500X-4PTH-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500X Switch[1]
C9500-ACCKITH-19I=	Accessory Kit for Cisco Catalyst 9500 Series – High-End - 19" rack mount
C9500-ACCKITH-23I=	Accessory Kit for Cisco Catalyst 9500 Series – High-End - 23" rack mount
C9500-4PTH-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series – High-End
C9500-ACC-KIT-19I=	Accessory Kit for Cisco Catalyst 9500 Series - 19" rack mount
C9500-ACC-KIT-23I=	Accessory Kit for Cisco Catalyst 9500 Series - 23" rack mount
C9500-4PT-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series

Product number	Description
SSD-120G	Cisco pluggable USB3.0 SSD storage – 120 GB
C9K-F3-SSD-240GB	Cisco pluggable SSD storage – 240 GB (Catalyst 9500X)[1]
C9K-F3-SSD-480GB	Cisco pluggable SSD storage – 480 GB (Catalyst 9500X)[1]
C9K-F3-SSD-960GB	Cisco pluggable SSD storage – 960 GB (Catalyst 9500X)[1]
C9K-F1-SSD-240G	Cisco pluggable SSD storage – 240 GB
C9K-F1-SSD-480G	Cisco pluggable SSD storage – 480 GB
C9K-F1-SSD-960G	Cisco pluggable SSD storage – 960 GB

[1] 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
C9500-32C	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
C9500-32QC	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
C9500-48Y4C	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
C9500-24Y4C	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
C9500-24Q	No	No	No	Yes	Yes	Yes	No	No	No
C9500-12Q	No	No	No	Yes	Yes	Yes	No	No	No
C9500-40X	No	No	No	Yes	Yes	Yes	No	No	No
C9500-16X	No	No	No	Yes	Yes	Yes	No	No	No

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

Figure 12 shows the 240-GB SSD storage.

Figure 12.
240-GB SSD storage

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).

Table 7. C9500X-28C8D Fan Options

Product number	Description
C9500X-FAN-1U-R	Catalyst 9500X front to back cooling fan
C9500X-FAN-1U-F	Catalyst 9500X back to front cooling fan

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 through15 show the power supplies available for the Cisco Catalyst 9500 Series

Figure 13.
950W AC power supply

Figure 14.
650W AC power supply

Figure 15.
1600W AC power supply

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
Power max rating	1500	1500
Input-voltage range and frequency	90-264Vac 47-63Hz	-40Vdc to -72Vdc
Power supply efficiency	92% (115Vac 50% load) 94% (230Vac 50% load)	94% (-48Vdc to -60Vdc, 50% load)
Input current	17A (max) at Vac 100V 7A (max) at Vac 240V	45A (max) at -40Vdc
Output ratings	Main Output: 12V 125A Standby Output: 3.3V 5A	Main Output: 12V 125A Standby Output: 3.3V 5A
Output holdup time	12ms	2ms

Power supply feature	C9K-PWR-1500WAC	C9K-PWR-1500WDC
Power-supply input receptacles	C22[1]	C10-638977-00 Amphenol Connector
Power cord rating	16A	N/A

[1]The Catalyst 9500X uses a different AC connector (C21) than the rest of the C9500 Product Family

Table 10. BTU Details for C9500X-28C8D with AC/ DC PSU

Total output BTU (Note: 1000 BTU/hr = 293W) - Model	C9K-PWR-1500WAC	C9K-PWR-1500WDC
C9500X-28C8D	4,034	4,034

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-930WDC-R	C9K-PWR-1600WAC-R	C9K-PWR-1600WDC-R
Power max rating	950W	950W	650W	930W	1600W	1600W
Input-voltage range and frequency	AC 90 to 264 VAC, 47 to 63 Hz	-36Vdc~ -72Vdc	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
Power supply efficiency	94%	91% at 48Vin, 50% load	94% (Typ)	92% (Typ)	94% (Typ)	92% (Typ)
Input current	AC 10A at 115VAC, 5 A at 230VAC	22.6A @ 48Vin, 950W	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)
Output ratings	12V at 79A, 12V at 3A	950W	12Vmain at 54A, 12Vsb at 3A	12Vmain at 54A, 12Vsb at 3A	12Vmain at 133A, 12Vsb at 3A	12Vmain at 133A, 12Vsb at 3A
Output holdup time	AC = 10 ms at maximum load	1ms	AC = 20 ms minimum for system	AC = 8 ms minimum for system	AC = 20 ms minimum for system	AC = 5 ms minimum for system
Power-supply input receptacles	AC IEC 60320 C16		AC IEC 60320 C14	Molex Minifit 44540-1001	AC IEC 60320 C16	Amphenol C10-638976-000
Power cord rating	AC 15A	DC 40A	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-930WDC-R	PWR-C4-950WAC-R	PWR-C4-950WDC-R
C9500-32C	3,631	3,709	N/A	N/A	N/A	N/A
C9500-32QC	N/A	N/A	1,815	1,856	N/A	N/A
C9500-48Y4C	N/A	N/A	1,856	1,856	N/A	N/A
C9500-24Y4C	N/A	N/A	1,454	1,484	N/A	N/A
C9500-24Q	N/A	N/A	N/A	N/A	2,900	2,976
C9500-12Q	N/A	N/A	N/A	N/A	1,536	1,562
C9500-40X with 10G NM	N/A	N/A	N/A	N/A	1,467	1,451
C9500-40X with 40G NM	N/A	N/A	N/A	N/A	1,365	1,376
C9500-16X with 10G NM	N/A	N/A	N/A	N/A	941	967
C9500-16X with 40G NM	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-930WDC-R	PWR-C4-950WAC-R	PWR-C4-950WDC-R
C9500-32C	Yes	Yes	No	No	No	No
C9500-32QC	No	No	Yes	Yes	No	No
C9500-48Y4C	No	No	Yes	Yes	No	No
C9500-24Y4C	No	No	Yes	Yes	No	No
C9500-24Q	No	No	No	No	Yes	Yes
C9500-12Q	No	No	No	No	Yes	Yes
C9500-40X	No	No	No	No	Yes	Yes
C9500-16X	No	No	No	No	Yes	Yes

Switch performance

Table 14 shows performance specifications for the Cisco Catalyst 9500 Series Switches

Table 14. 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
ASIC	**UADP 2.0**				**UADP 3.0**				**Q200**
Switching capacity	Up to 1920 Gbps	Up to 960 Gbps	Up to 960 Gbps	Up to 480 Gbps	Up to 6.4 Tbps[2]	Up to 3.2 Tbps[2]	Up to 3.2 Tbps[2]	Up to 2.0Tbps[2]	Up to 12 Tbps
Forwarding rate	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
Total number of MAC addresses	Up to 64,000[1]				Up to 82,000[1]				Up to 256,000[1]
Total number of IPv4 routes (indirect routes)	Up to 64,000 indirect[1,6]				Up to 256,000 indirect + direct[1,6]				Up to 2,000,000[6]
Total number of IPv4 host routes (direct routes and ARP)	Up to 80,000 host[1,6]				Up to 90,000 host/ARP[2,6]				Up to 256,000[1,6]
Total number of IPv6 routes (indirect routes)	Up to 32,000 indirect[1,6]				Up to 256,000 indirect + direct[1,6]				Up to 1,000,000[6]
Total number of IPv6 host routes (direct routes and NDP)	Up to 40,000 host[1,6]				Up to 90,000 host[1,6]				Up to 128,000[1,6]
Total number of IPv4 Multicast routes	Up to 32,000[1,6]				Up to 32,000[1,6]				Up to 32,000[1,6]
Total number of IPv6 Multicast routes	Up to 16,000[1,6]				Up to 32,000[1,6]				Up to 16,000[1,6]
QoS ACL scale	Up to 18,000[1]				Up to 16,000[1]				Up to 8,000[1]
Security ACL scale	Up to 18,000[1]				Up to 27,000[1]				Up to 8,000[1]
FNF entries	Up to 512,000[1]				Up to 256,000[1]				Up to 2,000,000[5]
DRAM	16 GB				16 GB				32 GB
Flash	16 GB				16 GB				16 GB
VLAN IDs	4094				4094				4094
PVST Instances	300[3]				4,000[1]				4094
STP Virtual Ports (Port* VLANs) for PVST	13,000				16,000				32,000

Performance numbers for all switch models	C9500-24Q	C9500-12Q	C9500-40X	C9500-16X	C9500-32C	C9500-32QC	C9500-48Y4C	C9500-24Y4C	C9500X-28C8D
ASIC	**UADP 2.0**				**UADP 3.0**				**Q200**
STP Virtual Ports (Port* VLANs) for MST	13,000				52,000[1]				32,000
Total Switched Virtual Interfaces (SVIs)	1,000				4,000[1]				4096
Jumbo frame	9,198 bytes				9,216 bytes				9,216 bytes

[1] Varies based on selected flexible ASIC template.

[2] Line rate for 187byte packet size and above.

[3] 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.

[4] 32,000 with C9500-32C and C9500-32QC; 52,000 with C9500-48Y4C; 28,000 with C9500-24Y4C.

[5] Roadmap

[6] Table Maximum. The exact % of allocation will depend on specific IP/mask combinations.

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 route are any 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 essentially, 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.

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 15 describes the default SDM ASIC template for C9500X models.

Table 15. SDM template descriptions for C9500X models

Features	Default Template
MAC Addresses	128,000
IP Host Routes[1]	128,000
IP LPM Routes[1]	2,000,000
IP Multicast Routes[1]	32,000
IGMP/MLD Snooping[1]	16,000
MPLS Labels[2]	256,000
Security/Object Groups	32,000
Security ACLs[1]	8,000
QoS ACLs[1]	8,000
PBR/NAT[3]	16,000
GRE Tunnels	1024
Sampled NetFlow entries[1]	2,000,000

[1] IPv4 and IPv6 entries coexist in the same tables, but IPv6 entries require two entries.

[2] Per-prefix labels are divided into internal (iBGP) and external (eBGP)

[3] Feature is not available at FCS, but will be available in future software releases

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 16 describes the standard SDM ASIC templates for C9500 models.

Table 16. 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**
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	32,000	32,000	32,000	32,000
NetFlow/ASIC	98,000	64,000	64,000	64,000
Security ACL	27,000[1]	27,000[1]	20,000[1]	27,000[1]
QoS ACL	16,000[1]	16,000[1]	8,000[1]	16,000[1]
PBR/NAT	3,000	3,000	15,500	2000
Tunnel/MACsec	3000	3000	2000	3000
LISP	1000	1000	1000	2000
SPAN	1000	1000	1000	1000
STP Instances	1000	1000	1000	1000
Control Plane Policing (CoPP)	1000	1000	1000	1000
NetFlow ACL	1000 ingress, 1000 egress	1000 ingress, 1000 egress	1000 ingress, 1000 egress	1000 ingress, 1000 egress

Template numbers for models C9500-12Q, C9500-24Q, C9500-40X, C9500-16X	Distribution template (Default)	Core template	NAT template	SDA template*
IPv4/IPv6 LPM	64,000 / 32,000	64,000 / 32,000	64,000 / 32,000	64,000 / 32,000
IPv4/IPv6 host	48,000 / 24,000	32,000 / 16,000	48,000 / 24,000	80,000 / 40,000
IPv4/ IPv6 Multicast route	16,000 / 8,000	32,000 / 16,000	32,000 / 16,000	16,000 / 8,000
IGMP/MLD snooping	16,000	16,000	16,000	16,000
MAC address	64,000	16,000	16,000	16,000
SGT label	8000	8000	8000	8000

Template numbers for models C9500-12Q, C9500-24Q, C9500-40X, C9500-16X	Distribution template (Default)	Core template	NAT template	SDA template*
NetFlow/ASIC	128,000	128,000	128,000	128,000
Security ACL	18,000	18,000	18,000	18,000
QoS ACL	18,000	18,000	3000	18,000
PBR/NAT	2000	2000	16,000	2000
Tunnel/MACsec	1000	1000	1000	1000
LISP	1000	1000	1000	1000
SPAN	1000	1000	1000	1000
STP instances	300[3]	300[3]	300[3]	300[3]
CoPP	1000	1000	1000	1000
NetFlow ACL	1000 ingress, 2000 egress	1000 ingress, 2000 egress	1000 ingress, 2000 egress	1000 ingress, 2000 egress

[1] ACL allocation is configurable between ingress, egress, IPv4 and non IPv4 (layer 2 and IPv6)

[2] SD-Access template has been removed from IOS XE 17.3.1 onwards (in lieu of Custom ASIC templates)

[3] 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

C9500X-28C8D

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 17. Custom template FIB configurable values

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

[1] Critical features require a minimum allocation to insure operation. If a custom value if not defined, this value is used.

[2] Some (non-critical) features are allowed to have a 0 entry allocation, to allow increased allocation of other features.

[3] Per-prefix labels are divided into internal (iBGP) and external (eBGP)

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 18. 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[1]	0 – 32,000	16,000	16,000
IGMP/MLD Snooping[1]	0 – 32,000	16,000	16,000
SGT/MPLS labels[2]	0 – 64,000	32,000	32,000
Netflow entries - Input[3]	0 – 64,000	32,000	32,000
Netflow entries - Output[3]	0 – 64,000	32,000	0
Total Resources	**416,000**		

[1] Total Layer 2 and Layer 3 Multicast entries may not exceed 48,000

[2] Each resource holds two SGT + MPLS entries

[3] NetFlow entries require double entries

Table 19. Custom template configurable ACL values

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

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 20. Minimum software requirements

Model	Description	Minimum software requirement
C9500-28C8D	Cisco Catalyst 9500X Switch with 28x100G + 8x400G Gigabit Ethernet	Cisco IOS XE Software Release 17.7.1
C9500-32C	Cisco Catalyst 9500 Series 32-port 40/100 Gigabit Ethernet with QSFP+/QSFP28	Cisco IOS XE Software Release 16.8.1a
C9500-32QC	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
C9500-48Y4C	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
C9500-24Y4C	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
C9500-24Q	Cisco Catalyst 9500 Series 24-port 40 Gigabit Ethernet with QSFP+	Open Cisco IOS XE Software Release 16.5.1a
C9500-12Q	Cisco Catalyst 9500 Series 12-port 40 Gigabit Ethernet with QSFP+	Open Cisco IOS XE Software Release 16.6.1
C9500-40X	Cisco Catalyst 9500 Series 40-port 1/10 Gigabit Ethernet with SFP/SFP+	Open Cisco IOS XE Software Release 16.6.1
C9500-16X	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).

For a more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide

Packaging

The Cisco Catalyst 9000 family introduced new packaging that includes vastly simplified base network packages (Network Essentials and Network Advantage) and term-based software packages (Cisco DNA Advantage and Cisco DNA Essentials). The Cisco DNA packages, in addition to on-box capabilities, also unlock additional functionality in Cisco DNA Center, enabling controller-based software-defined automation in your network.

For information about feature support on specific models, please refer to the Cisco Feature Navigator (https://cfn.cloudapps.cisco.com/ITDIT/CFN/jsp/index.jsp) and the Cisco Catalyst 9500 Series Release Notes.

License consumption is easily determined by the package itself. While perpetual licenses are always permanent and without an expiration date, subscription licenses have to be purchased for a 3-, 5-, or 7-year term (and hence are also known as term-based licenses). Table 15 shows the combinations of perpetual and subscription licenses that must be purchased.

Table 21. Licensing combinations

	Cisco DNA Essentials	Cisco DNA Advantage
Network Essentials	Yes	No
Network Advantage	No*	Yes

*At the time of Cisco DNA license renewal, the Cisco DNA Essentials license can be purchased to be used with Network Advantage

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 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.

Tables 22 shows the features included in the Network Essentials and Advantage packages. Table 24 shows the Cisco DNA Essentials, Advantage and Premier[1] packages.

Table 22. Network Essentials and Advantage package features

Features	Network Essentials	Network Advantage
Switch fundamentals Layer 2, Routed Access (RIP, EIGRP Stub, OSPF – Up to 1000 routes),PBR, PIM Stub Multicast (up to 1000 routes)), PVLAN[2], VRRP, PBR[2], CDP, QoS, FHS, 802.1x[2], Macsec-128, CoPP, SXP, IP SLA Responder, SSO[2]	✓	✓
Advanced switch capabilities and scale BGP, EIGRP, HSRP, IS-IS, BSR, MSDP, PIM SM, PIM SSM, PIM-BIDIR[2], IP SLA, OSPF	✗	✓
Network segmentation VRF, VXLAN, LISP, BGP-EVPN2, TrustSec[2], SGT[2], MPLS, mVPN[2]	✗	✓
Automation NETCONF, RESTCONF, gRPC, gNMI/gNOI, YANG, PnP Agent, ZTP/Open PnP, GuestShell (On-Box Python)	✓	✓
Telemetry and visibility Model-driven telemetry, sampled NetFlow[2], SPAN, RSPAN	✓	✓
High availability and resiliency GIR, NSF, ISSU[2], StackWise Virtual[2], SMU	✗	✓
IoT integration PTP2 (IEEE1588v2)	✗	✓
Security MACsec-256[2], WAN MACsec[3]	✗	✓
Cisco trustworthy solutions Trust Anchor module, Secure Boot, Image Signing, Modern Crypto, Runtime Defenses	✓	✓

Table 23. Cisco DNA Essentials and Advantage package features

Features	Cisco DNA Essentials	Cisco DNA Advantage
Switch features		
Optimized network deployments Cisco DNA Service for Bonjour	✗	✓
Advanced telemetry and visibility Flexible NetFlow[1], EEM	✓	✓

Features	Cisco DNA Essentials	Cisco DNA Advantage
Optimized telemetry a visibility ERSPAN[1], App Hosting (in Containers/VMs), Wireshark, ThousandEyes	✗	✓
Cisco DNA Center features		
Day 0 network bring-up automation Cisco Network Plug-n-Play application, network settings, device credentials, LAN Automation, Host onboarding	✓	✓
Element management Discovery, inventory, topology, software image, licensing, and configuration management	✓	✓
Element management Patch Management	✗	✓
Basic Assurance Health Dashboards – Network, Client, Application; Switch and Wired Client Health Monitoring	✓	✓
SD-Access Policy-based Automation and Assurance for Wired and Wireless[1]	✗	✓
Embedded Wireless (with or without SD-Access)[1] Cisco Catalyst 9800 wireless software package to enable wireless controller functionality**	✗	✓
Network assurance and analytics Global Insights, Trends, Compliance, Custom Reports; Switch 360, Wired Client 360; Fabric and Non-Fabric Insights; App Health	✗	✓
Meraki Cloud Monitoring	✓* limited device visability	✓

* Feature will be available in future software releases

**Note: A purchase of Cisco DNA Advantage per access point is required in order to enable the wireless controller functionality on Cisco Catalyst switches.

[1] Not supported on C9500X models

[2] Not supported on C9500 UADP based models

Specifications

Dimensions, physical specifications and weight

Catalyst 9500X models

Table 24 lists the dimensions, specifications, weight and operating temperature for the Cisco Catalyst 9500X models.

Table 24. Dimensions, physical specifications, weight and operating temperature

Description	Specifications	
SKU	C9500X-28C8D	
Dimensions (H x W x D)	H = 1.73” (4.39 cm) W = 17.5” (44.45 cm) D = 21.8” (55.37 cm) (including Fan Tray Handles)	
Rack Units (RU)	1 RU	
Chassis with 2 power supplies and built-In fan	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)	
Input voltage	See Table 3	
SKU	C9500X-FAN-1U-R	C9500X-FAN-1U-F
Operating temperature	-5° C to +45° C (23° to 133° F) sea level	-5° C to +35° C (23° to 95° F) sea level
Altitude	-5° C to +40° C (23° to 104 F) up to 5,000 feet (1500 m) -5° C to +35° C (23° to 95° F) up to 10,000 feet (3000 m)	-5° C to +30° C (23° to 86° F) up to 5,000 feet (1500 m) -5° C to +25° C (23° to 77° F) up to 10,000 feet (3000 m)
Storage temperature	-40° C to 70° C (-40° to 158° F)	
Relative humidity operating and nonoperating (noncondensing)	Relative humidity operating: 10 to 85% (noncondensing) Relative humidity nonoperating: 0 to 95% (noncondensing)	

Catalyst 9500 models

Table 25 lists the dimensions, specifications, weight and operating temperature for the Cisco Catalyst 9500 models.

Table 25. Dimensions, physical specifications, weight and operating temperature

Description	Specifications							
SKU	C9500-32C	C9500-32QC	C9500-48YC	C9500-24YC	C9500-12Q	C9500-24Q	C9500-40X	C9500-16X
Dimensions (H x W x D)	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			
Rack Units (RU)	1 RU							
Chassis with 2 power supplies and built-In fan	25.64 lb (11.63 kg)	21.85lLb (9.91 kg)	21.96 lb (9.96 kg)	20.99 lb (9.52 kg)	25.75 lb (11.68 kg)			23.6 lb (10.7 kg)
Input voltage	90 to 264 VAC*							
Operating temperature	32° to 104°F (0° to 40°C) up to altitude of 10,000 feet							
Altitude	Operation up to 10,000 feet at 40°C; up to 6,000 feet at 45°C							
Storage temperature	-4° to 149°F (-20° to 65°C)							
Relative humidity operating and nonoperating (noncondensing)	Ambient (noncondensing) operating: 5% to 90% Ambient (noncondensing) nonoperating and storage: 5% to 95%							
NEBS criteria levels	NEBS: • ETSI 300-019 Requirements are covered under GR-63-CORE with some deviations. • SR-3580 NEBS level 3 (GR-63-CORE, to current issue, GR-1089-CORE, to current issue)							

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

Mean-time between failures (MTBF)

Catalyst 9500X models

Table 26 lists mean-time between failures (MTBF) for the Cisco Catalyst 9500X Switch and components.

Table 26. MTBF information

Model	MTBF (hours)
C9500X-28C8D	123,950
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 27 lists mean-time between failures (MTBF) for the Cisco Catalyst 9500 Series and components.

Table 27. 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-930WDC-R	3,008,280
C9K-PWR-1600WAC-R	1,718,780
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://tmgmatrix.cisco.com/

Management and standards support

Table 28 shows management and standards support for the Cisco Catalyst 9500 Series.

Table 28. Management and standards support

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
Management	BRIDGE-MIB	BGP4-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
	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
	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

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
	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
	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-UDLDP-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

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
	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-UDLDP-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
	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-IPSEC-FLOW-MONITOR-MIB	MAU-MIB
	CISCO-IPSEC-MIB	MPLS-L3VPN-STD-MIB
	CISCO-IPSEC-PROVISIONING-MIB	MPLS-LDP-GENERIC-STD-MIB
	CISCO-IPSLA-AUTOMEASURE-MIB	MPLS-LDP-MIB
	CISCO-IPSLA-ECHO-MIB	MPLS-LSR-STD-MIB
	CISCO-IPSLA-JITTER-MIB	MPLS-VPN-MIB
	CISCO-L2-CONTROL-MIB	MSDP-MIB
		NHRP-MIB

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
		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 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
Standards	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	

Description	Cisco Catalyst 9500	Cisco Catalyst 9500 High Performance
	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 29 lists the safety and compliance information for the Cisco Catalyst 9500 Series.

Table 29. Safety and compliance information

Description	Specification
Safety certifications	C9500-12Q, C9500-24Q, C9500-40X, C9500-16X • UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943 C9500-32C, C9500-32QC, C9500-24Y4C, C9500-48Y4C • IEC 60950-1 plus Am1, Am2 Am9, Am10, Am11, Am12 and all deviations and differences • AS/NZS 60950.1.2011 • CAN/CSA-C22.2 No. 60950-1-07 • GB 4943-95 • EN 60950-1; 2006 plus Am1, Am 2, Am9, Am10, Am11, Am12 and all deviations and differences • NOM-019-SCFI-1998 • UL 60950-1, Second Edition C9500X-28C8D • UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • EN 62368-1 • UL 62368-1

Description	Specification
	• CAN/CSA-C22.2 No. 62368-1 • IEC 62368-1 • AS/NZS 62368-1
EMI and EMC compliance	C9500 Models • 47 CFR Part 15 Class A • CNS13438: 2006 Class A • EN 300 386 V1.6.1 • EN61000-3-2: 2014 • EN61000-3-3: 2013 • ICES-003 Issue 6: 2016 Class A • KN 32: 2015 Class A • TCVN 7189: 2009 Class A • EN 55032:2012/ AC:2013 Class A • EN 55032:2015 Class A • CISPR 32 Edition 2 Class A • V-2/2015.04 Class A • V-3/2015.04 Class A • CISPR24: 2010 + A1: 2015 • EN 300 386 V1.6.1 • EN55024: 2010 + A1: 2015 • KN35: 2015 • TCVN 7317: 2003 C9500X Models • CNS13438: 2006 Class A • EN 300 386 V1.6.1 • EN61000-3-2: 2014 • EN61000-3-3: 2013 • ICES-003 Issue 6: 2016 Class A • KS C 9832:2019 • CISPR32:2015:Ed:2 • EN 55032:2012/ AC:2013 Class A • EN 55032:2015 Class A • CISPR 32 Edition 2 Class A • VCCI/CISPR 32 2016 • CISPR24: 2010 + A1: 2015 • EN 300 386 V1.6.1 • EN55024: 2010 + A1: 2015 • KS C 9835:2019 • EN 55035:2017+A11:2020 • 47 CFR Part 15:2016

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 30 provides information about the E-LLW.

Table 30. E-LLW details

	Cisco E-LLW
Devices covered	Applies to Cisco Catalyst 9500 Series Switches.
Warranty duration	As long as the original customer owns the product.
End-of-life policy	In the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	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.
Effective date	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).
TAC support	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.
Cisco.com access	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
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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 23 for more information on Cisco's Technical Services available for the Cisco Catalyst 9500 Series Switches.

Table 31. Technical Services

Cisco Technical Services
Cisco Smart Net Total Care® Service • Around-the-clock, global access to the Cisco TAC • Unrestricted access to the extensive Cisco.com knowledge base and tools • NBD, 8x5x4, 24x7x4, and 24x7x2 advance hardware replacement and onsite parts replacement and installation available • Ongoing operating system software updates within the licensed feature set[1] • 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[2] • Ongoing operating system software updates[1]

Cisco Technical Services
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

[1] Cisco operating system updates include the following: maintenance releases, minor updates, and major updates within the licensed feature set.

[2] 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.

Software policy for Cisco Catalyst 9500 Series Switches

Cisco DNA Software for Access Switching is available for the Cisco Catalyst 9500

Cisco DNA Software for Access Switching offers comprehensive solutions for the enterprise campus and branch offices. Cisco DNA for Access Switching introduces a simpler and more economical way to deploy access, aggregation, and core switches across enterprise campus and branch locations.

The Cisco DNA Subscription for Switching offer delivers an unbound network on an open and extensible architecture to help you navigate the digital journey. This subscription offer simplifies the buying process and includes lower initiation costs and flexible terms.

For ordering information for Cisco DNA Software for the Cisco Catalyst 9500 Series, go to https://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html.

Software policy for network stack components

Customers with the Network Essential Stack and Network Advantage Stack software feature sets will be provided with maintenance updates and bug fixes. These are designed to maintain compliance of the software with published specifications, release notes, and industry standards as long as the original end user continues to own or use the product or for up to one year from the end-of-sale date for the product, whichever occurs earlier.

Cisco Embedded Support for Cisco DNA term components

Cisco Embedded Support delivers the right support for Cisco software products and suites. It will keep your business applications performing as expected and protect your investment. Cisco Embedded Support for the Cisco DNA Essentials and Cisco DNA Advantage term components is included as part of the switch value. Embedded Support provides access to TAC support, major software updates, maintenance and minor software releases, and the Cisco Software Support site, for increased productivity with anytime access.

Table 32. Cisco DNA Term Support on the 9500 Series

Model	C9500X-DNA-A-3Y/5Y/7Y or C9500X-DNA-E-3Y/5Y/7Y	C9500-DNA-A-3Y/5Y/7Y or C9500-DNA-E-3Y/5Y/7Y	C9500-DNA-L-A-3Y/5Y/7Y or C9500-DNA-L-E-3Y/5Y/7Y
C9500X-28C8D	Yes	N/A	N/A
C9500-32C	N/A	Yes	No
C9500-32QC	N/A	Yes	No
C9500-48Y4C	N/A	Yes	No
C9500-24Y4C	N/A	No	Yes
C9500-24Q	N/A	Yes	No
C9500-12Q	N/A	No	Yes
C9500-40X	N/A	Yes	No
C9500-16X	N/A	No	Yes

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.

Table 33 lists ordering information for the Cisco Catalyst 9500 Series.

Table 33. Ordering information

Product number	Product description
C9500X-28C8D-A	Catalyst 9500 28x100G + 8x400G switch, NW Advantage License
C9500X-28C8D-E	Catalyst 9500 28x100G + 8x400G switch, NW Essentials License
C9500-32C-E	Cisco Catalyst 9500 Series high performance 32-port 100G switch, NW Ess. License
C9500-32C-A	Cisco Catalyst 9500 Series high performance 32-port 100G switch, NW Adv. License
C9500-32QC-E	Cisco Catalyst 9500 Series high performance 32-port 40G switch, NW Ess. License
C9500-32QC-A	Cisco Catalyst 9500 Series high performance 32-port 40G switch, NW Adv. License
C9500-48Y4C-E	Cisco Catalyst 9500 Series high performance 48-port 25G switch, NW Ess. License
C9500-48Y4C-A	Cisco Catalyst 9500 Series high performance 48-port 25G switch, NW Adv. License
C9500-24Y4C-E	Cisco Catalyst 9500 Series high performance 24-port 1/10/25G switch, NW Ess. License
C9500-24Y4C-A	Cisco Catalyst 9500 Series high performance 24-port 1/10/25G switch, NW Adv. License
C9500-24Q-E	Cisco Catalyst 9500 24-port 40G switch, NW Ess. License

Product number	Product description
C9500-24Q-A	Cisco Catalyst 9500 24-port 40G switch, NW Adv. License
C9500-12Q-E	Cisco Catalyst 9500 12-port 40G switch, NW Ess. License
C9500-12Q-A	Cisco Catalyst 9500 12-port 40G switch, NW Adv. License
C9500-40X-E	Cisco Catalyst 9500 40-port 10G switch, NW Ess. License
C9500-40X-A	Cisco Catalyst 9500 40-port 10G switch, NW Adv. License
C9500-16X-E	Cisco Catalyst 9500 16-port 10G switch, NW Ess. License
C9500-16X-A	Cisco Catalyst 9500 16-port 10G switch, NW Adv. License
C9500-NM-2Q	Cisco Catalyst 9500 2 x 40GE Network Module
C9500-NM-8X	Cisco Catalyst 9500 8 x 10GE Network Module
C9500-NM-2Q=	Cisco Catalyst 9500 2 x 40GE Network Module Spare
C9500-NM-8X=	Cisco Catalyst 9500 8 x 10GE Network Module Spare
C9500-48X-A	Cisco Catalyst 9500 40-port 10G switch, 8 x 10GE Network Module, NW Adv. License
C9500-48X-E	Cisco Catalyst 9500 40-port 10G switch, 8 x 10GE Network Module, NW Ess. License
C9500-24X-A	Cisco Catalyst 9500 16-port 10G switch, 8 x 10GE Network Module, NW Adv. License
C9500-24X-E	Cisco Catalyst 9500 16-port 10G switch, 8 x 10GE Network Module, NW Ess. License
C9500-16X-2Q-A	Cisco Catalyst 9500 16-port 10G switch, 2 x 40GE Network Module, NW Adv. License
C9500-16X-2Q-E	Cisco Catalyst 9500 16-port 10G switch, 2 x 40GE Network Module, NW Ess. License
C9500-40X-2Q-A	Cisco Catalyst 9500 40-port 10G switch, 2 x 40GE Network Module, NW Adv. License
C9500-40X-2Q-E	Cisco Catalyst 9500 40-port 10G switch, 2 x 40GE Network Module, NW Ess. License
Cisco DNA License Upgrade	Upgrade from Essentials to Advantage
C9500-LIC=	Electronic SW License for C9500 Switches
Cisco DNA Term Licenses	
C9500X-DNA-E-3Y	Catalyst 9500X Cisco DNA Essential license (3Y) for 28C8D SKU
C9500X-DNA-E-5Y	Catalyst 9500X Cisco DNA Essential license (5Y) for 28C8D SKU
C9500X-DNA-E-7Y	Catalyst 9500X Cisco DNA Essential license (7Y) for 28C8D SKU
C9500X-DNA-A-3Y	Catalyst 9500X Cisco DNA Advantage license (3Y) for 28C8D SKU
C9500X-DNA-A-5Y	Catalyst 9500X Cisco DNA Advantage license (5Y) for 28C8D SKU

Product number	Product description
C9500X-DNA-A-7Y	Catalyst 9500X Cisco DNA Advantage license (7Y) for 28C8D SKU
C9500-DNA-E-3Y	Catalyst 9500 NW and Cisco DNA Essentials. license (3Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
C9500-DNA-E-5Y	Catalyst 9500 NW and Cisco DNA Essentials. license (5Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
C9500-DNA-E-7Y	Catalyst 9500 NW and Cisco DNA Essentials. license (7Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
C9500-DNA-A-3Y	Catalyst 9500 NW and Cisco DNA Advantage license (3Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
C9500-DNA-A-5Y	Catalyst 9500 NW and Cisco DNA Advantage license (5Y) for 24Q, 40X, 32C, 32QC, 48Y4C SKU
C9500-DNA-A-7Y	Catalyst 9500 NW and Cisco DNA Advantage license (7Y)
C9500-DNA-L-E-3Y	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (3Y) for 12Q, 16X, 24Y4C SKU
C9500-DNA-L-E-5Y	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (5Y) for 12Q, 16X, 24Y4C SKU
C9500-DNA-L-E-7Y	Catalyst 9500 NW and Cisco DNA Essentials. low port density license (7Y) for 12Q, 16X, 24Y4C SKU
C9500-DNA-L-A-3Y	Catalyst 9500 NW and Cisco DNA Advantage low port density license (3Y) for 12Q, 16X, 24Y4C SKU
C9500-DNA-L-A-5Y	Catalyst 9500 NW and Cisco DNA Advantage low port density license (5Y) for 12Q, 16X, 24Y4C SKU
C9500-DNA-L-A-7Y	Catalyst 9500 NW and Cisco DNA Advantage low port density license (7Y) for 12Q, 16X, 24Y4C SKU
Power supplies, cables, and fan for the Cisco Catalyst 9500 Series	
C9K-PWR-1600WAC-R	1600W AC Power Supply
C9K-PWR-650WAC-R	650W AC Power Supply
C9K-PWR-1600WDC-R	1600W DC Power Supply
C9K-PWR-930WDC-R	930W DC Power Supply
C9K-PWR-1600WACR/2	1600W AC Power Supply, Redundant
C9K-PWR-650WAC-R/2	650W AC Power Supply, Redundant
C9K-PWR-1600WDCR/2	1600W DC Power Supply, Redundant
C9K-PWR-930WDC-R/2	930W DC Power Supply, Redundant
C9K-PWR-C4-BLANK	Catalyst 9500 power supply blank cover

Product number	Product description
C9K-PWR-C5-BLANK	Catalyst 9500 power supply blank cover
C9K-T1-FANTRAY	Catalyst 9500 fan tray
FAN-T4-R	Catalyst 9500 Type 4 front to back cooling Fan
PWR-C4-950WAC-R	950W AC Config 4 Power Supply front to back cooling
PWR-C4-950WAC-R/2	950W AC Config 4 Power Supply front to back cooling, Redundant
PWR-C4-BLANK	Catalyst 9500 power supply blank cover
CAB-C15-CBN-JP	Japan Cabinet Jumper Power Cord, 250 VAC 12A, C14-C15
CAB-TA-250V-JP	Japan 250V AC Type A Power Cable
CAB-TA-AP	Australia AC Type A Power Cable
CAB-TA-AR	Argentina AC Type A Power Cable
CAB-TA-DN	Denmark AC Type A Power Cable
CAB-TA-EU	Europe AC Type A Power Cable
CAB-TA-IN	India AC Type A Power Cable
CAB-TA-IS	Israel AC Type A Power Cable
CAB-TA-IT	Italy AC Type A Power Cable
CAB-TA-SW	Switzerland AC Type A Power Cable
CAB-TA-UK	United Kingdom AC Type A Power Cable
CAB-TA-NA	North America AC Type A Power Cable
CAB-C15-CBN	Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors
CAB-TA-JP	Japan AC Type A Power Cable
Spare accessory and rack mount kits for the Cisco Catalyst 9500 Series	
C9500-ACCKITH-19I=	Accessory Kit for Cisco Catalyst 9500 Series – High-End - 19" rack mount
C9500-ACCKITH-23I=	Accessory Kit for Cisco Catalyst 9500 Series – High-End - 23" rack mount
C9500-4PTH-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series – High-End
C9500-ACC-KIT-19I=	Accessory Kit for Cisco Catalyst 9500 Series - 19" rack mount
C9500-ACC-KIT-23I=	Accessory Kit for Cisco Catalyst 9500 Series - 23" rack mount
C9500-4PT-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500 Series

Product number	Product description
Power supplies, cables, and fan for the Cisco Catalyst 9500X Switch	
C9K-PWR-1500WAC	Catalyst 9500X 1500W AC Power Supply
C9K-PWR-1500WDC	Catalyst 9500X 1500W DC Power Supply
C9K-PWR-1500WAC/2	Catalyst 9500X 1500W AC Power Supply, Redundant
C9K-PWR-1500WDC/2	Catalyst 9500X 1500W DC Power Supply, Redundant
PWR-C6-BLANK	Catalyst 9500X power supply blank cover
C9500X-FAN-1U-R	Catalyst 9500X front to back cooling fan
C9500X-FAN-1U-F	Catalyst 9500X back to front cooling fan
NO-POWER-CORD	ECO friendly green option, no power cable will be shipped
PWR-CAB-AC-USA520	US AC Power Cord for Cisco ASR 900, NEMA 5-20
PWR-CAB-AC-USA	Power Cord for AC V2 Power Module (USA), NEMA L6-20P
PWR-CAB-AC-AUS	Power Cord for AC V2 Power Module (Australia), AS 3112
PWR-CAB-AC-EU	Power Cord for AC V2 Power Module (Europe), CEE 7/7
PWR-CAB-AC-ITA	Power Cord for AC V2 Power Module (Italy), CEI-23-50
PWR-CAB-AC-SA	Power Cord for AC V2 Power Module (South Africa), SABS 164
PWR-CAB-AC-UK	Power Cord for AC V2 Power Module (UK), EN 60309-2
PWR-CAB-AC-ISRL	Power Cord for AC V2 Power Module (Israel), SI 32
PWR-CAB-AC-CHN	Power Cord for AC V2 Power Module (China), GB2099.1/GB1002
PWR-CAB-AC-BRA	Power Cord for AC V2 Power Module (Brazil), NBR 14136
PWR-CAB-AC-SUI	Power Cord for AC V2 Power Module (Swiss), SEV 1011
PWR-CAB-AC-JPN	Power Cord for AC V2 Power Module (Japan), JIS C8303
PWR-CAB-AC-IND	India AC Power Cord for Cisco ASR 900, IS:1293
PWR-CAB-AC-ARG	AC POWER CORD, WIRE HARNESS, Argentina, IRAM 2073, IEC60320 C21, ST, 4M, 30 AWG, STRANDED, 250.0 V, 16.0 A
PWR-2KW-DC-CBL	Power Cord - 2KW DC
Spare accessory and rack mount kits for the Cisco Catalyst 9500X Switch	
C9500X-ACCKIT-19I=	Accessory Kit for Cisco Catalyst 9500X Switch - 19" rack mount
C9500X-ACCKIT-23I=	Accessory Kit for Cisco Catalyst 9500X Switch - 23" rack mount

Product number	Product description
C9500X-4PTH-KIT=	Extension rails and brackets for four-point mounting for Cisco Catalyst 9500X Switch
Spare storage options for the Cisco Catalyst 9500X Switch	
C9K-F3-SSD-240GB=	Cisco pluggable SSD storage – 240 GB
C9K-F3-SSD-480GB=	Cisco pluggable SSD storage – 480 GB
C9K-F3-SSD-960GB=	Cisco pluggable SSD storage – 960 GB

For ordering information for Cisco DNA Software for the Cisco Catalyst 9500 Series Switches, go to https://www.cisco.com/c/en/us/products/software/one-access/switching-part-numbers.html.

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Document history

New or revised topic	Described In	Date
Added Meraki Cloud monitoring	Removed Cisco DNA Premier licenses	
Added Custom ASIC template, eWLC without SD-Access, EVPN, MPLS, Programmability, removed ETA and AVC, updated Operating temperature	Product Overview, Platform Details, Specifications	September 28th, 2020
Added NEBS Certification details, 16.11.1 features, VLAN ID correction, SDM template corrections, SVL	Page 13, 14, 15, 22, 23, 24	April 16th, 2019
Cisco Catalyst 9500 Series spec change	Updated Page 3	January 11th 2019
Product highlights changes (switching capacity and ports spec changes)	Updated Page 4	January 11th 2019
Cisco Catalyst 9500 Series configurations and port density spec changes	Updated Page 7	January 11th 2019
Performance spec changes	Updated Page 13	January 11th 2019
Text changes to "Important Note"	Updated Page 14	January 11th 2019
Text changes to "Cisco StackWise Virtual"	Updated Page 16	January 11th 2019
Text changes to "Trustworthy systems" and "Cisco StackWise Virtual"	Updated Page 18	January 11th 2019
Added text for Layer 3 Subinterface and BGP EVPN with VXLAN	Updated Page 20	January 11th 2019
Deleted text for "High-performance IP routing" and spec edits to "Minimum software requirements"	Updated Page 22	January 11th 2019
Text changes to "Licensing" and spec edits to "Network Essentials and Advantage Package Features"	Updated Page 23	January 11th 2019
Text changes to "Cisco DNA Essentials and Advantage Package Features"	Updated Page 24	January 11th 2019
Added product numbers for "Cisco Catalyst 9500 Series"	Updated Page 33	January 11th 2019
Deleted product numbers for "Cisco Catalyst 9500 Series"	Updated Page 34	January 11th 2019
Product highlights changes (switching capacity and ports spec changes)	Updated Page 4	January 11th 2019
Updates to Table 1	Updated Table 1	August 15th 2018
Added clearer description of SKUs, Updated date for Tables 1, 10, 11	Updated SKU descriptions, Table 11 data, Table 10 data, Table 1 Footnotes	July 3rd 2018
Added clearer descriptions of host routes and scale adjacency in hardware	Updated Table 10 Footnotes	June 1st 2018

New or revised topic	Described In	Date
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.	Updated Product Overview	Mar 31st 2018
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.	Updated Audio Video Bridging	Dec 15th 2017

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

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

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