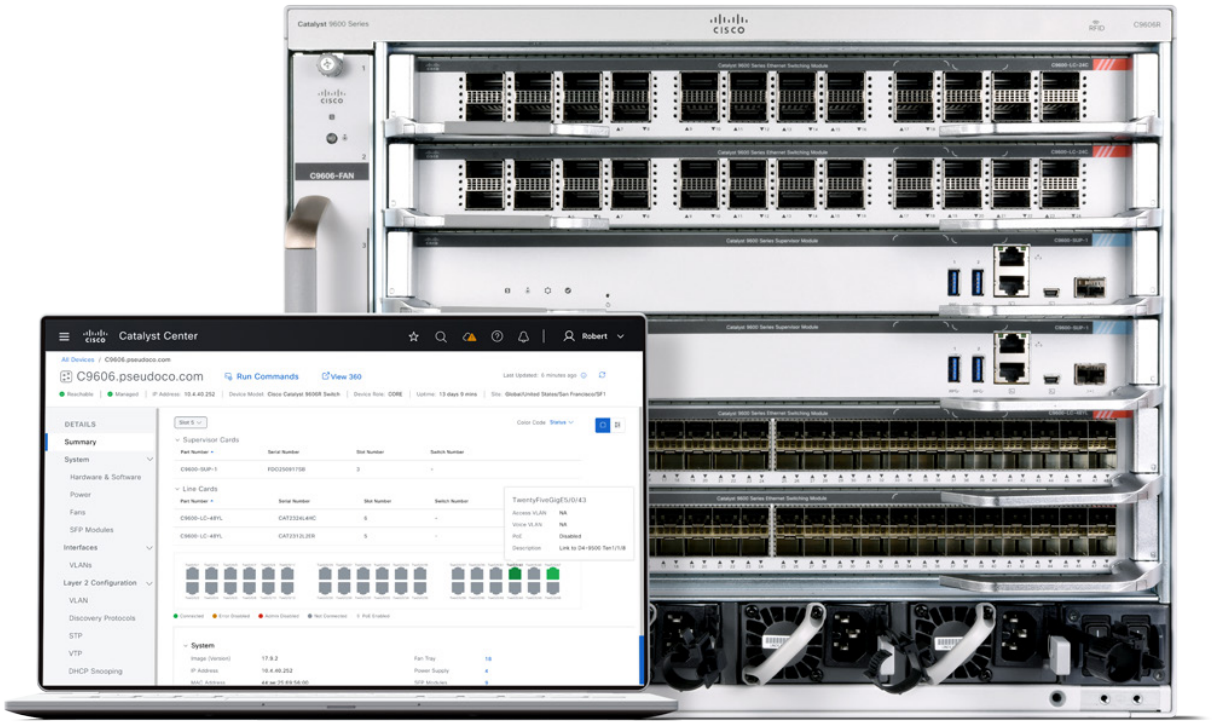
Cisco Catalyst 9600 Series Switches

Contents

Overview

Cisco Catalyst 9600 Series Switches are purpose-built for resiliency at scale and with comprehensive security that allows your business to grow at a low total operational cost. Built upon the foundation of the Catalyst 9000, the Catalyst 9600 Series offers scale and security when always-on is a must.



Platform highlights

As one of the industry's first purpose-built 25/50 Gigabit SFP and 100/400 Gigabit QSFP line of modular switches targeted for the enterprise campus, Catalyst 9600 Series switches deliver exceptional table scale (MAC, IP route, and Access Control List [ACL]) and buffering for enterprise applications.

Key features and benefits

Modular versatility	The Cisco Catalyst 9600 switch offers modular versatility, allowing flexible configurations and upgrades to meet evolving network demands, ensuring a future-ready investment.
Smart operations	Smart operations on the Catalyst 9600 enable simplified management and proactive troubleshooting, reducing operational complexity and costs through intelligent network insights.
High availability and resiliency	High availability and resiliency are core to the Catalyst 9600, featuring redundant components and seamless failover mechanisms to maintain uninterrupted network services.
Performance and scalability	The Catalyst 9600 switch is highly scalable, designed to accommodate growing network environments with increased throughput and expanded port densities as organizational needs evolve.
Advanced security	Advanced security on the Catalyst 9600 protects the network infrastructure with encryption, threat defense, and access control, ensuring a robust security posture.
Automation and analytics	Automation and analytics capabilities of the Catalyst 9600 streamline network operations, offering predictive insights and simplified policy enforcement for optimized network performance.

Cisco IOS XE: A modern, fully programmable, model-driven network operating system

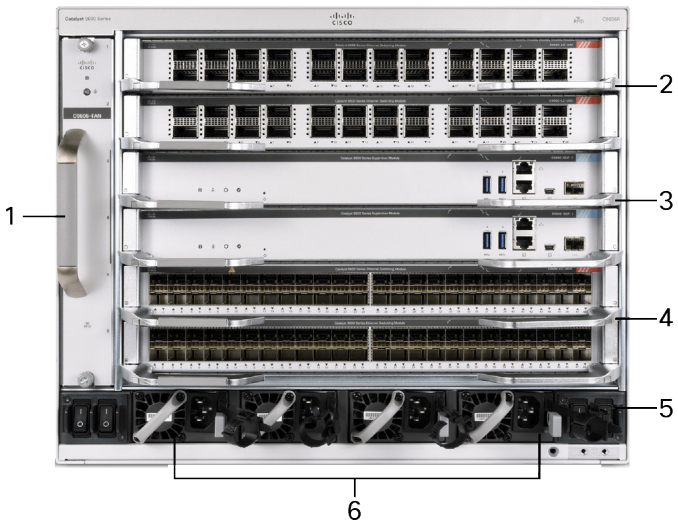
Cisco IOS XE Software opens a new paradigm in network configuration, operation, and monitoring through network automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various automation mechanisms are outlined below.

Cisco IOS XE key features and benefits

Simplified campus automation	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.
Automated device provisioning	Automated device provisioning 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 turnkey solutions such as Plug and Play and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.
API-driven configuration	API-driven configuration is available with modern network switches such as Cisco Catalyst 9600 Series switches. It supports a wide range of automation features and provides robust open APIs over NETCONF and RESTCONF using YANG data models for external tools, both off the shelf and custom built, to automatically provision network resources.
Granular visibility	Granular visibility enables model-driven telemetry to stream data from a switch to a destination. The data to be streamed is identified through subscription to a data set in a YANG model. The subscribed data set is streamed to the destination at specified intervals. Additionally, Cisco IOS XE enables the push model. It provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.
Seamless software upgrades and patching	Seamless ISSU/xFSU software upgrades and SMU patching supports OS resilience. On Cisco Catalyst 9600 Series switches Cisco IOS XE supports hot patching without reboot, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support lets you add patches without having to wait for the next maintenance release.
Trustworthy solutions built with Cisco Trust Anchor Technologies	Trustworthy solutions built with Cisco Trust Anchor Module (TAM/TPM) technologies provide a highly secure foundation for Cisco products. With Cisco Catalyst 9600 Series switches, these technologies enable hardware and software authenticity assurance for supply-chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include image signing, Secure Boot, and Cisco Trust Anchor Module.

Models and specifications

A fully assembled Catalyst 9600 includes the chassis, at least one supervisor engine, at least one line card for network connectivity, a fan tray, and at least two power supplies.



Label	Description
1	Fan tray assembly
2	Line card slots (top)
3	Supervisor module slots
4	Line card slots (bottom)
5	Power switches
6	Power supply modules

Figure 1. Front view of a Cisco Catalyst 9606R

Chassis

Cisco Catalyst 9600 Series switches offer one chassis option, two supervisor options, and multiple line-card options. The Catalyst 9606R chassis provides a common architecture that can scale up to 224 native 10-Gigabit, 25-Gigabit or 50-Gigabit SFP56 Ethernet ports (or up to 256 SFP with QSFP-4SFP breakout cables), and up to 128 native 40-Gigabit or 100-Gigabit QSFP28, or up to 8 native 400-Gigabit QSFP-DD Ethernet ports. The Cisco Catalyst 9600 Series redundant chassis offers High Availability (HA) by supporting 1 + 1 redundant supervisor engines with Stateful Switchover (SSO), Non-Stop Forwarding (NSF), and full-image In-Service Software Upgrades (ISSU). NSF/SSO and ISSU help ensure continuous packet forwarding during supervisor engine switchover to enable HA for business-critical applications.

The Catalyst C9606R chassis is enterprise-campus optimized, with efficient side-to-side airflow and full front accessibility for all removable components, including supervisors, line cards, power supplies, and a fan tray. The chassis also supports optional rear accessibility for the fan tray to enable efficient cable management. The Catalyst 9606R chassis, supervisor, line cards, power supply, and fan tray have embedded RFID tags that facilitate easy asset and inventory management using commercial RFID readers.

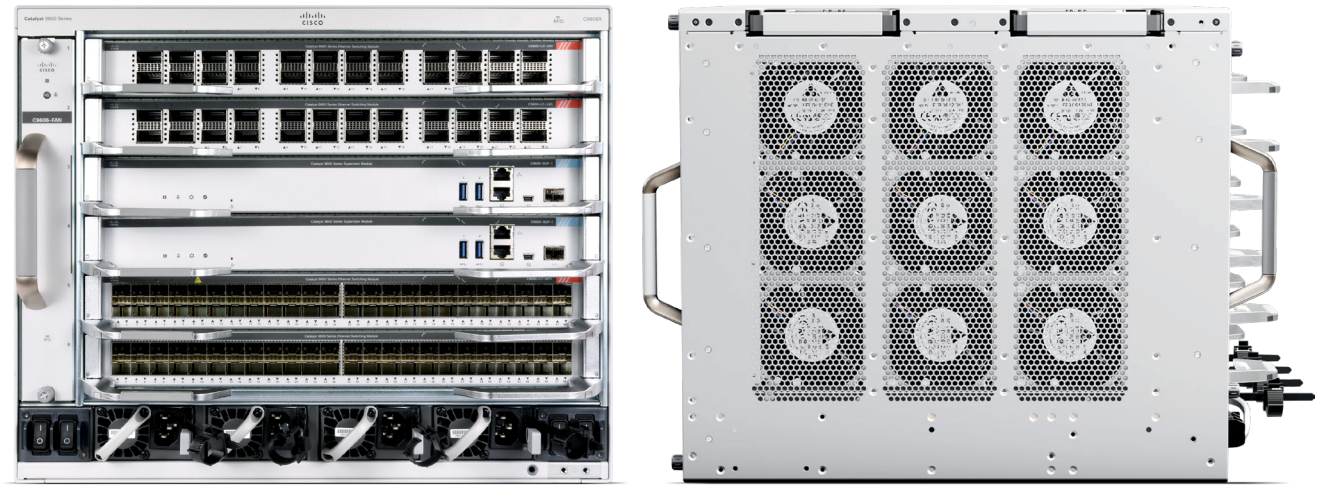


Figure 2. Rear and side view of Catalyst 9600 C9606R chassis

Cisco Catalyst 9606R chassis supports a wired switching capacity of up to 25.6 Tbps (12.8 Tbps full-duplex), with up to 6.4 Tbps (3.2 Tbps full-duplex) of bandwidth per slot.

Table 1. Chassis features

Feature	Cisco Catalyst 9606R chassis
Total number of slots	6
Line card slots	4
Supervisor engine slots	2
Dedicated supervisor engine slot numbers	3 and 4
Supervisor engine redundancy	Yes
Supervisor engines supported	C9600-SUP-1, C9600X-SUP-2
Maximum bandwidth scalability per line-card slot	6.4 Tbps (3.2Tbps full-duplex) with C9600X-SUP-2 2.4 Tbps (1.2Tbps full-duplex) with C9600-SUP-1

Feature	Cisco Catalyst 9606R chassis
Number of power-supply bays	4
Minimum number of power supplies	2[1]
Power supplies supported	3000W AC, 2000W AC, and 2000W DC
Number of fan-tray bays	1 (with 9 redundant fans)

[1] Fully loaded C9606R chassis, Minimum three power supplies required if input voltage is 110V

Table 2. Physical specifications of Cisco Catalyst 9606R Chassis

Description	Specifications
SKU/PID	C9606R
Dimensions (H x W x D)	35.43 x 44.2 x 40.9 cm 13.95 x 17.4 x 16.1 inches
Rack Units (RU)	8
Chassis weight with 2 power supplies (AC) and fan tray	31.31 kg (69.03 lbs)
Input voltage	AC: 90V to 264V, 47 to 63 Hz DC: -40V to -72V
Operating temperature	-5° to 45° C (23° to 113° F) up to 6000 feet (about 1.83 km) -5° to 40° C (23° to 104° F) up to 10,000 feet (about 3.05 km)

Description	Specifications
Storage temperature	-40° to 75° C (40° to 167° F)
Relative humidity, operating and non-operating, non-condensing	10% to 95%, Non-condensing
Altitude	-60 to 3000 meter (-197 to 9843 feet)
Mean Time Between Failures (MTBF) (hours)	C9606R: 4,113,900 C9606-FAN: 452,570 C9600-PWR-3KWAC: 300,000 C9600-PWR-2KWAC: 300,000 C9600-PWR-2KWDC: 300,000
Chassis weight (without fan tray, without PSU)	25.36 kg (55.90 lbs)
Weight of fan tray	3.56 kg (7.85 lbs)
Weight of individual PSUs	AC PSU (3000W): 1.4 kg (3.09 lbs) AC PSU (2000W): 1.2 kg (2.65 lbs) DC PSU (2000W): 1.28 kg (2.82 lbs)
BTU (British Thermal Unit) of 9606R chassis with fan tray	1,621 (max)

Fan tray

Each Cisco Catalyst 9606R chassis uses a single field-replaceable fan tray (C9606-FAN) for cooling. The fan tray can optionally be accessed from the rear for flexible cable management. The chassis is optimized for enterprise-campus wiring closets and rack rooms, with side-to-side airflow. The fan tray is composed of nine independently controlled fans. If any single fan fails, the system will continue to operate without a significant degradation in cooling as fan speeds change dynamically to compensate for fan failure.

Cisco Catalyst 9600 Series fans have a barometric sensor, which allows slower fan speed curves at lower altitudes. The fans also have individual Pulse-Wide Modulation (PWM) fine-tuning to reduce variability in fan revolutions per minute (rpm) under throttled conditions. The measured acoustic noise in a formal NEBS test environment is 77.7 LWAd (dB). The chassis are designed to accommodate fanless operation of up to 90 seconds to enable serviceability.

Figure 3. Cisco Catalyst 9606R chassis with fan tray and fan tray

Power supplies

The Cisco Catalyst 9600 Series Power Supply Units (PSUs) support two modes of operation.

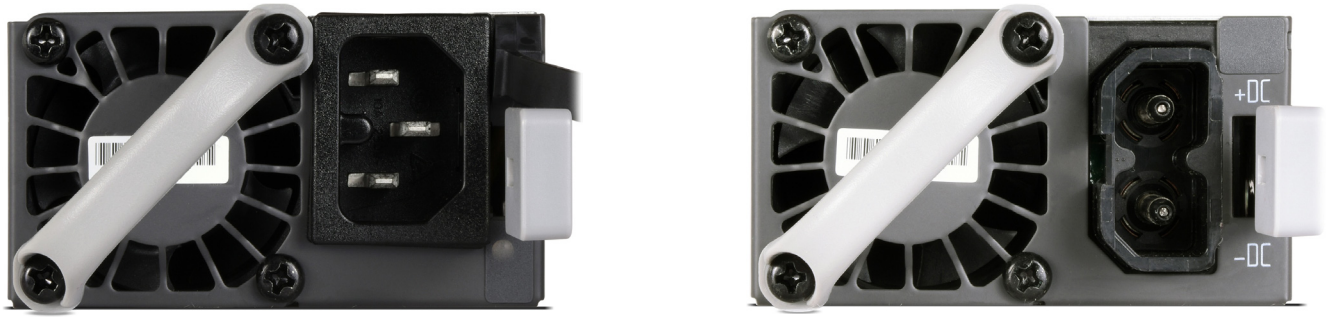


Figure 4. Cisco Catalyst C9606R 2000W AC and DC power supplies

Combined mode

The default Catalyst 9606R chassis power supply mode is Combined. In Combined mode, the total power available for the entire chassis is equal to the sum of the output of all the power supplies, multiplied by the share ratio. Additional power supply units operate at ~90% capacity. In Combined mode, the power supplies need to be of equal wattage. The power supplies can be AC and DC mixed provided AC input voltage is 220V.

- P = Power output of one PSU
- N = Number of PSU (1, 2, 3, or 4)
- Total combined power = P + (N–1) * P * (share ratio)

Redundant N+1 mode

The Catalyst 9606R chassis also supports N+1 redundancy mode, with N independent input circuits and safeguards against the failure of one (+1) of the circuits during a PSU failure. Additional PSUs operate at ~90% capacity. In redundant mode, the power supplies need to be of equal wattage. The power supplies can be AC and DC mixed provided AC input voltage is 220V.

- N = number of PSU are active (1, 2, or 3)
- +1 is the PSU reserved for redundancy

For more information, please visit the Catalyst 9600 Switches System Management Configuration Guide.

Power supply specifications

Table 3. Power supply specifications for Cisco Catalyst 9600 Series switches

Power supply feature	C9600-PWR-3KWAC	C9600-PWR-2KWAC	C9600-PWR-2KWDC
Max power rating[1]	3000W	2000W	2000W
Input voltage range and frequency	90VAC to 140VAC and 180VAC to 264VAC 47 to 63 Hz	90VAC to 140VAC and 180VAC to 264VAC 47 to 63 Hz	-40VDC to -72VDC frequency
Power supply efficiency	94% (typical)	94% (typical)	92% (typical)
Input current	17.6A max at 115VAC (1500W) 17.6A max at 230VAC (3000W)	10.5A max at 115VAC (1050W) 10.5 A max at 230VAC (2000W)	Maximum: 60A per DC input at -40VDC input (when full PSU loading)
Output ratings	12Vmain at 125A (15000W) 12Vmain at 250A (3000W)	12Vmain at 88A 12Vmain at 167A	12Vmain at 167A

Power supply feature	C9600-PWR-3KWAC	C9600-PWR-2KWAC	C9600-PWR-2KWDC
Output holdup time	AC = 20 ms minimum for system	AC = 20 ms minimum for system	AC = 5 ms minimum for system
Power-supply input receptacles	AC IEC 60320 C20	AC IEC 60320 C16	Amphenol C10-638976-000
Power-cord rating	AC 20A	AC 15A	DC 70A

[1]The power listed is the absolute maximum. Typically, the power would be 70% of absolute maximum.

Table 4. Cisco Catalyst 9600 Series power cord options

Power supply	Product number	Power cable options by country
C9600-PWR-3KWAC	CAB-9K20A-NA	North America/Japan 20A, 125VAC
	CAB-9K16A-US2	US/Japan 16A, 250VAC
	CAB-9K16A-AUS	Australia 16A, 250VAC
	CAB-9K16A-CH	China 16A, 250VAC
	CAB-9K16A-INT	International 16A, 250VAC
	CAB-9K16A-SW	Switzerland 16A, 250VAC
	CAB-9K16A-EU	Continental Europe 16A, 250VAC
	CAB-C19-CBN	Cabinet Jumper 16A, 250VAC
C9600-PWR-2KWAC	CAB-TA-CN	China AC Type A Power Cable
	CAB-TA-IS	Israel 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-IT	Italy AC Type A Power Cable

Power supply	Product number	Power cable options by country
	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
	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-ACBZ-12A	AC Power Cord (Brazil) 12A/125V BR-3-20 plug up to 12A
C9600-PWR-2KWDC	PWR-2KW-DC-CBL	Power Cord - 2KW DC

For detailed power installation instructions, please visit the Cisco Catalyst 9600 Series Switches Hardware Installation Guide.

Power consumption

Power consumption depends on the hardware configuration, that is, the specific supervisor engine and line cards installed and the power supplies. To model the power consumption for a specific hardware configuration, please visit the Cisco Power Calculator.

Supervisor engines

Cisco Catalyst 9600 Series switches offer industry-leading supervisor engines built for secure networks, IoT applications, next-generation mobility, and cloud adoption.

The Catalyst 9600 Supervisor Engine 1 (SUP-1) is built with the latest UADP 3.0 ASIC, with its programmable pipeline and template-based, configurable allocation of Layer 2 and Layer 3 forwarding, ACLs and QoS entries, making it optimal for next-generation Campus Distribution or Collapsed-Core designs.

The new Catalyst 9600X Supervisor Engine 2 (SUP-2) is based on the new Cisco Silicon One Q200 ASIC, which is purpose-built for the next-generation Campus Core and Edge designs with high-performance and scale routing and switching capabilities.

Cisco Catalyst 9600X Supervisor Engine 1

Supervisor Engine 1 use cases:

- C9600-SUP-1 is specifically designed for customers focusing on Layer 3 (core or collapsed-core) deployments with medium L2 and L3 forwarding scale and features, and higher ACL scale.
- Intended for combined L2 and L3 (distribution/aggregation) deployments, with comprehensive features.
- Provides bandwidth for dense medium-speed interfaces from 1G-25G SFP and 40G-100G QSFP, with optimized QoS buffers.
- Suitable for medium-scale VXLAN deployment as SDA LISP or BGP EVPN Border/Spine nodes, along with advanced Campus technologies such as NAT, VPLS and mVPN.

Supervisor Engine 1 highlights:

- The Cisco UADP 3.0 ASIC is future-ready for next-generation core technologies, with a programmable pipeline, micro-engine capabilities, and template-based customizable allocation of Layer 2, Layer 3, forwarding, ACL, and Quality-of-Service (QoS) entries.
- Cisco UADP 3.0 ASIC offers speeds up to 9.6 Tbps (4.8 Tbps full duplex) with up to 3 Bpps of forwarding performance.
- Cisco UADP 3.0 ASIC is the first to support double-width hardware tables with equivalent table size and processing performance for IPv4 and IPv6.
- Up to 108 MB of buffer (36 MB of unified buffer per ASIC).
- Intel 2.0-GHz x86 CPU with 8 cores and 16GB of DDR4 memory.
- Up to 960 GB of SATA SSD local storage for container-based application hosting.
- Line-rate, hardware-based Flexible NetFlow (FNF) delivers flow collection for up to 294,000 flows.
- IPv6 support in hardware provides wire-rate forwarding for IPv6 networks.
- Dual-stack support for IPv4 and IPv6 and dynamic hardware forwarding table allocations enable easy IPv4-to-IPv6 migration.
- Flexible routing (IPv4, IPv6, and multicast) tables, Layer 2 tables, ACL tables, and QoS tables.

Cisco Catalyst 9600X Supervisor Engine 2

Supervisor Engine 2 use cases:

- C9600X-SUP-2 is specifically designed for customers focusing on Layer 3 (core or edge) deployments with large L2 and L3 forwarding scale, with baseline L2 features and optimized ACL scale.
- Intended for campus gateway (internet) deployments that require high IPv4 or IPv6 route scale.
- Provides bandwidth for dense high-speed interfaces from 10G-50G SFP and 40G-400G QSFP, with deep QoS buffers.
- Suitable for high-scale VXLAN deployment as SDA LISP or BGP EVPN border/spine nodes.

Supervisor Engine 2 highlights:

- The Cisco Silicon One Q200 (ASIC) is purpose-built for the next generation network core and edge switch.
- Cisco Silicon One Q200 ASIC offers speeds up to 25.6 Tbps (12.8 Tbps full duplex) with up to 8 Bpps of forwarding performance.
- Cisco Silicon One Q200 ASIC is built on 7nm fabrication technology, capable of high performance while maintaining a low power footprint.
- Cisco Silicon One Q200 ASIC includes an 8GB on-chip 2.5D High Bandwidth Memory (HBM), for deep packet buffers and route table expansion.
- 80MB of dedicated low-latency buffer, with up to 8GB of HBM buffer.
- Intel 2.7-GHz x86 CPU with 8 cores and 32GB of DDR4 memory.
- Up to 960 GB of SATA SSD local storage for container-based application hosting (2x 10G SFP+ management ports).
- ASIC tables for switching scale up to 256K MAC addresses and IP routing scale up to 2M routes.
- IPv6 support in hardware provides wire-rate forwarding for IPv6 networks.
- Dual-stack support for IPv4 and IPv6 and dynamic hardware forwarding table allocations enable easy IPv4-to-IPv6 migration.
- Flexible routing (IPv4, IPv6, and multicast) tables, Layer 2 tables, ACL tables, and QoS tables.

Supervisor engine comparison

The Catalyst 9600 series Supervisor Engine 1 (with Cisco UADP 3.0) and Supervisor Engine 2 (with Cisco S1 Q200) are intended to be complementary products, and each model offers unique capabilities to meet specific networking needs. Each model plays a crucial and distinctive role in our portfolio. Both products may coexist in the same network, operating in complementary roles.

Table 5. Feature comparison for Cisco Catalyst 9600 Series supervisor engines

Model	C9600-SUP-1	C9600X-SUP-2
Resiliency and high availability		
Software Maintenance Upgrade (SMU)	✔	✔
Cisco StackWise Virtual	✔	✔
Cisco StackWise Virtual (QuadSup RPR)	✔	✘ (See Note 2)
Stateful Switchover (SSO)	✔ (2 SUP, SVL)	✔ (2 SUP, SVL)
In-Service Software Upgrade (ISSU)	✔ (2 SUP, SVL)	✔ (2 SUP, SVL)
Graceful Insertion and Removal (GIR)	✔	✔
MKA high availability	✔	✔ (See note 1)
Enterprise security		
Trustworthy solutions	✔	✔
Image signing	✔	✔
Secure boot	✔	✔
Cisco Trust Anchor module	✔	✔
MACsec encryption (256-bit AES-GCM)	✔	✔
Cisco WAN MACsec (256-bit AES-GCM)	✘	✔ (See note 4)
Object-Group ACLs (IPv4/IPv6)	✔	✔ (See note 3)

Model	C9600-SUP-1	C9600X-SUP-2
Enterprise QoS		
Modular QoS CLI (MQC)	✔	✔
Strict priority queuing	✔	✔
Class/color-aware queuing	✔ (WFQ)	✔ (VoQ)
Policing/metering	✔	✔
Shaping/bandwidth	✔	✔
Hierarchical QoS	✔ (2-level)	✔ (2-level)
IP routing		
Routing Information Protocol version 2 (RIPv2), and next generation (RIPng)	✔	✔
Open Shortest Path First version 2 (OSPFv2), and OSPFv3	✔	✔
Enhanced Interior Gateway Routing Protocol (EIGRP), and EIGRPv6	✔	✔
Intermediate System-to-Intermediate System Version 4 (IS-ISv4)	✔	✔
Border Gateway Protocol version 4 (BGPv4), and BGPv6	✔	✔
Protocol-Independent Multicast (PIM) Sparse- Mode (PIM- SM)	✔	✔
Protocol-Independent Multicast (PIM) Source-Specific Mode (PIM-SSM)	✔	✔
Bidirectional PIM (BIDIR-PIM)	✔	✘ (See Note 2)
IPv6 routing	✔	✔
L3 routed subinterfaces	✔	✔

Model	C9600-SUP-1	C9600X-SUP-2
Multiprotocol Label Switching (MPLS)		
MPLS L3 VPN	✔	✔
Ethernet over MPLS (EoMPLS)	✔	✔
Virtual Private LAN Service (VPLS)	✔	✘ (See Note 2)
MPLS over GRE	✔	✘ (See Note 2)
MPLS Traffic-Engineering (MPLS-TE)	✔	✔ (See note 2)
BGP Ethernet VPN (EVPN) VXLAN		
Fabric spine, leaf and border Support	✔	✔
L2/L3 Virtual Network Interface (VNI)	✔	✔
Distributed anycast gateway (symmetric IRB)	✔	✔
Centralized gateway (asymmetric IRB)	✔	✘
ESI multihome support	✔	✘
Tenant Routed Multicast (IPv4/IPv6)	✔	✔
L3 border handoff: Multi-VRF, MPLS L3VPN	✔	✔
L2 border handoff: VPLS, EoMPLS L2VPN	✔	✘
Software-Defined Access (SD-Access)		
Virtual extensible LAN (VXLAN)	✔	✔
L2 Virtual Network Interface (VNI)	✔	✔
L3 Virtual Network Interface (VNI)	✔	✔
SD-Access control plane	✔	✔

Model	C9600-SUP-1	C9600X-SUP-2
SD-Access border	✔	✔
SD-Access Layer 2 border	✔	✖
SD-Access edge	✖	✖
Flexible NetFlow (FNF)		
FNF IPv4 flow records	✔	✔ (Software, See note 1)
FNF IPv6 flow records	✔	✔ (Software, See note 1)<
FNF sampler	✔	✔ (See note 1)
FNF data export	✔	✔ >(See note 1)
NetFlow version 9 (NFv9) export	✔	✔ (See note 1)
IPFIX export	✔	✔ (See note 1)
Programmability		
NETCONF	✔	✔
RESTCONF	✔	✔
gNMI/gNOI	✔	✔
YANG models	✔	✔
ZTP/PnP	✔	✔
Smart operations		
Bluetooth wireless UI	✔	✔
RFID tags	✔	✔
Blue beacon	✔	✔

Model	C9600-SUP-1	C9600X-SUP-2
Out-of-Band management	✔	✔
Maximum bandwidth per slot	2.4 Tbps (1.2 Tbps full-duplex)	6.4 Tbps (3.2 Tbps full-duplex)
Minimum software requirement	IOS XE 16.11.1	IOS XE 17.7.1

[1] C9600X models: minimum IOS XE software release 17.8.1.

[2] C9600X models: feature is not available at FCS, but it is hardware capable.

[3] C9600X models: Object Group ACLs are supported only in the ingress direction.

[4] Need to order Catalyst 9000 HSEC License.

Table 6. Switch performance

Feature	C9600-SUP-1	C9600X-SUP-2
System switching capacity	Up to 9.6 Tbps (4.8 Tbps full-duplex)[1]	Up to 25.6 Tbps (12.8 Tbps full-duplex)[1]
Per-slot switching capacity	Up to 2.4 Tbps (1.2 Tbps full-duplex)	Up to 6.4 Tbps (3.2 Tbps full-duplex)
ASICs	3x UADP 3.0	1x Q200
Forwarding rate	3 Bpps (1 Bpps per ASIC)	8 Bpps
DRAM	16 GB	32 GB
Flash	16 GB	16 GB
SSD capacity	Up to 960 GB	Up to 960 GB
VLAN IDs	4,094	4,096[4]
PVST instances	1,000[2]	40,96[4]

Feature	C9600-SUP-1	C9600X-SUP-2
STP virtual ports (Port*VLANs) for PVST	16,000	32,000
STP virtual ports (Port*VLANs) for MST	100,000	100,000
Switched Virtual Interfaces (SVIs)	1,000[2]	4,096
Jumbo frames	9,216	9,216
Total number of MAC addresses	Up to 128,000[2,3]	Up to 256,000[2]
Total number of IPv4 routes	Up to 256,000 (indirect + direct) [2,3,4]	Up to 2,000,000[2,3,4]
Total number of IPv6 routes	Up to 256,000[2,3,4]	Up to 1,000,000[2,3,4]
Address Resolution Protocol (ARP) entries	Up to 90,000	Up to 128,000
Neighbor Discovery Protocol (NDP) entries	Up to 128,000	Up to 128,000
IGMP/MLD snooping entries	Up to 16,000[2]	Up to 16,000[2]
Multicast routes	Up to 32,000[2]	Up to 32,000[2]
QoS ACL scale (IPv4/IPv6)	Up to 16,000/8,000[2]	Up to 8,000/4,000[2]
Security ACL scale (IPv4/IPv6)	Up to 27,000/13,500[2]	Up to 8,000/4,000[2]
GRE Tunnels	Up to 1,024	Up to 1,024
MACsec sessions	Up to 2,000	Up to 1,024 per PHY

Feature	C9600-SUP-1	C9600X-SUP-2
NetFlow entries (IPv4/IPv6)	Up to 384,000 (full, 128,000 per ASIC)[2,3]	Up to 2,000,000 (sampled)
Packet buffer	Up to 108 MB (36 MB per ASIC)	80 MB (shared memory system) + 8 GB (high-bandwidth memory)

[1] Based on C9606R chassis with 4 line cards operating at 2.4 Tbps.

[2] Varies based on selected flexible SDM ASIC template.

[3] Total routes are shared between IPv4 and IPv6.

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

Cisco Catalyst 9600 Series switches have flexible interface types and port densities that allow you to mix and match network configurations to meet the specific needs of campus networks. See the following table for more information.

Table 7. Maximum chassis port densities

Cisco Catalyst 9606R Chassis	C9600-SUP-1	C9600X-SUP-2
400G	-	8
200G	-	8[4]
100G	48	128
50G	-	224
40G	96	128
25G	192	256[2]
10G	192	256[2]
5G[1]	192	-

Cisco Catalyst 9606R Chassis	C9600-SUP-1	C9600X-SUP-2
2.5G[1]	192	-
1G	192	8[3]
100M[1]	192	-
10M[1]	192	-

[1] C9600-LC-48TX (Multigigabit Ethernet RJ45).

[2] QSFP-4SFP Breakout Cable.

[3] C9600X-SUP-2 requires SFP-1G-SX or SFP-1G-LR with compatible line cards (see Cisco TMG Matrix for details)

[4] Hardware-ready (based on TMG availability).

Supervisor engine specifications

The following table lists physical specifications of Catalyst 9600X Supervisor Engine 2 and Supervisor Engine 1.

Table 8. Physical specifications for Catalyst 9600X Supervisor Engines

Description	Specifications
SKU	C9600-SUP-1, C9600X-SUP-2
Dimensions (H x W x D)	1.7 x 15.0 x 13.41" (4.32 x 38.1 x 34.06 cm) to faceplate 1.7 x 15.0 x 15.7" (4.32 x 38.1 x 39.88 cm) to ejector
Weight	5.45 Kg (12.02 lbs)
Rack units (RU)	1 RU
Operating temperature	-5° to 45° C (23° to 113° F) up to 6,000 feet -5° to 40° C (23° to 104° F) up to 10,000 feet
Storage temperature	-40° to 70° C (40° to 158° F)
Relative humidity, operating and non-operating, non-condensing	10% to 95%, noncondensing

Description	Specifications
Altitude	-60 to 3,000 m (-197 to 9843 feet)
Mean Time Between Failures (MTBF) (hours)	C9600-SUP-1: 271,420 C9600X-SUP-2: 305,880

Supervisor ASIC templates

Cisco Catalyst 9000 Series switches use flexible Software Database Manager (SDM) ASIC templates to enable universal deployments by leveraging the ASIC's ability to flexibly allocate resources to optimize table sizes for different places in the network.

Based on how the switch is used in the network, an appropriate standard SDM ASIC template may configured for specific features. The Catalyst 9600 Series Supervisor Engines support two types of SDM ASIC templates:

- Standard SDM templates: These are predefined (static) templates, based on the primary requirements for specific places in the network.
  - This includes the "default" SDM template, which is available without configuration. The default SDM template for Catalyst 9600 is the "core" template.
- Custom SDM templates: These are user-configured templates, using a set of Forwarding (FIB) and/or Access-Control (ACL) allocation parameters.

For more information, please visit Configuring SDM templates.

1. SDM templates - C9600-SUP-1

The following sections describe the Flexible ASIC SDM templates for C9600-SUP-1

Standard SDM ASIC templates

The following table describes the standard SDM ASIC templates for C9600-SUP-1

Table 9. SDM template descriptions for C9600-SUP-1

Features	Distribution template	Core template (default)	NAT template
MAC addresses	82,000	32,000	32,000
IPv4/IPv6 routes (LPM/host)	114,000	212,000	212,000
Multicast routes	16,000	32,000	32,000
IGMP/MLD snooping	2,000	2,000	2,000
MPLS/SGT label	32,000	32,000	32,000
NetFlow entries	98,000	64,000	64,000
NetFlow ACL	1,000 ingress, 1,000 egress	1,000 ingress, 1,000 egress	1,000 ingress, 1,000 egress
Security ACLs	270,00[1]	270,00[2]	200,00[1]
QoS ACLs	160,00[1]	160,00[2]	80,00[1]
PBR/NAT	3,000	3,000	15,500
Tunnel/MACsec	3,000	3,000	2,000
LISP	1,000	1,000	1,000
STP instances	1,000	1,000	1,000
CoPP	1,000	1,000	1,000

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

Performance and scalability numbers are per ASIC where applicable, with three ASICs in the Catalyst 9600 Series Supervisor Engine 1.

Custom ASIC templates

Beginning with the Cisco IOS XE 17.3.1 release, a custom SDM template will allow you to configure the Forwarding (FIB) and Access-Control (ACL) features of the template based on your requirements.

Table 10. Custom template configurable FIB values for C9600-SUP-1

Features	Scale values (min to 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] MPLS labels require double entries.

[3] NetFlow records require double entries.

Table 11. Custom template configurable ACL values

Features	Scale values (min to max)	Step units	Default value
Security ACL—input	6,000 – 21,000	10-90%	6,000
Security ACL—output	6,000 – 21,000	10-90%	21,000
QoS ACL—input	2,000 – 14,000	10-90%	8,000
QoS ACL—output	2,000 – 14,000	10-90%	8,000
NetFlow ACL—input	250 – 750	10-90%	512

Features	Scale values (min to max)	Step units	Default value
NetFlow ACL—output	250 – 750	10-90%	512
Flow SPAN—input	250 – 750	10-90%	512
Flow SPAN—output	250 – 750	10-90%	512
Total resources	54,000		

2. SDM templates – C9600X-SUP-2

The following sections describe the Flexible ASIC SDM templates for C9600X-SUP-2.

Default SDM ASIC template

The following table describes the default SDM ASIC (Core) template for C9600X-SUP-2.

Table 12. SDM template descriptions for C9600X-SUP-2

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

Features	Default template
PBR/NAT[3]	16,000
GRE Tunnels	1,024
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.

Custom ASIC templates

Beginning with the Cisco IOS XE 17.7.1 release, a custom SDM template allows you to configure several Forwarding (FIB) features of the template based on your requirements. Note that Access-Control (ACL) customization is not supported and uses a shared (first-come, first-serve) model.

The following table describes the Custom SDM ASIC templates for C9600X-SUP-2.

Table 13. Custom template FIB configurable values for C9600X-SUP-2

Features	Default value	Scale values (min to max)	Step units
MAC addresses	128,000	32,000[1] – 256,000	1,000
IPv4 host routes	128,000	32,000[1] – 256,000	1,000
IPv6 host routes	64,000	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] – 512,000	1,000
Total resources	608,000		

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

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

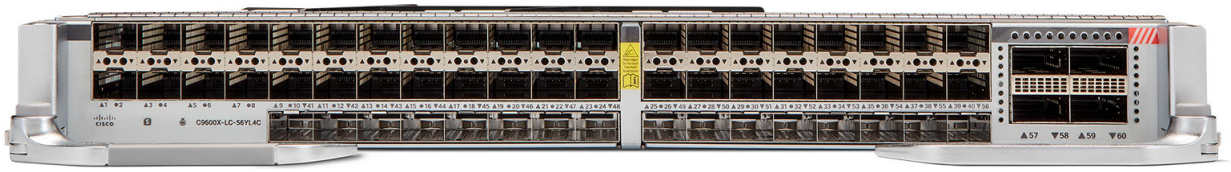
[3] Per-prefix labels are divided into internal (iBGP) and external (eBGP).

Line cards

Line cards provide the physical network ports and are essential modular components that enhance the adaptability and performance of Cisco Catalyst 9600 Series switches, meeting diverse network requirements and helping to protect the investment in network infrastructure.

Line card models

C9600X-LC-56YL4C



56-port 50/25/10GE, 4-port 100GE line card

Line card use cases:

- C9600X-LC-56YL4C combo card is specifically designed for high port-density Campus Core or Distribution designs, with majority SFP optics.
- The unique 3-row 1RU design provides 56 ports of multi-rate SFP56 ports to connect to downstream devices (for example, Access switches).
- The same line card also provides 2 ports of multi-rate QSFP28 ports to connect to upstream devices (for example, SP or DC switches), without need for addition modules.

Line card highlights:

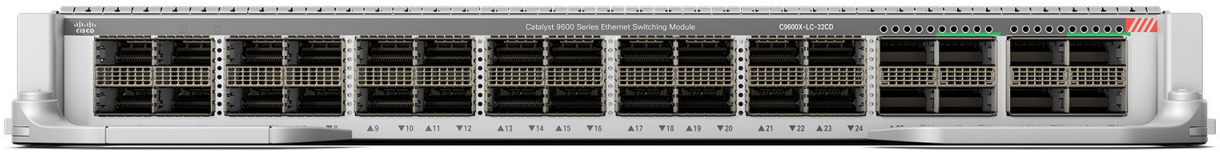
- Paired with **C9600X-SUP-2** (3.2 Tbps full-duplex bandwidth), this line card provides up to 56 ports of 50/25/10GE, 4 ports of 40/100GE non-blocking.
- 50/25/10/1GE[1] SFP56, 100GE QSFP28 ports.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec and WAN MACsec encryption algorithm[2].

Notes:

[1] C9600X-SUP- 2 only supports SFP-1G-SX/LH optics for 1Gbps. See Cisco TMG Matrix or IOS-XE 17.14.1 Release Notes for details.

[2] WAN MACsec is supported only on C9600X-SUP-2 and HSEC license required.

C9600X-LC-32CD



30-port 100/40GE, 2-port 200GE, 2-port 400GE line card

Line card use cases:

- C9600X-LC-32CD combo card is specifically designed for high port-density Campus Core or Edge designs, with majority QSFP optics.
- Able to support 32 line-rate QSFP28 ports for maximum high-speed upstream or downstream connections.
- Able to convert four QSFP28 ports into two QSFP-DD port for high-speed connections to upstream devices (for example, SP or DC switches).

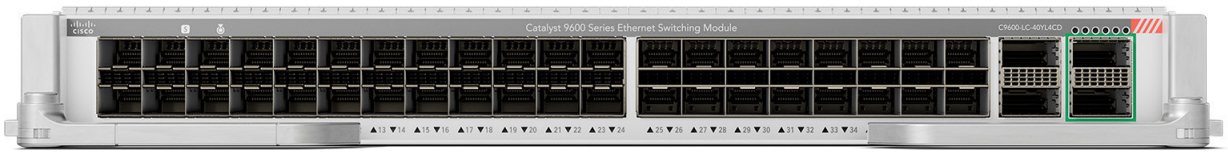
Line card highlights:

- Paired with **C9600X-SUP-2** (3.2 Tbps full-duplex bandwidth), this line card provides up to 30 ports of 100/40 GE, 2 ports of 400/200/100 GE non-blocking.
- 100/40 GE QSFP28, 400/200 GE QSFP-DD ports.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec and WAN MACsec encryption algorithm[1].

Notes:

[1] **WAN MACsec is supported only on C9600X-SUP-2 and HSEC license required.**

C9600-LC-40YL4CD



40-port 50/25/10GE, 2-port 200GE, 2-port 400GE line card

Line card use cases:

- C9600X-LC-40YL4CD combo card is specifically designed for medium-high port-density Campus Core or Distribution designs, with both SFP and QSFP optics.
- The traditional 2-row 1RU design provides 40 ports of multi-rate SFP56 ports to connect to downstream devices (for example, Access switches).
- The same line card also provides 2 ports of multi-rate QSFP28 ports and two port of multi-rate QSFP-DD to connect to upstream devices (for example, SP or DC switches), without need for addition modules.
- This line card can also operate with both Supervisor Engine 2 or Supervisor Engine 1, providing increased flexibility and reusability.

Line card highlights:

- Paired with **C9600X-SUP-2** (3.2 Tbps full-duplex bandwidth), this line card provides up to 40 non-blocking ports of 50/25/10/1GE[1], 2 ports of 40/100/2002 GE and 2 ports of 400GE.
- Paired with **C9600-SUP-1** (1.2 Tbps full-duplex bandwidth), this line card provides up to 40 non-blocking ports of 25/10/1GE and 2 ports of 40/100GE.
- 50/25/10GE SFP56, 100GE QSFP28, 200GE[2] QSFP56 and 400GE QSFP-DD ports.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec and WAN MACsec encryption algorithm[3].

Notes:

[1] C9600X-SUP-2 only supports SFP-1G-SX/LH optics for 1Gbps. See Cisco TMG Matrix or IOS-XE 17.14.1 Release Notes for details.

[2] Hardware-capable with C9600X-SUP-2.

[3] WAN MACsec is supported only on C9600X-SUP-2 and HSEC license required.

C9600-LC-24C

24-port 100/40GE line card

Line card use cases:

- C9600-LC-24C line card is specifically designed for medium port-density Campus Core designs, with majority QSFP optics.
- Able to support 24 line-rate QSFP28 ports for high-density high-speed upstream or downstream connections.
- This line card can also operate with both Supervisor Engine 2 or Supervisor Engine 1, providing increased flexibility and reusability.

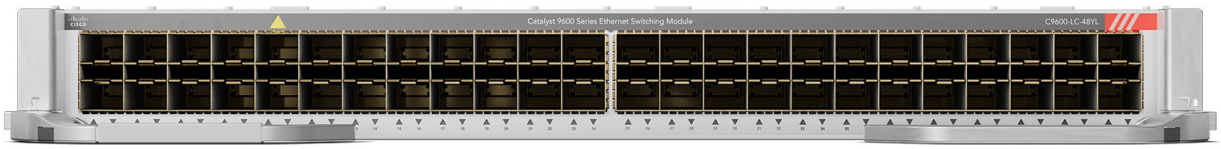
Line card highlights:

- Paired with **C9600-SUP-1** (1.2 Tbps full-duplex bandwidth), this line card provides up to 24 non-blocking ports of 40 GE or 12 non-blocking ports of 100 GE.
- Paired with **C9600X-SUP-2** (3.2 Tbps full-duplex bandwidth), this line card provides up to 24 non-blocking ports of 100/40 GE.
- 40 GE, 100 GE QSFP28 ports.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec-256 encryption algorithm is available on the UADP 3.0 ASIC[1].

Notes:

[1] **This line card does not support MACsec with C9600X-SUP-2.**

C9600-LC-48YL



48-port 50[1]/25GE/10GE/1GE line card

Line card use cases:

- C9600-LC-48YL line card is specifically designed for high port-density Campus Core or Distribution designs, with majority SFP optics.
- Able to support 48 line-rate SFP56 ports for high-density high-speed upstream or downstream connections.
- This line card can also operate with both Supervisor engine 2 or Supervisor engine 1, providing increased flexibility and reusability.

Line card highlights:

- Paired with **C9600-SUP-1** (1.2 Tbps full-duplex bandwidth), this line card provides up to 48 nonblocking ports of 25/10/1GE[2].
- Paired with **C9600X-SUP-2** (3.2 Tbps full-duplex bandwidth), this line card provides up to 48 nonblocking ports of 50[1]/25/10/1GE[2].
- 50[1], 25, 10, and 1 GE[2] SFP28, SFP+ ports.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec-256 encryption algorithm is available on the UADP ASIC[3].

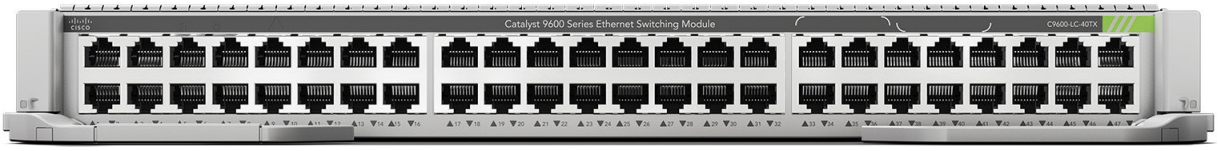
Notes:

[1] 50GE support is available only on C9600X-SUP-2.

[2] C9600X-SUP-2 only supports SFP-1G-SX/LH optics for 1Gbps. See Cisco TMG Matrix or IOS-XE 17.14.1 Release Notes for details.

[3] This line card does not support MACsec with C9600X-SUP-2.

C9600-LC-48TX



48-port multigigabit RJ45 copper line card

Line card use cases:

- C9600-LC-48TX line card is specifically designed for high port-density Campus Distribution or Access designs, with majority MultiGigabit (mGiG) RJ45 ports.
- Able to support 48 line-rate 10G-baseT mGig ports for high-density high-speed downstream connections, based on copper cabling.
- This line card can also operate with both Supervisor Engine 2 or Supervisor Engine 1, providing increased flexibility and reusability.

Line card highlights:

- Supported on C9600-SUP-1 and C9600X-SUP-2.
- 48 ports nonblocking.
- 10GE, 5GE, 2.5GE, 1GE, 100Mbps multigigabit RJ45 copper ports[1].
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec-256 encryption algorithm is available on the UADP 3.0 ASIC[2].

Notes:

[1] Only 10 GE supported on C9600X-SUP-2.

[2] This line card does not support MACsec with C9600X-SUP-2.

C9600-LC-48S

48-port 1GE line card

Line card use cases:

- C9600-LC-48S line card is specifically designed for high port-density Campus Distribution or Access designs, with majority SFP optics.
- Able to support 48 line-rate SFP+ ports for high-density high-speed upstream or downstream connections.

Line card highlights:

- Supported only on C9600-SUP-1.
- 48 ports nonblocking 100M/1GE.
- Advanced Encryption Standard 256 (AES-256) support with the powerful MACsec-256 encryption algorithm is available on the UADP 3.0 ASIC[1].

Notes:

[1] UADP 3.0 ASIC is part of Supervisor Engine 1.

Line card compatibility

Cisco Catalyst 9600 Series switches offers the ability to mix and match a range of line cards to support numerous cores and distribution deployments. Supported line cards are listed in the following tables by part number.

Table 14. Line card-compatibility and minimum software requirement

Product number	Description	C9600-SUP-1	C9600-SUP-2
C9600X-LC-56YL4C	Cisco Catalyst 9600 Series Combo line card 56 ports 50/25/10GE SFP56 4 ports 100/40GE QSFP28 uplinks	Not supported	17.13.1
C9600X-LC-32CD	Cisco Catalyst 9600 Series Combo line card 30 ports 10 0/40GE QSFP28 2 ports 400/2002/100/40GE QSFP-DD	Not supported	17.9.1
C9600-LC-40YL4CD	C9600-LC-40YL4CD Cisco Catalyst 9600 Series Combo line card 40 ports 1/10/25GE SFP and 2 ports 40/100GE QSFP Uplinks	17.7.1	17.7.1
C9600-LC-24C	Cisco Catalyst 9600 Series 24-port 40GE/12-Port 100GE	16.11.1	17.7.1
C9600-LC-48YL	Cisco Catalyst 9600 Series 48-port 25GE/10GE/1GE	16.11.1	17.7.1
C9600-LC-48TX	Cisco Catalyst 9600 Series 48-port RJ45 Copper - 10GE/5GE/2.5GE/1GE/100Mbps/10Mbps	17.1.1	17.7.1
C9600-LC-48S	Cisco Catalyst 9600 Series 48-Port 1GE	17.2.1	Not supported

Line card specifications

Table 15. Port information

Line Card	Port Speed	Maximum ports with C9600-SUP-1	Maximum ports with C9600X-SUP-2
C9600X-LC-56YL4C	1 GE	NA	8[3]
	25, 10 GE	NA	256[1]
	50 GE	NA	256[1]
	100 GE	NA	16
C9600X-LC-32CD	40 GE	NA	128
	100 GE	NA	128
	200 GE	NA	8
	400 GE	NA	8
C9600-LC-40YL4CD	1 GE	160	8[3]
	25, 10 GE	192	256[1]
	50 GE	NA	256[1]
	100 GE	8	16
	200 GE	NA	8
	400 GE	NA	8
C9600-LC-24C	40 GE	96	96
	100 GE	48	96
	10 GE2	96	96

Line Card	Port Speed	Maximum ports with C9600-SUP-1	Maximum ports with C9600X-SUP-2
C9600-LC-48YL	1 GE	192	8[3]
	25, 10 GE	192	192
	50 GE	NA	192
C9600-LC-48S	1 GE	192	NA
C9600-LC-48TX	5GE, 2.5GE, 1GE, 100M, 10M	192	NA
	10 GE	192	192

[1] Breakout support in roadmap, not available at FCS.

[2] With CVR adapter.

[3] C9600X-SUP-2 only supports SFP-1G-SX/LH optics for 1Gbps. See Cisco TMG Matrix for details.

Table 16. Power details

Line Card	Max rated power C9600-SUP-1	Max rated power C9600X-SUP-2
C9600X-LC-56YL4C	NA	420 W
C9600X-LC-32CD	NA	420 W
C9600-LC-40YL4CD	420 W	420 W
C9600-LC-24C	200 W	280 W
C9600-LC-48YL	230 W	300 W
C9600-LC-48TX	315 W	315 W
C9600-LC-48S	160 W	NA

Catalyst 9600X-SUP-2 provides higher power to support higher high port speeds and density.

Table 17. Mean Time Before Failure (MTBF)

Line Card	MTBF (Hours)
C9600X-LC-56YL4C	580,420
C9600X-LC-32CD	580,420
C9600-LC-40YL4CD	580,420
C9600-LC-24C	710,750
C9600-LC-48YL	640,750
C9600-LC-48TX	543,000
C9600-LC-48S	640,750

Table 18. Standards, technologies, environmental specifications

Feature	Description
Standards	Gigabit Ethernet: IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab
Physical Dimensions (H x W x D)	1.7 x 15.0 x 13.41” (to faceplate) (4.32 x 38.1 x 34.06 cm) 1.7 x 15.0 x 15.7” (to ejector) (4.32 x 38.1 x 39.88 cm)
Weight	C9600X-LC-56YL4C: 3.75 kg (8.27 lbs) C9600X-LC-32CD: 3.95 kg (8.71 lbs) C9600-LC-40YL4CD: 3.75 kg (8.27 lbs) C9600-LC-24C: 3.48 Kg (7.67 lbs) C9600-LC-48YL: 3.55 Kg (7.83 lbs) C9600-LC-48TX: 4.03 kg (8.88 lbs) C9600-LC-48S: 3.55 Kg (7.83 lbs)

Feature	Description
Operating Temperature	-5° to 45° C (23° to 113° F) up to 6,000 feet (1828.8 meter) -5° to 40° C (23° to 104° F) up to 10,000 feet (3048 meter)
Storage Temperature	-40° to 75° C (40° to 167° F)
Relative Humidity, Operating and Non- operating, Non-condensing	10% to 95%, noncondensing
Altitude	-60 to 3000 m (-197 to 9843 feet)

Pluggable optics

Optical transceivers, also known as pluggable optics, are required to operate a Cisco Catalyst 9600 Series fiber-optic line card. Cisco Catalyst 9600 Series fiber-optic line cards provide a variety of optical port types and speeds. These are compatible with Cisco-branded or non-Cisco branded optical transceivers.

For details about the different optical modules supported by each line card and the minimum Cisco software release required for each of the supported optical modules, please visit the following links:

Optics compatibility for each Cisco Catalyst 9600 Series Line Card:

- C9600-LC-56YL4C (56-port 50/25/10/1GE, 4-port 40/100GE)
- C9600X-LC-32CD (30-port 100/40GE, 2-port 200GE, 2-port 400GE)
- C9600-LC-40YL4CD (40-port 50/25/10GE, 2-port 200GE, 2-port 400GE)
- C9600-LC-24C (24-port 40GE/12-port 100GE)
- C9600-LC-48YL (48-port 50/25GE/10GE/1GE)
- C9600-LC-48S (48-Port 100M/1GE)
- C9600-LC-48TX (48-port RJ45 Copper - No optical interfaces available)

For more information about Cisco pluggable optics, please visit Optical Transceivers and Coherent Optics.

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. Licenses are managed through Cisco smart accounts. For a more detailed overview on Licensing, go to Cisco Software Licensing and Smart Accounts.

Creating Smart Accounts by using the Cisco Smart Software Manager (Cisco SSM) enables you to order devices and licensing packages and 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 add-on licenses that you want to renew.

You must order an add-on license in order to purchase a 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 reloading.

Required licensing There are two choices for software subscription: Network Advantage, Cisco DNA or Cisco Catalyst. For more details, go to Cisco Catalyst and DNA Software Subscription Matrix.

Cisco Enterprise Agreement

The Cisco Enterprise Agreement (EA) is a flexible licensing solution that simplifies the purchase, management, and deployment of Cisco technologies. By combining multiple Cisco software and services into one agreement, the EA provides easy access to a wide range of products, including networking, security, collaboration, and data center solutions. This approach reduces administrative tasks, offers predictable costs, and allows for scalability and adaptability. With the flexibility of the Cisco EA, organizations can drive digital transformation and innovation while maintaining control over their IT investments. For more information, go to Cisco Enterprise Agreement.

Migration essentials

The Cisco Catalyst 9000 switching platform is designed for the new era of networking, with ASIC and software innovations to deliver an intent-based network. Within the Cisco Catalyst 9000 Series switching family, the Cisco Catalyst 9600 Series switches are Cisco's leading modular enterprise switching core and distribution platform, built for intent-based architecture, security, Internet of Things (IoT), and cloud.

Simply put, Cisco Catalyst 9600 Series switches provide better functionality, performance, and security than previous models.

Why upgrade

The benefits of upgrading to the Cisco Catalyst 9600 Series switches.

Key benefits:

- 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.
- Reinforce security and redefine the experience for your hybrid workforce big and small.
- Reduced cost, complexity and downtime with Cisco Software-Defined Access. Automate policy, enable fast service creation and get 360-degree contextual insights across users, devices, and applications. Assure network performance with real-time and historical data analytics, to learn, adapt, and even detect problems before they happen.
- Create better customer and employee experiences through higher performance and improved support for mobility and new apps.
- Advanced end-to-end security designed to work together to detect and stop threats, simplify security complexity, keep your business more secure and make your IT more productive.
- The Catalyst 9000 family is also the first in the line to offer the Cisco IOS XE and Cisco Catalyst subscription-based software licenses, allowing customers to purchase the features and capabilities they need. See the benefits you could be receiving now by comparing the Cisco Catalyst 9600 Series to older switches.

Resources for upgrading

Cisco Validated design and deployment resources

Access design and deployment documentation to take advantage of Cisco products as part of your architecture. Cisco Validated helps you deliver trusted, unified experiences at every touchpoint.

Access Cisco Validated for Campus and Branch

Cisco Catalyst 9000 Series switches feature comparison

Compare the benefits of upgrading from previous Catalyst switch models to the Catalyst 9200, 9300, 9400, 9500, and 9600 Series switches, with detailed comparisons of the switches' features and capabilities.

Discover upgrade benefits.

Migrating from Cisco Catalyst 6500/6800 to 9600 Series switches

Deploy Cisco Catalyst 9600 Series switches in the enterprise networking environment using this guide. The guide is intended for network planner and engineers who are familiar with the Cisco Catalyst 6500 and 6800 Series switches.

Read migration guide.

Customer Stories

Discover a library of stories sharing examples of how Cisco technology helps our customers make the world more connected, inclusive, sustainable, and secure.

See what customers are saying.

Ordering information

The following table lists the ordering information for chassis, power supplies, supervisor engines, line cards, and accessories that are commonly used with the Cisco Catalyst 9600 Series, as well as the Cisco DNA and Cisco Catalyst term licenses.

For a detailed overview of the ordering process, please visit the Cisco Catalyst 9600 Series Switches Ordering Guide.

We recommend working with a Cisco partner to purchase.

- Find a partner
- Create an estimate

Table 19. Ordering information

Product number	Description
C9606R (=)	Cisco Catalyst 9600 Series 6 Slot Chassis
C9600-SUP-1 (=)	Cisco Catalyst 9600 Series Supervisor 1 Module
C9600-SUP-1/2	Cisco Catalyst 9600 Series Redundant Supervisor 1 Module
C9600X-SUP-2 (=)	Cisco Catalyst 9600 Series Supervisor 2 Module
C9600X-SUP-2/2	Cisco Catalyst 9600 Series Redundant Supervisor 2 module
C9600-LC-24C (=)	Cisco Catalyst 9600 Series 24-Port 40GE/12-Port 100GE line card
C9600-LC-48YL (=)	Cisco Catalyst 9600 Series 48-Port 50/25/10/1GE line card
C9600-LC-48TX (=)	Cisco Catalyst 9600 Series 48-port RJ45 Copper – 10GE/5GE/2.5GE/1GE/100Mbps/10Mbps line card
C9600-LC-48S (=)	Cisco Catalyst 9600 Series 48-Port 1GE line card
C9600-LC-40YL4CD (=)	Cisco Catalyst 9600 Series Combo line card 40 ports 50/25/10GE SFP56 2 ports 200/100/40QSFP56 uplinks 2 ports 400/200/100GE QSFP-DD uplinks

Product number	Description
C9600X-LC-56YL4C (=)	Cisco Catalyst 9600 Series Combo line card 56 ports 50/25/10GE SFP56 4 ports 100/40GE QSFP28 uplinks
C9600X-LC-32CD (=)	Cisco Catalyst 9600 Series Combo line card 30 ports 100/40G QSFP28 2 ports 400/200/100G QSFP-DD
C9606-FAN (=)	Cisco Catalyst 9600 Series C9606 chassis fan tray
C9K-F2-SSD-240GB (=)	Cisco Catalyst 9600 Series 240GB SSD storage
C9K-F2-SSD-480GB (=)	Cisco Catalyst 9600 Series 480GB SSD storage
C9K-F2-SSD-960GB (=)	Cisco Catalyst 9600 Series 960GB SSD storage
Cisco DNA Software Term Licenses	Description
C9600-DNA-A	C9600 Cisco DNA Advantage Software subscription term license
C9600-DNA-A-3Y	C9600 Cisco DNA Advantage Software subscription, 3-year license
C9600-DNA-A-5Y	C9600 Cisco DNA Advantage Software subscription, 5-year license
C9600-DNA-A-7Y	C9600 Cisco DNA Advantage Software subscription, 7-year license
Cisco Catalyst Software Term License	Description
C9600-DNX-A-3Y	C9600 Advantage Catalyst Software subscription, 3-year license
C9600-DNX-A-5Y	C9600 Advantage Catalyst Software subscription, 5-year license
C9600-DNX-A-7Y	C9600 Advantage Catalyst Software subscription, 7-year license

Product number	Description
Power Supplies	**Description**
C9600-PWR-3KWAC (=)	Cisco Catalyst 9600 Series 3000W AC Power Supply
C9600-PWR-2KWAC (=)	Cisco Catalyst 9600 Series 2000W AC Power Supply
C9600-PWR-2KWDC (=)	Cisco Catalyst 9600 Series 2000W DC Power Supply
Spare accessories and kits	**Description**
C9606-SLOT-BLANK (=)	Cisco Catalyst 9600 Series blank for chassis module slot
C9606-PWR-BLANK (=)	Cisco Catalyst 9600 Series blank for chassis power supply slot
CAB-CONSOLE-USB	Console Cable 6ft with USB Type A and mini-B
CAB-CONSOLE-RJ45	Console Cable 6ft with RJ45 and DB9F
C9606-RACK-KIT=	Cisco Catalyst 9600 Series 6-slot chassis Rack Mount
C9606-ACC-KIT=	Cisco Catalyst 9600 Series 6-slot chassis Accessory Kit
C9606-SHELF-KIT=	Cisco Catalyst 9600 Series 6-slot chassis Shelf Install Kit
C9606-FB-23-KIT=	Cisco Catalyst 9600 Series 6-slot chassis Front to Back Kit

Product sustainability

Cisco is embedding sustainability into the product lifecycle—from manufacturing to end of use. Designed with consideration for Cisco's **Circular Design Principles**, our products feature both individual and portfolio-wide programs and innovations, including those that address efficient architecture design, power consumption, energy management, packaging sustainability, and takeback. These elements are pivotal in reducing operational costs and advancing net-zero Greenhouse Gas (GHG) emissions targets, and other sustainability-related ambitions.

Information about Cisco's Environmental, Social, and Governance (ESG) initiatives and performance is available in **Cisco's Purpose Reporting Hub**.

Table 20. Sustainability references

Sustainability topic		Description
Power	Power calculator	The Cisco Power Calculator tool enables estimation of energy consumption for specific supervisor, line-card and power-supply configurations. Cisco Power Calculator
	Power management configuration	The power management chapter in the System Management Configuration Guide provides detailed information on power management features and configurations available for the Cisco Catalyst 9600 Series Switches. The features discussed include power-supply modes, module operating states, and power-budgeting considerations. System management and power management
Energy management	Catalyst Center dashboard	The Catalyst Center dashboard offers comprehensive energy management capabilities, allowing users to monitor power usage, energy mix, costs, and CO2e emissions and optimize energy consumption in real time. Catalyst Center release notes
	Environmental monitoring configuration	The environmental monitoring chapter in the System Management Configuration Guide provides guidelines for configuring monitoring of environmental conditions of chassis components. System management and environmental monitoring
Ecolabels	80 PLUS Platinum/ Titanium Certified Power Supply Units (PSUs)	Catalyst 9600 Series Switches support the highest efficiency power supply units. 80 PLUS Platinum Certified PSUs offer up to 92% efficiency at 50% load and titanium PSUs reaching up to 94% efficiency at 50% load. Power supply units

Sustainability topic		Description
Materials, modularity, and reuse	Hardware standardization and modularity	The Catalyst 9600 Series family of switches uses standard subassemblies and common modular components across products to streamline production and enhance repairability and upgradability.
	Simplified architecture	Catalyst 9600 Series Switches offer a simplified architecture by consolidating multiple discreet ASIC/NPU components into a central System-on-Chip (SoC) architecture, providing multiple discrete functions in a more integrated design. Catalyst 9600 architecture
	Recycled content	Catalyst 9600 Series Switches use non-commodity plastic components that contain up to 75% post-consumer recycled content.
	Powder-coat finish	Catalyst 9600 Series Switches eliminated the use of oil-based wet paints, instead using a powder-coating finish. A powder-coating finish reduces the amount of harmful solvents used and Volatile Organic Compounds (VOCs) emitted during the painting process.
	Bezel-free design	The Catalyst 9600 Series Switches use a bezel-free design reducing plastic usage.
	Cisco Takeback and Reuse	This program allows customers to return used equipment for responsible recycling and reuse. Takeback and Reuse Program
	Cisco Refresh	This program offers certified remanufactured products, providing cost-effective alternatives to new equipment. Cisco Refresh
Packaging	Removal of single-use plastic bags	The Catalyst 9600 Series Accessory Kit (C9606-ACC-KIT) is packaged with fiber-based materials, removing single-use plastic bags.
	Foam reduction	Expanded foam end caps used in packaging hardware are now replaced with thermoform cushioning end caps (made of at least 50% post-consumer recycled content). Circular economy and packaging sustainability
	Accessory opt-in	Accessory opt-in allows customers to select whether to include the accessory kit. Not including the kit results in using fewer materials and reducing waste. The default is now to not include the kit unless it is required. Catalyst 9600 Series Switches Ordering Guide

Sustainability topic		Description
Regulatory compliance	Environmental compliance	Information regarding Cisco compliance with applicable environmental laws and regulations is available at the Environmental Compliance section of Cisco's Purpose Reporting Hub. Environmental compliance
	Product Approvals Status (PAS)	Information regarding the certification status for given Cisco products in certain countries is available at Cisco's self-service PAS database. PAS database
	Product-related materials compliance	This page addresses Cisco's position regarding relevant product-related materials legislation, such as Restriction of Hazardous Substances (RoHS); Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH). RoHS and REACH
	Waste Electrical and Electronic Equipment (WEEE), battery, and packaging compliance	This page discusses Cisco's position regarding relevant product-related legislation on recycling, battery, and packaging. WEEE, battery and packaging
	Cisco packaging materials and codes	This table provides packaging material identification for packaging used for Cisco products. Packaging materials and codes
General	Sustainability inquiries	Contact this alias for questions and information related to Cisco's general and product-specific sustainability initiatives. csr_inquiries@cisco.com
	Cisco policies, positions, and guides	Links to select Cisco's Environmental Sustainability policies, positions, and guides are provided in the "Policies, positions, and guides" section of Cisco's Purpose Reporting Hub. Policies, positions, and guides
	Cisco Green Pay	This page provides an overview of Cisco Green Pay, a financing program aimed at promoting more sustainable technology adoption by providing flexible payment options. Green Pay

Appendix

Safety and compliance

Chassis

The section below lists the safety and compliance information for the Cisco Catalyst 9600 Series chassis.

Safety and certifications for C9606R chassis	EMI and EMC compliance
• IEC 60950-1 plus Am1, Am2, Am9, Am10, Am11, Am12, and all deviations and differences • EN 60950-1; 2006 • IEC 62368-1 Second Edition with all deviations and differences • UL 60950-1, Second Edition • UL 62368-1, Second Edition • AS/NZS 60950.1.2011 • CAN/CSA-C22.2 No. 60950-1-07 • CAN/CSA-C22.2 No. 62368-1-14 • GB 4943-95 • NOM-019-SCFI-1998	• 47 CFR Part 15 Class A CNS13438: 2006 Class A EN 300 386 V1.6.1 • EN 61000-3-2: 2014 • EN 61000-3-3: 2013 • EN 300 386 V1.6.1 • EN 55032:2012/ AC:2013 Class A EN 55032:2015 Class A • EN 55024: 2010 + A1: 2015 • ICES-003 Issue 6: 2016 Class A • KN 35: 2015 • KN 32: 2015 Class A • TCVN 7189: 2009 Class A • TCVN 7317: 2003 • CISPR 32 Edition 2 Class A • CISPR 24: 2010 + A1: 2015 • V-2/2015.04 Class A V-3/2015.04 Class A • EN55024: 2010 + A1: 2015 • KN35: 2015 • TCVN 7317: 2003

Supervisor Engine

The section below lists the safety and compliance information for the Cisco Catalyst 9600 Series Supervisor Engines.

EMI and EMC compliance

- 47 CFR Part 15 Class A CNS13438: 2006 Class A EN 300 386 V1.6.1
- EN 61000-3-2: 2014
- EN 61000-3-3: 2013
- EN 300 386 V1.6.1
- EN 55032:2012/ AC:2013 Class A EN 55032:2015 Class A
- EN 55024: 2010 + A1: 2015
- ICES-003 Issue 6: 2016 Class A
- KN 35: 2015
- KN 32: 2015 Class A
- TCVN 7189: 2009 Class A
- TCVN 7317: 2003
- CISPR 32 Edition 2 Class A
- CISPR 24: 2010 + A1: 2015
- V-2/2015.04 Class A V-3/2015.04 Class A

Line cards

The section below lists the safety and compliance information for the Cisco Catalyst 9600 Series line cards.

Safety conditions	Safety certifications
• Fiber-optic lasers: Class 1 laser products	• UL 60950-1 • CAN/CSA-C222.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950.1 • IEEE 802.3

Electromagnetic emissions	Electromagnetic emissions
• EN55032:2015 • EN61000-3-2:2014 • EN55032:2012 • NM EN 55032:2015 • QCVN 118:2018/BTTTT • ICES-003:2016:Iss:6 • NM EN 61000-3-3:2015 • NM EN 61000-3-2:2015 • 47 CFR Part 15:2016 • KN61000-3-3:2014 • CISPR32:2012:Ed:1 • EN300 386:2012:V1.6.1 • KN61000-3-2:2014 • CNS13438:2006 • CISPR32:2015:Ed:2 • KN32:2015\ • EN61000-3-3:2013 • CISPR24:2010+A1:2015	• ROHS5

Electromagnetic emissions	Electromagnetic emissions
• CISPR35:2016:Ed:1 • EN55024:2010 • EN55024:2010:A1 • EN55035:2017 • EN61000-6-1:2007 • EN61000-6-2:2005 • IEC61000-6-1:2016:Ed:3 • IEC61000-6-2:2016:Ed:3 • KN35:2015 • NM EN 55024:2018 • TCVN 7317:2003	

Management and Industry standards

The following section lists management and standards support for the Cisco Catalyst 9600 Series.

SNMP management MIB
• BGP4-MIB BRIDGE-MIB • CISCO-ACCESS-ENVMON-MIB CISCO-AUTH-FRAMEWORK-MIB CISCO-BGP4-MIB • CISCO-BRIDGE-EXT-MIB CISCO-BULK-FILE-MIB CISCO-CABLE-DIAG-MIB CISCO-CALLHOME-MIB CISCO-CDP-MIB • CISCO-CEF-MIB • CISCO-CLASS-BASED-QOS-MIB CISCO-CONFIG-COPY-MIB CISCO-CONFIG-MAN-MIB CISCO-CONTEXT-MAPPING-MIB CISCO-DATA-COLLECTION-MIB CISCO-DHCP-SNOOPING-MIB CISCO-EIGRP-MIB • CISCO-EMBEDDED-EVENT-MGR-MIB CISCO-ENHANCED-IMAGE-MIB CISCO-ENHANCED-MEMPOOL-MIB CISCO-ENTITY-ASSET-MIB • SCO-HSRP-EXT-MIB CISCO-HSRP-MIB • CISCO-ENTITY-EXT-MIB • CISCO-ENTITY-FRU-CONTROL-MIB CISCO-ENTITY-SENSOR-MIB

SNMP management MIB

- CISCO-ENTITY-VENDORTYPE-OID-MIB CISCO-ENVMON-MIB
- CISCO-ERR-DISABLE-MIB CISCO-FLASH-MIB CISCO-FTP-CLIENT-MIB CISCO-HSRP-EXT-MIB CISCO-HSRP-MIB
- CISCO-IETF-BFD-MIB
- CISCO-IETF-DHCP-SERVER-EXT-MIB CISCO-IETF-DHCP-SERVER-MIB CISCO-IETF-ISIS-MIB
- CISCO-IETF-PPVPN-MPLS-VPN-MIB CISCO-IF-EXTENSION-MIB
- CISCO-IGMP-FILTER-MIB
- CISCO-IMAGE-LICENSE-MGMT-MIB CISCO-IMAGE-MIB
- CISCO-IP-CBR-METRICS-MIB CISCO-IP-STAT-MIB
- CISCO-IP-URPF-MIB CISCO-IPMROUTE-MIB
- CISCO-IPSLA-AUTOMEASURE-MIB CISCO-IPSLA-ECHO-MIB
- CISCO-IPSLA-JITTER-MIB CISCO-L2-CONTROL-MIB
- CISCO-L2L3-INTERFACE-CONFIG-MIB CISCO-LAG-MIB
- CISCO-LICENSE-MGMT-MIB CISCO-LISP-EXT-MIB
- CISCO-LOCAL-AUTH-USER-MIB CISCO-MAC-AUTH-BYPASS-MIB CISCO-MAC-NOTIFICATION-MIB CISCO-MEMORY-POOL-MIB CISCO-MPLS-LSR-EXT-STD-MIB CISCO-NHRP-EXT-MIB
- CISCO-NTP-MIB
- CISCO-OSPF-MIB
- CISCO-OSPF-TRAP-MIB CISCO-PAE-MIB
- CISCO-PAGP-MIB CISCO-PIM-MIB CISCO-PING-MIB CISCO-PKI-MIB
- CISCO-PORT-SECURITY-MIB
- CISCO-PORT-STORM-CONTROL-MIB CISCO-PRIVATE-VLAN-MIB
- CISCO-PROCESS-MIB
- CISCO-PRODUCTS-MIB
- CISCO-RESILIENT-ETHERNET-PROTOCOL-MIB CISCO-RTTMON-ICMP-MIB
- CISCO-RTTMON-IP-EXT-MIB
- CISCO-RTTMON-MIB CISCO-RTTMON-RTP-MIB

SNMP management MIB

- CISCO-SNMP-TARGET-EXT-MIB CISCO-STP-EXTENSIONS-MIB CISCO-SYSLOG-MIB
- CISCO-TCP-METRICS-MIB CISCO-TCP-MIB
- CISCO-TRUSTSEC-INTERFACE-MIB
- CISCO-TRUSTSEC-MIB
- CISCO-TRUSTSEC-POLICY-MIB CISCO-TRUSTSEC-SERVER-MIB CISCO-TRUSTSEC-SXP-MIB CISCO-UDLDP-MIB
- CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB CISCO-VLAN-MEMBERSHIP-MIB
- CISCO-VRF-MIB
- CISCO-VTP-MIB ENTITY-MIB ENTITY-STATE-MIB
- EtherLike-MIB HC-ALARM-MIB HC-RMON-MIB
- IEEE8021-PAE-MIB
- IEEE8023-LAG-MIB
- IF-MIB
- IGMP-STD-MIB
- IP-FORWARD-MIB IP-MIB
- IPMROUTE-STD-MIB LISP-MIB
- LLDP-EXT-MED-MIB LLDP-MIB
- MAU-MIB
- MPLS-L3VPN-STD-MIB
- MPLS-LDP-GENERIC-STD-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

SNMP management 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, IEEE 802.3by 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 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

Document history

New or revised topic	Described in	Date
Merged supervisor engines, line cards, and chassis in a single data sheet	All relevant sections	October 7, 2024
Added simplified campus automation	All relevant sections	June 4, 2024
Added 1G support for C9600X using SFP-1G-SX/LH	All applicable areas	April 15, 2024
Added C9600X-LC-56YL4C line sections	All applicable areas	November 21, 2023
Added Cisco Catalyst Software subscription	Software section	September 14, 2023
Added 3000W AC power supply and updated Cisco environmental sustainability section	All applicable areas	November 24, 2022
Added C9600X-LC-32CD sections	All applicable tables	June 14, 2022
Added C9600X-SUP-2 and C9600-LC-40YL4CD sections	All applicable tables	February 03, 2022
Added C9600-LC-48TX sections	All applicable tables	November 25, 2019
Original version of C9600 Series switches data sheet	Data sheet	March 25, 2019

C78-xxxxxxx-xx 02/25