Cisco Catalyst 9400 Series Line Cards Datasheet

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Overview

The Cisco Catalyst 9400 Series is Cisco's lead modular enterprise switching access platform built for security, IoT and cloud. This switch series forms the foundational building blocks for SD-Access — Cisco's leading enterprise architecture. The platform provides unparalleled investment protection with a chassis architecture that is capable of supporting up to 9Tbps of system bandwidth and unmatched power delivery for high density IEEE 802.3BT (60W PoE). Redundancy is now table stakes across the portfolio. The Cisco Catalyst 9400 Series delivers state-ofthe-art High Availability (HA) with capabilities like SSO/NSF, uplink resiliency, N+1/N+N redundancy for power supplies. The platform is enterprise optimized with an innovative dual-serviceable fan tray design, side to side airflow and is closet-friendly with ~16" depth. A single system can scale up to 384 access ports with your choice of 1G copper, 1G fiber, Cisco UPOE and PoE+ options. The platform also supports advanced routing and infrastructure services, SD-Access capabilities and network system virtualization. These features enable optional placement of the platform in the core and aggregation layers of small to medium-sized campus environments.

The Cisco Catalyst 9400 Series offers Multigigabit Ethernet, Cisco UPOE, data, and 10G fiber line cards.

Cisco Catalyst 9400 Series Multigigabit Line Card

Figure 1. Cisco Catalyst 9400 Series 48-Port UPOE® line card (C9400-LC-48UX) with 24 port Multigigabit ports and 24 10/100/1000 Mbps Ports.

The Cisco Catalyst 9400 Series 48-Port UPOE Line Card with 24 port Multigigabit ports and 24 10/100/1000 Mbps Ports provides the solution you need to support newer applications such as

802.11ac Wave 2 access points with your existing Ethernet access cabling. Multigigabit switch ports allow automatic negotiation of 100-Mbps, 1-Gbps, 2.5-Gbps, and 5-Gbps speeds on existing Category 5e and 6 cable, and all the way up to 10-Gbps speeds over Category 6 cabling. The Multigigabit Ethernet line card supports Power over Ethernet (PoE), PoE Plus (PoE+), and Cisco Universal PoE (Cisco UPOE) to deliver 15W, 30W, or 60W to the access point. Cisco remains the only vendor that can provide 60W to power downstream devices in a next-generation workspace. So you can power more devices—IP phones, IPTVs, surveillance cameras, virtual desktop clients, and many others—without having to install extra wall or ceiling circuits, while taking advantage of advanced power management capabilities such as Cisco EnergyWise. You can now realize all of these Cisco UPOE benefits in a single switching platform, while enabling Multigigabit Wi-Fi speeds

Features

● 48 ports with 24 Multigigabit ports and 24 10/100/1000 Mbps ports

●Speeds of 100/1000 Mbps, 2.5/5 Gbps, and 10GBASE-T on the Multigigabit ports and 10/100/1000 Mbps on the other ports

● Nonblocking up to 1000 Mbps on all ports

● RJ-45 interface on all ports

● Supported on Cisco IOS ® XE Software Release 16.6.2 or later

● Cisco UPOE: Capable of up to 60W on all ports in the line card

● Energy Efficient Ethernet 802.3az on all 10/100/1000 ports

● IEEE 802.3bz Multigigabit Ethernet standard on the Multigigabit ports

● IEEE 802.3af/at and Cisco prestandard PoE

● IEEE 802.1AE (MACsec-256) capability in hardware

● Layer 2 to Layer 4 Jumbo Frame support (up to 9198 bytes)

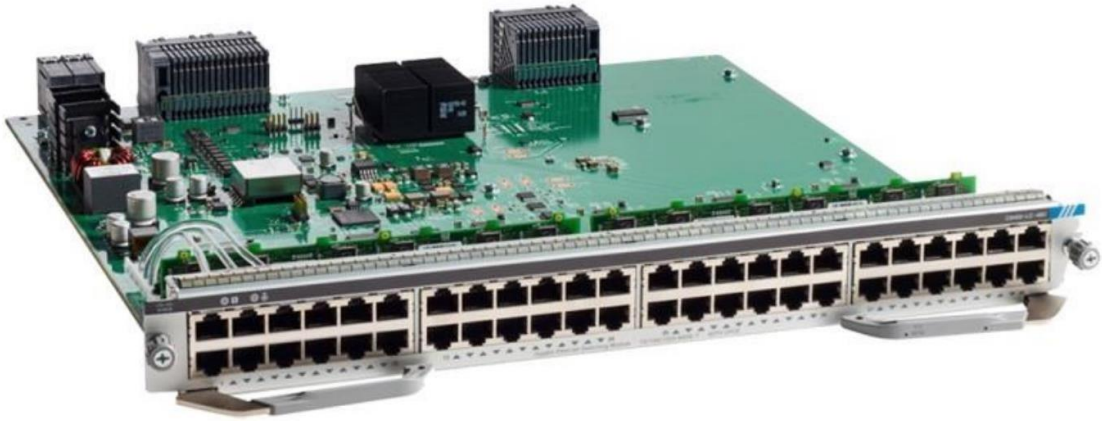
●Enterprise and commercial: Designed to power next-generation IP phones, wireless access points, wireless base stations, video cameras, virtual desktop clients, and other PoE/Cisco UPOE devices

● Support for campus and branch applications requiring enhanced performance for large file transfers and network backups

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1	Bandwidth per slot	80 Gbps	80 Gbps
(C9400-SUP-1)	Oversubscription	3.3:1	3.3:1
C9400 Supervisor Engine-1XL	Bandwidth per slot	120 Gbps	80 Gbps
(C9400-SUP-1XL)	Oversubscription	2.2:1	3.3:1

Cisco Catalyst 9400 Series UPOE line card

Figure 2. Cisco Catalyst 9400 Series 48-Port UPOE 10/100/1000 (RJ-45) line card (C9400-LC-48U)



The UPOE line card supports PoE, PoE+, and Cisco UPOE to deliver 15W, 30W, or 60W to the access point. 60W of inline power can power more devices—including IP phones, IPTVs, surveillance cameras, virtual desktop clients, and many others—without having to install extra wall or ceiling circuits while taking advantage of advanced power management capabilities such as Cisco EnergyWise.

Features

● 48 ports nonblocking

● 10/100/1000 module (RJ-45)

● Supported on Cisco IOS XE Software Release 16.6.1 or later

● Cisco UPOE is enabled, capable of up to 60W on all ports in the line card

● Energy Efficient Ethernet 802.3az

● IEEE 802.3af/at and Cisco pre-standard PoE

● IEEE 802.1AE (MACsec-256) capability in hardware

● Layer 2 to Layer 4 Jumbo Frame support up to 9198 bytes

●Enterprise and commercial design to power next-generation IP phones, wireless base stations, video cameras, virtual desktop clients, and other PoE and Cisco UPOE devices

●Ideal for campus and branch applications requiring enhanced performance for large file transfers and network backups

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1 (C9400-SUP-1)	Bandwidth per slot	80 Gbps	80 Gbps
	Oversubscription	1:1	1:1
C9400 Supervisor Engine-1XL (C9400-SUP-1XL)	Bandwidth per slot	120 Gbps	80 Gbps
	Oversubscription	1:1	1:1

Cisco Catalyst 9400 Series Poe+ Line Card

Figure 3. Cisco Catalyst 9400 Series 48-Port PoE+ 10/100/1000 (RJ-45) line card (C9400-LC-48P)

Features

● 48 ports nonblocking

● 10/100/1000 module (RJ-45)

● Supported on Cisco IOS XE Software Release 16.8.1 or later

● PoE+ is enabled, capable of up to 30W on all ports in the line card

● Energy Efficient Ethernet 802.3az

● Supports IEEE 802.3af/at

● IEEE 802.1AE (MACsec-256) capability in hardware

● Layer 2 to Layer 4 Jumbo Frame support up to 9198 bytes

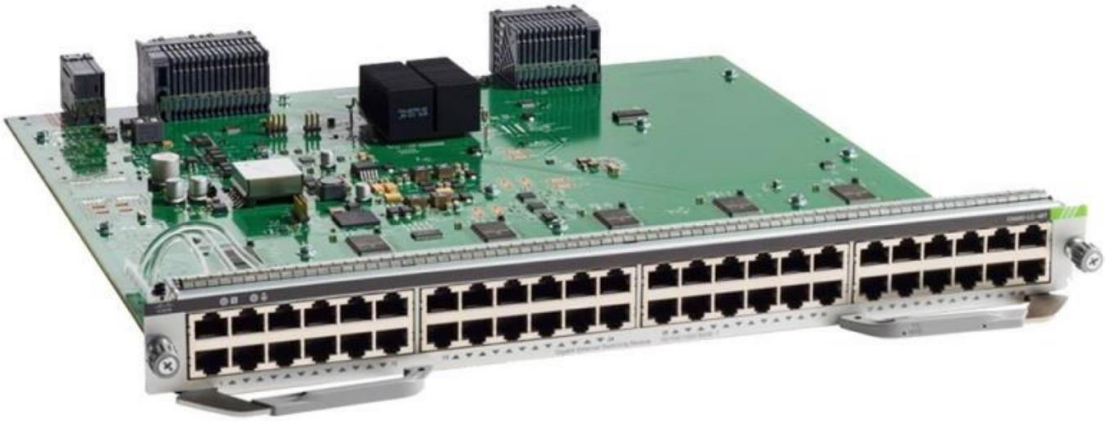
●Enterprise and commercial design to power next-generation IP phones, wireless base stations, video cameras, virtual desktop clients, and other PoE

● Ideal for campus and branch applications requiring enhanced performance for large file transfers and network backups

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1	Bandwidth per slot	80 Gbps	80 Gbps
(C9400-SUP-1)	Oversubscription	1:1	1:1
C9400 Supervisor Engine-1XL	Bandwidth per slot	120 Gbps	80 Gbps
(C9400-SUP-1XL)	Oversubscription	1:1	1:1

Cisco Catalyst 9400 Series RJ-45 data line card

Figure 4. Cisco Catalyst 9400 Series 48-port 10/100/1000 (RJ-45) line card (C9400-LC-48T)



Features

- Supports up to 48 ports nonblocking
- 10/100/1000 module (RJ-45)
- Supported on Cisco IOS XE Software Release 16.6.1 or later
- Energy Efficient Ethernet 802.3az
- IEEE 802.1AE (MACsec-256) capability in hardware

● Layer 2 to Layer 4 Jumbo Frame support up to 9198 bytes

● Enterprise and commercial design for data only user access

●Ideal for campus and branch applications requiring enhanced performance for large file transfers and network backups

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1	Bandwidth per slot	80 Gbps	80 Gbps
(C9400-SUP-1)	Oversubscription	1:1	1:1
C9400 Supervisor Engine-1XL	Bandwidth per slot	120 Gbps	80 Gbps
(C9400-SUP-1XL)	Oversubscription	1:1	1:1

Cisco Catalyst 9400 Series 10 Gigabit Ethernet Fiber Line Card

Figure 5. Cisco Catalyst 9400 Series 24-port 10 Gigabit Ethernet (SFP+) line card (C9400-LC-24XS)

The Cisco Catalyst 9400 Series 24-port 10 Gigabit Ethernet line card can be deployed for high-performance and high-density 10 Gigabit Ethernet aggregations in the campus and in small to medium-sized networks as a core switch. The Cisco Catalyst 9400 Series 24-port 10 Gigabit Ethernet line card supports standard Small Form-Factor Pluggable Plus (SFP+) optics. The ports can be used

interchangeably as Gigabit Ethernet and 10 Gigabit Ethernet to support phased migration from Gigabit Ethernet to 10 Gigabit Ethernet.

Features

- Supports up to 24 ports of 10GE or 24 Ports 1GE SFP
- SFP+ and SFP can be used simultaneously on the same line card without any restrictions
- Supported on Cisco IOS XE Software Release 16.6.2 or later
- IEEE 802.1AE (MACsec-256) capability in hardware
- Layer 2 to Layer 4 Jumbo Frame support (up to 9198 bytes)
- Designed for enterprise backbone and collapsed access deployments

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1 (C9400-SUP-1)	Bandwidth per slot	80 Gbps	80 Gbps
	Oversubscription	3:1	3:1
C9400 Supervisor Engine-1XL (C9400-SUP-1XL)	Bandwidth per slot	120 Gbps	80 Gbps
	Oversubscription	2:1	3:1

Cisco Catalyst 9400 Series 48-port 1 Gigabit Ethernet Fiber Line Card

Figure 6. Cisco Catalyst 9400 Series 48-port 1 Gigabit Ethernet (SFP) line card (C9400-LC-48S)

Features

● Supports up to 48 nonblocking SFP ports

● Supported on Cisco IOS XE Software Release 16.8.1 or later

● IEEE 802.1AE (MACsec-256) capability in hardware

● Layer 2 to Layer 4 Jumbo Frame support (up to 9198 bytes)

●Enterprise, mid-market, and commercial core and distribution deployments requiring line-rate capability

● Service provider: Gigabit Ethernet aggregation for DSL Access Multiplexer (DSLAM), Passive Optical Network (PON), and mobile data backhaul; FTTX for residential and business applications

●Enterprise: Providing Fiber to the Desktop (FTTD), for deployments where non-blocking is mandatory requirement

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1	Bandwidth per slot	80 Gbps	80 Gbps
(C9400-SUP-1)	Oversubscription	1:1	1:1
C9400 Supervisor Engine-1XL	Bandwidth per slot	120 Gbps	80 Gbps
(C9400-SUP-1XL)	Oversubscription	1:1	1:1

Cisco Catalyst 9400 Series 24-port 1 Gigabit Ethernet Fiber Line Card

Figure 7. Cisco Catalyst 9400 Series 24-port 1 Gigabit Ethernet (SFP) line card (C9400-LC-24S)

Features

● Supports up to 24 nonblocking SFP ports

● Supported on Cisco IOS XE Software Release 16.8.1 or later

● IEEE 802.1AE (MACSEC 256) capability in hardware (software roadmap)

● Layer 2 to Layer 4 Jumbo Frame support (up to 9198 bytes)

●Enterprise, mid-market, and commercial core and distribution deployments requiring line-rate capability

●Service provider: Gigabit Ethernet aggregation for DSL Access Multiplexer (DSLAM), Passive Optical Network (PON), and mobile data backhaul; FTTX for residential and business applications

●Enterprise: Providing Fiber to the Desktop (FTTD), for deployments where non-blocking is mandatory requirement

Supervisor	Performance	Chassis C9407R	Chassis C9410R
C9400 Supervisor Engine-1 (C9400-SUP-1)	Bandwidth per slot	80 Gbps	80 Gbps
	Oversubscription	1:1	1:1
C9400 Supervisor Engine-1XL (C9400-SUP-1XL)	Bandwidth per slot	120 Gbps	80 Gbps
	Oversubscription	1:1	1:1

Technology

Power over Ethernet

The Cisco Catalyst 9400 Series offers line cards, power supplies, and accessories required to deploy and operate standards-based Power over Ethernet, Power over Ethernet Plus (PoE/PoE+) and Cisco UPOE. PoE provides power over 100 m of standard Unshielded Twisted-Pair (UTP) cables when an IEEE 802.3af/at-compliant or Cisco pre-standard powered device is attached to the PoE/PoE+ and Cisco UPOE line card port. Instead of requiring wall power, attached devices such as IP phones, wireless base stations, video cameras, and other IEEE-compliant appliances can use power provided from the Cisco Catalyst 9400 Series UPOE line cards. This capability gives network administrators centralized control over power and eliminates the need to install outlets in ceilings and other out-of-the-way places where a powered device can be installed. Although all references to “PoE/PoE+/UPOE,” “inline power,” and “voice” power supplies and line cards are synonymous, there are currently four versions: Cisco pre-standard, IEEE 802.3af compliant, IEEE 802.3at compliant, and Cisco UPOE. Every Cisco Catalyst 9400 Series chassis and PoE power supply supports the IEEE 802.3af/at standard and the Cisco pre-standard power implementation, helping ensure backward compatibility with existing devices powered by Cisco. All IEEE 802.3af/at-compliant and Cisco UPOE line cards can distinguish an IEEE or Cisco pre-standard

powered device from an unpowered Network Interface Card (NIC), helping ensure that power is applied only when an appropriate device is connected.

Energy Efficient Ethernet

Energy Efficient Ethernet (EEE) is an IEEE 802.3az standard that is designed to reduce power consumption in Ethernet networks during idle periods. EEE can be enabled on devices that support Low Power Idle (LPI) mode. Such devices can save power by entering LPI mode during periods of low utilization. In LPI mode, systems on both ends of the link can save power by shutting down certain services. EEE provides the protocol needed to transition into and out of LPI mode in a way that is transparent to upper layer protocols and applications.

Features and benefits

Functional transparency

Cisco Catalyst 9400 Series Switches offer a line of modules that support numerous speeds and physical media combinations. These line cards are functionally transparent; all the packet processing, queuing, buffering and Quality of Service (QoS) occur in the supervisor engine. To that end line cards acquire the features and capabilities of the installed supervisor engine. The architecture let you easily upgrade all Ethernet line cards on your Cisco Catalyst 9400 Series systems to newer switching functions by adding a new supervisor engine. The simple design of the line cards results in a very high Mean Time Between Failures (MTBF), helping ensure high availability for a single connection to an end user.

Modular versatility

The Cisco Catalyst 9400 Series is a centralized architecture that is designed to provide dedicated wire-speed bandwidth to each line card slot within the chassis. Each line card has a dedicated bandwidth to the supervisor engine for packet processing. All network data that flows into the Cisco Catalyst 9400 Series through the various line cards goes through the supervisor engine for processing, even in single-slot port-to-port communications.

A modular, centralized design allows you to use your investment in high-performance line cards across the entire line of Cisco Catalyst 9400 Series chasses and supervisor engines. With the centralized architecture of the Cisco Catalyst 9400 Series, all line cards deployed in a chassis benefit from the enhanced features that the supervisor engine provides, including QoS; Layer 2, 3, and 4 routing; and hardware-based IPv6.

Specification summary: Ports for line cards

Table 1. Port Information for line cards

Line card	Number of ports	Port speed	Port type	Cisco Catalyst 9400 Series min/max ports	
				C9407R	C9410R
C9400-LC-48UX	48	24 Multigigabit 100/1000 Mbps 2.5/5 Gbps 10GBASE-T ports and 24 10/100/1000 ports	RJ-45 UPOE IEEE 802.3at, IEEE 802.3af, Cisco prestandard	48/240	48/384
C9400-LC-48U	48	10/100/1000	RJ-45 UPOE IEEE 802.3at, IEEE 802.3af, Cisco pre-standard	48/240	48/384
C9400-LC-48T	48	10/100/1000	RJ-45	48/240	48/384
C9400-LC-24XS	24	10 GE or 1 GE	SFP/SFP+	24/120	24/192
C9400-LC-48P	48	10/100/1000	RJ-45 POE IEEE 802.3at, IEEE 802.3af, Cisco pre-standard	48/240	48/384
C9400-LC-24S	24	1 GE	SFP	24/120	24/192
C9400-LC-48S	48	1 GE	SFP	48/240	48/384

Optics

Cisco Catalyst 9400 Series line cards provide a variety of optical port types and port speeds, including SFP+ and SFP. 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 contact us.

Product specifications:

Standards, technologies, environmental, and other line card features

Table 2. Product specifications

Feature	Description
Standards	● Gigabit Ethernet: IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab, IEEE 803.3at, IEEE 802.3af, IEEE 802.3az, IEEE 802.3bz
EtherChannel technology	● Gigabit EtherChannel: All 1000 Mbps ports ● 10 Gigabit EtherChannel: All 10Gbps ports ● IEEE 802.3ad (Link Aggregation Control Protocol) ● Port Aggregation Protocol (PaGP): Yes ● Number of ports per tuple: 16 with LACP and 8 with PaGP ● EtherChannel and IEEE 802.3ad technology across line cards: Yes
Physical dimensions	● Occupies one slot in the Cisco Catalyst 9400 Series platform ● Dimensions (H x W x D): 1.6 x 14.92 x 14.57 in. (4.06 x 37.90 x 37.00 cm)
Environmental conditions	● Operating temperature: ● Normal Operating* Temperature and Altitudes:

Feature	Description
	◦ 27° to 109°F (-5 to +45°C), up to 6,000 feet (1800 m) ◦ 27° to 104°F (-5 to +40°C), up to 10,000 feet (3000 m) ◦ *Minimum ambient temperature for cold startup is 0°C ● Short-Term** Exceptional Conditions: ◦ 27° to 119°F (-5 to +55°C), up to 6,000 feet (1800 m) ◦ 27° to 114°F (-5 to +50°C), up to 10,000 feet (3000 m) ◦**Not more than following in one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences ● Storage temperature: -40° to 158° F (-40° to 70°C) ● Relative humidity: 10 to 95%, noncondensing ● Operating altitude: -60 to 3000m
Safety conditions	Fiber optic lasers: Class 1 laser products
Safety certifications	● 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 certifications	● 47 CFR Part 15 ● CISPR22 Class A ● EN 300 386 V1.6.1 ● EN 55022 Class A ● EN 55032 Class A ● CISPR 32 Class A ● EN61000-3-2 ● EN61000-3-3 ● ICES-003 Class A

Feature	Description
	● TCVN 7189 Class A ● V-3 Class A ● CISPR24 ● EN 300 386 ● EN55024 ● TCVN 7317
ROHS compliance	ROHS5

Power and MTBF Information

Table 3. Power and MTBF information

Part number	Max rated power (W)	Rated MTBF (hours)
C9400-LC-48U	65	823,000
C9400-LC-48T	65	1,157,000
C9400-LC-24XS	200	545,080
C9400-LC-48UX	240	411,790
C9400-LC-48P	65	771,720
C9400-LC-24S	120	1,114,710
C9400-LC-48S	170	944,960

Note: All power numbers shown in Table 3 are maximum values recommended for facility power and cooling capacity planning. These figures are not indicative of the actual power draw during operation. Typical power draw is about 40%-75% maximum rated power value shown

Ordering information.

Table 4. Ordering information

Part number ("=" Indicates "Spare")	Product name
C9400-LC-48U(=)	Cisco Catalyst 9400 Series 48-Port UPOE 10/100/1000 (RJ-45)
C9400-LC-48T(=)	Cisco Catalyst 9400 Series 48-Port 10/100/1000 (RJ-45)
C9400-LC-24XS(=)	Cisco Catalyst 9400 Series 24-Port 10 Gigabit Ethernet(SFP+)
C9400-LC-48UX(=)	Cisco Catalyst 9400 Series 48-Port UPOE w/ 24p mGig 24p RJ-45
C9400-LC-48P(=)	Cisco Catalyst 9400 Series 48-Port POE+ 10/100/1000 (RJ-45)
C9400-LC-24S(=)	Cisco Catalyst 9400 Series 24-Port Gigabit Ethernet(SFP)
C9400-LC-48S(=)	Cisco Catalyst 9400 Series 48-Port Gigabit Ethernet(SFP)

Cisco Enhanced Limited Lifetime Hardware warranty

The Cisco Catalyst 9400 Series Switches come with a Cisco 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 review the warranty statement shipped with your specific product carefully before use. Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

Table 5. E-LLW details

Devices covered	Applies to Cisco Catalyst 9400 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 9400 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.