Cisco N9164E-NS4-O Switch

Contents

Cisco N9164E-NS4-O switch is a 64-port OSFP 800G fixed switch.

Product overview

Artificial intelligence and machine learning (AI/ML) applications are being used increasingly in today's data centers, and Cisco Nexus® 9000 Series Switches have the hardware and software capabilities to provide the right latency, congestion-management mechanisms, and telemetry to meet the requirements of those applications. Cisco Nexus 9000 Series Switches address the need for high-performance, power-efficient, compact switching in network infrastructures and are designed to support high-density 800G fabrics for next-generation leaf and spine designs.

Large-cloud and data-center networking teams require a flexible, reliable solution that efficiently manages, troubleshoots, and analyzes their IT infrastructure. In addition, they need security, automation, visibility, analytics, and assurance. Coupled with tools such as Cisco Nexus Dashboard Insights for visibility and Cisco Nexus Dashboard Fabric Controller for automation, Cisco Nexus 9000 Series Switches are ideal platforms to build a high-performance AI/ML network fabric.

The Cisco N9164E-NS4-O switch is a new addition to the Cisco Nexus 9000 Series high-density 800G aggregation switches for the data center fabric. It also offers various lower port speeds and densities, including 400, 200, and 100 Gbps. The Cisco N9164E-NS4-O switch is powered by the NVIDIA Spectrum-4 application-specific integrated circuit (ASIC), equipped to support next-generation AI networking architecture. The Cisco Cloud Reference Architecture (CRA), utilizing the Cisco N9100 switch powered by NVIDIA Spectrum-X™ Ethernet switch silicon, is compliant with the NVIDIA Cloud Partner (NCP) reference architecture requirements.

The Cisco N9164E-NS4-O is a 2-rack-unit (2RU) 64-port OSFP 800 Gigabit Ethernet switch. It supports 51.2 Tbps of bandwidth and provides 160MB of on-die packet buffer with consistent and low cut-through latency.

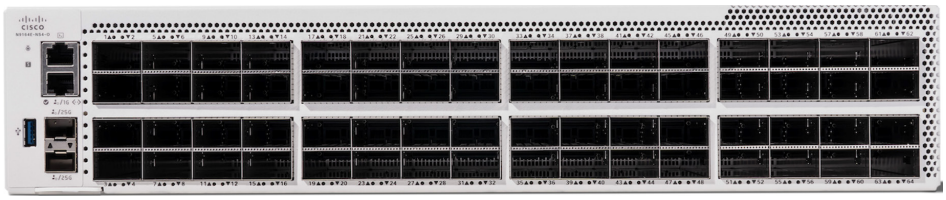

Figure 1. Cisco N9164E-NS4-O switch, frontside

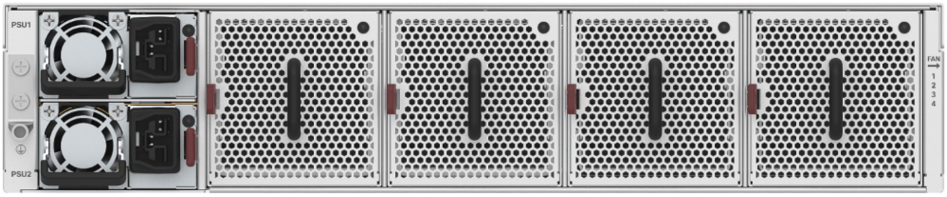

Figure 2. Cisco N9164E-NS4-O switch, backside

Features and benefits

Table 1. Features and benefits

Feature	Benefit
Architectural flexibility	• Purpose-built Cisco NX-OS Software operating system with comprehensive, proven innovations. The operating system is modular, with a dedicated process for each routing protocol – a design that isolates faults while increasing availability. The operating system is modular, with a dedicated process for each routing protocol – a design that isolates faults while increasing availability. • Support for standards-based VXLAN EVPN fabrics, inclusive of hierarchical multisite support. • Three-tier BGP architectures, enabling horizontal, nonblocking IPv6 network fabrics at AI scale. • Comprehensive protocol support for Layer-3 (v4 and v6) unicast and multicast routing protocol suites. • Cisco Nexus Dashboard Data Broker provides customers complete observability into their network and solution(s) that can help them identify and mitigate security threats, realize and remediate performance bottlenecks, adhere to data compliance, and have insight into capacity-planning operations.
Extensive programmability	• Day-0 automation through Power on Auto Provisioning (POAP), drastically reducing provision time. • Industry-leading integrations for leading DevOps configuration-management applications, such as Red Hat Ansible, extensive native YANG, and industry-standard OpenConfig model support through RESTCONF/NETCONF/gNMI. • REST API interacting with Data Management Engine (DME). • Model-driven telemetry, which enhances network observability. • Third-party application-hosting using Cisco Application Framework (CAF).
High scalability, flexibility, and security	• 512,000 forwarding entries flexibly shared across Access Control List (ACL), Longest Prefix Match (LPM) routes, host routes, Media Access Control (MAC) list, Equal-Cost Multipath (ECMP), and tunnel applications.

Feature	Benefit

AI/ML networking	• Cisco Nexus 9000 Series Switches support innovative congestion management and flow-control algorithms along with the latency and telemetry to meet the design requirements of AI/ML fabrics.
	• Adaptive Routing distributes traffic across multiple paths or links that optimizes performances at scale.
	• Priority Flow Control (PFC) is a key capability supported on Cisco Nexus 9000 Series Switches that prevents Ethernet frame drops by signaling, controlling, and managing Ethernet flows along a path by sending pause frames to appropriate senders.
	• The platform also supports Explicit Congestion Notification (ECN), which provides end-to-end notification per IP flow by marking packets that experienced congestion, without dropping traffic. The platform is capable of tracking ECN statistics, including the number of marked packets that have experienced congestion.
	• The platform offers lossless transport for Remote Direct Memory Access (RDMA) over converged Ethernet (RoCE) with support of Data-Center-Bridging (DCB) protocols:
	  – Enhanced Transmission Selection (ETS) reserves bandwidth per priority class in network contention situations.
	  – Data Center Bridging Exchange Protocol (DCBX) can discover and exchange priority and bandwidth information with endpoints.
	• Weighted Random Early Detection (WRED) is a congestion-avoidance technique that allows Cisco Nexus 9000 Series Switches to detect and react to congestion in the network by marking flows that could cause congestion.
	• The platform offers Cisco's innovative intelligent buffer management, which offers the capability to distinguish between mice and elephant flows and apply different queue-management schemes to them based on their network-forwarding requirements in the event of link congestion.

Feature	Benefit
Hardware and software high availability	• Virtual Port-Channel (vPC) technology provides Layer-2 multipathing through the elimination of Spanning Tree Protocol (STP). • Capability to link fabrics in a VXLAN environment, eliminating the need for peer-to-peer vPCs. The 128-way Equal-Cost Multipath (ECMP) routing enables the use of Layer-3 fat-tree designs. This feature helps organizations prevent network bottlenecks, increase resiliency, and add capacity with little network disruption. • Software-Maintenance Upgrades (SMUs) contain fixes for specific defects. They provide a quick resolution of critical issues. • In-Service Software Upgrades (ISSUs) allow upgrades of device software while the switch continues to forward traffic. ISSUs reduce or eliminate the downtime typically caused by software upgrades. • The switches use hot-swappable Power-Supply Units (PSUs) and fans with N+1 redundancy.
Cisco Nexus Dashboard	• Cisco Nexus Dashboard is an automation and operations platform that simplifies data-center and cloud-network operations through visibility, analytics and sustainability. • Cisco Nexus Dashboard is included with all Cisco Nexus 9000 switch tiered licenses. Unlock seamless management capabilities. Gain flexibility, real-time insights, and access to advanced features tailored to your needs. Learn more about data center networking subscriptions.

Licensing

The Cisco N9164E-NS4-O switch is used with XF3 class Cisco Data Center Network (Cisco DCN) Premier, Advantage, and Essentials subscription licenses. The licensing guide illustrates the software packaging and licensing available to enable advanced features. For the latest software release information and recommendations, refer to the release notes.

Product specifications

Table 2. Cisco N9164E-NS4-O switch specifications

Item	Cisco N9164E-NS4-O switch
Technical	• 64-port 800G OSFP ports • Supports 2x400, 4x200, and 4x100 breakout • On-die buffer: 160MB fully shared • System memory: 64GB • SSD: 240 GB • USB: 1 port • RS-232 serial console ports: 1 • Management ports: 1 • CPU Intel Ice-Lake D-1734NT 8C/ 2.0GHz
Power and cooling	• Power: 3000W HVAC/HVDC • Hot-swappable, 4 fans, 3+1 redundancy • Typical power: TBD • Maximum power: 3000 W
Physical and environmental	• Dimensions (W x D x H):17.29 inch x 27.76 inch x 3.46 inch (439.2 x 705 x 87.9 mm) • Acoustics: – Port-side intake: – at 50% fan speed: 78.3 dBA – at 70% fan speed: 86.9 dBA – at 90% fan speed: 92.6 dBA – at 100% fan speed: 93 dBA • Operating temperature: 32 to 104F (0 to 40C) • Nonoperating (storage temperature): -40 to 158F (-40 to 70C) • Humidity: 5 to 95% (non-condensing) • Altitude: 0 to 9,842 ft (0 to 3000m)

Table 3. Cisco N9164E-NS4-O switch power-supply specifications

Item	Cisco HVAC/HVDC
Output power	3000 W
Input voltage	90-140 AC 180-305 AC 190-400 DC
Input frequency	47–63 Hz
Connector	APP SAF-D-GRID Ultra Short 2006
Efficiency	80PLUS Platinum

Table 4. Cisco N9164E-NS4-O weight

Item	Cisco HVAC/HVDC
N9164E-NS4-O without power supplies or fans	3 7.0 lbs (16.8 kg)
N9164E-NS4-O with power supplies or fans	45.5 lbs (20.6 kg)
PSU3KW-HVPI	1.75 lbs (0.79 kg)
NXASFAN-190CFPMI	1.25 lbs (0.57 kg)

Ordering information

Table 5. Ordering information

Part #	Product Description
N9164E-NS4-O	Cisco N9100 64p 800G switch w/ OSFP
N9164E-NS4-O=	Cisco N9100 64p 800G switch w/ OSFP w/o power supply, fans
PSU3KW-HVPI	Cisco 3000W HV power module with port-side intake
PSU3KW-HVPI=	Cisco 3000W HV power module with port-side intake, spare
NXASFAN-190CFMPI	Cisco fan tray, port-side intake airflow
NXASFAN-190CFMPI=	Cisco fan tray, port-side intake airflow, spare
NXK-ACC-KIT3-S	Cisco 2RU fixed system installation kit short
NXK-ACC-KIT3-S=	Cisco 2RU fixed system installation kit short, spare
NXK-ACC-KIT3-L	Cisco 2RU fixed system installation kit long
NXK-ACC-KIT3-L=	Cisco 2RU fixed system installation kit long, spare

Warranty information

The Cisco N9164E-NS4-O switch 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).

Product sustainability

Information about Cisco's Environmental, Social, and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Table 6. Cisco environmental sustainability information

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries, and packaging	WEEE Compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Countries and regions supported	
Power	Power	Table 3: Power-supply specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Weight	Table 4: weight specifications

Cisco and Partner Services

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco N9100 switch in your data center. The 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 uses an architecture-led approach to help you align your data-center infrastructure with your business goals and achieve long-term value. The Cisco SMARTnet® service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources.

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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.