Data sheet
Cisco public

Cisco N9500 Series Switches

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Product overview

Application architectures and deployment modes are rapidly evolving. Modern applications are multinode, highly modular, and deployed over a combination of bare-metal, virtual, and cloud data center environments. In addition to that, individual departments within an organization have varying infrastructure and networking needs. These factors require that data center networks be simple, programmable, extensible, scalable, and shareable to meet the demands of applications.

The Cisco N9000 Series Switches operate in one of two modes – Cisco Application Centric Infrastructure (Cisco ACI™) or Cisco NX-OS. In Cisco ACI mode, these switches provide a turnkey, fully automated, policy-based architecture to design and manage data center fabrics. In Cisco NX-OS mode, these switches provide the capability to use foundational layer 2/3 technologies, as well as modern technologies such as VXLAN, with a Border Gateway Protocol–Ethernet VPN (BGP-EVPN) control plane, Segment routing, Multiprotocol Label Switching (MPLS), and automation via NX-APIs.

The Cisco N9000 Series Switches include the N9500 Series modular switches and the N9200/N9300 Series fixed switches.



Figure 1.
Cisco N9000 Series Switch Chassis

The Cisco N9500 Series modular switches support a comprehensive selection of line cards and fabric modules that provide 1-, 10-, 25-, 40-, 50-, 100-, 200-, and 400-Gigabit Ethernet interfaces. Using these line cards the Cisco N9500 Series switches can be configured with up to.

1. 256 400-Gigabit Ethernet ports (or)
2. 524 200-Gigabit Ethernet ports# (or)
3. 1024 100-Gigabit Ethernet ports (or)
4. 2048 50-Gigabit Ethernet ports (or)
5. 1024 40-Gigabit Ethernet ports (or)
6. 2304 25-Gigabit Ethernet ports (or)
7. 2304 1/10-Gigabit Ethernet ports

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The supervisor, system controller, power supplies, and line cards are common across all three switches. Each switch, however, has unique fabric modules, and fan trays that plug in vertically in the rear of the chassis.

Table 1. Features and benefits

Feature	Benefit
High performance	The Cisco N9500 Series switch delivers nonblocking performance at a latency of 5 microseconds or less at 400-, 100-, 50-, 40-, 25-, 10-, and 1-Gigabit Ethernet speeds. This enables customers to build robust and scalable high-speed fabrics that can support several thousands of high-speed access ports.
Telemetry	The Cisco N9500 Series switches support extensive switch and flow telemetry capabilities that provide extensive real-time visibility into switch and fabric states.
High-density 1-, 10-, 25-, 40- and 50-Gigabit Ethernet access configuration	Organizations can transition from low-speed (100-Megabit Ethernet and 1-Gigabit Ethernet) server access designs to high-speed (1-, 10-, 25-, 40-, and 50-Gigabit Ethernet) server access designs with the same port density.
High-density 10-, 40-, 100- and 400-Gigabit Ethernet aggregation and spine configuration	The Cisco N9500 Series Switches help organizations transition from 1- and 10-Gigabit Ethernet infrastructure to 10-, 40-, 100-, and 400-Gigabit Ethernet infrastructures to support the increased bandwidth demands of scale-out, multinode application environments. The compatibility of 400-Gigabit Ethernet QSFP-DD modules, 100-Gigabit Ethernet QSFP28 modules, and 40-Gigabit Ethernet QSFP+ modules enables the migration and coexistence of 40-, 100- and 400-Gigabit Ethernet ports in the fabric.
High availability, reliability, and scalability	The Cisco N9500 Series Switches are designed with redundant supervisors, system controllers, power supplies, and fan trays, which eliminate any single point of failure in the chassis. These switches also support up to 6 fabric modules, which provide redundancy and graceful degradation of switching capacity in the event of fabric module failures. All transceivers are pluggable to support the highest possible Mean Time Between Failure (MTBF) for the switch.
Designed for the future	The Cisco N9500 Series Switches are designed for future expansion with the capability to support higher speed ports and more bandwidth.
Power efficiency	The Cisco N9500 Series Switches are the first switch chassis designed without a midplane. The line cards and fabric modules connect directly. This revolutionary design provides optimal front-to-back airflow and helps the switch operate with less power. In addition, all Cisco N9500 Series switch power supplies are rated at or higher than 80PLUS Platinum for AC inputs and equivalent efficiency for DC inputs. The typical power consumption per 10-Gigabit Ethernet port is less than 3.5 watts (W). The typical power consumption per 40- and 100-Gigabit Ethernet port is less than 14W and 22W respectively.

Deployment scenarios

The Cisco N9500 Series Switches support various deployment scenarios:

- Spine nodes in a spine-leaf fabric
- Core or aggregation node in an L2/L3 network
- Border gateway in a L2/L3 network

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Spine-leaf fabric architecture

The high port-density and ability to support multispeed ports on the same chassis make the Cisco N9500 Series Switches the ideal choice as a spine in spine-leaf fabric architectures. The Cisco N9500 Series Switches can function as a spine in either Cisco Application Centric Infrastructure (Cisco ACI) or Cisco NX-OS operating modes (Figure 2).

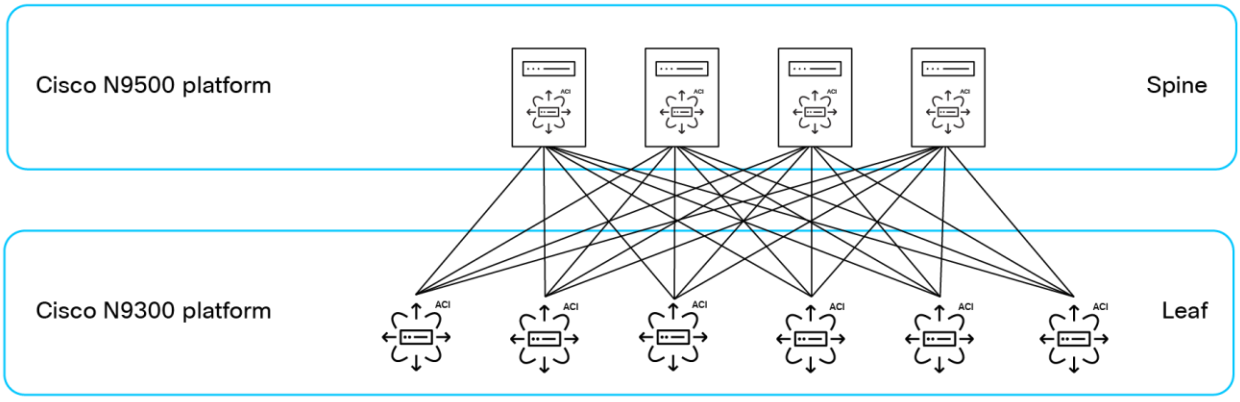


Figure 2.
Spine-Leaf Architecture using Cisco N9300 and N9500 Switches

Cisco ACI is the most comprehensive solution to enable data center automation and application agility. It provides a secure, scalable, deterministic, and integrated policy-based architecture, which enables rapid application deployment and workload mobility in data centers. The Cisco N9000 Series cloud-scale switches are the foundation to deploy and run Cisco ACI. The Cisco N9500 Series cloud-scale switches and select Cisco N9300 Series cloud-scale switches provide the ACI spine functionality in the Cisco ACI fabric. The Cisco N9300 Series cloud-scale switches provide the ACI leaf functionality in the Cisco ACI fabric.

In Cisco NX-OS mode, the Cisco N9500 Series Switches support foundational routing and switching technologies along with modern technologies such as VXLAN with BGP-EVPN control plane, segment routing, MPLS, and open APIs. These technologies provide the flexibility to build spine-leaf data center fabrics or classical three-tier data center networks. In this mode, the Cisco® Data Center Network Manager (DCNM) can manage the Cisco N9500 Series Switches.

Core, Aggregation, and gateway roles

The Cisco N9500 Series Switches support line cards that provide a choice of smart buffers, deep buffers, large tables, and high-density, high-speed Ethernet interfaces. These hardware capabilities, along with extensive routing and switching software capabilities, make the Cisco N9500 Series Switches an excellent choice as a core, aggregation, or gateway switch.

End-of-row access layer switch

As the Cisco N9500 Series Switches support high-density, multispeed Ethernet ports, these switches can also be deployed as end-of-row switches providing access connections to blade or rack servers. The Cisco N9500 Series Switches also provide the flexibility to incrementally transition from lower-speed server connections to higher-speed server connections.

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Switch components for the Cisco N9500 series

The Cisco N9500 Series Switch includes the components shown in Figure 3.

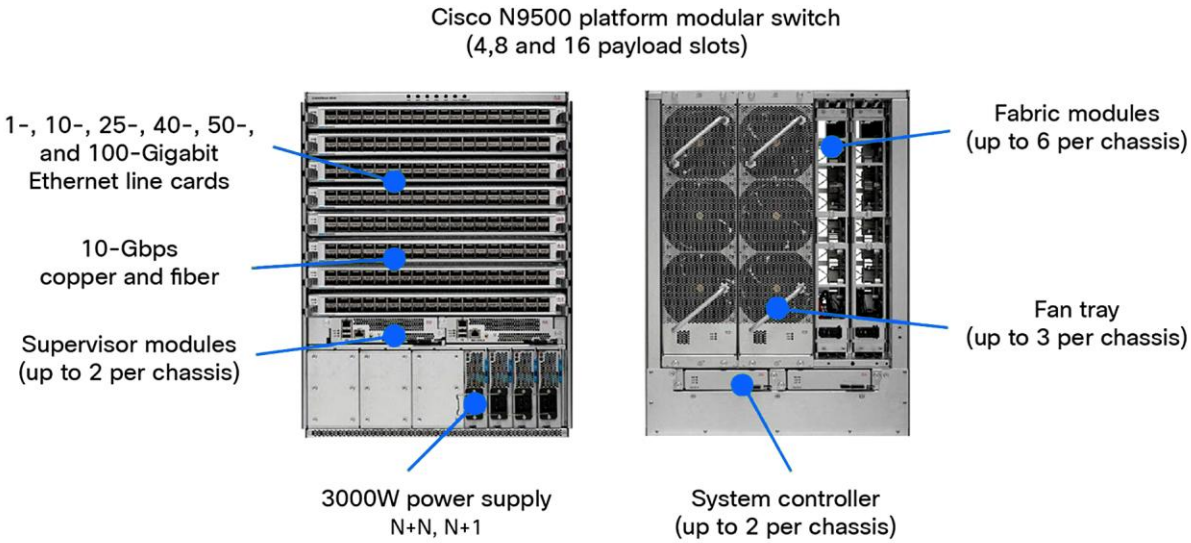


Figure 3.
Cisco N9500 Series Switch Components

The Cisco N9500 Series switches support several line cards and fabric modules. The following data sheets describe each family of line cards and fabric modules:

- Cisco N9500 Cloud Scale Line Cards and Fabric Modules. URL: https://www.cisco.com/c/en/us/products/collateral/switches/n-9000-series-switches/datasheet-c78-736677.html.
- Cisco N9500 R-Series (Deep Buffer) Line Cards and Fabric Modules. URL: https://www.cisco.com/c/en/us/products/collateral/switches/n-9000-series-switches/datasheet-c78-738321.html.
- Cisco N9500 Classic Line Cards and Fabric Modules. URL: https://www.cisco.com/c/en/us/products/collateral/switches/n-9000-series-switches/datasheet-c78-741336.html.

Switch chassis for the Cisco N9500 series

The Cisco N9500 Series Switch has Three Chassis – a 4-Slot, 8-Slot, and 16-Slot Chassis.

N9K-C9504: 4-Slot Chassis 	• Up to 4 line cards • Up to 4 power supplies • Up to 6 fabric modules of the same type • Up to 2 system controllers • Up to 2 supervisors of the same type • Up to 3 fan trays

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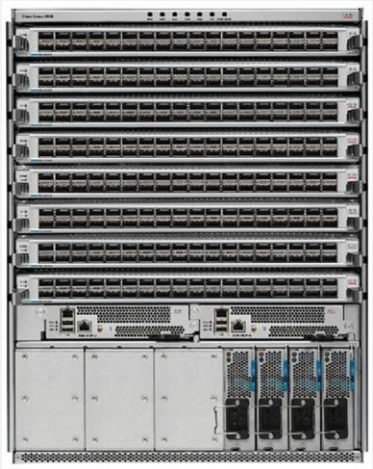
N9K-C9508: 8-Slot Chassis 	• Up to 8 line cards • Up to 8 power supplies • Up to 6 fabric modules of the same type • Up to 2 system controllers • Up to 2 supervisors of the same type • Up to 3 fan trays
N9K-C9516: 16-Slot Chassis 	• Up to 16 line cards • Up to 10 power supplies • Up to 6 fabric modules of the same type • Up to 2 system controllers • Up to 2 supervisors of the same type • Up to 3 fan trays

Table 2. Cisco N9500 series switch chassis specifications

	Cisco N9504 Chassis	Cisco N9508 Chassis	Cisco N9516 Chassis
Number of line card slots	4	8	16
Dimensions (H x W x D)	12.25 x 17.50 x 33.15 in. (31.1 x 44.50 x 84.20 cm)	22.70 x 17.50 x 31.76 in. (57.78 x 44.50 x 80.67 cm)	36.70 x 17.50 x 31.76 in. (93.41 x 44.50 x 80.67 cm)
Weight	84 lb (38.2 kg)	150 lb (68.2 kg)	192 lb (87.3 kg)
Rack Units	7	13	21
Mean Time Between Failure (MTBF) Hours	1,038,080	928,910	680,000
Operating temperature	32 to 104° F (0 to 40° C)		

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	Cisco N9504 Chassis	Cisco N9508 Chassis	Cisco N9516 Chassis
Nonoperating temperature	-40 to 158°F (-40 to 70°C)		
Humidity	5 to 95% (noncondensing)		
Altitude	0 to 13,123 ft (0 to 4,000m)		
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC		
Safety	UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1 Second Edition EN 60950-1 Second Edition IEC 60950-1 Second Edition AS/NZS 60950-1 GB4943		
EMC: Emissions	47CFR Part 15 (CFR 47) Class A AS/NZS CISPR22 Class A CISPR22 Class A EN55022 Class A ICES003 Class A VCCI Class A EN61000-3-2 EN61000-3-3 KN22 Class A CNS13438 Class A		
EMC: Immunity	EN55024 CISPR24 EN300386 KN 61000-4 series		
RoHS	The product is RoHS-6 compliant with exceptions for leaded-ball grid-array (BGA) balls and lead press-fit connectors.		

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Supervisor modules for the Cisco N9500 series

A pair of redundant supervisor modules manages all switch operations using a state-synchronized, active-standby model. The supervisor accepts an external clock and supports management through multiple ports – two USB ports, a serial port, and a 10/100/1000-Mbps Ethernet port. All supervisors support Cisco ACI or NX-OS deployments. Redundant supervisors should be of the same type within a chassis.

Table 3. Cisco N9500 series supervisor modules specifications

	N9K-SUP-A	N9K-SUP-A+	N9K-SUP-B	N9K-SUP-B+
Processor	4 core, 4 thread 1.8GHz x86	4 core, 8 thread 1.8GHz x86	6 core, 12 thread 2.2GHz x86	6 core, 12 thread 1.9GHz X86
DRAM	16GB	16GB	24GB	32GB
SSD	64GB	64GB	256GB	256GB
Weight	4.84 lb (2.2 kg)	5.2 lb (2.37 kg)	6.00 lb (2.72 kg)	5.3 lb (2.39 kg)
Typical power	69 W	69 W	75 W	75 W
Maximum power	80 W	80 W	80 W	90 W
MTBF hours	312,070	414,240	292,110	421,040
Hot swappable	Yes			
Airflow	Port-side intake			

System controller for the Cisco N9500 platform

A pair of redundant system controllers offloads chassis management functions from the supervisor modules. The controllers are responsible for managing the power supplies and fan trays; they are also the central point for the Gigabit Ethernet Out-of-Band Channel (EOBC) between the supervisors, fabric modules, and line cards.

Table 4. Cisco N9500 series system controller specifications

	N9K-SC-A
Weight	1.91 lb (0.9 kg)
Typical power	14 W
Maximum power	25 W
MTBF hours	1,380,210
Hot swappable	Yes
Airflow	Port-side intake

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Fabric module for the Cisco N9500 platform

Each Cisco N9500 Series Chassis supports up to six fabric modules, which plug in vertically at the back of the chassis behind the fan trays. The Cisco N9500 line card and fabric module data sheets provide additional information about the various fabric modules.

Fan trays for the Cisco N9500 platform

The Cisco N9500 chassis supports two versions of hot-swappable fan trays that are compatible with specific fabric modules. Each fan tray covers two fabric module slots and enables front-to-back air-flow for the entire chassis. An appropriate fabric module blank card should be installed in all empty fabric module slots to ensure proper air-flow and cooling of the chassis.

Table 5. Fan tray specifications

	N9K-C9504-FAN	N9K-C9504-FAN2	N9K-C9508-FAN	N9K-C9508-FAN2	N9K-C9516-FAN
Fabric Module	N9K-C9504-FM-E N9K-C9504-FM-R N9K-C9504-FM-S N9K-C9504-FM	N9K-C9504-FM-G	N9K-C9508-FM-E2 N9K-C9508-FM-E N9K-C9508-FM-R N9K-C9508-FM-S N9K-C9508-FM	N9K-C9508-FM-G	N9K-C9516-FM-E2 N9K-C9516-FM-E N9K-C9504-FM
Fabric Module Blank	N9K-C9504-FM-CV	N9K-C9504-FAN-PWR	N9K-C9508-FM-CV	N9K-C9508-FAN-PWR	N9K-C9516-FM-CV
Weight	5.76 lb (2.6 kg)	8.2 lb (3.7 kg)	9.59 lb (4.4 kg)	8.6 lb (3.9 kg)	11.50 lb (5.2 kg)
Typical power	95 W	306W	176 W	450W	330 W
Maximum power	150 W	600W	250 W	900W	451 W
Hot swappable	Yes				
Airflow	Port-side intake				

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Cisco N9500 platform power supply

The Cisco N9500 platform supports hot-swappable, front-panel-accessible AC, DC, and universal high voltage AC/DC power supplies. The total power budget required for the mix and number of line cards and fabric modules installed in the chassis determines the ability to support power supply redundancy modes – combined, n + 1, n + n, or input-source redundancy.

The 3150W high voltage AC/DC power supply offers two power inputs each of which can provide up to 3150 W of output power. This unique capability offers more flexibility in provisioning power redundancy for the chassis.

Table 6. Power supply specifications

	Cisco N9500 3000W AC Power Supply	Cisco N9500 3000W DC Power Supply	Cisco N9500 3000W HV AC/DC Power Supply	Cisco N9500 3150W HV AC/DC Power Supply
Output power	3000 W	3000 W	3000 W	3150 W
Input voltage	AC: 200V to 240V	DC: -48V to -60V (nominal) -40V to -72V (min – max)	AC: 200V to 277V DC: 240V to 380V (nominal) 192V to 400V (min – max)	AC: 200V to 277V DC: 240V to 380V (nominal) 192V to 400V (min – max)
Number of inputs	1	2 (1500 W output per input)	1	2 (3150 W output per input)
Frequency	50 to 60 Hz	N/A	AC: 47 to 63 Hz DC: N/A	AC: 47 to 63 Hz DC: N/A
Efficiency	80PLUS Platinum	80PLUS Platinum Equivalent	80PLUS Platinum (AC) 80PLUS Platinum Equivalent (DC)	80PLUS Titanium (AC) 80PLUS Titanium Equivalent (DC)
Weight	6.2 lb (2.8 kg)	6.4 lb (2.9 kg)	5.9 lb (2. 7 kg)	9.9 lb (4.5 kg)
MTBF hours	868,870	1,761,580	965,700	838,900
Hot swappable	Yes			
Airflow	Yes			

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Table 7. Ordering information

Part number	Product description
Hardware	
N9K-C9504 (=)	Cisco N9504 Chassis with 4 line card slots
N9K-C9508(=)	Cisco N9508 Chassis with 8 line card slots
N9K-C9516(=)	Cisco N9516 Chassis with 16 line card slots
N9K-SUP-A+(=)	Cisco N9500 4-Core/8-Thread Supervisor
N9K-SUP-B+(=)	Cisco N9500 6-Core/12-Thread Supervisor
N9K-SUP-A(=)	Cisco N9500 4-Core/4-Thread Supervisor
N9K-SUP-B(=)	Cisco N9500 6-Core/12-Thread Supervisor
N9K-SC-A(=)	Cisco N9500 System Controller
N9K-PAC-3000W-B(=)	Cisco N9500 3000W 200V to 240V AC PS, Port-Side Intake
N9K-PDC-3000W-B(=)	Cisco N9500 3000W -48V-60V DC PS, Port-Side Intake
N9K-PUV-3000W-B(=)	Cisco N9500 3000W 200V to 277V AC or 240V to 380V DC Universal high voltage AC/DC PS, Port-Side Intake
N9K-PUV2-3000W-B(=)	Cisco N9500 3150W 200V to 277V AC or 240V to 380V DC Universal high voltage AC/DC PS, Port-Side Intake
N9K-C9504-FAN(=)	Fan Tray for Cisco N9504 Chassis
N9K-C9504-FAN2(=)	N9500 4-slot chassis 400G cloud scale fan tray (Generation 2)
N9K-C9504-FAN-PWR(=)	N9500 4-slot chassis 400G cloud scale fan tray power connector
N9K-C9508-FAN(=)	Fan Tray for Cisco N9508 Chassis
N9K-C9508-FAN2(=)	N9500 8-slot chassis 400G cloud scale fan tray (Generation 2)
N9K-C9508-FAN-PWR(=)	N9500 8-slot chassis 400G cloud scale fan tray power connector
N9K-C9516-FAN(=)	Fan Tray for Cisco N9516 Chassis
Accessories	
N9K-C9500-RMK=	Cisco N9500 Rack Mount Kit for N9508 and N9516 chassis
N9K-C9504-RMK=	Cisco N9500 Rack Mount Kit for N9504
N9K-C9500-ACK=	Cisco N9500 Accessory Kit

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Note

All part numbers with “=” sign refer to Spare part numbers for ordering.

Warranty

The Cisco N9500 platform has a 1-year limited hardware warranty. The warranty includes hardware replacement with a 10-day turnaround from receipt of a Return Materials Authorization (RMA).

Cisco environmental sustainability

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

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

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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

Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco N9500 platform in your data center. These innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase operation efficiency and improve your data center network.

Cisco Advanced Services use an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value. Cisco SMARTnet™ Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home service, which offers proactive diagnostics and real-time alerts on your Cisco N9500 platform switch.

Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

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Cisco Capital

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For more information

For more information about the Cisco N9000 Series, please visit https://www.cisco.com/go/n9000.

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Document history

New or revised topic	Described in	Date
Product name change	Throughout the data sheet	August 2026

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Printed in USA C78-729404-33 08/26

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