Cisco Catalyst 8500 Series Edge Platforms

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The Cisco Catalyst 8500 Series Edge Platforms are high-performance cloud edge platforms designed for accelerated services, multi-layer security, cloud-native agility, and edge intelligence to accelerate your journey to cloud.

Foundation for Software-Defined WAN

Cisco® Catalyst® 8500 Series Edge Platforms (Catalyst 8500) with Cisco IOS® XE SD-WAN Software deliver Cisco's secure, cloud-scale SD-WAN solution for aggregation sites. Featuring the all-new third-generation Cisco Quantum Flow Processor (QFP), the Catalyst 8500 Series Edge Platforms are built for services from the ground up. The Catalyst 8500 Series Edge Platforms are compact 1RU devices with interface flexibility options, including 1GE, 10GE, 40GE, and 100GE ports. Powered by Cisco IOS XE, fully programmable software architecture, and API support, these platforms can facilitate automation at scale to achieve zero-touch IT capability while migrating workloads to the cloud.

Product overview

Product highlights

Table 1. Product highlights

Product feature	Benefits and description
All-new third-generation Quantum Flow Processor (QFP) ASIC	• Inline hardware-accelerated encryption for high-throughput IPsec and MACsec • High-performance routing and SD-WAN with services
IPsec	• Up to 2.5X higher IPsec throughput than 2nd Gen QFP devices
Multicore control processor	• Intel x86 CPU with 16 GB memory default (up to 64 GB memory) for high-speed control plane processes
Interface flexibility	• Options for 1GE, 10GE, 40GE, and 100GE ports
DRAM	• All Catalyst 8500 models have 16 GB default DRAM and can be upgraded to 32 GB and 64 GB for higher scale
SSD storage	• Default 32-GB eUSB for storage with optional 480-GB SSD upgrade for additional storage on the platform
Redundancy	• High-efficiency dual power supplies by default for power supply redundancy • All Catalyst 8500 models support software redundancy with 2 Cisco IOS processes running on a single device (IOS XE routing mode)
Form factor	• Compact 1RU form factor
Integrated security	• Hardware-anchored Secure Boot and Secure Unique Device Identification (SUDI) support for Plug and Play to verify the identity of the hardware and software

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Platform details

Models and configurations

The C8500-12X4QC model (Figure 1) allows for a maximum of 240GE ports to be enabled simultaneously. It offers:

- 12x 1/10GE ports
- 2x 40GE ports
- 2x 40/100GE ports

The C8500-12X model (Figure 2) offers 12x 1/10GE ports.

Figure 1.
C8500-12X4QC

Figure 2.
C8500-12X with 12x 1/10GE ports

Table 2 provides details on each model's configurations and port density. Table 3 shows the maximum port configurations for the Cisco Catalyst C8500-12X4QC model.

Table 2. Cisco Catalyst 8500 Series configurations and port density

Model	Description	Max 1GE ports	Max 10GE ports	Max 40GE ports	Max 100GE ports
C8500-12X4QC*	12-port 1/10GE, 2-port 40/100GE, 2-port 40GE	12*	12*	4*	2*
C8500-12X	12-port 1/10GE	12	12	0	0

***Up to 240GE of ports can be enabled simultaneously**

Table 3. Maximum ports configurations for Cisco Catalyst C8500-12X4QC

Ports type	Configuration
Max 1 GE	12x1GE
Max 10 GE	12x10GE
Max 40 GE + 10 GE	4x40GE + 8x10GE
Max 100 GE	2x100GE*

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Ports type	Configuration
Max 100 GE + 40 GE	1x100GE + 3x40GE
Max 100 GE + 40 GE + 10 GE	1x100GE + 1x40GE + 8x10GE
Max 100 GE + 10 GE	1x100GE + 12x10GE
Max 10 GE + 40 GE	12x10GE + 3x40GE

*When Bay 1 is set up in 100GE mode, no other ports available in Bay 0 or Bay 1.

Figures 3 and 4 are a series of images that highlight the Cisco Catalyst C8500-12X4QC model's port options in each of its bays.

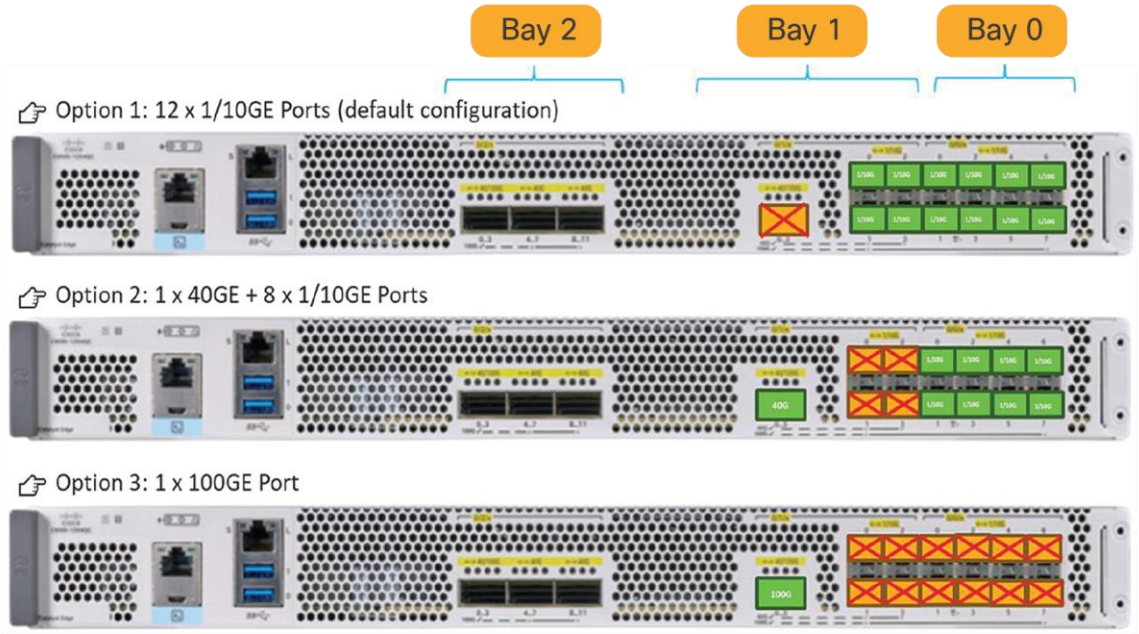

Figure 3.
Bay 0 + bay 1 port options

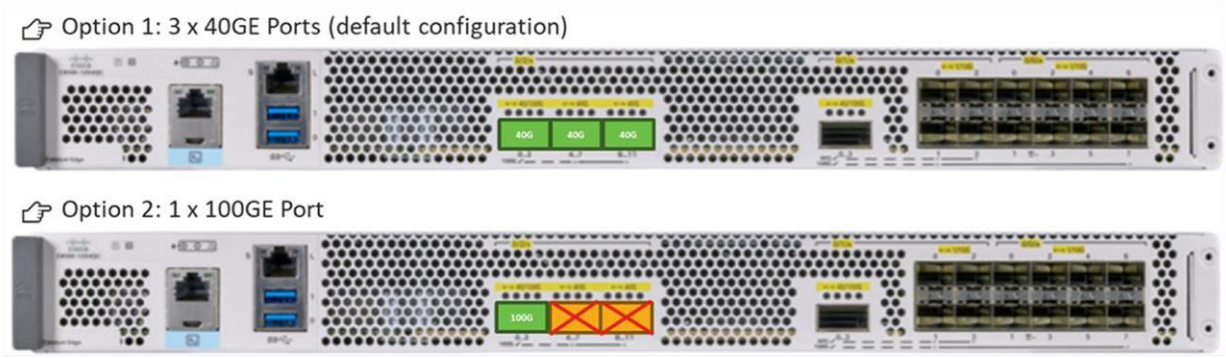

Figure 4.
Bay 2 port options

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Table 4a. Cisco controller mode (SD-WAN) performance specifications

	C8500-12X4QC	C8500-12X
SD-WAN IPsec Throughput (1400Bytes, clear text)	UP to 68Gbps	Up to 51Gbps
SD-WAN IPsec Throughput (IMIX*, clear text)**	Up to 31.9Gbps	Up to 22.6Gbps
SD-WAN Overlay Tunnels scale	8000	8000

Table 4b. Cisco autonomous mode (non SD-WAN) performance specifications

	C8500-12X4QC	C8500-12X
IPv4 Forwarding Throughput (1400Bytes)	Up to 197Gbps	Up to 118Gbps
IPsec Throughput (1400Bytes, clear text)**	Up to 135Gbps	Up to 84Gbps
Number of IPsec SVTI Tunnels	4000	4000

Table 4c. Cisco autonomous mode (non SD-WAN) system scalability

	C8500-12X4QC	C8500-12X
Number of ACLs per system	4000	4000
Number of IPv4 ACEs per system	380K	47K
Number of IPv4 Routes	4M w/ default 16GB	4M w/ default 16GB
Number of IPv6 Routes	4M w/ default 16GB	4M w/ default 16GB
Number of Queues	256K	256K
Number of NAT Sessions	16M	12M
Number of Firewall Sessions	6M	6M
Number of VRFs	8000	8000

*IMIX is average packet size of 352 Bytes packet size

**Based on clear text traffic measurement from traffic generator

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Overall platform benefits

Accelerated services with Cisco Software-Defined WAN

Cisco SD-WAN is a set of intelligent software services that allow you to connect users, devices, and branch office locations reliably and securely across a diverse set of WAN transport links. Cisco Catalyst 8000 Series Edge Platforms can dynamically route traffic across the “best” link based on up-to-the-minute application and network conditions for great application experiences. You get tight control over application performance, bandwidth usage, data privacy, and availability of your WAN links—control you need as your branches conduct greater volumes of mission-critical business with both on-premises and cloud controllers.

Application optimization

Ensure that SD-WAN networks meet Service-Level Agreements (SLAs) and maintain strong performance, even if network problems occur. With multi-cloud access, you can accelerate your SaaS applications with a simple template push from the SD-WAN controller.

Multi-layer security

You can now move your traditional and complex WAN networks to a more agile software-defined WAN with integrated security. The Cisco Catalyst 8500 Series Edge Platforms feature on-premises and cloud-based security options.

Cloud-native agility with programmable software architecture

Cisco continues to offer a feature-rich traditional IOS XE routing stack on the Cisco Catalyst 8000 Series Edge Platforms. IP Routing, IPSec, Quality of Service (QoS), firewall, Network Address Translation (NAT), Network-Based Application Recognition (NBAR), Flexible NetFlow (FNF), and many other features are part of Cisco IOS XE, a fully programmable software architecture with API support and a wide variety of protocols and configurations. With an integrated software image and a single binary file, you can now choose between Cisco IOS XE SD-WAN and Cisco IOS XE. And easily move from one to the other when you choose to do so.

5G-ready

The Cisco Catalyst 8500 Series Edge Platforms are built for future 5G networks. These platforms support external cellular gateway modules with LTE/5G capability for improved throughputs and latency.

Compact form factor

The Cisco Catalyst 8500 Series Edge platforms feature compact 1RU platforms with rich interface options, including 1G, 10G, 40G, and 100G ports. Featuring the highly efficient third-generation QFP, the Cisco Catalyst 8500 Series Edge Platforms are built without compromising on performance and ports.

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Memory, storage, and accessory options

Table 5. Cisco Catalyst 8500 Series memory, storage, and accessory options

Product number	Description
MEM-C8500-16GB	Cisco C8500 16 GB memory
MEM-C8500-32GB	Cisco C8500 32 GB memory
MEM-C8500-64GB	Cisco C8500 64 GB memory
SSD-M2SATA-480G	Cisco C8500 SSD M.2 SATA 480 GB
C8500-ACCKIT-19	Cisco Catalyst 8500 Edge accessory kit - 19 inches
C8500-ACCKIT-23	Cisco Catalyst 8500 Edge accessory kit - 23 inches
C8500-4PT-KIT	Cisco Catalyst 8500 Edge accessory kit - 4-post kit

Optics and transceivers modules

A full list of optics and transceivers is available at: https://tmgmatrix.cisco.com/?si=C8500

Resiliency and high availability

Platform redundancy is critical, as any downtime has direct impact to a customer's business. The Catalyst 8500 Series Edge Platforms ship with high-efficiency dual power supplies by default for power supply redundancy. All Catalyst 8500 models support software redundancy with two IOS XE processes running on a single device (IOS XE routing mode) for additional control-plane resiliency.

Power supplies

Table 6. Cisco Catalyst 8500 Series power supply specifications

Power supply feature	PWR-CH1-750WACR	PWR-CH1-950WDCR
Power maximum rating	750W	950W
Input-voltage range and frequency	85 to 264 VAC 47 to 63 Hz	DC: -40 to -72V; -48V nominal
Power supply efficiency	80 Plus Platinum	86%
Input current	9.4 A to 3.0 A	27.6 A to 15.3 A (23 A)
Output ratings	12 V 63 A	12 V 79 A
Output holdup time	20 ms	4 ms

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Power supply feature	PWR-CH1-750WACR	PWR-CH1-950WDCR
Power supply input receptacles	IEC 320 C14	Amphenol FXTH series 2 terminal block
Power cord rating	10 A	#10 wire 30 A

RFID tags: Catalyst 8500 Series Edge Platforms have an embedded RFID tag that holds Serial Number and Product ID for easy asset and inventory management using commercial RFID readers.

The RFID tag is external and can be easily removed if needed or can be unselected at the time of ordering.

Software requirements

Table 7. Minimum software requirements for Cisco Catalyst 8500 Series Edge Platforms

Part number	Description	Minimum software requirement
C8500-12X4QC	Cisco Catalyst 8500 Series 12-port SFP+, 2-port QSFP+, 2-port QSPF28	Cisco IOS XE Software Release 17.3.2
C8500-12X	Cisco Catalyst 8500 Series 12-port SFP+	Cisco IOS XE Software Release 17.3.2

Table 8. Software features and protocols for autonomous mode

Feature	Description
Protocols	IPv4, IPv6, static routes, Routing Information Protocol Versions 1 and 2 (RIP and RIPv2), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Border Gateway Protocol (BGP), BGP Router Reflector, Intermediate System-to-Intermediate System (IS-IS), Multicast Internet Group Management Protocol Version 3 (IGMPv3), Protocol Independent Multicast Sparse Mode (PIM SM), PIM Source-Specific Multicast (SSM), Resource Reservation Protocol (RSVP), Cisco Discovery Protocol, Encapsulated Remote Switched Port Analyzer (ERSPAN), Cisco IOS IP Service-Level Agreements (IPSLA), Call Home, Cisco IOS Embedded Event Manager (EEM), Internet Key Exchange (IKE), Access Control Lists (ACL), Ethernet Virtual Connections (EVC), Dynamic Host Configuration Protocol (DHCP), Frame Relay, DNS, Locator ID Separation Protocol (LISP), Hot Standby Router Protocol (HSRP), RADIUS, Authentication, Authorization, and Accounting (AAA), Application Visibility and Control (AVC), Distance Vector Multicast Routing Protocol (DVMRP), IPv4-to-IPv6 Multicast, Multiprotocol Label Switching (MPLS), Layer 2 and Layer 3 VPN, IPsec, MACsec Layer 2 Tunneling Protocol Version 3 (L2TPv3), Bidirectional Forwarding Detection (BFD), IEEE 802.1ag, and IEEE 802.3ah
High Availability	Software redundancy with dual IOS, Box-to-Box application-level redundancy
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN, Point-to-Point Protocol (PPP), Multilink Point-to-Point Protocol (MLPPP), High-Level Data Link Control (HDLC), and PPP over Ethernet (PPPoE)
Traffic management	Quality of Service (QoS), Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and Network-Based Application Recognition (NBAR)
Cryptographic algorithms	Encryption: DES, 3DES, AES-128, or AES-256 (in CBC and GCM modes) Authentication: RSA (748/1024/2048 bit), ECDSA (256/384 bit) Integrity: MD5, SHA, SHA-256, SHA-384, SHA-512

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Table 9. Software features and protocols for controller mode

Feature	Description
Core Features	IPv4, IPv6, static routes, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Border Gateway Protocol (BGP), Overlay Management Protocol (OMP), Application Aware Routing (AAR), Traffic Engineering, Service Insertion, zero-trust, whitelisting, tamper-proof module, DTLS/TLS, IPsec, classification, prioritization, low latency queuing, remarking, shaping, scheduling, policing, mirroring, Multicast IPv4 Support, Service advertisement and insertion policy, SNMP, NTP, DNS client, Dynamic Host Configuration Protocol (DHCP), DHCP client, DHCP server, DHCP relay, config archival, syslog, SSH, SCP, Cflowd v10 IPFIX export, IPv6 for transport-side, VRRP, MPLS, NAT (DIA, Service-side, static, overload/PAT, NAT64, etc), NAT pools, split DNS, Access Control Lists (ACL), Bidirectional Forwarding Detection (BFD), Netconf over SSH, CLI, NTP server support, BFD with service-side BGP, BGP community propagation to OMP, 6 SLA classes for AAR, Trustsec/SDA (Inline SGT propagation), custom app with SD-AVC, multicast AAR, dynamic on-demand tunnels, PIM-SM, OSPFv3, route policies, Multi-VRF support
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN
Application Experience	Quality of Service (QoS), Forward Error Correction (FEC), COS Marking, Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Network-Based Application Recognition (NBAR), Software Defined Application Visibility and Control (SD-AVC), per tunnel QoS, Cloud onRamp for SaaS, Enhanced Office 365 traffic steering, Direct Internet Access, Flexible Netflow (FnF)
Cryptographic Algorithms	Encryption: AES-256 (in CBC and GCM modes), Internet Key Exchange (IKE), Cisco PKI Authentication: AAA, RSA (2048 bit), ESP-256-CBC, HMAC-SHA1, ECDSA (256/384 bit) Integrity: SHA-1, SHA-2
Security	Built-in end-to-end Segmentation (VPNs), ZBFW, PKI, DNS Layer Security, Security Internet Gateway (Umbrella, Zscaler), ALG for ZBFW

Specifications

Mechanical specifications

Table 10. Mechanical specifications for the Cisco Catalyst Series 8500 Edge Platforms

Description	Specification	
Part number	**C8500-12X4QC**	**C8500-12X**
Dimensions (H x W x D)	1.73 in. x 17.50 in. x 18.46 in.	1.73 in. x 17.50 in. x 18.46 in.
Rack Units (RU)	1RU	1RU
Chassis weight with 2x AC power supplies and fan tray	20.75 lbs	20.25 lbs
Input voltage	AC: 85 to 264 VAC DC: -40 to 72V; 48V nominal	
Operating temperature	32 to 104°F (0 to 40°C)	

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Description	Specification	
Part number	**C8500-12X4QC**	**C8500-12X**
Storage temperature	-40 to 150° F (-40 to 70° C)	
Relative humidity operating and nonoperating noncondensing	Ambient (noncondensing) operating: 10 to 85% Ambient (noncondensing) nonoperating and storage: 5 to 95%	
NEBS criteria levels	GR-1089 and GR-63	
Altitude	-500 to 10,000 feet (152 to 3048 meters)	
Mean Time Between Failures (MTBF)	146,700 hours	156,200 hours

Safety and compliance

Table 11. Safety and compliance specifications for the Cisco Catalyst Series 8500 Edge Platforms

Description	Specification
Safety certifications	• UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
EMC (Emissions)	47 CFR Part 15 Class A ICES 003 Class A AS/NZS CISPR 32 Class A CISPR 22/CISPR 32 Class A EN55022/EN55032 Class A VCCI Class A CNS-13438 Class A KN32 Class A IEC/EN 61000-3-2: Power Line Harmonics IEC/EN 61000-3-3: Voltage Fluctuations and Flicker

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Description	Specification
EMC (Immunity)	IEC/EN-61000-4-2: Electrostatic Discharge Immunity IEC/EN-61000-4-3: Radiated Immunity IEC/EN-61000-4-4: Electrical Fast Transient Immunity IEC/EN-61000-4-5: Surge AC, DC, and Signal Ports IEC/EN-61000-4-6: Immunity to Conducted Disturbances IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations KN35
EMC (ETSI/EN)	EN300 386: Telecommunications Network Equipment (EMC) EN55022: Information Technology Equipment (Emissions) EN55032: Multimedia Equipment (Emissions) EN55024: Information Technology Equipment (Immunity) EN55035: Multimedia Equipment (Immunity) EN50082-1/EN-61000-6-1: Generic Immunity Standard

Licensing

All Cisco Catalyst 8500 Series Edge Platforms are offered only with a Cisco DNA Software subscription. Only Cisco DNA Advantage and Cisco DNA Premier are available for the Cisco Catalyst 8500 Series Edge Platforms.

For more details, refer to this C8500 ordering guide:

Ordering information

Table 12. Orderable SKUs for the Cisco Catalyst 8500 Series Edge Platforms

Product number	Product description
L-DNA-C8500	Cisco C8500 subscription
C8500-12X4QC	Cisco C8500-12X4QC Edge Platform
C8500-12X	Cisco C8500-12X Edge Platform
PWR-CH1-750WACR	Cisco C8500 750W AC Power
PWR-CH1-750WACR=	Cisco C8500 750W AC Power, Spare
PWR-CH1-950WDCR	Cisco C8500 950W DC Power
PWR-CH1-950WDCR=	Cisco C8500 950W DC Power, Spare
SSD-M2SATA-480G	Cisco C8500 SSD M.2 SATA 480GB
SSD-M2SATA-480G=	Cisco C8500 SSD M.2 SATA 480GB, Spare
MEM-C8500-16GB	Cisco C8500 16GB Memory

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Product number	Product description
MEM-C8500-16GB=	Cisco C8500 16GB Memory, Spare
MEM-C8500-32GB	Cisco C8500 32GB Memory
MEM-C8500-32GB=	Cisco C8500 32GB Memory, Spare
MEM-C8500-64GB	Cisco C8500 64GB Memory
MEM-C8500-64GB=	Cisco C8500 64GB Memory, Spare
C8500-FAN-1R=	Cisco C8500 Fan Tray, 1RU, Spare
C8500-ACCKIT-19	Cisco C8500 Accessory Kit – 19”
C8500-ACCKIT-19=	Cisco C8500 Accessory Kit – 19”, Spare
C8500-ACCKIT-23	Cisco C8500 Accessory Kit – 23”
C8500-ACCKIT-23=	Cisco C8500 Accessory Kit – 23”, Spare
C8500-4PT-KIT	Cisco C8500 Accessory Kit – 4 Post Kit
C8500-4PT-KIT=	Cisco C8500 Accessory Kit – 4 Post Kit, Spare
C8500-RFID-1R	Cisco C8500 RFID – 1RU

Services

Cisco Customer Experience Support Services for Catalyst 8000 platforms and Cisco DNA Software for SD-WAN and Routing

This section discusses the Cisco Support Services available for Catalyst 8000 platforms and associated Cisco DNA Software for SD-WAN and Routing, as well as optional Support Service offers.

- **Catalyst 8000 platforms:** Cisco Solution Support is the default and recommended Cisco Support Service. However, Cisco Solution Support is not mandatory; it can be removed or replaced with another Cisco support service or partner service per the customer’s preference.
- **Cisco DNA Software for SD-WAN and Routing:** Cisco Solution Support is the default Cisco support service. However, Cisco Solution Support is not mandatory; the customer may choose to use the Cisco Subscription Embedded Software Support included with the purchase of this software.

Note:

- When Solution Support is selected, it must be ordered on both the Catalyst 8000 platform and Cisco DNA Software for SD-WAN and Routing for complete customer entitlement to this premium support service.
- SD-WAN and Routing, with both Solution Support or Cisco Subscription Embedded Software Support, customers are entitled to maintenance releases and software updates for **Cisco DNA SD-WAN and Routing software only**. The support for the Catalyst 8000 platform’s OS and network stack, along with OS updates, is covered by the support contract on the Catalyst 8000 platform.

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Cisco Solution Support is a premium support purpose-built for today's multiproduct, multivendor network environments and provides:

- A primary point of contact centralizing support across a solution deployment
- Solution, product, and interoperability expertise
- No requirement for customers to isolate their issue to a product to open a case
- 30-minute service response objective for Severity 1 and 2 cases
- Prioritized case handling over product support cases
- Product support team coordination (Cisco and Solution Support Alliance Partners)
- Accountability for multiproduct, multivendor issue management from first call to resolution, no matter where the issue resides

Learn more about Cisco Solution Support at https://www.cisco.com/go/solutionsupport

Cisco Subscription Embedded Software Support includes:

- Access to support and troubleshooting via online tools and web case submission. Case severity or escalation guidelines are not applicable.
- Cisco Technical Assistance Center (TAC) access 24 hours per day, 7 days per week to assist by telephone, or web case submission and online tools with application software use and troubleshooting issues.
- Access to www.cisco.com, providing helpful technical and general information on Cisco products, as well as access to Cisco's online Software Center library.

Note: No additional products or fees are required to receive embedded support for Cisco DNA Software for SD-WAN and Routing. However, if using embedded support for this software, hardware support for the Catalyst 8000 platforms must be purchased separately, as Cisco Subscription Embedded Software Support does not cover hardware. In this case, Cisco Smart Net Total Care Service is recommended for Catalyst 8000 platforms.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

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