

# Cisco Nexus 3172PQ, 3172TQ, 3172TQ-32T, 3172PQ-XL, and 3172TQ-XL Switches

## Product Overview

The Cisco Nexus<sup>®</sup> 3172PQ, 3172TQ, 3172TQ-32T, 3172PQ-XL, and 3172TQ-XL Switches are dense, high-performance, 10- and 40-Gbps Layer 2 and 3 switches that are members of the Cisco Nexus 3100 switch platform. All switches offer improved port density and scalability in compact one-rack-unit (1RU) form factors. The Cisco Nexus 3172 switches run the industry-leading Cisco<sup>®</sup> NX-OS Software operating system, which helps ensure continuous availability and sets the standard for mission-critical data center environments. They are well suited for data centers that require cost-effective, power-efficient line-rate Layer 2 and 3 top-of-rack (ToR) switches. These switches also support forward and reverse airflow (port-side exhaust and port-side intake) schemes with AC and DC power inputs.

Five Cisco Nexus 3172 switches are available:

- The Cisco Nexus 3172PQ (Figure 1) is a 10-Gbps Enhanced Small Form-Factor Pluggable (SFP+)-based ToR switch with 48 SFP+ ports and 6 Quad SFP+ (QSFP+) ports. Each SFP+ port can operate in 100-Mbps, 1-Gbps, or 10-Gbps mode, and each QSFP+ port can operate in native 40-Gbps or 4 x 10-Gbps mode. This switch is a true phy-less switch that is optimized for low latency and low power consumption.

**Figure 1.** Cisco Nexus 3172PQ Switch



- The Cisco Nexus 3172TQ (Figure 2) is a 10GBASE-T switch with 48 10GBASE-T ports and 6 QSFP+ ports. This switch is well suited for customers who want to reuse existing copper cabling while migrating from 1-Gbps to 10-Gbps servers.
- The Cisco Nexus 3172TQ-32T (Figure 2): This switch is the Cisco Nexus 3172TQ with 32 10GBASE-T ports and 6 QSFP+ ports enabled. The ports are enabled through software licensing. This switch provides a cost-effective solution for customers who require up to 32 10GBASE-T ports per rack. This switch comes with a 32-10GBASE-T port license preinstalled. To enable the remaining 16 10GBASE-T ports, the customer installs the 16-port upgrade license.

**Figure 2.** Cisco Nexus 3172TQ and 3172TQ-32T Switch



- The Cisco Nexus 3172PQ-XL (Figure 3) and Cisco Nexus 3172TQ-XL (Figure 4) are minor hardware revisions of the Cisco Nexus 3172PQ and 3172TQ, respectively. Enhancements include an additional 4 GB of memory (for a total of 8 GB). The additional memory allows users to perform object-model programming. The Cisco Nexus 3172PQ-XL and 3172TQ-XL also have 2.5-GHz CPUs.

**Figure 3.** Cisco Nexus 3172PQ-XL Switch



**Figure 4.** Cisco Nexus 3172TQ-XL Switch



## Main Benefits

The Cisco Nexus 3172 switches provide the following main benefits:

- Wire-rate Layer 2 and 3 switching on all 72 10 Gigabit Ethernet ports
  - The Cisco Nexus 3172 switches provide Layer 2 and 3 switching of up to 1.4 terabits per second (Tbps) and up to 1 billion packets per second (bps) in a compact 1RU form factor.
- High availability
  - Virtual port-channel (vPC) technology provides Layer 2 multipathing through the elimination of Spanning Tree Protocol. 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 and allows organizations to prevent network bottlenecks, increase resiliency, and add capacity with little network disruption.
  - Advanced reboot capabilities are included through In Service Software Upgrade (ISSU) and Fast Reboot capabilities.
  - Power-supply units (PSUs) and fans are hot swappable.

- High performance
  - The Cisco Nexus 3172 switches deliver ultra-low nominal latency, which allows customers to implement high-performance infrastructure for high-frequency trading (HFT) workloads.
- Purpose-built on the NX-OS operating system with comprehensive, proven innovations
  - Power-on auto provisioning (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.
  - Ethanalyzer is a built-in packet analyzer for monitoring and troubleshooting control-plane traffic and is based on the popular Wireshark open-source network protocol analyzer.
  - Precision Time Protocol (PTP; IEEE 1588) provides accurate clock synchronization and improved data correlation with network captures and system events.
  - Complete Layer 3 unicast and multicast routing protocol suites are supported, including Border Gateway Protocol (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).
- Network traffic monitoring with Cisco Nexus Data Broker
  - Build simple, scalable and cost-effective network test access point (TAP) or Cisco Switched Port Analyzer (SPAN) aggregation for network traffic monitoring and analysis.

## Configuration

The Cisco Nexus 3172 switches have the following configurations:

- Cisco Nexus 3172PQ and 3172PQ-XL
  - 48 fixed 10 Gigabit Ethernet SFP+ ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - 6 fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)
- Cisco Nexus 3172TQ and 3172TQ-XL
  - 48 fixed 10GBASE-T ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - 6 fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)
- Cisco Nexus 3172TQ-32T
  - 32 fixed 10GBASE-T ports (can operate at 100-Mbps, 1-Gbps, and 10-Gbps speeds)
  - Six fixed QSFP+ ports (each QSFP+ port can support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet)
  - Upgrade to 48 fixed 10GBASE-T and 6 QSFP+ ports by installing a 16-port upgrade license
- Locator LED
- Dual redundant<sup>1</sup> power supplies
- Redundant (3+1) and hot-swappable fans
- One 10/100/1000-Mbps management port
- One RS-232 serial console port

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<sup>1</sup> Cisco Nexus 3172TQ DC power supplies operate in combined mode only.

- One USB port

Support for both forward (port-side exhaust) and reversed (port-side intake) airflow schemes is available.

## Transceiver and Cabling Options

The Cisco Nexus 3172 switches support a wide variety of 1, 10, and 40 Gigabit Ethernet connectivity options. 1 and 10 Gigabit Ethernet connectivity is achieved in the first 48 ports, and 40 Gigabit Ethernet connectivity is achieved using QSFP+ transceivers in the last 6 ports.

QSFP+ technology allows a smooth transition from 10 to 40 Gigabit Ethernet infrastructure in the data center. The Cisco Nexus 3172 switches support connectivity over copper and fiber cables, providing excellent physical-layer flexibility. For low-cost cabling, copper-based 40-Gbps Twinax cables can be used, and for longer cable reaches, short-reach optical transceivers are excellent.

Connectivity can be established from the QSFP ports to an upstream 10 Gigabit Ethernet switch using a splitter cable that has a QSFP transceiver on one end and four SFP+ transceivers on the other end. Similar capability can be achieved using optical transceivers by procuring third-party fiber splitters. In addition, 1G and 10G interfaces can be supported on QSFP ports with the Cisco CVR-QSFP-SFP10G adapter.

Please refer to the latest compatibility matrix for information about all supported optics:

- 40 Gigabit Ethernet compatibility matrix:  
[http://www.cisco.com/c/en/us/td/docs/interfaces\\_modules/transceiver\\_modules/compatibility/matrix/40GE\\_Tx\\_Matrix.html](http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/40GE_Tx_Matrix.html).
- 10 Gigabit Ethernet compatibility matrix:  
[http://www.cisco.com/c/en/us/td/docs/interfaces\\_modules/transceiver\\_modules/compatibility/matrix/10GE\\_Tx\\_Matrix.html](http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/10GE_Tx_Matrix.html).
- 1 Gigabit Ethernet compatibility matrix:  
[http://www.cisco.com/c/en/us/td/docs/interfaces\\_modules/transceiver\\_modules/compatibility/matrix/GE\\_Tx\\_Matrix.html](http://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/GE_Tx_Matrix.html).

For more information about the transceiver types, see

[http://www.cisco.com/en/US/products/hw/modules/ps5455/prod\\_module\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/modules/ps5455/prod_module_series_home.html).

## Cisco NX-OS Software Overview

NX-OS is a data center–class operating system built with modularity, resiliency, and serviceability at its foundation. NX-OS helps ensure continuous availability and sets the standard for mission-critical data center environments. The self-healing and highly modular design of NX-OS makes zero-impact operations a reality and provides exceptional operation flexibility.

Focused on the requirements of the data center, NX-OS provides a robust and comprehensive feature set that meets the networking requirements of present and future data centers. With an XML interface and a command-line interface (CLI) like that of Cisco IOS® Software, NX-OS provides state-of-the-art implementations of relevant networking standards as well as a variety of true data center–class Cisco innovations.

## Cisco NX-OS Software Benefits

Table 4 summarizes the benefits that NX-OS offers.

**Table 1.** Benefits of Cisco NX-OS Software

Feature	Benefit
<p><b>Common software throughout the data center:</b> NX-OS runs on all Cisco data center switch platforms (Cisco Nexus 7000, 6000, 5000, 4000, and 3000 Series Switches, Cisco Nexus 1000V Switches, and Cisco Nexus 2000 Series Fabric Extenders).</p>	<ul style="list-style-type: none"> <li>• Simplification of data center operating environment</li> <li>• End-to-end Cisco Nexus and NX-OS fabric</li> <li>• No retraining necessary for data center engineering and operations teams</li> </ul>
<p><b>Software compatibility:</b> NX-OS interoperates with Cisco products running any variant of Cisco IOS Software and also with any networking OS that conforms to the networking standards listed as supported in this data sheet.</p>	<ul style="list-style-type: none"> <li>• Transparent operation with existing network infrastructure</li> <li>• Open standards</li> <li>• No compatibility concerns</li> </ul>
<p><b>Modular software design:</b> NX-OS is designed to support distributed multithreaded processing. NX-OS modular processes are instantiated on demand, each in a separate protected memory space. Thus, processes are started and system resources allocated only when a feature is enabled. The modular processes are governed by a real-time preemptive scheduler that helps ensure timely processing of critical functions.</p>	<ul style="list-style-type: none"> <li>• Robust software</li> <li>• Fault tolerance</li> <li>• Increased scalability</li> <li>• Increased network availability</li> </ul>
<p><b>Troubleshooting and diagnostics:</b> NX-OS is built with unique serviceability functions to allow network operators to take early action based on network trends and events, enhancing network planning and improving network operations center (NOC) and vendor response times. Cisco Smart Call Home and Cisco Online Health Management System (OHMS) are some of the features that enhance the serviceability of NX-OS.</p>	<ul style="list-style-type: none"> <li>• Quick problem isolation and resolution</li> <li>• Continuous system monitoring and proactive notifications</li> <li>• Improved productivity of operations teams</li> </ul>
<p><b>Ease of management:</b> NX-OS provides a programmatic XML interface based on the NETCONF industry standard. The NX-OS XML interface provides a consistent API for devices. NX-OS also provides support for Simple Network Management Protocol (SNMP) Versions 1, 2, and 3 MIBs.</p>	<ul style="list-style-type: none"> <li>• Rapid development and creation of tools for enhanced management</li> <li>• Comprehensive SNMP MIB support for efficient remote monitoring</li> </ul>
<p><b>Using the Cisco Nexus Data Broker software and Cisco Plug-in for OpenFlow agent,</b> the Cisco Nexus 3172 switches can be used to build a scalable, cost-effective, and programmable TAP or SPAN aggregation infrastructure. This approach replaces the traditional purpose-built matrix switches with these switches. You can interconnect these switches to build a multilayer topology for TAP or SPAN aggregation infrastructure.</p>	<ul style="list-style-type: none"> <li>• Scalable and cost effective</li> <li>• Robust traffic filtering capabilities</li> <li>• Traffic aggregation from multiple input ports across different switches</li> <li>• Traffic replication and forwarding to multiple monitoring tools</li> </ul>
<p><b>Role-based access control (RBAC):</b> With RBAC, NX-OS enables administrators to limit access to switch operations by assigning roles to users. Administrators can customize access and restrict it to the users who require it.</p>	<ul style="list-style-type: none"> <li>• Effective access control mechanism based on user roles</li> <li>• Improved network device security</li> <li>• Reduction in network problems arising from human error</li> </ul>

## Cisco NX-OS Software Packages for Cisco Nexus 3172 Switches

The software packages available for the Cisco Nexus 3172 switches offer flexibility and comprehensive features while being consistent with the Cisco Nexus access switches. The default system software has comprehensive Layer 2 and base Layer 3 feature sets with extensive security and management features. To enable advanced Layer 3 IP routing functions, an additional license must be installed, as described in Table 5. See Table 7 later in this document for a complete list of software features.

**Table 2.** Software Licensing for Cisco Nexus 3172 Switches

Software Package	Features Supported
<b>System default: Base license (N3K-BAS1K9) included; no purchase necessary</b>	<ul style="list-style-type: none"> <li>Comprehensive Layer 2 feature set: VLAN, IEEE 802.1Q Trunking, vPC, Link Aggregation Control Protocol (LACP), Unidirectional Link Detection UDLD (standard and aggressive), Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree Protocol (RSTP), spanning-tree guards, and Transparent VLAN Trunk Protocol (TVTP)</li> <li>Security: Authentication, authorization, and accounting (AAA); access control lists (ACLs), Dynamic Host Configuration Protocol (DHCP) snooping, storm control, private VLAN (PVLAN), and configurable Control-Plane Policing (CoPP)</li> <li>Management features: Cisco Data Center Network Manager (DCNM) support, console, Secure Shell Version 2 (SSHv2) access, Cisco Discovery Protocol, SNMP, and syslog</li> <li>Layer 3 IP routing: inter-VLAN routing (IVR), static routes, RIPv2, ACLs, OSPFv2, EIGRP stub, Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), and Unicast Reverse-Path Forwarding (uRPF)</li> <li>Multicast: PIM SM, SSM, and MSDP</li> </ul>
<b>LAN Enterprise license (N3K-LAN1K9)</b>	<ul style="list-style-type: none"> <li>Advanced Layer 3 IP routing: BGP, and Virtual Route Forwarding lite (VRF-lite)</li> </ul>
<b>Cisco Nexus Data Broker license (NDB-FX-SWT-K9)</b>	<ul style="list-style-type: none"> <li>License for using the TAP and SPAN aggregation functions with Cisco Nexus Data Broker; only the Base license is needed for this feature</li> </ul>

### Cisco Data Center Network Manager

The Cisco Nexus 3172 switches are supported in DCNM. DCNM is designed for the Cisco Nexus hardware platforms, which are enabled for NX-OS. DCNM is a Cisco management solution that increases overall data center infrastructure uptime and reliability, improving business continuity. Focused on the management requirements of the data center network, DCNM provides a robust framework and comprehensive feature set that can meet the routing, switching, and storage administration needs of present and future data centers. DCNM automates the provisioning process, proactively monitors the LAN by detecting performance degradation, secures the network, and simplifies the diagnosis of dysfunctional network elements.

### Cisco Nexus Data Broker

The Cisco Nexus 3172 switches with Cisco Nexus Data Broker can be used to build a scalable and cost-effective traffic monitoring infrastructure using network TAPs and SPAN. This approach replaces the traditional purpose-built matrix switches with one or more OpenFlow-enabled Cisco Nexus switches. You can interconnect these switches to build a scalable TAP or SPAN aggregation infrastructure. You also can combine TAP and SPAN sources to bring the copy of the production traffic to this TAP or SPAN aggregation infrastructure. In addition, you can distribute these sources and traffic monitoring and analysis tools across multiple Cisco Nexus switches. For more details, visit <http://www.cisco.com/go/nexusdatabroker>.

## Product Specifications

Table 6 lists the specifications for the Cisco Nexus 3172 switches, Table 7 lists software features, and Table 8 lists management standards and support.

**Table 3.** Specifications

Description	Specification
<b>Physical</b>	<ul style="list-style-type: none"> <li>1RU fixed form factor</li> <li>Cisco Nexus 3172PQ and 3172PQ-XL: 72 x 10 Gigabit Ethernet ports (48 SFP+ and 6 QSFP+)               <ul style="list-style-type: none"> <li>48 SFP ports support 1 and 10 Gigabit Ethernet</li> <li>6 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each</li> </ul> </li> <li>Cisco Nexus 3172TQ and 3172TQ-XL: 72 x 10 Gigabit Ethernet ports (48 10GBASE-T and 6 QSFP+)               <ul style="list-style-type: none"> <li>48 RJ-45 ports support 100 Mbps, 1 Gbps, and 10 Gbps</li> <li>6 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each</li> </ul> </li> </ul>

Description	Specification		
	<ul style="list-style-type: none"> <li>• Cisco Nexus 3172TQ-32T: 48 x 10 Gigabit Ethernet ports (32 10GBASE-T and 6 QSFP+) <ul style="list-style-type: none"> <li>◦ 32 RJ-45 ports support 100 Mbps and 1 and 10 Gigabit Ethernet</li> <li>◦ 6 QSFP ports support 4 x 10 Gigabit Ethernet or 40 Gigabit Ethernet each</li> </ul> </li> <li>• Redundant fans (3+1)</li> <li>• 2 redundant power supplies</li> <li>• Management, console, and USB flash-memory ports</li> </ul>		
<b>Performance</b>	<ul style="list-style-type: none"> <li>• 1.4-Tbps switching capacity</li> <li>• Forwarding rate of up to 1 bpps</li> <li>• Line-rate traffic throughput (both Layer 2 and 3) on all ports</li> <li>• Configurable maximum transmission units (MTUs) of up to 9216 bytes (jumbo frames)</li> </ul>		
<b>Hardware tables and scalability</b>	Number of MAC addresses	288,000	
	Number of VLANs	4096	
	Number of spanning-tree instances	<ul style="list-style-type: none"> <li>• RSTP: 512</li> <li>• MSTP: 64</li> </ul>	
	Number of ACL entries	<ul style="list-style-type: none"> <li>• 4000 ingress</li> <li>• 1000 egress</li> </ul>	
	Routing table	<ul style="list-style-type: none"> <li>• 16,000 prefixes and 16,000 host entries</li> <li>• 8000 multicast routes</li> </ul>	
	Number of EtherChannels	64 (with vPC)	
	Number of ports per EtherChannel	32	
	System memory	4 GB (3172PQ, 3172TQ, and 3172TQ-32T) 8 GB (3172PQ-XL and 3172TQ-XL)	
	Buffer size	12 MB shared	
	Boot flash	2 GB	
<b>Power</b>	Number of power supplies	2	
	Power supply types	<ul style="list-style-type: none"> <li>• AC (forward and reversed airflow) <ul style="list-style-type: none"> <li>◦ - N2200-PAC-400W and N2200-PAC-400W-B (PQ models)</li> <li>◦ - NXA-PAC-500W and NX-PAC-500W-B (TQ models)</li> </ul> </li> <li>• DC (forward and reversed airflow) <ul style="list-style-type: none"> <li>◦ - N2200-PDC-400W and N3K-PDC-350W-B (PQ models)</li> <li>◦ - NXA-PDC-500W and NX-PDC-500W-B (TQ models)</li> </ul> </li> </ul>	
	Typical operating power	<ul style="list-style-type: none"> <li>• 3172PQ and 3172PQ-XL: 143 W</li> <li>• 3172TQ and 3172TQ-XL: 360 W</li> </ul>	
	Maximum power	3172PQ and 3172PQ-XL: 293W 3172TQ and 3172TQ-XL: 440W	
	AC PSUs	<ul style="list-style-type: none"> <li>• Input voltage</li> <li>• Frequency</li> <li>• Efficiency</li> </ul>	
	DC PSUs	<ul style="list-style-type: none"> <li>• Input voltage</li> <li>• Maximum current (PSU output – System input)</li> <li>• Efficiency</li> </ul>	
	Typical heat dissipation	<ul style="list-style-type: none"> <li>• 3172PQ and 3172PQ-XL: 488 BTU/hr</li> <li>• 3172TQ and 3172TQ-XL: 1228 BTU/hr</li> </ul>	
	Maximum heat dissipation	<ul style="list-style-type: none"> <li>• 3172PQ and 3172PQ-XL: 1000 BTU/hr</li> <li>• 3172TQ and 3172TQ-XL: 1501 BTU/hr</li> </ul>	
	<b>Cooling</b>	<ul style="list-style-type: none"> <li>• Forward and reversed airflow schemes:</li> </ul>	



Description	Specification	
	<ul style="list-style-type: none"> <li>◦ Forward airflow: Port-side exhaust (air enters through fan-tray and power supplies and exits through ports)</li> <li>◦ Reversed airflow: Port-side intake (air enters through ports and exits through fan-tray and power supplies)</li> <li>• Redundant fans</li> <li>• Hot swappable (must swap within 1 minute)</li> </ul>	
<b>Sound</b>	Measured sound power (maximum) <ul style="list-style-type: none"> <li>• Fan speed: 40% duty cycle</li> <li>• Fan speed: 70% duty cycle</li> <li>• Fan speed: 100% duty cycle</li> </ul>	<ul style="list-style-type: none"> <li>• 64.9 dBA</li> <li>• 69.3 dBA</li> <li>• 76.7 dBA</li> </ul>
<b>Environment</b>	Dimensions (height x width x depth)	<ul style="list-style-type: none"> <li>• 3172PQ and 3172PQ-XL: 1.72 x 17.3 x 17 in. (4.4 x 43.9 x 43.2 cm)</li> <li>• 3172TQ, 3172TQ-32T and 3172TQ-XL: 1.72 x 17.3 x 19.7 in. (4.4 x 43.9 x 50.5 cm)</li> </ul>
	Weight	<ul style="list-style-type: none"> <li>• 3172PQ and 3172PQ-XL: 18.6 lb (8.4 kg)</li> <li>• 3172TQ, 3172TQ-32T and 3172TQ-XL: 22.0 lb (10 kg)</li> </ul>
	Operating temperature	<ul style="list-style-type: none"> <li>• 32 to 104°F (0 to 40°C)</li> </ul>
	Storage temperature	<ul style="list-style-type: none"> <li>• -40 to 158°F (-40 to 70°C)</li> </ul>
	Operating relative humidity	<ul style="list-style-type: none"> <li>• 10 to 85% noncondensing</li> <li>• Up to 5 days at maximum (85%) humidity</li> <li>• Recommend ASHRAE data center environment</li> </ul>
	Storage relative humidity	<ul style="list-style-type: none"> <li>• 5 to 95% noncondensing</li> </ul>
	Altitude	<ul style="list-style-type: none"> <li>• 0 to 10,000 ft (0 to 3000m)</li> </ul>

Please refer to the Cisco Nexus 3000 Series Verified Scalability Guide for scalability numbers validated for specific software releases: [http://www.cisco.com/en/US/products/ps11541/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps11541/products_installation_and_configuration_guides_list.html).

**Table 4.** Software Features

Description	Specification
<b>Layer 2</b>	<ul style="list-style-type: none"> <li>• Layer 2 switch ports and VLAN trunks</li> <li>• IEEE 802.1Q VLAN encapsulation</li> <li>• Support for up to 4096 VLANs</li> <li>• Rapid Per-VLAN Spanning Tree Plus (PVRST+) (IEEE 802.1w compatible)</li> <li>• MSTP (IEEE 802.1s): 64 instances</li> <li>• Spanning Tree PortFast</li> <li>• Spanning Tree Root Guard</li> <li>• Spanning Tree Bridge Assurance</li> <li>• Cisco EtherChannel technology (up to 32 ports per EtherChannel)</li> <li>• LACP: IEEE 802.3ad</li> <li>• Advanced port-channel hashing based on Layer 2, 3, and 4 information</li> <li>• vPC</li> <li>• Jumbo frames on all ports (up to 9216 bytes)</li> <li>• Storm control (unicast, multicast, and broadcast)</li> <li>• Private VLANs</li> <li>• NVGRE entropy</li> <li>• Resilient hashing</li> </ul>



Description	Specification
<b>Layer 3</b>	<ul style="list-style-type: none"> <li>• Layer 3 interfaces: Routed ports on interfaces, switch virtual interfaces (SVIs), port channels, and subinterfaces (total: 1024)</li> <li>• 64-way ECMP</li> <li>• 4000 ingress and 1000 egress ACL entries</li> <li>• IPv6 routing: Static, OSPFv3, and BGPv6</li> <li>• Routing protocols: Static, RIPv2, EIGRP, OSPF, and BGP</li> <li>• Bidirectional Flow Detection (BFD) for BGP, OSPF, and IPv4 static routes</li> <li>• HSRP and VRRP</li> <li>• ACL: Routed ACL with Layer 3 and 4 options to match ingress and egress ACLs</li> <li>• VRF: VRF-lite (IP VPN), VRF-aware unicast (BGP, OSPF, and RIP), and VRF-aware multicast</li> <li>• Unicast Reverse-Path Forwarding (uRPF) with ACL; strict and loose modes</li> <li>• Jumbo frame support (up to 9216 bytes)</li> <li>• Generic Routing Encapsulation (GRE) tunneling</li> <li>• Advanced BGP features including BGP add-path for eBGP and iBGP, remove-private-as enhancements and eBGP next hop unchanged</li> <li>• IP-in-IP Tunnel support</li> </ul>
<b>Multicast</b>	<ul style="list-style-type: none"> <li>• Multicast: PIMv2, PIM-SM, and PIM-SSM</li> <li>• Bootstrap router (BSR), Auto-RP, and Static RP</li> <li>• MSDP and Anycast RP</li> <li>• Internet Group Management Protocol (IGMP) Versions 2 and 3</li> </ul>
<b>Quality of Service (QoS)</b>	<ul style="list-style-type: none"> <li>• Layer 2 IEEE 802.1p (class of service [CoS])</li> <li>• 8 hardware queues per port</li> <li>• Per-port QoS configuration</li> <li>• CoS trust</li> <li>• Port-based CoS assignment</li> <li>• Modular QoS CLI (MQC) compliance</li> <li>• ACL-based QoS classification (Layers 2, 3, and 4)</li> <li>• MQC CoS marking</li> <li>• Differentiated services code point (DSCP) marking</li> <li>• Weighted Random Early Detection (WRED)</li> <li>• CoS-based egress queuing</li> <li>• Egress strict-priority queuing</li> <li>• Egress port-based scheduling: Weighted Round-Robin (WRR)</li> <li>• Explicit Congestion Notification (ECN)</li> <li>• Configurable ECN marking per port</li> <li>• Priority Flow Control (with 3 no-drop queues and 1 default queue with strict priority scheduling between queues)</li> <li>• Policy Based Routing (PBR)</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Ingress ACLs (standard and extended) on Ethernet</li> <li>• Standard and extended Layer 3 and 4 ACLs include IPv4, Internet Control Message Protocol (ICMP), TCP, and User Datagram Protocol (UDP)</li> <li>• VLAN-based ACLs (VACLs)</li> <li>• Port-based ACLs (PACLs)</li> <li>• Named ACLs</li> <li>• ACLs on virtual terminals (vty)</li> <li>• DHCP snooping with Option 82</li> <li>• Port number in DHCP Option 82</li> <li>• DHCP relay</li> <li>• Dynamic Address Resolution Protocol (ARP) inspection</li> <li>• Configurable CoPP</li> <li>• SPAN with ACL filtering</li> </ul>

Description	Specification
<b>Cisco Nexus Data Broker</b>	<ul style="list-style-type: none"> <li>• Topology support for TAP and SPAN aggregation</li> <li>• Support for QinQ to tag input source TAP and SPAN ports</li> <li>• Configuration of symmetric hashing to load-balance traffic to multiple tools</li> <li>• Traffic filtering based on Layer 1 through Layer 4 header information</li> <li>• Traffic replication and forwarding to multiple monitoring tools</li> <li>• Robust RBAC</li> <li>• Northbound representational state transfer (REST) API for all programmability support</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• POAP</li> <li>• Python scripting</li> <li>• Cisco EEM</li> <li>• Switch management using 10/100/1000-Mbps management or console ports</li> <li>• CLI-based console to provide detailed out-of-band management</li> <li>• In-band switch management</li> <li>• Locator and beacon LEDs</li> <li>• Configuration rollback</li> <li>• SSHv2</li> <li>• Secure Copy (SCP) server</li> <li>• Telnet</li> <li>• AAA</li> <li>• AAA with RBAC</li> <li>• RADIUS</li> <li>• TACACS+</li> <li>• Syslog</li> <li>• Syslog generation on system resources (for example, FIB tables)</li> <li>• Embedded packet analyzer</li> <li>• SNMP v1, v2, and v3</li> <li>• Enhanced SNMP MIB support</li> <li>• XML (NETCONF) support</li> <li>• Remote monitoring (RMON)</li> <li>• Advanced Encryption Standard (AES) for management traffic</li> <li>• Unified username and passwords across CLI and SNMP</li> <li>• Microsoft Challenge Handshake Authentication Protocol (MS-CHAP)</li> <li>• Digital certificates for management between switch and RADIUS server</li> <li>• Cisco Discovery Protocol Versions 1 and 2</li> <li>• RBAC</li> <li>• SPAN on physical layer, port channel, and VLAN</li> <li>• Tunable buffer allocation for SPAN</li> <li>• Encapsulated Remote SPAN (ERSPAN)</li> <li>• Ingress and egress packet counters per interface</li> <li>• PTP (IEEE 1588) boundary clock</li> <li>• Network Time Protocol (NTP)</li> <li>• Cisco OHMS</li> <li>• Comprehensive bootup diagnostic tests</li> <li>• Cisco Call Home</li> <li>• Cisco DCNM</li> <li>• Advanced buffer utilization monitoring</li> <li>• sFlow</li> </ul>

**Table 5.** Management and Standards Support

Description	Specification	
<b>MIB Support</b>	<p>Generic MIBs</p> <ul style="list-style-type: none"> <li>• SNMPv2-SMI</li> <li>• CISCO-SMI</li> <li>• SNMPv2-TM</li> <li>• SNMPv2-TC</li> <li>• IANA-ADDRESS-FAMILY-NUMBERS-MIB</li> <li>• IANAifType-MIB</li> <li>• IANAiprouteprotocol-MIB</li> <li>• HCNUM-TC</li> <li>• CISCO-TC</li> <li>• SNMPv2-MIB</li> <li>• SNMP-COMMUNITY-MIB</li> <li>• SNMP-FRAMEWORK-MIB</li> <li>• SNMP-NOTIFICATION-MIB</li> <li>• SNMP-TARGET-MIB</li> <li>• SNMP-USER-BASED-SM-MIB</li> <li>• SNMP-VIEW-BASED-ACM-MIB</li> <li>• CISCO-SNMP-VACM-EXT-MIB</li> <li>• MAU-MIB</li> <li>• CISCO-SWITCH-QOS-MIB</li> <li>• CISCO-CLASS-BASED-QOS-MIB</li> </ul> <p>Ethernet MIBs</p> <ul style="list-style-type: none"> <li>• CISCO-VLAN-MEMBERSHIP-MIB</li> <li>• LLDP-MIB</li> <li>• IP-MULTICAST-MIB</li> </ul> <p>Configuration MIBs</p> <ul style="list-style-type: none"> <li>• ENTITY-MIB</li> <li>• IF-MIB</li> <li>• CISCO-ENTITY-EXT-MIB</li> <li>• CISCO-ENTITY-FRU-CONTROL-MIB</li> <li>• CISCO-ENTITY-SENSOR-MIB</li> <li>• CISCO-SYSTEM-MIB</li> <li>• CISCO-SYSTEM-EXT-MIB</li> <li>• CISCO-IP-IF-MIB</li> <li>• CISCO-IF-EXTENSION-MIB</li> <li>• CISCO-NTP-MIB</li> <li>• CISCO-VTP-MIB</li> <li>• CISCO-IMAGE-MIB</li> <li>• CISCO-IMAGE-UPGRADE-MIB</li> </ul>	<p>Monitoring MIBs</p> <ul style="list-style-type: none"> <li>• NOTIFICATION-LOG-MIB</li> <li>• CISCO-SYSLOG-EXT-MIB</li> <li>• CISCO-PROCESS-MIB</li> <li>• RMON-MIB</li> <li>• CISCO-RMON-CONFIG-MIB</li> <li>• CISCO-HC-ALARM-MIB</li> </ul> <p>Security MIBs</p> <ul style="list-style-type: none"> <li>• CISCO-AAA-SERVER-MIB</li> <li>• CISCO-AAA-SERVER-EXT-MIB</li> <li>• CISCO-COMMON-ROLES-MIB</li> <li>• CISCO-COMMON-MGMT-MIB</li> <li>• CISCO-SECURE-SHELL-MIB</li> </ul> <p>Miscellaneous MIBs</p> <ul style="list-style-type: none"> <li>• CISCO-LICENSE-MGR-MIB</li> <li>• CISCO-FEATURE-CONTROL-MIB</li> <li>• CISCO-CDP-MIB</li> <li>• CISCO-RF-MIB</li> </ul> <p>Layer 3 and Routing MIBs</p> <ul style="list-style-type: none"> <li>• UDP-MIB</li> <li>• TCP-MIB</li> <li>• OSPF-MIB</li> <li>• BGP4-MIB</li> <li>• CISCO-HSRP-MIB</li> </ul>
<b>Standards</b>	<ul style="list-style-type: none"> <li>• IEEE 802.1D: Spanning Tree Protocol</li> <li>• IEEE 802.1p: CoS Prioritization</li> <li>• IEEE 802.1Q: VLAN Tagging</li> <li>• IEEE 802.1s: Multiple VLAN Instances of Spanning Tree Protocol</li> <li>• IEEE 802.1w: Rapid Reconfiguration of Spanning Tree Protocol</li> <li>• IEEE 802.3z: Gigabit Ethernet</li> <li>• IEEE 802.3ad: Link Aggregation Control Protocol (LACP)</li> <li>• IEEE 802.3ae: 10 Gigabit Ethernet (Cisco Nexus 3064-X)</li> <li>• IEEE 802.3ba: 40 Gigabit Ethernet</li> <li>• IEEE 802.3an: 10GBASE-T (Cisco Nexus 3064-T)</li> <li>• IEEE 802.1ab: LLDP</li> <li>• IEEE 1588-2008: Precision Time Protocol (Boundary Clock)</li> </ul>	

Description	Specification
RFC	<p>BGP</p> <ul style="list-style-type: none"> <li>• RFC 1997: BGP Communities Attribute</li> <li>• RFC 2385: Protection of BGP Sessions with the TCP MD5 Signature Option</li> <li>• RFC 2439: BGP Route Flap Damping</li> <li>• RFC 2519: Framework for Interdomain Route Aggregation</li> <li>• RFC 2545: Use of BGPv4 Multiprotocol Extensions</li> <li>• RFC 2858: Multiprotocol Extensions for BGPv4</li> <li>• RFC 3065: Autonomous System Confederations for BGP</li> <li>• RFC 3392: Capabilities Advertisement with BGPv4</li> <li>• RFC 4271: BGPv4</li> <li>• RFC 4273: BGPv4 MIB: Definitions of Managed Objects for BGPv4</li> <li>• RFC 4456: BGP Route Reflection</li> <li>• RFC 4486: Subcodes for BGP Cease Notification Message</li> <li>• RFC 4724: Graceful Restart Mechanism for BGP</li> <li>• RFC 4893: BGP Support for 4-Octet AS Number Space</li> </ul> <p>OSPF</p> <ul style="list-style-type: none"> <li>• RFC 2328: OSPF Version 2</li> <li>• RFC 3101: OSPF Not-So-Stubby-Area (NSSA) Option</li> <li>• RFC 3137: OSPF Stub Router Advertisement</li> <li>• RFC 3509: Alternative Implementations of OSPF Area Border Routers</li> <li>• RFC 3623: Graceful OSPF Restart</li> <li>• RFC 4750: OSPF Version 2 MIB</li> </ul> <p>RIP</p> <ul style="list-style-type: none"> <li>• RFC 1724: RIPv2 MIB Extension</li> <li>• RFC 2082: RIPv2 MD5 Authentication</li> <li>• RFC 2453: RIP Version 2</li> </ul> <p>IP Services</p> <ul style="list-style-type: none"> <li>• RFC 768: UDP</li> <li>• RFC 783: Trivial File Transfer Protocol (TFTP)</li> <li>• RFC 791: IP</li> <li>• RFC 792: ICMP</li> <li>• RFC 793: TCP</li> <li>• RFC 826: ARP</li> <li>• RFC 854: Telnet</li> <li>• RFC 959: FTP</li> <li>• RFC 1027: Proxy ARP</li> <li>• RFC 1305: Network Time Protocol (NTP) Version 3</li> <li>• RFC 1519: Classless Interdomain Routing (CIDR)</li> <li>• RFC 1542: BootP Relay</li> <li>• RFC 1591: Domain Name System (DNS) Client</li> <li>• RFC 1812: IPv4 Routers</li> <li>• RFC 2131: DHCP Helper</li> <li>• RFC 2338: VRRP</li> </ul> <p>IP Multicast</p> <ul style="list-style-type: none"> <li>• RFC 2236: IGMPv2</li> <li>• RFC 3376: IGMPv3</li> <li>• RFC 3446: Anycast Rendezvous Point Mechanism Using PIM and MSDP</li> <li>• RFC 3569: Overview of SSM</li> <li>• RFC 3618: MSDP</li> <li>• RFC 4601: PIM-SM: Protocol Specification (Revised)</li> <li>• RFC 4607: SSM for IP</li> <li>• RFC 4610: Anycast-RP using PIM</li> <li>• RFC 5132: IP Multicast MIB</li> </ul>

## Software Requirements

Cisco Nexus 3100 platform switches are supported by Cisco NX-OS Software Release 6.0(2) U2(1) and later. Cisco Nexus 3172TQ-32T and 3100-XL platform switches are supported by Cisco NX-OS Software Release NXOS-703I2.2 and later. NX-OS interoperates with any networking OS, including Cisco IOS Software, that conforms to the networking standards mentioned in this data sheet.

## Regulatory Standards Compliance

Table 9 summarizes regulatory standards compliance for the Cisco Nexus 3000 Series.

**Table 6.** Regulatory Standards Compliance: Safety and EMC

Specification	Description
<b>Regulatory compliance</b>	<ul style="list-style-type: none"> <li>• Products should comply with CE Markings per directives 2004/108/EC and 2006/95/EC.</li> </ul>
<b>Safety</b>	<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>
<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>• KN24</li> </ul>
<b>RoHS</b>	<ul style="list-style-type: none"> <li>• RoHS 5 compliant except for lead press-fit connectors</li> </ul>

## Ordering Information

Table 10 provides ordering information for the Cisco Nexus 3172 switches.

**Table 7.** Ordering Information

Part Number	Description
<b>Chassis</b>	
<b>N3K-C3172PQ-10GE</b>	Nexus 3172PQ, 48 SFP+ and 6 QSFP+ ports
<b>N3K-C3172PQ-XL</b>	Nexus 3172PQ-XL, 48 SFP+ and 6 QSFP+ ports
<b>N3K-C3172TQ-10GT</b>	Nexus 3172TQ, 48 10GBase-T RJ-45 and 6 QSFP+ ports
<b>N3K-C3172TQ-32T</b>	Nexus 3172TQ, 32 10GBase-T RJ-45 and 6 QSFP+ ports
<b>N3K-C3172TQ-XL</b>	Nexus 3172TQ-XL, 48 10GBase-T RJ-45 and 6 QSFP+ ports
<b>NXA-FAN-30CFM-F</b>	Nexus 2K/3K single fan, Forward airflow (port side exhaust)
<b>NXA-FAN-30CFM-B</b>	Nexus 2K/3K single fan, Reversed airflow (port side intake)
<b>N2200-PAC-400W</b>	N2K/3K 400W AC Power Supply, Forward airflow (port side exhaust)
<b>N2200-PAC-400W-B</b>	N2K/3K 400W AC Power Supply, Reversed airflow (port side intake)

Part Number	Description
<b>NXA-PAC-500W</b>	Nexus 3K 500W AC PSU, Forward airflow (port side exhaust)
<b>NXA-PAC-500W-B</b>	Nexus 3K 500W AC PSU, Reversed airflow (port side intake)
<b>N2200-PDC-400W</b>	N2K/3K 400W DC Power Supply, Forward airflow (port side exhaust)
<b>N3K-PDC-350W-B</b>	N3K Series 350W DC Power Supply, Reversed airflow (port side intake)
<b>NXA-PDC-500W</b>	Nexus 3K 500W DC PSU, Forward airflow (port side exhaust)
<b>NXA-PDC-500W-B</b>	Nexus 3K 500W DC PSU, Reversed airflow (port side intake)
<b>Software Licenses</b>	
<b>N3K-BAS1K9*</b>	Nexus 3000 Layer 3 Base License
<b>N3K-LAN1K9*</b>	Nexus 3000 Layer 3 LAN Enterprise License (Requires N3K-BAS1K9 License)
<b>NDB-FX-SWT-K9</b>	License for Tap/SPAN aggregation using Cisco Nexus Data Broker
<a href="#">N3K-32X-LIC</a>	Factory installed 32 Port license for N3172TQ-32T
<a href="#">N3K-16T-UPG=</a>	16 Port Upgrade License for N3172TQ-32T.
<b>Spares</b>	
<b>NXA-FAN-30CFM-F=</b>	Nexus 2K/3K single fan, Forward airflow (port side exhaust), Spare
<b>NXA-FAN-30CFM-B=</b>	Nexus 2K/3K single fan, Reversed airflow (port side intake), Spare
<b>N2000-PAC-400W=</b>	N2K/3K 400W AC Power Supply, Forward airflow (port side exhaust), Spare
<b>N2000-PAC-400W-B=</b>	N2K/3K 400W AC Power Supply, Reversed airflow (port side intake), Spare
<b>N2200-PDC-400W=</b>	N2K/3K 400W DC Power Supply, Forward airflow (port side exhaust), Spare
<b>NXA-PAC-500W=</b>	Nexus 3K 500W AC PSU, Forward airflow (port side exhaust), Spare
<b>NXA-PAC-500W-B=</b>	Nexus 3K 500W AC PSU, Reversed airflow (port side intake), Spare
<b>N3K-PDC-350W-B=</b>	N3K Series 350W DC Power Supply, Reversed airflow (port side intake), Spare
<b>NXA-PDC-500W=</b>	Nexus 3K 500W DC PSU, Forward airflow (port side exhaust), Spare
<b>NXA-PDC-500W-B=</b>	Nexus 3K 500W DC PSU, Reversed airflow (port side intake), Spare
<b>N3K-C3064-ACC-KIT=</b>	Nexus 3064PQ Accessory Kit
<b>Bundles</b>	
<b>N3K-C3172-FA-L3</b>	Nexus 3172PQ, Forward Airflow (port side exhaust), AC P/S, Base and LAN Enterprise License Bundle
<b>N3K-C3172-BA-L3</b>	Nexus 3172PQ, Reversed Airflow (port side intake), AC P/S, Base and LAN Enterprise License Bundle
<b>N3K-C3172-FD-L3</b>	Nexus 3172PQ, Forward Airflow (port side exhaust), DC P/S, Base and LAN Enterprise License Bundle
<b>N3K-C3172-BD-L3</b>	Nexus 3172PQ, Reversed Airflow (port side intake), DC P/S, Base and LAN Enterprise License Bundle

\* When switch is used in Nexus 9000 mode, N3K-BAS1K9 license is not applicable. In that case, N3K-LAN1K9 is required for any L3 feature and will cover all L3 features supported by the device.

## Warranty

The Cisco Nexus 3100 platform 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).

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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 3000 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 use an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value. Cisco SMARTnet<sup>®</sup> Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home service capability, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 3000 Series Switches. Spanning the entire network lifecycle, Cisco Services help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

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Cisco Capital<sup>®</sup> 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 you have just one predictable payment. Cisco Capital financing is available in more than 100 countries. [Learn more.](#)

## For More Information

For more information about Cisco Nexus 3000 Series Switches, please visit <http://www.cisco.com/go/nexus3000>.

For more information about Cisco Nexus Data Broker, please visit <http://www.cisco.com/go/nexusdatabroker>.



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