

# Cisco Nexus 9300-EX Platform Switches

## Product Overview

The Cisco Nexus<sup>®</sup> 9300-EX platform is the next generation of fixed Cisco Nexus 9000 Series Switches. The new platform, based on Cisco's Cloud Scale ASIC supports cost-effective cloud-scale deployments, an increased number of endpoints, and cloud services with wire-rate security and telemetry. The platform is built on modern system architecture designed to provide high performance to meet the evolving needs of highly scalable data centers and growing enterprises. Cisco Nexus 9300-EX platform switches offer a variety of interface options to transparently migrate existing data centers from 100-Mbps, 1-Gbps, and 10-Gbps speeds to 25 Gbps at the server, and from 10- and 40-Gbps speeds to 50 and 100 Gbps at the aggregation layer.

The platform provides investment protection for customers, delivering large buffers, immense Layer 2 and Layer 3 scalability, and performance to meet the changing needs of highly virtualized, automated cloud environments in data centers. The platform hardware supports Cisco<sup>®</sup> Data Center Interconnect (DCI) features, enabling flexible workload mobility and LAN and SAN convergence.

The platform has the capability to collect comprehensive Cisco Tetration Analytics<sup>™</sup> telemetry information at line rate across all the ports without adding any latency to the packets or negatively affecting switch performance. This telemetry information is exported every 100 milliseconds by default directly from the switch's application-specific integrated circuit (ASIC). This information consists of three types of data:

- **Flow information:** This information contains information about endpoints, protocols, ports, when the flow started, how long the flow was active, etc.
- **Interpacket variation:** This information captures any interpacket variations within the flow. Examples include variation in time to live (TTL), IP and TCP flags, payload length, etc.
- **Context details:** Context information is derived outside the packet header, including variation in buffer utilization, packet drops within a flow, association with tunnel endpoints, etc.

The Cisco Tetration Analytics platform consumes this telemetry data, and by using unsupervised machine learning and behavior analysis it can provide outstanding pervasive visibility across everything in your data center in real time. By using algorithmic approaches, the Cisco Tetration Analytics platform provides a deep application insights and interactions, enabling dramatically simplified operations, a zero-trust model, and migration of applications to any programmable infrastructure. To learn more, go to <http://www.cisco.com/go/tetration>.

Cisco provides two modes of operation for Cisco Nexus 9000 Series Switches. Organizations can use Cisco NX-OS Software to deploy the switches in standard Cisco Nexus switch environments (NX-OS mode). Organizations also can use a hardware infrastructure that is ready to support the Cisco Application Centric Infrastructure (Cisco ACI<sup>™</sup>) platform to take full advantage of an automated, policy-based, systems-management approach (ACI mode).

## Switch Models

Table 1 summarizes the Cisco Nexus 9300-EX platform switch models.

**Table 1.** Cisco Nexus 9300-EX Platform Switches

Model	Description
Cisco Nexus 93180YC-EX Switch	48 x 10/25-Gbps fiber ports and 6 x 40/100-Gbps Quad Small Form-Factor Pluggable 28 (QSFP28) ports
Cisco Nexus 93108TC-EX Switch	48 x 10GBASE-T ports and 6 x 40/100-Gbps QSFP28 ports

The Cisco Nexus 93180YC-EX Switch (Figure 1) is a 1-rack-unit (1RU) switch with latency of less than 1 microsecond that supports 3.6 terabits per second (Tbps) of bandwidth and over 2.8 billion packets per second (bps). The 48 downlink ports on the 93180YC-EX can be configured to work as 1-, 10-, or 25-Gbps ports, offering deployment flexibility and investment protection. The uplink can support up to six 40- and 100-Gbps ports, or a combination of 10-, 25-, 40-, 50-, and 100-Gbps connectivity, offering flexible migration options.

**Figure 1.** Cisco Nexus 93180YC-EX Switch



The Cisco Nexus 93108TC-EX Switch (Figure 2) is a 1RU switch that supports 2.16 Tbps of bandwidth and over 1.7 bpps. The 48 10GBASE-T downlink ports on the 93108TC-EX can be configured to work as 100-Mbps, 1-Gbps, or 10-Gbps ports. The uplink can support up to six 40- and 100-Gbps ports, or a combination of 10-, 25-, 40-, 50-, and 100-Gbps connectivity, offering flexible migration options.

**Figure 2.** Cisco Nexus 93108TC-EX Switch



## Features and Benefits

The Cisco Nexus 9300-EX platform provides the following features and benefits:

- High performance and scalability
  - The platform provides wire-rate Layer 2 and 3 switching on all ports.
  - Robust system specifications support complex applications and features such as a quad-core CPU with 24 GB of system memory and a 64-GB solid-state disk (SSD) drive.
  - The 40-MB buffer supports highly scalable data centers and big data applications.
- 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 [VXLAN Network with MP-BGP EVPN Control Plane](#) for more information).

- Hardware and software high availability
  - Virtual port-channel (vPC) technology provides Layer 2 multipathing through the elimination of Spanning Tree Protocol. It also enables fully utilized bisectonal 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.
- Purpose-built Cisco NX-OS Software operating system with comprehensive, proven innovations
  - Open programmability supports built-in DevOps automation tools such as [Puppet](#), Chef, and Ansible.
  - Cisco [NX-API](#) supports a common programmatic approach across Cisco Nexus switches.
  - Power-on autoprovisioning (POAP) enables touchless bootup and configuration of the switch, drastically reducing provisioning time.
  - Cisco Embedded Event Manager (EEM) and Python scripting enable automation and remote operations in the data center.
  - Advanced buffer monitoring reports real-time buffer use 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 engineer traffic without Resource Reservation Protocol (RSVP) traffic engineering (TE). It provides a control-plane alternative for increased network scalability and virtualization.
  - Fibre Channel over Ethernet (FCoE<sup>\*\*</sup>) N-Port Virtualization (NPV) support enables the network administrator to control domain IDs and points of management on a Fibre Channel network as it scales. This feature enables LAN and SAN converged networks on a lossless, reliable Ethernet network.
  - Network traffic monitoring with Cisco Nexus Data Broker builds simple, scalable, and cost-effective network test access points (TAPs) and Cisco Switched Port Analyzer (SPAN) aggregation for network traffic monitoring and analysis.
  - Automate the time-consuming tasks of creating, installing, and maintaining appropriate fabricwide switch configurations with the new [Cisco Nexus Fabric Manager](#).

<sup>\*\*</sup> Software support is on the roadmap. Please visit the latest [release notes](#) for additional information.

The Cisco Nexus 9300-EX platform offers industry-leading density and performance with flexible port configurations that can support existing copper and fiber cabling (Table 2).

**Table 2.** Cisco Nexus 9300-EX Platform Switch Features

Feature	Cisco Nexus 93180YC-EX	Cisco Nexus 93108TC-EX
<b>Ports</b>	48 x 10/25-Gbps and 6 x 40/100-Gbps QSFP28 ports	48 x 10GBASE-T and 6 x 40/100-Gbps QSFP28 ports
<b>Downlink supported speeds</b>	1/10/25-Gbps speeds	100-Mbps and 1/10-Gbps speeds
<b>CPU</b>	4 cores	4 cores
<b>System memory</b>	24 GB	24 GB
<b>SSD drive</b>	64 GB	64 GB
<b>System buffer</b>	40 MB	40 MB
<b>Management ports</b>	2 ports: 1 RJ-45 and 1SFP	2 ports: 1 RJ-45 and 1SFP
<b>USB ports</b>	1	1
<b>RS-232 serial ports</b>	1	1
<b>Power supplies (up to 2)</b>	650W AC, 930W DC, or 1200W HVAC/HVDC	650W AC, 930W DC, or 1200W HVAC/HVDC
<b>Typical power* (AC/DC)</b>	210W	290W
<b>Maximum power* (AC/DC)</b>	470W	499W
<b>Input voltage (AC)</b>	100 to 240V	100 to 240V
<b>Input voltage (high-voltage AC [HVAC])</b>	200 to 277V	200 to 277V
<b>Input voltage (DC)</b>	-48 to -60V	-48 to -60V
<b>Input voltage (high-voltage DC [HVDC])</b>	-240 to -380V	-240 to -380V
<b>Frequency (AC)</b>	50 to 60 Hz	50 to 60 Hz
<b>Fans</b>	4	4
<b>Airflow</b>	Port-side intake and exhaust	Port-side intake and exhaust
<b>Physical dimensions (H x W x D)</b>	1.72 x 17.3 x 22.5 in. (4.4 x 43.9 x 57.1 cm)	1.72 x 17.3 x 22.5 in. (4.4 x 43.9 x 57.1 cm)
<b>Acoustics</b>	48.5 dBA at 40% fan speed, 64.9 dBA at 70% fan speed, and 77.8 dB at 100% fan speed	48.6 dBA at 40% fan speed, 65.2 dBA at 70% fan speed, and 76.5 dB at 100% fan speed
<b>RoHS compliance</b>	Yes	Yes

\* 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 Software Overview

NX-OS is a purpose-built data center operating system designed for performance, resiliency, scalability, manageability, and programmability at its foundation. It provides a robust and comprehensive feature set that meets the demanding requirements of virtualization and automation in present and future data centers.

The Cisco Nexus 9000 Series uses an enhanced version of NX-OS with a single binary image that supports every switch in the 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. In the event of a process failure, the process can be restarted without loss of state. The operating system supports hot and cold patching and online diagnostics.

The software packaging for the Cisco Nexus 9000 Series 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 3 lists the software packaging and licensing available to enable advanced features.

**Table 3.** Software Packaging and Licensing

Packaging	License Form	Part Number	Supported Features
Cisco Nexus 9000 Series Fixed Enhanced Layer 3 license	Switch based	N93-LAN1K9	Layer 3 features, including full OSPF, EIGRP, BGP, and VXLAN
Cisco Data Center Network Manager (DCNM) license	Switch based	DCNM-LAN-N93-K9	DCNM license for Cisco Nexus 9000 Series fixed switching platform
Cisco Nexus Data Broker license	Switch based	NDB-FX-SWT-K9	Data Broker license for Cisco Nexus 9000 Series fixed switching platform
FCoE** license	Switch based	N93-FNPV1K9	FCoE NPV license for Cisco Nexus 9300 platform switches
Cisco Nexus Fabric Manager license	Switch based	N9K-NFM1K9	Fabric Manager license for automated installation and maintenance of switch configurations across the fabric
Cisco Tetration Analytics	Switch based	N93-TTR1K9	Flow Telemetry data collection at line rate

\*\* Software support is on the roadmap. Please visit the latest [release notes](#) for additional information.

For a complete list of supported features, refer to the [Cisco Feature Navigator](#).

## Software Requirements

The Cisco Nexus 9300-EX platform supports the NX-OS operating system. NX-OS interoperates with any networking operating system, including Cisco IOS® Software, that conforms to the networking standards described in this data sheet.

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

## Specifications

Table 4 lists the performance and scalability specifications for the Cisco Nexus 9300-EX platform switches. (Check the software release notes for feature support information.)

**Table 4.** Performance and Scalability Specifications\*

Item	Cisco Nexus 9300-EX Platform Switches
Maximum number of longest prefix match (LPM) routes*	<ul style="list-style-type: none"> <li>Shipping: 16,000</li> <li>Maximum: 896,000</li> </ul>
Maximum number of IP host entries*	<ul style="list-style-type: none"> <li>Shipping: 256,000 (IPv4)**; 128,000 (IPv6)** shared</li> <li>Maximum: 896,000</li> </ul>
Maximum number of MAC address entries*	<ul style="list-style-type: none"> <li>Shipping: 96,000</li> <li>Maximum: 256,000</li> </ul>
Number of multicast routes*	<ul style="list-style-type: none"> <li>Shipping: 16,000</li> <li>Maximum: 32,000</li> </ul>
Number of Interior Gateway Management Protocol (IGMP) snooping groups	32,000
Maximum number of Cisco Nexus 2000 Series Fabric Extenders per switch*	16
Number of access control list (ACL) entries	Per slice of the forwarding engine: <ul style="list-style-type: none"> <li>4000 ingress</li> <li>2000 egress</li> </ul> Maximum: <ul style="list-style-type: none"> <li>8000 ingress</li> <li>4000 egress</li> </ul>
Maximum number of VLANs	4096
Maximum number of Virtual Routing and Forwarding (VRF) instances	Maximum: 16,000 Shipping: 1,000

Item	Cisco Nexus 9300-EX Platform Switches
Maximum number of ECMP paths	64
Maximum number of port channels	512
Maximum number of links in a port channel	32
Number of active SPAN sessions	4
Maximum number of Rapid per-VLAN Spanning Tree (RPVST) instances	<ul style="list-style-type: none"> <li>• Shipping: 500</li> <li>• Maximum: 4000</li> </ul>
Maximum number of Hot-Standby Router Protocol (HSRP) groups	490
Maximum number of Multiple Spanning Tree (MST) instances	64
Flow-table size used for Cisco Tetration Analytics platform	32,000

\* More templates and greater scalability are on the roadmap. Refer to the [Cisco Nexus 9000 Series Verified Scalability Guide](#) documentation for the latest exact scalability values validated for specific software.

\*\* Shared entries.

## Environmental Properties

Table 5 lists the environmental properties, and Table 6 lists the weight for the Cisco Nexus 9300-EX platform switches.

**Table 5.** 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 6.** Weight

Component	Weight
Cisco Nexus 93180YC-EX without power supplies or fans	17.2 lb (7.8 kg)
Cisco Nexus 93108TC-EX without power supplies or fans	17.7 lb (8.0 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 7 summarizes regulatory standards compliance for the Cisco Nexus 9300-EX platform switches.

**Table 7.** Regulatory Standards Compliance: Safety and EMC

Specification	Description
<b>Regulatory compliance</b>	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC
<b>Safety</b>	NEBS <ul style="list-style-type: none"> <li>• UL 60950-1 Second Edition</li> <li>• CAN/CSA-C22.2 No. 60950-1 Second Edition</li> <li>• EN 60950-1 Second Edition</li> <li>• IEC 60950-1 Second Edition</li> <li>• AS/NZS 60950-1</li> <li>• GB4943</li> </ul>

Specification	Description
<b>EMC: Emissions</b>	<ul style="list-style-type: none"> <li>• 47CFR Part 15 (CFR 47) Class A</li> <li>• AS/NZS CISPR22 Class A</li> <li>• CISPR22 Class A</li> <li>• EN55022 Class A</li> <li>• ICES003 Class A</li> <li>• VCCI Class A</li> <li>• EN61000-3-2</li> <li>• EN61000-3-3</li> <li>• KN22 Class A</li> <li>• CNS13438 Class A</li> </ul>
<b>EMC: Immunity</b>	<ul style="list-style-type: none"> <li>• EN55024</li> <li>• CISPR24</li> <li>• EN300386</li> <li>• KN 61000-4 series</li> </ul>
<b>RoHS</b>	The product is RoHS-6 compliant with exceptions for leaded-ball grid-array (BGA) balls and lead press-fit connectors.

## Supported Optics Modules

For details about the optics modules available and the minimum software release required for each supported module, visit [http://www.cisco.com/en/US/products/hw/modules/ps5455/products\\_device\\_support\\_tables\\_list.html](http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html).

## Ordering Information

Table 8 presents ordering information for the Cisco Nexus 9300-EX platform switches.

**Table 8.** Ordering Information

Part Number	Product Description
<b>Base Part Numbers</b>	
<b>N9K-C93180YC-EX</b>	Nexus 9K Fixed with 48p 1/10G/25G SFP+ and 6p 40G/100G QSFP28
<b>N9K-C93108TC-EX</b>	Nexus 9K Fixed with 48p 10G BASE-T and 6p 40G/100G QSFP28
<b>Power Supplies</b>	
<b>NXA-PAC-650W-PI</b>	Nexus 9000 650W AC PS, Port-side Intake
<b>NXA-PAC-650W-PE</b>	Nexus 9000 650W AC PS, Port-side Exhaust
<b>UCSC-PSU-930WDC</b>	Nexus 9000 930W DC PS, Port-side Intake
<b>UCS-PSU-6332-DC</b>	Nexus 9000 930W DC PS, Port-side Exhaust
<b>N9K-PUV-1200W</b>	Nexus 9300 1200W Universal Power Supply, Bi-directional air flow and Supports HVAC/HVDC
<b>Fans</b>	
<b>NXA-FAN-30CFM-F</b>	Nexus 2K/3K/9K Single Fan, port side exhaust airflow
<b>NXA-FAN-30CFM-B</b>	Nexus 2K/3K/9K Single Fan, port side intake airflow
<b>Software</b>	
<b>N93-LAN1K9</b>	Enhanced L3 including full OSPF, EIGRP, BGP
<b>NDB-FX-SWT-K9</b>	Tap/SPAN Agg lic for 1 Cisco Nexus Fixed Switch
<b>N93-FNPV1K9</b>	FCOE NPV License for 9300 Series Switches
<b>N9K-NFM1K9</b>	Nexus Fabric Manager license
<b>DCNM-LAN-N93-K9</b>	DCNM license for Nexus 9000 Fixed Platform
<b>N93-TTR1K9</b>	Cisco Tetration Analytics for 9300 Series Switches

Part Number	Product Description
<b>Power Cords</b>	
<b>CAB-250V-10A-AR</b>	AC Power Cord - 250V, 10A - Argentina (2.5 meter)
<b>CAB-250V-10A-BR</b>	AC Power Cord - 250V, 10A - Brazil (2.1 meter)
<b>CAB-250V-10A-CN</b>	AC Power Cord - 250V, 10A - PRC (2.5 meter)
<b>CAB-250V-10A-ID</b>	AC Power Cord - 250V, 10A, South Africa (2.5 meter)
<b>CAB-250V-10A-IS</b>	AC Power Cord - 250V, 10A - Israel (2.5 meter)
<b>CAB-9K10A-AU</b>	Power Cord, 250VAC 10A 3112 Plug, Australia (2.5 meter)
<b>CAB-9K10A-EU</b>	Power Cord, 250VAC 10A CEE 7/7 Plug, EU (2.5 meter)
<b>CAB-9K10A-IT</b>	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy (2.5 meter)
<b>CAB-9K10A-SW</b>	Power Cord, 250VAC 10A MP232 Plug, SWITZ (2.5 meter)
<b>CAB-9K10A-UK</b>	Power Cord, 250VAC 10A BS1363 Plug (13 A fuse), UK (2.5 meter)
<b>CAB-9K12A-NA</b>	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America (2.5 meter)
<b>CAB-AC-L620-C13</b>	North America, NEMA L6-20-C13 (2.0 meter)
<b>CAB-C13-C14-2M</b>	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length (2 meter)
<b>CAB-C13-C14-AC</b>	Power cord, C13 to C14 (recessed receptacle), 10A (3 meter)
<b>CAB-C13-CBN</b>	Cabinet Jumper Power Cord, 250 VAC 10A, C14-C13 Connectors (0.7 meter)
<b>CAB-IND-10A</b>	10A Power cable for India (2.5 meter)
<b>CAB-N5K6A-NA</b>	Power Cord, 200/240V 6A North America (2.5 meter)
<b>CAB-HVAC-SD-0.6M</b>	HVAC Power cable for Anderson-LS-25
<b>CAB-HVAC-C14-2M</b>	HVAC power cable for C14, 2 meters (no more than 240 V)
<b>CAB-HVAC-RT-0.6M</b>	HVAC Power cable with right angle connector for RF-LS-25
<b>Accessories</b>	
<b>N3K-C3064-ACC-KIT</b>	Nexus 3K/9K Fixed Accessory Kit

## Warranty

The Cisco Nexus 9300-EX 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 9300-EX platform deployment:

- Cisco Data Center Quick Start Service for Cisco Nexus 9000 Series Switches: This offering provides consulting services that include technical advice and assistance to help deploy Cisco Nexus 9000 Series Switches.
- Cisco Data Center Accelerated Deployment Service for Cisco Nexus 9000 Series Switches: This service delivers planning, design, and implementation expertise to bring your project into production. The service also provides recommended next steps, an architectural high-level design, and operation-readiness guidelines to scale the implementation to your environment.
- 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 Cisco ACI, Cisco SMARTnet™ Service, and Cisco Smart Net Total Care™\* service.

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

\* For Cisco products only.

## Cisco Capital Financing

Cisco Capital® financing can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce capital expenditures (CapEx), accelerate your growth, and optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital financing is available in more than 100 countries. [Learn more.](#)

## For More Information

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



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