Cisco Nexus 9300-GX2 Series Fixed Switches

Contents

Product highlights

In the evolving landscape of applications, there is an increased bandwidth requirement due to emergence of AI-powered applications. Large cloud and data-center networking teams require a flexible, reliable solution that efficiently manages, troubleshoots, and analyzes their IT infrastructure. They need security, automation, visibility, analytics, and assurance. Equipped to support this next-generation cloud architecture, the Cisco Nexus® 9300-GX2 series switches are based on Cisco Cloud Scale technology.

The Cisco Nexus 9300-GX2 series addresses the need for high-performance, power-efficient, compact switches in the networking infrastructure. These switches are designed to support 50G, 100G, 200G, and 400G fabrics for next-generation leaf and spine designs and IP storage fabrics. The platform is built with backward-compatible 400G optical interface Quad Small Form-Factor Pluggable-Double Density (QSFP-DD) to transparently migrate existing data center fabrics from 40-Gbps and 100-Gbps speeds to 400 Gbps; it also offers various lower port speeds and densities, including 10, 25, 50, and 200 Gbps, using breakouts. Cisco provides two modes of operation for Cisco Nexus 9000 Series Switches. Organizations can deploy Cisco Application Centric Infrastructure (Cisco ACI®) or Cisco NX-OS mode.

Switch model

Table 1. Cisco Nexus 9300-GX2 series switches

Model	Description
Cisco Nexus 9364D-GX2A	64 x 400-Gbps QSFP-DD and 2x 1/10 -Gbps SFP+ ports
Cisco Nexus 9332D-GX2B	32 x 400-Gbps QSFP-DD and 2x 1/10 -Gbps SFP+ ports

The Cisco Nexus 9364D-GX2A is a 2-Rack-Unit (2RU) switch that supports 25.6 Tbps of bandwidth and 9.49 bpps across 64 fixed 400G QSFP-DD ports and two fixed 1/10G SFP+ ports (Figure 1). Breakout cables are supported on all ports to achieve up to 256 ports of 10/25/50/100-Gbps or 128 ports of 200-Gbps. The first 16 ports, marked in green, are capable of wire-rate MACsec and Cloudsec encryption. The switch is best suited to support massive scale-out fabrics as a compact, high-density spine.

Figure 1.
Cisco Nexus 9364D-GX2A switch

The Cisco Nexus 9332D-GX2B is a compact form-factor 1-Rack-unit (1RU) switch that supports 12.8 Tbps of bandwidth and 5.77 bpps across 32 fixed 400G QSFP-DD ports and two fixed 1/10G SFP+ ports (Figure 1). Breakout is supported on all ports to achieve up to 128 ports of 10/25/50/100-Gbps or 64 ports of 200-Gbps. The last eight ports, marked in green, are capable of wire-rate MACsec and Cloudsec encryption.

Figure 2.
Cisco Nexus 9332D-GX2B switch

Features and benefits

The Cisco Nexus 9300-GX2 series switches provide the following features and benefits:

- **Architectural flexibility**
  - Industry-leading Cisco Software-Defined Networking (SDN) solution with Cisco ACI support. Cisco ACI is a holistic, intent-driven architecture with centralized automation and policy-based application profiles. It provides a robust, transport network for dynamic workloads and is built on a network fabric that combines time-tested protocols with new innovations to create a highly flexible, scalable, and resilient architecture of low-latency, high-bandwidth links. This fabric delivers a network that can support the most demanding and flexible data center environments.
  - Purpose-built Cisco NX-OS Software operating system with comprehensive, proven innovations. A single binary image supports every switch in the Cisco Nexus 9000 Series, simplifying image management. 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 (Refer to **VXLAN network with MP-BGP EVPN control plane for more information**)
  - Three-tier BGP architectures, enabling horizontal, nonblocking IPv6 network fabrics at web scale
  - Segment Routing (SR and SRv6) allows the network to forward Multiprotocol Label Switching (MPLS) packets and engineer traffic without Resource Reservation Protocol (RSVP) Traffic Engineering (TE). It provides a control-plane alternative for increased network scalability and virtualization.
  - Comprehensive protocol support for Layer 3 (v4 and v6) unicast and multicast routing protocol suites, including BGP, Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Routing Information Protocol Version 2 (RIPv2), Protocol Independent Multicast Sparse Mode (PIM-SM), Source-Specific Multicast (SSM), and Multicast Source Discovery Protocol (MSDP)
- **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, Chef, Puppet, and SALT. Extensive native YANG and industry-standard OpenConfig model support through RESTCONF/NETCONF
  - Pervasive APIs for all switch Command-Line Interface (CLI) functions (JSON-based RPC over HTTP/HTTPs)

- **High scalability, flexibility, and security**
  - Flexible forwarding tables support up to two million shared entries on Cisco Nexus 9300-GX2 models.
  - IEEE 802.1ae MAC Security (MACsec) and CloudSec[1] (VTEP to VTEP encryption) capability on select ports of 9300-GX2 models, allows traffic encryption at the physical layer and provides secure server, border leaf, and leaf-to-spine connectivity.
- **Intelligent buffer management**
  - The platform offers Cisco's innovative intelligent buffer management, which offers the capability to distinguish mice and elephant flows and apply different queue management schemes to them based on their network forwarding requirements in the event of link congestion.
  - Intelligent buffer management functions include:
    - Approximate Fair Dropping (AFD) with Elephant Trap (ETRAP). AFD distinguishes long-lived elephant flows from short-lived mice flows, by using ETRAP. AFD exempts mice flows from the dropping algorithm so that mice flows will get their fair share of bandwidth without being starved by bandwidth-hungry elephant flows. Also, AFD tracks elephant flows and subjects them to the AFD algorithm in the egress queue to grant them their fair share of bandwidth.
    - ETRAP measures the byte counts of incoming flows and compares this against the user-defined ETRAP threshold. After a flow crosses the threshold, it becomes an elephant flow.
    - Dynamic Packet Prioritization (DPP) provides the capability of separating mice flows and elephant flows into two different queues so that buffer space can be allocated to them independently. Mice flows—sensitive to congestion and latency—can take priority queue and avoid reordering that allows the elephant flows to take full link bandwidth
- **Remote Direct Memory Access (RDMA) over converged Ethernet – RoCE support**
  - The platform offers lossless transport for Remote Direct Memory Access (RDMA) over converged Ethernet with support of Data Center Bridging (DCB) protocols:
    - Priority-based Flow Control (PFC) prevents drops in the network and pause-frame propagation per priority class.
    - 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.
  - 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.

[1] Please check software release notes to get the latest support for each product to enable MACsec and Cloudsec

- **Hardware and software high availability**
  - Virtual Port-Channel (vPC) technology provides Layer 2 multipathing through the elimination of Spanning Tree Protocol (STP). It also enables fully utilized bisectional bandwidth and simplified Layer 2 logical topologies without the need to change the existing management and deployment models.
  - The 64-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.
  - Advanced reboot capabilities include hot and cold patching.
  - The switches use hot-swappable Power-Supply Units (PSUs) and fans with N+1 redundancy.
- **Cisco Data Center Network Assurance and Insights**
  - Support for Intelligent automation with day-2 operation tools with Cisco Data Center Network Assurance and Insights. Click here to learn more.

Specifications

Table 2. Cisco Nexus 9300 ACI spine switch specifications

Model	Cisco Nexus 9364D-GX2A	Cisco Nexus 9332D-GX2B
Physical	• 64-port 400G QSFP-DD ports and 2-port 1/10G SFP+ ports • Buffer: 120MB • System memory: 32GB • SSD: 128GB • USB: 1 port • RS-232 serial console ports: 1 • Management ports: 2 (1 x10/100/1000BASE-T and 1 x1-Gbps SFP) • CPU: 6 cores	• 32-port 400G QSFP-DD ports and 2-port 1/10G SFP+ ports • Buffer: 120MB • System memory: 32 GB • SSD: 128GB • USB: 1 port • RS-232 serial console ports: 1 • Management ports: 2 (1 x10/100/1000BASE-T and 1 x 1-Gbps SFP) • CPU: 4 cores
Power and cooling	• Power: 3200W AC • Input voltage: 100 to 240V AC • Hot-swappable, 4 fans, 3+1 redundancy • Frequency: 50 to 60 Hz (AC) • Efficiency: 90% or greater (20 to 100% load) • Port-side intake • Typical power: TBD • Maximum power: TBD	• Power: 1500W AC • Input voltage: 100 to 240V AC • Hot-swappable, 6 fans, 5+1 redundancy • Frequency: 50 to 60 Hz (AC) • Efficiency: 90% or greater (20 to 100% load) • Port-side intake • Typical power: 638 W • Maximum power: 1442 W
Environmental	• Physical (H x W x D): 3.45 x17.3 x 29.78 in. (8.76 x 43.94x 75.65 cm) • Operating temperature: 32 to 104° F (0 to 40° C) • Nonoperating (storage) temperature: -40 to 158° F (-40 to 70° C) • Humidity: 5 to 85% (noncondensing) • Altitude: 0 to 13,123 ft (0 to 4000m)	• Physical (H x W x D): 1.72 x 17.3x 22.9 in. (4.4 x 43.9 x 58.1 cm). Mean Time Between Failure (MTBF): 214,330 hours • Acoustics: 71.1 dBA at 50% fan speed, 81.2 dBA at 70% fan speed, and 88 dBA at 100% fan speed • Operating temperature: 32 to104° F (0 to 40° C) • Nonoperating (storage) temperature: -40 to 158° F (-40 to70° C) • Humidity: 5 to 85% (noncondensing) • Altitude: 0 to 13,123 ft (0 to 4000m)

Cisco Nexus 9300-GX2 series switches support NX-OS and also ACI spine-and-leaf functionality for fully flexible deployments. Table 3 lists the switch mode support.

Table 3. Switch mode support

Item	N9K-C9364D-GX2A	N9K-C9332D-GX2B
ACI spine	Yes	Yes
ACI leaf	Yes	Yes
NX-OS	Yes	Yes

Performance and scalability

Table 4 lists the performance and scalability specifications for the Cisco Nexus 9300-GX2 switches.

Table 4. Performance and scalability specifications

Item	Cisco Nexus 9300-GX2A series switches	Cisco Nexus 9300-GX2B series switches
Number of slices	4 slice-pairs	2 slice-pairs
Maximum number of IPv4 Longest Prefix Match (LPM) routes*	~1 Million	~2 Million
Maximum number of IPv4 host entries*	~1 Million	~2 Million
Maximum number of MAC address entries*	~500K	~1 Million
Maximum number of multicast routes	256,000	256,000
Number of Interior Gateway Management Protocol (IGMP) snooping groups	Maximum: 32,000	Maximum: 32,000
Maximum number of Access-Control-List (ACL) entries	• 6000 ingress/slice • 3000 egress/slice • Max: 48,000 ingress, 24,000 egress	• 6000 ingress/slice • 3000 egress/slice • Max: 24,000 ingress, 12,000 egress
Maximum number of VLANs	4096**	4096**
Number of Virtual Routing and Forwarding (VRF) instances	Maximum: 16,000	Maximum: 16,000
Maximum number of ECMP paths	64	64
Maximum number of port channels*	2K	2K
Maximum number of links in a port channel*	1K	1K

Item	Cisco Nexus 9300-GX2A series switches	Cisco Nexus 9300-GX2B series switches
Number of active SPAN sessions	32	32
Maximum number of VLANs in Rapid per-VLAN Spanning Tree (RPVST) instances	4K	4K
Maximum number of Hot-Standby Router Protocol (HSRP) groups	490	490
Maximum number of Multiple Spanning Tree (MST) instances	64	64
Flow-table size	64K/slice	128K/slice
Number of Network Address Translation (NAT) entries	1K	1K

* Refers to the hardware capacity, please visit the Cisco Nexus 9000 Series Verified Scalability Guide and Cisco Application Policy Infrastructure Scalability Guide for the latest supported scalability numbers validated for specific software.

** 127 VLANs out of 4096 are reserved

Table 5. Weight

Component	Weight
Cisco Nexus 9364D-GX2A without power supplies or fans	58 lbs (26.3 kg)
Cisco Nexus 9332D-GX2B without power supplies or fans	28 lbs (12.7 kg)
NXA-PAC-1500W-PI	2.64 lbs (1.2 kg)
NXA-PAC-3200W-PI	6.6 lbs (3Kg)
NXASFAN-160CFM2PI	1.3bs (0.6kg)
NXA-SFAN-35CFM-PI	0.26 lbs (0.1 kg)

Regulatory standards compliance

Table 6 summarizes regulatory standards compliance for the Cisco Nexus 9300-GX2 switches.

Table 6. Regulatory standards compliance: safety and EMC

Specification	Description
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.

Supported optics pluggable

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

Software licensing

The software packaging for the Cisco Nexus 9000 Series offers flexibility and a comprehensive feature set. 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 and Cisco Nexus Data Broker, you must install additional 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 product bulletin at https://www.cisco.com/go/nexus9000.

Ordering information

Table 7 presents ordering information for the Cisco Nexus 9300-GX2 series switches.

Table 7. Ordering information

Part number	Product description
Hardware	
N9K-C9364D-GX2A	Cisco Nexus 9364D-GX2A Switch with 64p 400/100-Gbps QSFP-DD ports and 2p 1/10 SFP+ ports
N9K-C9332D-GX2B	Cisco Nexus 9332D-GX2B Switch with 32p 400/100-Gbps QSFP-DD ports and 2p 1/10 SFP+ ports
FAN options	
NXASFAN-160CFM2PI	Cisco Nexus Fan, 160CFM, port-side intake airflow
NXA-SFAN-35CFM-PI	Cisco Nexus Fan, 35CFM, port-side intake airflow
Power supply options	
NXA-PAC-3200W-PI	Cisco Nexus 3200W AC PS, port-side intake
NXA-PAC-1500W-PI	Cisco Nexus 1500W AC PS, port-side intake
Power cords	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU (2.5 meters)
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy (2.5 meters)
CAB-9K10A-SW	Power Cord, 250VAC 10A MP232 Plug, SWITZ (2.5 meters)
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America (2.5 meters)
CAB-TA-UK	United Kingdom AC Type A Power Cable
CAB-TA-250V-JP	Japan 250V AC Type A Power Cable
CAB-TA-EU	Europe AC Type A Power Cable
CAB-C15-CBN	Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors
CAB-ACBZ-12A	AC Power Cord (Brazil) 12A/125V BR-3-20 plug up to 12A
CAB-TA-IN	India AC Type A Power Cable
CAB-TA-IS	Israel AC Type A Power Cable

Part number	Product description
CAB-C15-CBN-EURA	Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors. More
CAB-C15-CBN-JP	CAB-C15-CBN-JP
CAB-C15-CBN-CK	Cabinet Jumper Power Cord, 250 VAC 10A, C14-C15 Connectors More

Warranty

The Cisco Nexus 9300 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).

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

Reference links to **product-specific environmental sustainability information** that is mentioned in relevant sections of this data sheet are provided in the following tables:

Sustainability topic	Reference
General	
Product compliance	Table 6. Safety and compliance information
Power	
Power supply	Table 2. Product specifications: power supplies, typical and maximum power specification

Sustainability topic	Reference
Material	
Unit weight, dimensions and mean time between failures metrics	**Table 2**. Product specifications

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Service and support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 9300 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. 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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For more information

For more information on Cisco Nexus 9000 Series Switches and for the latest software release information and recommendations, please visit https://www.cisco.com/go/nexus9000.

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Printed in USA C78-743854-05 01/22