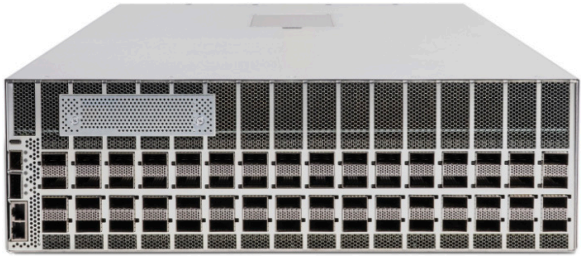
Cisco N9364E-SP2R Series Switches





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Cisco N9000 Series Switches: powering next-generation data centers

Cisco N9000 Series Switches for high-performance networking

The exponential growth of AI and machine-learning workloads demands a new era of network scalability, transcending the traditional boundaries of a single data center. Cisco's "scale across" architecture, powered by leading-edge 800G network switches, enables enterprises to unify multiple geographically distributed data centers into a single, massive computing resource pool. This innovative approach addresses the critical challenges of power, cooling, and physical space limitations inherent in single-site expansions. Cisco® N9000 Series Switches, featuring the Cisco® Silicon One® P200 chip as the industry's first 51.2Tbps full-duplex, deep buffer processor, purpose-built for the Scale Across Era. It is the only 51.2Tbps deep-buffer chip designed to scale across all DCI needs to the foundational high-density 800G fabrics necessary for this transformation. These platforms deliver unprecedented throughput, deep buffering for congestion management, and advanced programmability, ensuring seamless and secure operation of distributed AI clusters across hundreds or even thousands of kilometers. Cisco empowers organizations to build elastic, consistent, and giga-scale AI infrastructure that is both future-ready and optimized for the most demanding workloads.

Cisco N9364E-SP2R: next-generation 800G spine switch

The Cisco N9364E-SP2R switch introduces high-density 800G spine to the data center fabric, while also supporting 400G, 200G, and 100G port speeds. Powered by Cisco Silicon One P200 ASIC, it is built for next-generation data-center deployments. The N9364E-SP2R features a 3RU form factor with 64 ports of 800 Gigabit Ethernet, available in QSFP-DD and OSFP options, delivering up to 102.4T Tbps of bandwidth, 19.2 billion packets per second (bpps), 144 MB of on-die packet buffer, and 16GB High Bandwidth Memory (HBM), MACsec, and IPsec, crucial for handling bursty AI traffic and preventing packet loss.

Enterprise-ready flexibility and security

Cisco N9000 Series Switches provide a balanced combination of flexibility, robust security, and simplified operations for enterprise networks. Support for mixed port speeds enables seamless migration from 10/25/50G to 100/400/800G. Comprehensive data-center, multicast, Layer-2/3 capabilities – including EVPN-VXLAN, vPC, and advanced routing – simplify deployment, while features such as MACsec, secure boot, role-based access control, and network segmentation protect critical assets. Integrated automation and telemetry further streamline operations in hybrid- and multicloud environments.

Simplified data center operations

Data-center teams benefit from flexible, scalable solutions that simplify management, troubleshooting, and analytics. The N9000 series switches integrate seamlessly with Cisco Nexus Dashboard, providing enhanced security, automation, visibility, and assurance-making them an ideal foundation for building resilient, high-performance network fabrics.

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High-performance Cisco ACI fabrics

Cisco N9000 Series spine switches form the high-speed backbone of the Cisco ACI® fabric, connecting leaf switches through a fully meshed spine-leaf topology. These spine switches provide high port density and throughput, enabling scalable and resilient data-center networking. Leveraging advanced capabilities such as integrated analytics, and telemetry, these switches can operate as a Cisco ACI spine switch. N9000 series switches offer dual-role flexibility, allowing deployment as either spine or leaf switches depending on fabric requirements. The fabric is centrally managed by the Cisco Application Policy Infrastructure Controller (APIC), which automates policy enforcement and network operations, ensuring high availability and load balancing across the spine-leaf architecture. Within this “scale across” architecture, Cisco ACI provides the intelligent, automated fabric for each individual data center, ensuring consistent policy enforcement and operational simplicity, which are then seamlessly interconnected by the high-speed 800G backbone.

Features and benefits

Table 1. Features and benefits

Feature	Benefit
Architectural flexibility	• Cisco N9000 Series Switches support Cisco NX-OS VXLAN EVPN, Cisco IP Fabric for Media, Cisco Nexus Data Broker, and IP routed on Ethernet switched Layer-2 fabrics, using a comprehensive set of unicast and multicast IPv6/IPv4 and Ethernet protocols. • 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. • Purpose-built Cisco Application Centric Infrastructure (Cisco ACI) spine switch provides a software-defined networking (SDN) solution for data centers, offering policy-based automation, centralized management, and enhanced visibility. The N9000 series switches are foundational hardware for ACI, designed for high performance, scalability, and programmability in modern data-center environments. • Support for standards-based VXLAN EVPN fabrics, inclusive of hierarchical multisite support (Refer to VXLAN Network with MP-BGP EVPN Control Plane Design Guide for more information.) • Three-tier BGP architectures, enabling horizontal, nonblocking IPv6 network fabrics at web scale. • Comprehensive protocol support for Layer-3 (v4 and v6) unicast and multicast routing protocol suites.

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Feature	Benefit
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 Ansible. Extensive Native YANG, and industry-standard OpenConfig model support through RESTCONF/NETCONF/gNMI • REST API interacting with Cisco NX-OS Software 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	• MACsec (Media Access Control Security), standardized by IEEE 802.1AE, provides robust Layer-2 security by encrypting Ethernet frames at line rate, ensuring data confidentiality, integrity, and origin authenticity between connected devices. Implemented in hardware for high performance and low latency, MACsec protects against a wide range of Layer-2 attacks, including eavesdropping, tampering, and replay attacks, and secures critical control-plane protocols. • IPsec provides data confidentiality, integrity, and authentication between peers at the IP layer. It secures sensitive traffic by establishing secure tunnels between two endpoints, encrypting and authenticating the data flows. IPsec uses protocols such as Internet Key Exchange (IKE) for negotiation and key management, and supports various encryption and authentication algorithms. It protects traffic based on access lists and applies security associations to ensure secure transmission. IPsec tunnels can be configured on Cisco Nexus switches to secure data flows between hosts or gateways, providing network layer encryption without requiring changes to individual applications.

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Feature	Benefit
Networking	Cisco N9000 Series Switches support innovative congestion management and flow-control algorithms along with the right latency and telemetry to meet the design requirements of AI/ML fabrics. • Priority flow control (PFC) is a key capability supported on Cisco N9000 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 N9000 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 various flows and apply different queue-management schemes to them based on their network-forwarding requirements in the event of link congestion.

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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 vPC. The 128-way Equal-Cost Multipath Protocol (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. • The switches use hot-swappable power-supply units (PSUs) and fans with N+1 redundancy.
Cisco Nexus Dashboard	• Cisco Nexus Dashboard is a platform that transforms data-center networks through simplicity, automation, and analytics. Cisco Nexus Dashboard is a central management console for multiple data center sites and a common platform for hosting Cisco data center operation services. These services are available for all the data center fabrics and provide real-time analytics, visibility, assurance for network policies and operations, as well as policy orchestration for the data center fabrics, such as NX-OS deployments spanning LAN Fabric, SAN, and IP Fabric for Media (IPFM) networks. Cisco Nexus Dashboard 4.1 integrates multiple services like Insights, Orchestrator, and Fabric Controller into a single, seamless platform for data center operations.

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Licensing

The default system software has a comprehensive Layer-2 security and management feature set. To enable additional functions, including Layer-3 IP unicast and IP multicast routing you must install additional licenses. The Cisco N9364E-SP2R switches uses the 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.

This data sheet specifies hardware capabilities only. Please refer to Cisco ACI or Cisco NX-OS software release notes and appropriate feature documentation for more details.

Product specifications

Table 2. Cisco N9364E-SP2R switches specifications

Item	Cisco N9364E-SP2R switch
Technical	• 64-port 800G OSFP (N9364E-SP2R-O) • 64-port 800G QSFP-DD (N9364E-SP2R-Q) • Supports 2x400G, 4x200G, 8x100G, 1x400G, 2x200G, 4x100G, 8x50G, 4x50G, 2x100G, 4x25G, 4x10G breakout • High bandwidth memory (HBM): 16GB • On-die buffer: 144MB fully shared • System memory: 64GB, DDR5 • SSD: 240 GB • USB: 1 port • RS-232 serial console ports: 1 • Management ports: 1 • AMD Ryzen Embedded V3000 Series 3.0 GHz CPU
Power and cooling	• Power: 4 power supplies, 2+2 redundancy, powered by 2x3000W HVAC/HDVC • Hot-swappable, 7 fans, 6+1 redundancy • Typical power: 2500W • Maximum power: 5100W

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Item	Cisco N9364E-SP2R switch
Physical and environmental	• Dimensions (5.12 x 17.29 x 24.69) inches • Acoustics: – Port-side intake: – At 50% fan speed: Front (69.9 dBA), Rear (74.2 dBA) – At 70% fan speed: Front (75.7 dBA), Rear (82.3 dBA) – At 90% fan speed: Front (80.1 dBA), Rear (88.5 dBA) – At 100% fan speed: Front (81.2 dBA), Rear (89.6 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) • Mean Time Between Failure (MTBF): TBD hours

Table 3. Cisco N9364E-SP2R switches power-supply specifications

Model	Cisco HVAC/HVDC
System power	6000 W (2 x PSUs)
Input voltage	90-140 VAC 180-305 VAC 190-400 VDC
Input frequency	47-63 Hz
Connector	APP SAF-D-GRID Ultra Short 2006
Efficiency	80PLUS Platinum

Table 4. Cisco N9364E-SP2R switch weight

Part number	Weight
N9364E-SP2R-Q/O without power supplies or fans	53.73 lbs (24.37 kg)
N9364E-SP2R-Q/O with power supplies and fans	72 lbs (32.65 kg)
PSU3KW-HVPI (Max 4)	3.0 lbs (1.36 kg)
FAN-PI-V4 (Max 5)	1.15 lbs (0.52 kg)
FAN-1RU-PI-V2 (Max 2)	0.26 lbs (0.11 kg)

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Supported optics modules

For details on the optical modules available and the minimum software release required for each supported optical module, visit here.

Ordering information

Table 5. Ordering information

Part #	Product description
N9364E-SP2R-O	Cisco N9300 64p 800G switch w/ OSFP
N9364E-SP2R-O=	Cisco N9300 64p 800G switch w/ OSFP w/o power supply, fans
N9364E-SP2R-Q	Cisco N9300 64p 800G switch w/ QSFP-DD
N9364E-SP2R-Q=	Cisco N9300 64p 800G switch w/ QSFP-DD 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
FAN-PI-V4	Cisco fan tray, port-side intake airflow
FAN-PI-V4=	Cisco fan tray, port-side intake airflow, spare
FAN-1RU-PI-V2	Cisco aux fan tray, port-side intake airflow
FAN-1RU-PI-V2=	Cisco aux fan tray, port-side intake airflow, spare
NXK-ACC-KIT2-2RU	Cisco rack mount kit
NXK-ACC-KIT2-2RU=	Cisco rack mount kit, spare

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Warranty information

The Cisco N9364E-SP2R switches have 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		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	Table 6: Regulatory compliance
Power	Power	Table 3: Power-supply specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Weight	Table 4. Weight

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Cisco and partner services

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco N9000 Series Switches 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.

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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