Cisco Nexus 9232C Switch

Product Overview

The Cisco Nexus® 9232C Switch is part of Cisco Nexus 9200 platform switches. The Cisco Nexus 9200 platform consists of industry-leading ultra-high-density fixed-configuration data center switches with line-rate Layer 2 and 3 features that support enterprise applications, service provider hosting, and cloud computing environments. These switches support a wide range of port speeds with flexible combinations of 1/10/25/40/50/100-Gbps connectivity in compact form factors. Using the widely deployed industry-leading Cisco® NX-OS Software operating system, the Cisco Nexus 9200 platform is designed for programmable fabric, which offers the flexibility, mobility, and scale needed by service providers and infrastructure-as-a-service (IaaS) and cloud providers. It is also designed for programmable networks, which automate configuration and management for customers who want to take advantage of the DevOps model and tool sets.

The Cisco Nexus 9232C Switch (Figure 1) is a 1-rack-unit (1RU) switch that supports 6.4 terabits per second (Tbps) of bandwidth and more than 5.1 billion packets per second (bpps) across thirty-two 100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) ports. Each port on the 9232C can be individually configured into 1x100-Gbps port, 4 x10-Gbps ports, 4 x 25-Gbps ports, 1 x 40-Gbps port, or 2 x 50-Gbps ports.

Figure 1. Cisco Nexus 9232C Switch

Features and Benefits

The Cisco Nexus 9232C Switch provides the following features and benefits:

- High performance and scalability
  - The platform provides wire-rate Layer 2 and 3 switching on all ports with up to 6.4 Tbps and over 5.1 bpps of bandwidth.
  - With up to 30 MB of shared buffer, the platform is an excellent choice for scalable data centers and big data applications. The capability to fine-tune buffer allocation for nondrop queues makes the Cisco Nexus 9200 platform well suited for IP storage designs.
- Virtual Extensible LAN (VXLAN)
  - The platform offers native line-rate VXLAN routing.
  - The Border Gateway Protocol (BGP) Ethernet Virtual Private Network (EVPN) control plane provides scalable multitenancy and host mobility (refer to the document “VXLAN Network with MP-BGP EVPN Control Plane” for more information).

- Hardware and software high availability
  - 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.
  - Patching helps ensure undisruptive upgrades in most cases.
  - The switches use hot-swappable power-supply units (PSUs) and fans with N+1 redundancy.
- Purpose-built NX-OS operating system with comprehensive, proven innovations
  - Open programmability supports built-in DevOps automation tools such as Puppet, Chef, and Ansible.
  - Cisco NX-API supports for a common programmatic approach across Cisco Nexus switches.
  - Power-on autoprovisioning (POAP) enables touchless bootup and configuration of the switch, drastically reducing provisioning time.
  - The onboard Python scripting engine supports automation and remote operations in the data center.
  - Advanced buffer monitoring reports real-time buffer utilization per port and per queue, which allows organizations to monitor traffic bursts and application traffic patterns.
  - Complete Layer 3 unicast and multicast routing protocol suites are supported, 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).
  - Segment routing allows the network to forward Multiprotocol Label Switching (MPLS) packets and perform traffic engineering without Resource Reservation Protocol (RSVP) traffic engineering (TE). It provides a control-plane alternative for increased network scalability and virtualization.

The Cisco Nexus 9232C offers industry-leading density and performance with flexible port configurations that can support existing fiber cabling (Table 1).

Table 1. Cisco Nexus 9232C Switch Characteristics

Model	Cisco Nexus 9232C
Ports	32 x 100-Gbps QSFP28 ports
Supported speeds	1*, 10, 25, 40, 50, and 100 Gbps
Port configuration	32 fixed QSFP28 ports, with each being individually configured into 1 x 100-Gbps, 4 x 10-Gbps, 4 x 25-Gbps, 1 x 40-Gbps, or 2 x 50-Gbps ports
CPU	4 cores
System memory	16 GB
Solid-state disk (SSD) drive	64 GB
Shared system buffer	30 MB
Management ports	3 RJ-45 ports
USB ports	1
RS-232 serial ports	1
Power supplies (up to 2)	930W DC, 650W AC, or 1200W HVAC/DC
Typical power (AC)**	272 watts (W)
Maximum power (AC)**	601W
Input voltage (AC)	100 to 240V
Input voltage (HVAC)	200 to 277V
Input voltage (DC)	–48 to –60V

Model	Cisco Nexus 9232C
Input voltage (HVDC)	–240 to –380V
Frequency (AC)	50 to 60 Hz
Fans	4
Airflow	Port-side intake and exhaust
Physical (H x W x D)	1.72 x 17.3 x 22.5 in. (4.4 x 43.9 x 57.1 cm)
RoHS compliance	Yes

* Please check the latest software release notes for breakout and port-speed support.

** Typical and maximum power values are based on input drawn from the power circuit. The power supply value (for example, 650W AC power supply: NXA-PAC-650W-PI) is based on the output rating to the inside of the switch.

Cisco NX-OS Features and Benefits

The software packaging for the Cisco Nexus 9000 Series Switches offers flexibility and a comprehensive feature set while being consistent with Cisco Nexus access switches. 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. Table 2 lists the software packaging and licensing available to enable advanced features.

Table 2. Software Packaging and Licensing

Packaging	Chassis Based	Part Number	Supported Features
Cisco Nexus 9200 and 9300 Layer 3 license	Chassis	N93-LAN1K9	Layer 3 features, including full OSPF, EIGRP, BGP, and VXLAN
Cisco Data Center Network Manager (DCNM) license	Chassis	DCNM-LAN-N93-K9	DCNM license for Cisco Nexus 9000 Series
Cisco Nexus Data Broker license	Chassis	L-NDB-FX-SWT-K9	Data Broker license for Cisco Nexus 9000 Series

For a complete list of supported features, refer to Cisco Feature Navigator.

Software Requirements

The Cisco Nexus 9200 platform supports the NX-OS operating system.

For the latest software release information and recommendations, please refer to the product bulletin at http://www.cisco.com/go/nexus9000.

Specifications

Table 3 lists the performance and scalability specifications for the Cisco Nexus 9200 platform switches. (Please check the software release notes for feature support information.)

Table 3. Performance and Scalability Specifications*

Item	Cisco Nexus 9232C Switch
Maximum number of longest prefix match (LPM) routes* (Shipping: Support in initial software release)	Shipping: 16,000 Maximum: 256,000
Maximum number of IP host entries* (Shipping: Support in initial software release)	Shipping: 96,000 (ECMP) Maximum: 256,000
Maximum number of MAC address entries* (Shipping: Support in initial software release)	Shipping: 96,000 Maximum: 256,000
Number of multicast routes* (Shipping: Support in initial software release)	Shipping: 10,000 Maximum: 32,000
Number of Interior Gateway Management Protocol (IGMP) snooping groups	32,000
Number of access control list (ACL) entries*	Per slice of the forwarding engine: 4000 ingress 2000 egress Maximum: 24,000 ingress 12,000 egress Shipping: 21,492 ingress 10,740 egress
Maximum number of VLANs	4096
Maximum number of Virtual Routing and Forwarding (VRF) instances	16,000
Maximum number of links in a port channel	32
Maximum number of ECMP paths	64
Maximum number of ECMP groups	256
Maximum number of ECMP members	64,000
Maximum number of port channels	512
Number of active Cisco Switched Port Analyzer (SPAN) sessions	4
Maximum number of Rapid per-VLAN Spanning Tree (RPVST) instances (Shipping: Support in initial software release)	Shipping: 507 Maximum: 4000
Maximum number of Hot-Standby Router Protocol (HSRP) groups	490
Maximum number of Multiple Spanning Tree (MST) instances	64
Maximum number of VXLAN tunnel endpoints (VTEPs)	2000

* More templates and greater scalability are on the roadmap. Please refer to the Cisco Nexus 9000 Series Verified Scalability Guide document for the latest exact scalability numbers validated for specific software.

Environmental Properties

Table 4 lists the environmental properties, and Table 5 lists the weight for the Cisco Nexus 9200 platform switches.

Table 4. Environmental Properties

Property	Description
Operating temperature	32 to 104°F (0 to 40°C)
Nonoperating (storage) temperature	–40 to 158°F (–40 to 70°C)
Humidity	5 to 95% (noncondensing)
Altitude	0 to 13,123 ft (0 to 4000m)

Table 5. Weight

Component	Weight
Cisco Nexus 9232C without power supplies or fans	17.8 lb (8.1 kg)
650W AC power supply	2.42 lb (1.1 kg)
930W DC power supply	2.42 lb (1.1 kg)
1200W HVDC/HVAC power supply	2.42 lb (1.1 kg)
Fan tray: NXA-FAN-30CFM-F or NXA-FAN-30CFM-B	0.92 lb (0.4 kg)

Regulatory Standards Compliance

Table 6 summarizes regulatory standards compliance for the Cisco Nexus 9200 platform 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	NEBS[1] • 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.

[1] Check the latest NEBS compliance report for support.

Supported Optics Modules

Table 7 lists the optics modules supported.

Table 7. Optics Support Information

Part Number	Product Description
QSFP-100G-AOC (1m-30m)	QSFP 100-Gbps to QSFP 100-Gbps AOC: 1, 2, 3, 5, 7, 10, 15, 20, 25, and 30m
QSFP-100G-CU (1m-5m)	QSFP 100-Gbps to QSFP 100-Gbps copper DAC: 1, 2, 3, and 5m
QSFP-4SFP25G-CU (1m-5m)	QSFP 100-Gbps to 4 x SFP 25-Gbps passive copper breakout cable: 1, 2, 3, and 5m
QSFP-100G-SR4-S	100GBASE SR4 transceiver module with MPO-12 connector: multimode fiber up to 100m
QSFP-100G-LR4-S	100GBASE LR4 transceiver module for single-mode fiber (SMF) with LC connector: 10 km
QSFP-100G-CWDM4-S	100GBASE CWDM4 transceiver module for single-mode fiber (SMF) with LC connector: 2 km
QSFP-100G-PSM4-S	100GBASE PSM4 transceiver module with MPO-12 connector: single-mode fiber up to 500m

Ordering Information

Table 8 presents ordering information for the Cisco Nexus 9200 platform switches.

Table 8. Ordering Information

Part Number	Product Description
Base Part Number	
N9K-C9232C	Nexus 9200 with 32p 40G 100G QSFP28
Power Supplies	
NXA-PAC-650W-PI	Nexus 9000 650W AC PS, Port-side Intake
NXA-PAC-650W-PE	Nexus 9000 650W AC PS, Port-side Exhaust
UCSC-PSU-930WDC	Nexus 9000 930W DC PS, Port-side Intake
UCS-PSU-6332-DC	Nexus 9000 930W DC PS, Port-side Exhaust
N9K-PUV-1200W*	Nexus 9300 1200W Universal Power Supply, Bi-directional air flow and Supports AC/HVDC
FAN	
NXA-FAN-30CFM-F	Nexus 2K/3K/9K Single Fan, port side exhaust airflow
NXA-FAN-30CFM-B	Nexus 2K/3K/9K Single Fan, port side intake airflow
Software	
N93-LAN1K9	Enhanced L3 including full OSPF, EIGRP, BGP for Nexus 9200/9300 Platform
DCNM-LAN-N93-K9	DCNM license for Nexus 9200/9300 Platform
L-NDB-FX-SWT-K9	Data Broker license for Nexus 9200/9300 Platform
Power Cords	
CAB-250V-10A-AR	AC Power Cord - 250V, 10A - Argentina (2.5 meter)
CAB-250V-10A-BR	AC Power Cord - 250V, 10A - Brazil (2.1 meter)
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC (2.5 meter)
CAB-250V-10A-ID	AC Power Cord - 250V, 10A, South Africa (2.5 meter)
CAB-250V-10A-IS	AC Power Cord - 250V, 10A - Israel (2.5 meter)
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia (2.5 meter)
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU (2.5 meter)
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy (2.5 meter)
CAB-9K10A-SW	Power Cord, 250VAC 10A MP232 Plug, SWITZ (2.5 meter)
CAB-9K10A-UK	Power Cord, 250VAC 10A BS1363 Plug (13 A fuse), UK (2.5 meter)

Part Number	Product Description
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America (2.5 meter)
CAB-AC-L620-C13	North America, NEMA L6-20-C13 (2.0 meter)
CAB-C13-C14-2M	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length (2 meter)
CAB-C13-C14-AC	Power cord, C13 to C14 (recessed receptacle), 10A (3 meter)
CAB-C13-CBN	Cabinet Jumper Power Cord, 250 VAC 10A, C14-C13 Connectors (0.7 meter)
CAB-IND-10A	10A Power cable for India (2.5 meter)
CAB-N5K6A-NA	Power Cord, 200/240V 6A North America (2.5 meter)
CAB-HVAC-SD-0.6M	HVAC Power cable for Anderson-LS-25
CAB-HVAC-C14-2M	HVAC power cable for C14, 2 meters (no more than 240 V)
CAB-HVAC-RT-0.6M	HVAC Power cable with right angle connector for RF-LS-25
Accessories	
N3K-C3064-ACC-KIT	Nexus 3K/9K Fixed Accessory Kit

Warranty

The Cisco Nexus 9200 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).

Service and Support

Cisco offers a range of professional, solution, and product support services for each stage of your Cisco Nexus 9200 deployment:

- Cisco Migration Service for Cisco Nexus 9000 Series Switches: This service helps you migrate from Cisco Catalyst® 6000 Series Switches to Cisco Nexus 9000 Series Switches.
- Cisco Product Support: Support service is available globally 24 hours a day, 7 days a week, for Cisco software and hardware products and technologies associated with Cisco Nexus 9000 Series Switches. Enhanced support options delivered by Cisco also include solution support for the Cisco Application Centric Infrastructure (Cisco ACI™) platform and Cisco SMARTnet™ Service and Cisco Smart Net Total Care™ offerings.*

For more information, visit http://www.cisco.com/go/services.

* Support is offered for Cisco products only.

For More Information

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

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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