Cisco Nexus 6004 Extensible Fixed Switch

Cisco Nexus 6000 Series Switches Product Overview

Cisco Nexus® 6000 Series Switches are part of the Cisco® Unified Fabric solution. They run the industry-leading Cisco NX-OS Software operating system and are designed to create the flexible, scalable network architectures for virtualized and cloud environments.

Cisco Nexus 6000 Series switches deliver high-density, 10- and 40-Gb Ethernet connectivity in an energy-efficient compact form factor. Easily scale your architecture to support growing bandwidth demands without sacrificing energy efficiency or rack space. A robust integrated Layer 2 and Layer 3 feature set gives you a versatile platform that you can deploy in environments such as:

- Direct-attach 10- and 40-Gb Ethernet access
- High-density Cisco fabric extender aggregation deployments
- Leaf-and-spine architectures
- Compact aggregation deployments

All Cisco Nexus 6000 Series products use the same set of Cisco application-specific integrated circuits (ASICs) and a single software image. Feature and operational consistency simplify management, while advanced analytics, PowerOn Auto Provisioning (POAP), and Python and Tool Command Language (Tcl) script increase programmability and efficiency. Cisco Nexus 6000 Series Switches also support Cisco Nexus 2200 platform fabric extenders, Cisco Nexus B22 Blade Fabric Extenders, In-Service Software Upgrades (ISSUs), and Cisco FabricPath.

Cisco Nexus 6004 Switch Overview

The Cisco Nexus 6004 Switch is the first switch in the Cisco Nexus 6000 Series. It extends the industry-leading innovation and versatility of the Cisco Nexus 5000 Series data center switches and runs the same industry-leading Cisco NX-OS Software operating system. The Cisco Nexus 6004 is versatile. Choose either front-to-back or back-to-front airflow options to suit traditional data center implementation or large-scale cloud deployments. And with 10-Gb Ethernet, 40-Gb Ethernet, and FCoE connectivity options, you can build a scalable Cisco Unified Fabric across a range of physical and virtual server environments. An extensible architecture also makes the Cisco Nexus 6004 a low-cost entry point for small-scale deployments.

The Cisco Nexus 6004 (Figure 1) is a four-rack-unit (4RU) 10- and 40-Gb Ethernet switch with the industry's highest port density in a compact, energy-efficient form factor. It offers eight line-card expansion module (LEM) slots to support up to 96 ports of 40-Gbps throughput. Each LEM supports 12 ports of 40-Gb Ethernet in a quad small form-factor pluggable (QSFP) footprint. Each 40-Gb Ethernet port can also be split into four line-rate 10-Gb Ethernet ports using QSFP breakout cables. This flexibility makes the Cisco Nexus 6004 the only fully extensible fixed 10- and 40-Gb Ethernet platform in the industry. The Cisco Nexus 6004 also offers a Unified expansion module for 1/10 Gigabit Ethernet and FC/FCoE support.

Figure 1. Cisco Nexus 6004 Switch

Integrated Layer 2 and Layer 3 features enhance performance to deliver low-latency, wire speed of approximately 1 microsecond for any packet size. The Cisco Nexus 6004 maintains wire-speed performance for up to 96 40-Gb Ethernet ports or 384 10-Gb Ethernet ports using QSFP breakout cables for Ethernet and FCoE traffic. Overall throughput reaches 7.68 terabits per second (Tbps). The Cisco Nexus 6004 also supports 1-Gigabit connectivity using QSFP to SFP or Enhanced SFP (SFP+) adapters for more flexibility.

Cisco Nexus 6004 Switch Expansion Module Options

Cisco Nexus 6004 expansion modules offer multiple interface options with the chassis base. Each 40 Gigabit Ethernet expansion module provides 12 ports of 40-Gb Ethernet and FCoE ports using a QSFP interface. With all eight expansion modules installed, the Cisco Nexus 6004 delivers 96 ports of QSFP or 384 ports of 10-Gb Ethernet (SFP+) using the breakout cables. And all expansion modules are hot-swappable. The 40 Gigabit Ethernet expansion module for the Cisco Nexus 6004 is shown in Figure 2.

Figure 2. 12-Port 40-Gbps Line-Card Expansion Module

The Cisco Nexus 6004 also offers a Unified Expansion module for Ethernet/FCoE and native Fibre Channel support. Unified port module provides up to twenty 1/10 Gigabit Ethernet and FCoE ports using the SFP+ interface or up to twenty ports of 8/4/2-Gbps native Fibre Channel connectivity using the SFP+ and SFP interfaces; the use of 1/10 Gigabit Ethernet or 8/4/2-Gbps Fibre Channel on a port is mutually exclusive but can be selected for any of the twenty physical ports per module.

Efficient Transceiver and Cabling Options

High-bandwidth Gigabit Ethernet connectivity can pose transmission challenges. However, the Cisco Nexus 6004 platform supports numerous 10- and 40-Gb Ethernet connectivity options using Cisco 40GBASE QSFP and breakout cable options.

Table 1 lists the supported transceiver and cable options.

Table 1. Cisco Nexus 6004 Transceiver Support Matrix

Cisco SFP	Description
QSFP-40G-SR4	40GBASE-SR4 QSFP module (multimode fiber [MMF] at 100m)
QSFP-40G-CSR4	40GBASE Extended CSR4 QSFP module (MMF at 300m)
QSFP-4x10G-AC7M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cables, 7m, active
QSFP-4x10G-AC10M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cables, 10m, active
QSFP-H40G-CU1M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 1m, passive
QSFP-H40G-CU3M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 3m, passive
QSFP-H40G-CU5M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 5m, passive
QSFP-H40G-ACU7M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 7m, active
QSFP-H40G-ACU10M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 10m, active
QSFP-4SFP10G-CU1M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 1m
QSFP-4SFP10G-CU3M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 3m
QSFP-4SFP10G-CU5M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 5m
QSFP-40GE-LR4	Cisco 40GBASE-LR4 QSFP+ transceiver module for single-code fiber (SMF), duplex LC connector
QSFP-4SFP10G-CU1M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 1m
QSFP-4SFP10G-CU3M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 3m
QSFP-4SFP10G-CU5M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assemblies, 5m
QSFP-40G-SR-BD	Cisco QSFP40G BiDi Short-reach Transceiver
CVR-QSFP-SFP10G-	Cisco 40GBASE QSFP to SFP+ and SFP adapter (QSA) for 1G (GLC-T, SX/LH) and 10G-LR connectivity
FET-40G	40G Line Extender for FEX
FET-10G	10G Line Extender for FEX (with breakout cable)

Cisco Nexus 6004 switches support an innovative Twinax copper cabling solution that connects to standard QSFP connectors for in-rack use. You can use optical cabling for longer cable runs (Table 2).

- **In-rack or adjacent-rack cabling:** QSFP+ direct-attach 40 Gigabit Ethernet copper cables integrate transceivers with Twinax cables into an energy-efficient, low-cost, and low-latency solution. QSFP+ direct-attach 40 Gigabit Ethernet Twinax copper cables use only 1.5 watts (W) of power per transceiver and introduce less than 0.1 microsecond of latency per link.
- **Longer cable runs:** the Cisco Nexus 6004 supports multimode, short-reach optical QSFP transceivers. These optical transceivers use approximately 1.5W per transceiver and have a latency of less than 0.1 microsecond.

Table 2. Cisco Nexus 6004 Support for QSFP Direct-Attach 40 Gigabit Ethernet Copper for In-Rack Cabling, and Direct-Attach Breakout Cable for Optical Solutions for Longer Connections (Ethernet Only)

Connector (Media)	Cable	Distance	Maximum Power Consumption	Transceiver Latency (Link)
QSFP CU copper	Twinax	1m 3m 5m	~1.5W	~0.1 microsecond
QSFP ACU copper	Active Twinax	7m 10m	~1.5W	~0.1 microsecond
QSFP SR4 MMF	MMF (OM3) MMF (OM4)	100m 150m	~1.5W	~0.1 microsecond

Connector (Media)	Cable	Distance	Maximum Power Consumption	Transceiver Latency (Link)
QSFP CSR4 MMF	MMF (OM3) MMF (OM4)	300m 400m	~1.5W	~0.1 microsecond
QSFP LR4	SMF	10 km	~3.5W	~0.1 microsecond
QSFP BIDI	MMF (OM3)[2] MMF (OM4)[*3] MMF (OM4+)[*4]	100m 125m 150m	Approximately 3.5W	Approximately 0.1 microsecond

[2] Connector loss budget for OM3 Fiber is 1.5dB.
[*3] 125m over OM4 fiber is with an Engineered Link with 1dB budget for connector loss.
[*4] 150m over OM4+ Fiber is an Engineered Link with 1dB budget for connector loss. One of the recommended fibers for OM4+ is Panduit's Signature Core Fiber. Please refer to the below link for additional information http://www.panduit.com/en/signature-core.

Features and Benefits

The Cisco Nexus 6004 delivers scalable performance, intelligence, and a broad set of features to address the needs of data center networks. A comprehensive feature set makes the Cisco Nexus 6004 especially well suited for virtualized and cloud-based deployment. Cisco high-performance application specific integrated circuits (ASICs) integrate and connect virtual environments to high-performance data-center servers. The Cisco Nexus 6004 can be deployed in the middle of row or at the end of row in the data center.

Scalable architecture protects your investment. In 10-Gb Ethernet optimized environments, scale up to 384 ports of 10-Gb Ethernet interfaces. You can easily meet increasing demand for 40-Gb Ethernet connectivity, thanks to the switch's combined high port density, lossless Ethernet, wire-speed performance, and very low latency. And a common Ethernet-based fabric across physical and virtual deployment simplifies management. Cisco Nexus 6004 features include:

- **Optimization for virtualization and cloud deployments:** The Cisco Nexus 6004 supports demanding virtualized and cloud computing environments with high scalability and performance. You can rely on the Cisco Nexus 6004 to meet current and future needs.
- **Density and resiliency:** Cisco Nexus switches are designed just like the servers they support. Ports and power connections are at the rear, close to server ports. This keeps cable lengths short and efficient. Hot-swappable power and fan modules are accessible from the front panel, along with at-a-glance view of switch operation status. Front-to-back or back-to-front cooling is consistent with server designs to support efficient data center hot- and cold-aisle designs. Serviceability is enhanced with customer-replaceable units accessible from the front panel. And QSFP ports accommodate your choice of interconnects, including copper Twinax cable for short runs and fiber for long runs.
- **Energy efficiency:** The Cisco Nexus 6004 helps data centers operate within their space, power, and cooling parameters while reducing carbon footprints. Switch power supplies can maintain 90 percent efficiency at load conditions as low as 25 percent utilization. Size the switch appropriately to support full loads without sacrificing energy efficiency.
- **Low latency:** The Cisco Nexus 6004 with cut-through switching supports approximately 1 microsecond of port-to-port latency for any packet size with features enabled.

- **Intelligent Switched Port Analyzer (SPAN) and Encapsulated SPAN (ERSPAN):** SPAN and ERSPAN are used for troubleshooting and robust traffic monitoring. The Cisco Nexus 6004 only uses extra bandwidth capacity for SPAN and ERSPAN traffic. And any fabric bandwidth not used for data traffic can be allocated to this purpose. SPAN and ERSPAN traffic is categorized as best effort. If links are congested, SPAN and ERSPAN traffic is dropped first. The Cisco Nexus 6004 can support up to 31 line-rate SPAN and ERSPAN sessions.
- **Flexible buffer management:** A 25-MB packet buffer is shared among every 3 ports of 40-Gb Ethernet or every 12 ports of 10-Gb Ethernet. Of the 25-MB buffer, 16 MB are used for ingress buffering, and 9 MB are used for egress buffering. You can designate buffers as shared, dedicated, or shared plus dedicated. Flexible buffer management lets you dynamically tune buffer sizes if congestion occurs.
- **Multicast enhancements:** The Cisco Nexus 6004 supports line-rate Layer 2 and Layer 3 multicast throughput for all frame sizes. It offers optimized multicast replication through the fabric and at the egress point, and large buffers absorb bursty traffic. The switch supports 32,000 multicast routes and Internet Group Management Protocol (IGMP) snooping tables in hardware. Multicast enhancements include flow-based hashing for multicast traffic over PortChannels and enhanced bidirectional Protocol Independent Multicast (BiDiR PIM) support. The Cisco Nexus 6004 also supports IP-based forwarding for IGMP snooping.
- **Future support for Dynamic Fabric Automation (DFA):** The Cisco Nexus 6004 with support for DFA helps simplify, automate, and optimize data center networks. Now you can deploy 10- and 40-Gb Ethernet leaf-and-spine fabrics to reduce provisioning time, improve data center orchestration and maintenance, and manage network growth more easily.

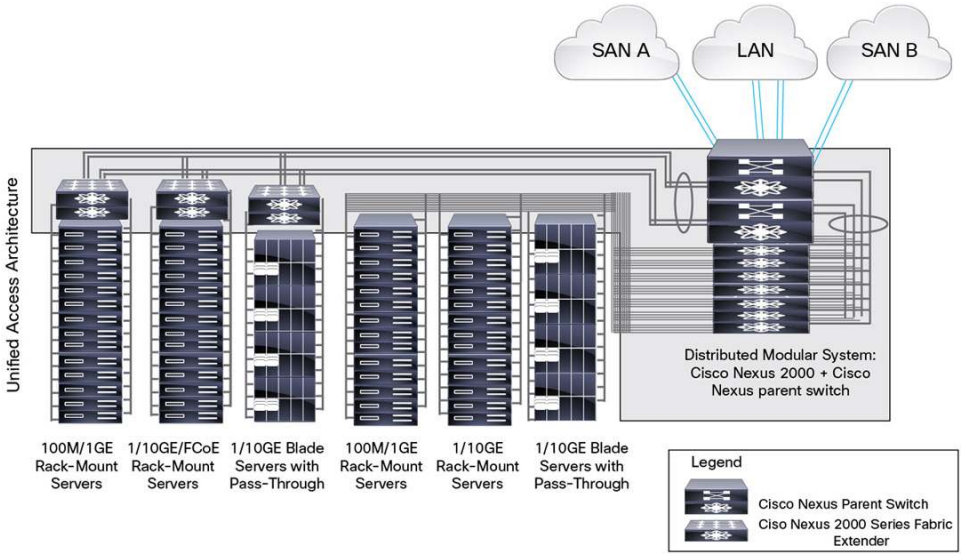
Applications

The Cisco Nexus 6004 supports numerous application scenarios, making the switch a versatile data center option.

Unified Access Architecture: High-Density Fabric Extender Aggregator

Cisco Fabric Extender Technology (FEX Technology) enables you to build a single, modular fabric that extends from Cisco Nexus switches to Cisco Unified Computing System™ (Cisco UCS®) servers to adapters (Cisco Adapter FEX) and to virtual machines (Cisco Data Center Virtual Machine FEX [VM-FEX]). Cisco FEX Technology is based on the emerging IEEE 802.1br standard. Designing the network using Cisco FEX Technology provides flexibility, cabling efficiency, and a single point of management. Cisco Nexus 2200 platform fabric extenders can be single or dual connected (using enhanced virtual PortChannels [EvPCs]) to two upstream Cisco Nexus 6004 Switches (Figure 3). Servers or the end host can connect to single or dual Cisco Nexus 2200 platform fabric extenders using network-interface-card (NIC) teaming when the parent Cisco Nexus 6004 is EvPC-enabled.

Figure 3. Sample Unified Access Deployment Scenario Supporting 2304 1 or 10 Gigabit Ethernet Servers with a Single Pair of Access-Layer Switches and a Single Point of Management



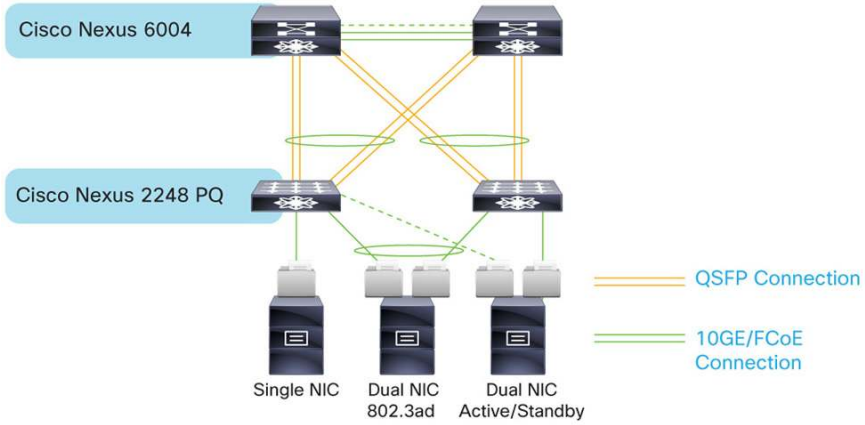
Common Cisco Nexus 2200 platform and Cisco Nexus 6000 Series deployment options include:

- **Rack servers with 100 Megabit Ethernet, Gigabit Ethernet, or 10 Gigabit Ethernet NICs:** The fabric extender can be physically located at the top of the rack, and the Cisco Nexus 6000 Series Switch can reside in the middle or at the end of the row. Alternately, the fabric extender and the Cisco Nexus 6000 Series Switch can both reside at the end or middle of the row.
- **Mixed 1 and 10 Gigabit Ethernet environments:** Rack servers can run at either speed in the same rack or in adjacent racks.
- **10-Gb Ethernet and FCoE deployments:** Use servers with converged network adapters (CNAs) for unified fabric environments with the Cisco Nexus 2232PP 10GE Fabric Extender.
- **1 and 10-Gb Ethernet BASE-T server connectivity:** Simplify migration from 1 to 10GBASE-T and reuse structured cabling efficiently.
- **1 and 10 Gigabit Ethernet blade servers with pass-through blades**
- **Low-latency, high-performance computing environments**
- **Virtualized access**

In addition to fabric extender deployment options, the Cisco Nexus 6004 can perform as a high-density fabric extender aggregation platform. For example:

- **High-density 10-Gb Ethernet switching:** Use the Cisco Nexus 6004 and the Cisco Nexus 2248PQ 10GE Fabric Extender (Figure 4), a 10-Gb Ethernet fabric extender with four 40-Gb Ethernet uplinks to the Cisco Nexus 6004. This combination consolidates more than 2304 10-Gb Ethernet connections in a single management plane. It also provides the highest 10-Gb Ethernet server density available with a low oversubscription ratio.

Figure 4. Cisco Nexus 2248PQ Connected to Cisco Nexus 6004 Using QSFP Links



- **10-Gb Ethernet connection consolidation:** Use the Cisco Nexus 6004 with the Cisco Nexus 2232PP 10 Gigabit Ethernet fabric extender to consolidate more than 768 10-Gb Ethernet connections in a single management plane.
- **Deploy a single point of management:** Aggregate a variety of blade fabric extender options into a Cisco Nexus 6004 using 10 Gigabit Ethernet. This solution provides a single point of management for blade server deployments.
- **Create high-density 1-Gb Ethernet switching:** Use the Cisco Nexus 6004 and a Cisco Nexus 2248TP Gigabit Ethernet fabric extender as a high-density 1 Gigabit Ethernet switching system. This combination also consolidates 2304 1-Gb Ethernet connections into a single management plane.

Table 3 lists the fabric extenders that the Cisco Nexus 6004 supports. Please refer to the Cisco Nexus 2200 platform data sheets and release notes for more information about each product.

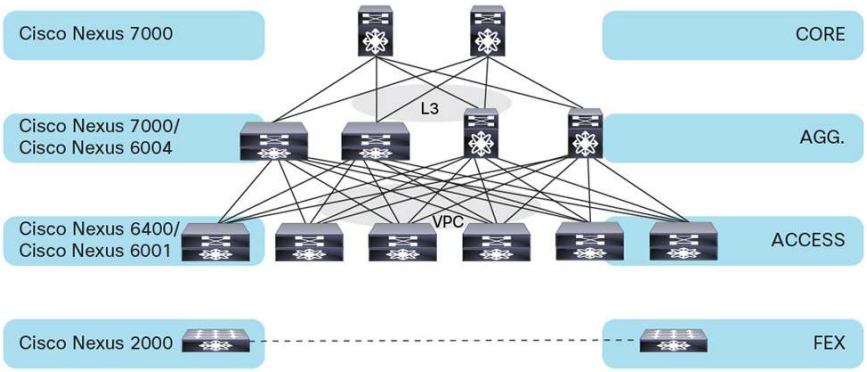
Table 3. Cisco Nexus 2000 Series Fabric Extenders Supported with Cisco Nexus 6004

Description	Specification
Cisco Nexus 2248PQ	Forty-eight 1 and 10 Gigabit Ethernet SFP+ host interfaces and four 40 Gigabit Ethernet (sixteen 10 Gigabit Ethernet SFP+) network interfaces
Cisco Nexus 2224TP	Twenty-four 100/1000BASE-T host interfaces and two 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP	Forty-eight 100/1000BASE-T host interfaces and four 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP-E	Forty-eight 100/1000BASE-T host interfaces and four 10 Gigabit Ethernet fabric interfaces (SFP+) (32-MB shared buffer)
Cisco Nexus 2232PP	Thirty-two 1 and 10 Gigabit Ethernet and FCoE host interfaces (SFP+) and eight 10 Gigabit Ethernet and FCoE fabric interfaces (SFP+)
Cisco Nexus 2232TM	Thirty-two 1 and 10 Gigabit Ethernet BASE-T host interfaces and eight 10 Gigabit Ethernet (SFP+) uplink modules
Cisco Nexus 2232TM-E	Thirty-two 1 and 10 Gigabit Ethernet BASE-T host interfaces and eight 10 Gigabit Ethernet (SFP+) uplink modules (for lower power consumption and improved bit error rate [BER])
Cisco Nexus B22HP	Sixteen 1 and 10 Gigabit Ethernet BASE-KR internal host interfaces and eight 10 Gigabit Ethernet fabric (SFP+) network interfaces
Cisco Nexus B22F	Sixteen 10 Gigabit Ethernet BASE-KR internal host interfaces and eight 10 Gigabit Ethernet fabric (SFP+) network interfaces
Cisco Nexus B22DELL	Sixteen 1 and 10 Gigabit Ethernet BASE-KR internal host interfaces and eight 10 Gigabit Ethernet fabric (SFP+) network interfaces
Cisco Nexus B22IBM	Fourteen 1 and 10 Gigabit Ethernet BASE-KR internal host interfaces and eight 10 Gigabit Ethernet fabric (SFP+) network interfaces

Compact Aggregation

Data center designs are increasingly moving toward less oversubscription, starting at the server access layer. At the same time, more 10-Gb Ethernet server deployments demand top-of-rack (ToR) solutions that can provide 40-Gb Ethernet uplinks. The Cisco Nexus 6004 with high-density 40 Gigabit Ethernet ports is an excellent compact aggregation platform for ToR switches with 40 Gigabit Ethernet uplinks (Figure 5).

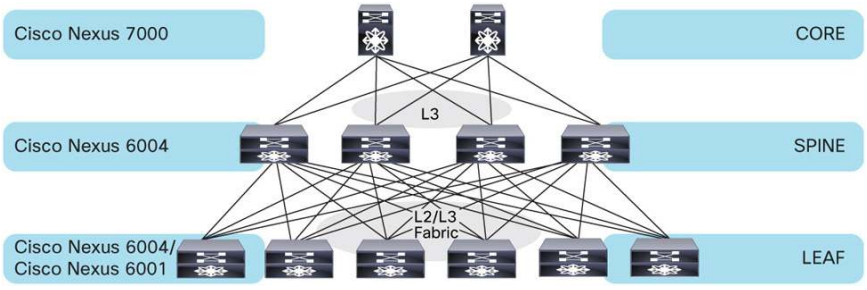
Figure 5. Scalable Data Center Access and Aggregation Using Cisco Nexus 6000 Series



Large-Scale Fabric (Layer 2 and Layer 3): Leaf-and-Spine Architecture

Data center architectures are changing to more efficiently support multiple, high-traffic applications. New, large-scale nonblocking fabrics promote heavy east-west or north-south traffic. The Cisco Nexus 6004 is an excellent leaf or spine node in a Layer 2 or Layer 3 fabric design. As a high-density, low-latency switch, it flattens the network architecture to support connections that scale to more than 10,000 servers with large bisectional bandwidth. The leaf-and-spine design helps ensure low-latency fabric with a low hop count. Spine switches create a nonblocking, low-latency fabric, forwarding packets between leaves. Leaf switches provide connectivity to servers. A highly meshed architecture helps ensure high network availability with minimal impact on customer traffic if a failure occurs. The Cisco Nexus 6004 can be deployed as a Layer 2 or Layer 3 spine or leaf switch (Figure 6) for design flexibility.

Figure 6. Cisco Nexus 6004 as a Leaf or Spine Switch in a Large-Scale Layer 2 or Layer 3 Fabric



Multihop FCoE

Cisco Unified Fabric combines data center and storage networks into a single high-performance, highly available, and scalable network. The Cisco Nexus 6004 is the first switch in the industry to support 40 Gigabit Ethernet FCoE (Figure 7 and Figure 8). The Cisco Nexus 6004 can support end-to-end data center convergence from server to storage with multihop FCoE connectivity. Its FCoE function complements FCoE functionality on Cisco Nexus 5500 platforms. With a broad selection of standards-based FCoE switches, Cisco Unified Fabric provides a simplified infrastructure based on lossless 10 and 40 Gigabit Ethernet for:

- Access and core network layers
- Storage traffic (FCoE, Small Computer System Interface over IP [iSCSI]
- Network-attached storage [NAS])

Figure 7. Cisco Nexus 6004 as 40-Gbps FCoE Aggregation Device

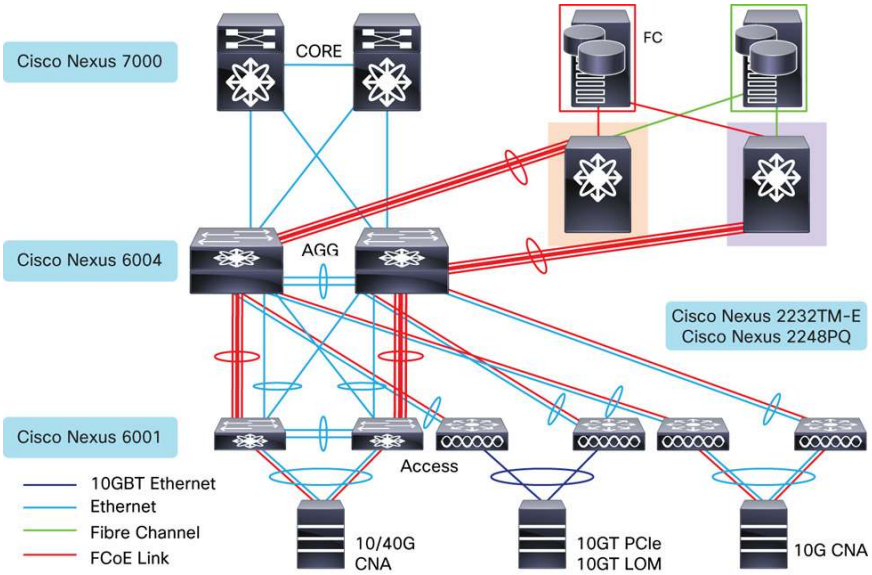
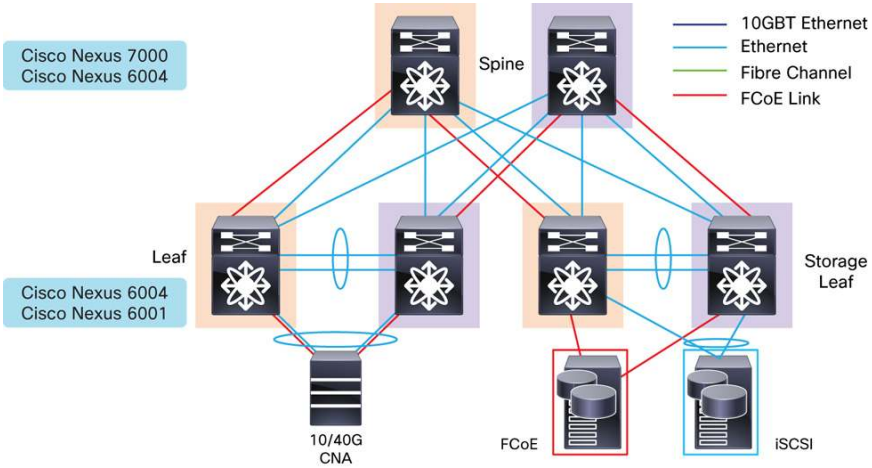


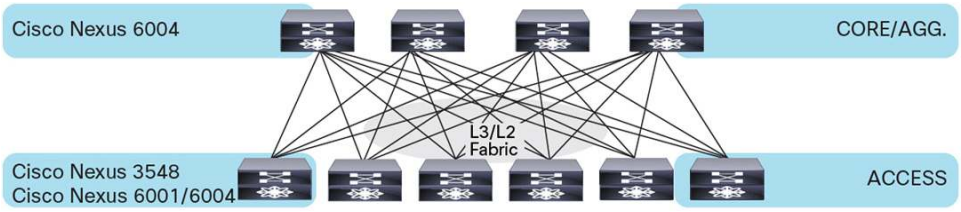
Figure 8. Cisco Nexus 6004 in 10 and 40 Gigabit Ethernet FabricPath SAN



High-Performance Computing and High-Frequency Trading

High-performance computing (HPC) and high-frequency trading (HFT) environments can use the Cisco Nexus 6004 as a high-density access-layer switch. In these environments, the switch helps reduce latency by consolidating server traffic with minimal network hops (Figure 9). Get the most 10- and 40-Gb Ethernet ports per rack unit and approximately 1 microsecond of latency port to port for any packet size. Further protect your investment with integrated line-rate Layer 2 and Layer 3 features for high scalability and integrated data analytics with programmability. Cisco Nexus 6004 switches provide you with management visibility and high performance for bulk transfers that InfiniBand solutions can't match.

Figure 9. Cisco Nexus 6004 in HPC and HFT Deployment



Product Architecture

The Cisco Nexus 6000 Series is built on two custom ASICs: a unified crossbar fabric and a unified port controller. Depending on your desired port density, each Cisco Nexus 6000 Series Switch contains a single or multiple unified crossbar fabric ASICs. The unified crossbar fabric is a single-stage, nonblocking crossbar. It provides connectivity and arbitration between unified port controllers to access the fabric. The Cisco Nexus 6000 Series offers superior performance by implementing quality of service (QoS)-aware buffering, queuing, and scheduling for unicast and multicast traffic.

Multiple unified port controllers support fixed ports and expansion modules within the switch. Each unified port controller handles three 40-Gbps or twelve 10-Gbps ports. Each controller also processes packets with features such as forwarding, buffering, and queuing decisions for each frame. The cut-through characteristic of the architecture provides low latency for both 10 and 40 Gbps at 1 microsecond, independent of the frame size.

Cisco NX-OS Software Overview

The Cisco NX-OS operating system easily meets today's virtualization and automation needs. Support both Ethernet and storage demands. Customize your environment and encourage innovation with access to OS services. And greatly simplify management at the same time.

Cisco NX-OS Software Features and Benefits

- **Software compatibility:** Cisco NX-OS Software Release 6.0 works with Cisco products running any variant of the Cisco IOS Software operating system. It also works with any networking operating system that conforms to the networking standards listed in this data sheet.
- **Common software throughout the data center:** A common operating system across the data center simplifies management of everything - LAN, SAN, and Layer 4 through 7 network services.

- **Modular software design:** Cisco NX-OS is designed to support distributed multithreaded processing on symmetric multiprocessors (SMPs), multicore CPUs, and distributed line-card processors. Offload intense computation, such as hardware table programming, to dedicated processors across the line cards. Cisco NX-OS instantiates modular processes on demand, each in a protected memory space. Processes are launched and system resources allocated only when a feature is enabled. A real-time preemptive scheduler helps ensure timely processing of critical functions.
- **Enhanced virtual PortChannel (vPC):** The vPC feature allows one end of a PortChannel to be split across a pair of Cisco Nexus 5000 Series Switches. vPC provides Layer 2 multipathing by eliminating Spanning Tree Protocol-blocked ports in dual-homed connections. Now you can simplify Layer 2 logical topologies and get full bisectional bandwidth utilization without changing your management and deployment models. The vPC feature also enables edge devices to connect to Cisco Nexus 2000 Series Fabric Extenders and the Cisco Nexus 2000 Series Fabric Extenders can connect to Cisco Nexus 5000 Series Switches using vPC at the same time.
- **Cisco FabricPath:** Cisco FabricPath is a set of multipath Ethernet technologies that combine reliability and scalability with the flexibility of Layer 2 networks to build massively scalable data centers. Cisco FabricPath offers a topology-based, Layer 2 routing mechanism that provides an equal-cost multipath (ECMP) forwarding model and solves MAC address table scalability problems that are characteristic of switched Layer 2 networks. Cisco FabricPath also supports vPC+, a technology that allows redundant interconnection of the existing Ethernet infrastructure to Cisco FabricPath without using Spanning Tree Protocol. Cisco FabricPath benefits include:
  - Operational simplicity: An autodiscovery mechanism eliminates additional platform configuration. By offering Layer 2 connectivity, the “VLAN anywhere” characteristic simplifies provisioning and offers workload flexibility across the network.
  - High resiliency and performance: Because Cisco FabricPath is a Layer 2 routed protocol, it offers stability, scalability, and optimized resiliency, along with network failure containment.
  - Massively scalable fabric: By building a forwarding model on 16-way ECMP routing, Cisco FabricPath helps prevent bandwidth bottlenecks. You can add capacity dynamically, without network disruption.
  - Multiple-topology support: Cisco FabricPath provides support for two distinct topologies, providing VLAN localization and reuse in the network.
- **Automation:** Cisco NX-OS power-on provisioning automatically configures devices. Create custom Python scripts to further customize your environment.
- **Programmatic XML interface: the** Cisco NX-OS XML interface is based on the NETCONF industry standard. A consistent API for devices accelerates development and tool creation.
- **Simple Network Management Protocol (SNMP):** Cisco NX-OS complies with SNMPv1, v2, and v3. It supports an extensive collection of MIBs.
- **Role-based access control (RBAC):** With RBAC, you can limit access to switch operations by assigning roles to users. Administrators can customize access and restrict it to the users who require it.

Cisco NX-OX Software Packaging for Cisco Nexus 6004 Series

Cisco Nexus 6004 software packaging offers flexibility and a comprehensive feature set while being consistent with Cisco Nexus access switches. Default system software has a comprehensive Layer 2 security and management feature set and base-level Layer 3 feature set. For advanced Layer 3 IP Unicast and IP Multicast routing functions, you must install additional licenses. Table 4 lists the software packaging and licensing available to enable various advanced features.

Table 4. Software Packaging and Licensing

License	Chassis Based or Port Based	Part Number	Supported Features
Cisco Nexus 6004 Layer 3 Base Software License	Chassis	N6K-BAS1K9	Static routing, Routing Information Protocol Version 2 (RIPv2), Open Shortest Path First Version 2 (OSPFv2), Enhanced Interior Gateway Routing Protocol (EIGRP) stub, Hot-Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), Interior Gateway Management Protocol Versions 2 and 3 (IGMPv2 and v3), Protocol-Independent Multicast Version 2 (PIMv2) (sparse mode), routed access control list (ACL), and unicast Reverse Path Forwarding (uRPF); OSPF scalability is limited to 256 dynamically learned routes
Cisco Nexus 6004 Layer 3 Enterprise (LAN) Software License	Chassis	N6004-LAN1K9	Advanced Layer 3 features: Full EIGRP, OSPF, Border Gateway Protocol (BGP), and Virtual Route Forwarding Lite (VRF-Lite)
Cisco Nexus 6004 FCoE NPV License	Chassis	N6K-FNPV-SSK9	FCoE N-Port Virtualizer (NPV) features supported on Cisco Nexus 6000 Series
Cisco Nexus 6004 Enhanced Layer 2 Software License	Chassis	N6004-EL2-SSK9	Cisco FabricPath supported on Cisco Nexus 6000 Series
Cisco Nexus 6000 VM-FEX Software License	Chassis	N6K-VMFEXK9	Cisco Data Center VM-FEX supported on Cisco Nexus 6000 Series
Cisco Nexus 6004 Software Bundle	Chassis/Ports	N6004-SBUN-P1-L	LAN, Enhanced Layer 2, Layer 3 Basic, Layer 3 Advanced, Cisco Data Center Network Manager (DCNM) LAN, Cisco Data Center VM-FEX, and Fibre Channel and FCoE storage features
Cisco Nexus 6004 Software Bundle Chassis	Chassis	N6004-SBUN-P1	LAN, Enhanced Layer 2, Layer 3 Basic, Layer 3 Advanced, Cisco DCNM LAN and SAN, Cisco Data Center VM-FEX, and Fibre Channel and FCoE storage features per chassis
Cisco Nexus 6004 Storage Protocols Services License: 16 ports of 10 Gigabit Ethernet or 4 ports of 40 Gigabit Ethernet	Port	N6004-4Q-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 16 ports of 10 Gigabit Ethernet or 4 ports of 40 Gigabit Ethernet
Cisco Nexus 6000 Storage Protocols Services License: 48 ports of 10 Gigabit Ethernet or 12 ports of 40 Gigabit Ethernet	Port	N6004-12Q-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 48 ports of 10 Gigabit Ethernet or 12 ports of 40 Gigabit Ethernet

Cisco Prime Data Center Network Manager

Cisco Prime™ Data Center Network Manager (DCNM) provides LAN and SAN management capabilities for Cisco Nexus and Cisco MDS 9000 Series switches. Gain efficient control, monitoring, and provisioning with the GUI:

- Cisco Unified Fabric visibility and topology display with VMware vSphere integration shows connectivity from the virtual machine to the VMware ESX host, to the switch and storage array.
- Event aggregation and filtering prevents information overload and helps you quickly identify network problems.
- Deployment wizards and user-modifiable templates help you implement best practices.
- RBAC secures devices and provides appropriate delegation.

- Integrated domain dashboards, health monitoring, reporting, change tracking, and user auditing provide comprehensive management capabilities.
- Trend monitoring of ports and traffic let you optimize existing resources and anticipate new resource requirements.

Table 5 lists the specifications for the Cisco Nexus 6004.

Note: Please check software release notes for feature support information.

Table 5. Product Specifications

Performance
• Cisco Nexus 6004: Layer 2 and Layer 3 hardware forwarding at 7.68 Tbps • Support for up to 256,000 MAC addresses • Low-latency of ~1 microsecond using cut-through forwarding for predictable, consistent traffic latency regardless of packet size, traffic pattern, or features enabled on 10 and 40 Gigabit Ethernet interfaces • 25-MB buffer per three 40 Gigabit Ethernet QSFP interfaces • Line-rate traffic throughput on all ports
Interfaces
• Cisco Nexus 6004: Up to 96 40 Gigabit Ethernet and FCoE ports through the use of 8 expansion modules • 12-port 40 Gigabit Ethernet and FCoE expansion module • 20-port unified expansion module • 10 Gigabit Ethernet interface through QSFP breakout cable • 1 Gigabit Ethernet interface through a QSFP to SFP and SFP+ adapter (QSA) • Extension through the Cisco Nexus 2200 platform
Layer 2 Features
• Layer 2 switch ports and VLAN trunks • IEEE 802.1Q VLAN encapsulation • Support for up to 4000 VLANs • Support for up to 4000 ACLs • Rapid Per-VLAN Spanning Tree Plus (PVRST+; IEEE 802.1w compatible) • Multiple Spanning Tree Protocol (MSTP; IEEE 802.1s) instances: 64 instances • Spanning Tree PortFast • Spanning Tree root guard • Spanning Tree Bridge Assurance • Cisco EtherChannel technology (up to 16 ports per EtherChannel) • Cisco vPC technology • vPC configuration synchronization • vPC Shutdown • Link Aggregation Control Protocol (LACP): IEEE 802.3ad • Advanced PortChannel hashing based on Layer 2, 3, and 4 information • Jumbo frames on all ports (up to 9216 bytes) • Pause frames (IEEE 802.3x) • Storm control (unicast, multicast, and broadcast) • Private VLANs • Private VLAN over trunks (isolated and promiscuous) • Private VLANs over vPC and EtherChannels • VLAN remapping • Cisco FabricPath • EvPC and vPC+ with Cisco FabricPath • Cisco Adapter FEX • Cisco Data Center VM-FEX • Support for up to 48 fabric extenders (Layer 2) with each Cisco Nexus 6004 Switch

Layer 3 Features
• Layer 3 interfaces: Routed ports on Cisco Nexus 6004 platform interfaces, switched virtual interface (SVI), PortChannels, subinterfaces, and PortChannel subinterfaces • Support for up to 32,000 IPv4 and 8000 IPv6 host prefixes • Support for up to 8000 multicast routes (IPv4) • Support for up to 8000 IGMP snooping groups* • Support for 4000 VRF entries • Support for up to 4096 VLANs • Equal-Cost Multipathing (ECMP) up to 64 ways • 4000 flexible ACL entries • Routing protocols: Static, RIPv2, EIGRP, OSPFv2, and BGP • IPv6 routing protocols: Static, OPFv3, BGPv6, and EIGRPv6 • IPv6 VRF-Lite • BFD support: OSPFv2, BGPv4, EIGRP, and VRF • vPC+ routing protocol peering • Policy-based routing (IPv4 and IPv6) • HSRP and VRRP • IP-directed broadcast • ACL: Routed ACL with Layer 3 and 4 options to match ingress and egress ACLs • Multicast: PIMv2 sparse mode, Source-Specific Multicast (SSM), BiDir PIM, Multicast Source Discovery Protocol (MSDP), IGMPv2 and v3, and Multicast VLAN Registration (MVR) • VRF: VRF-Lite (IP VPN); VRF-aware unicast; and BGP-, OSPF-, RIP-, and VRF-aware multicast • uRFP with ACL; strict and loose modes • Jumbo frame support (up to 9216 bytes) • Support for up to 24 fabric extenders on each Cisco Nexus 6004
QoS
• Layer 2 IEEE 802.1p (class of service [CoS]) • 8 unicast queues and 8 multicast queues per port • Per-port QoS configuration • CoS trust • Port-based CoS assignment • Modular QoS CLI (MQC) compliance: IPv4 and IPv6 • ACL-based QoS classification (Layers 2, 3, and 4) • Flexible TCAM carving • MAC address and Address Resolution Protocol (ARP) hardware carving • MQC CoS marking • Per-port virtual output queuing • CoS-based egress queuing • Egress strict-priority queuing • Egress port-based scheduling: Weighted Round Robin (WRR) • Control Plan Policing (CoPP): IPv4 and IPv6
Security
• Ingress ACLs (standard and extended) on Ethernet and virtual Ethernet ports • Standard and extended Layer 2 ACLs: MAC address, protocol type, etc. • Standard and extended Layer 3 to 4 ACLs: IPv4 and IPv6, Internet Control Message Protocol (ICMP and ICMPv6), TCP, User Datagram Protocol (UDP), etc. • Ingress policing • VLAN-based ACLs (VACLs) • Port-based ACLs (PACLs) • Named ACLs • Optimized ACL distribution • ACLs on virtual terminals (VTYs) • ACL logging (IPv4 only) • Dynamic Host Configuration Protocol (DHCP) snooping with Option 82 • Dynamic ARP Inspection • IP source guard

- DHCP relay: Up to 32 destinations
- Ethernet port security
- IPv6 router ACL (RACL), PACL, and VACL
- iSCSI type-length-value (TLV) element

High-Availability Features

- ISSU for Layer 2
- Hot-swappable field-replaceable power supplies, fan modules, and expansion modules
- N+1 or N+N power redundancy
- N+1 fan module redundancy

Management

- Switch management using 10-, 100-, and 1000-Mbps management or console ports
- CLI-based console to provide detailed out-of-band management
- In-band switch management
- Port-based locator and beacon LEDs
- Configuration synchronization
- Module preprovisioning
- Configuration rollback
- Secure Shell (SSH) Protocol Version 2 (SSHv2)
- Telnet
- Authentication, authorization, and accounting (AAA)
- AAA with RBAC
- RADIUS
- TACACS+
- Syslog (8 servers)
- Embedded packet analyzer
- SNMPv1, v2, and v3 (IPv4 and IPv6)
- Enhanced SNMP MIB support
- XML (NETCONF) support
- Remote monitoring (RMON)
- Advanced Encryption Standard (AES) for management traffic
- Unified username and passwords across CLI and SNMP
- Microsoft Challenge Handshake Authentication Protocol (MS-CHAP)
- Digital certificates for management between switch and RADIUS server
- Cisco Discovery Protocol Versions 1 and 2
- RBAC
- SPAN on physical, PortChannel, and VLAN
- ERSPAN
- Ingress and egress packet counters per interface
- Network Time Protocol (NTP)
- Cisco Generic Online Diagnostics (GOLD)
- Comprehensive bootup diagnostic tests
- Cisco Embedded Event Manager (EEM)
- Call Home feature
- Smart Call Home feature
- Default interface
- Cisco Fabric Manager
- Cisco DCNM
- CiscoWorks LAN Management Solution (LMS)

Data Center Bridging

- CEE- and IEEE-compliant policy feature card (PFC; per-priority pause frame support)
- PFC link distance support: 300m
- CEE-compliant Data Center Bridging Exchange (DCBX) Protocol
- CEE- and IEEE-compliant Enhanced Transmission Selection (ETS)

FCoE Features (Requires Storage Services License)

- T11 standards-compliant FCoE (FC-BB-5)
- T11 FCoE Initialization Protocol (FIP) (FC-BB-5)
- Any 10 or 40 Gigabit Ethernet port configurable as FCoE
- SAN administration separate from LAN administration
- Fibre Channel forwarding (FCF)
- Fibre Channel enhanced port types: VE, TE, and VF
- Direct attachment of FCoE targets
- Fabric Device Management Interface (FDMI)
- Fibre Channel ID (FCID) persistence
- Distributed device alias services
- In-order delivery
- Port tracking
- Cisco FCoE NPV technology
- N-port identifier virtualization (NPIV)
- Fabric services: Name server, registered state change notification (RSCN), login services, and name-server zoning
- Per-VSAN fabric services
- Cisco Fabric Services
- Diffie-Hellman Challenge Handshake Authentication Protocol (DH-CHAP) and Fibre Channel Security Protocol (FC-SP)
- Distributed device alias services
- Host-to-switch and switch-to-switch FC-SP authentication
- Fabric Shortest Path First (FSPF)
- Standard zoning
- Enhanced zoning
- Cisco Fabric Analyzer
- Cisco Data Center Network Manager (DCNM) - SAN
- Storage Management Initiative Specification (SMI-S)
- Boot from SAN over vPC and EvPC
- FCP
- VSAN trunking
- Fabric Device Management Interface (FDMI)
- Fibre Channel ID (FCID) persistence
- Distributed device alias services
- In-order delivery
- Port tracking
- Cisco NPV technology
- Fabric binding for Fibre Channel
- Port security
- Fibre Channel traceroute
- Fibre Channel ping
- Fibre Channel debugging

SNMP MIBs

Generic MIBs

- SNMPv2-SMI
- CISCO-SMI
- SNMPv2-TM
- SNMPv2-TC
- IANA-ADDRESS-FAMILY-NUMBERS-MIB
- IANAifType-MIB
- IANAiprouteprotocol-MIB
- HCNUM-TC
- CISCO-TC
- SNMPv2-MIB
- SNMP-COMMUNITY-MIB
- SNMP-FRAMEWORK-MIB
- SNMP-NOTIFICATION-MIB

- SNMP-TARGET-MIB
- SNMP-USER-BASED-SM-MIB
- SNMP-VIEW-BASED-ACM-MIB
- CISCO-SNMP-VACM-EXT-MIB

Layer 3 MIBs

- UDP-MIB
- TCP-MIB
- OSPF-MIB
- BGP4-MIB
- CISCO-HSRP-MIB

Ethernet MIBs

- CISCO-VLAN-MEMBERSHIP-MIB
- CISCO-Virtual-Interface-MIB
- CISCO-VTP-MIB

Configuration MIBs

- ENTITY-MIB
- IF-MIB
- CISCO-ENTITY-EXT-MIB
- CISCO-ENTITY-FRU-CONTROL-MIB
- CISCO-ENTITY-SENSOR-MIB
- CISCO-FLASH-MIB
- CISCO-SYSTEM-MIB
- CISCO-SYSTEM-EXT-MIB
- CISCO-IP-IF-MIB
- CISCO-IF-EXTENSION-MIB
- CISCO-SERVER-INTERFACE-MIB
- CISCO-NTP-MIB
- CISCO-IMAGE-MIB
- CISCO-IMAGE-CHECK-MIB
- CISCO-IMAGE-UPGRADE-MIB
- CISCO-CONFIG-COPY-MIB
- CISCO-ENTITY-VENDORTYPE-OID-MIB
- CISCO-BRIDGE-MIB

Monitoring MIBs

- DIFFSERV-DSCP-TC
- NOTIFICATION-LOG-MIB
- DIFFSERV-MIB
- CISCO-CALLHOME-MIB
- CISCO-SYSLOG-EXT-MIB
- CISCO-PROCESS-MIB
- RMON-MIB
- CISCO-RMON-CONFIG-MIB
- CISCO-HC-ALARM-MIB
- LLDP MIB

Security MIBs

- CISCO-AAA-SERVER-MIB
- CISCO-AAA-SERVER-EXT-MIB
- CISCO-COMMON-ROLES-MIB
- CISCO-COMMON-MGMT-MIB
- CISCO-RADIUS-MIB
- CISCO-SECURE-SHELL-MIB
- TCP/IP MIBs
- INET-ADDRESS-MIB
- TCP-MIB

• CISCO-TCP-MIB • UDP-MIB • IP-MIB • CISCO-IP-PROTOCOL-FILTER-MIB • CISCO-DNS-CLIENT-MIB • CISCO-PORTSECURITY- MIB
Miscellaneous MIBs
• START-MIB • CISCO-LICENSE-MGR-MIB • CISCO-FEATURE-CONTROL-MIB • CISCO-CDP-MIB • CISCO-RF-MIB • CISCO-ETHERNET-FABRIC-EXTENDER-MIB • CISCO-BRIDGE-MIB • CISCO-FCOE-MIB • CISCO-PORTCHANNEL-MIB • Cisco-zs-MIB
Standards
Industry Standards
• IEEE 802.1D: Spanning Tree Protocol • IEEE 802.1p: CoS prioritization • IEEE 802.1Q: VLAN tagging • IEEE 802.1Qaz: Enhanced transmission selection • IEEE 802.1Qbb: Per-priority pause • IEEE 802.1s: Multiple VLAN instances of Spanning Tree Protocol • IEEE 802.1w: Rapid reconfiguration of Spanning Tree Protocol • IEEE 802.3: Ethernet • IEEE 802.3ad: LACP with fast timers • IEEE 802.3ae: 10 Gigabit Ethernet • SFF 8431 SFP+ CX1 support • RMON
Physical Specifications
QSFP Optics
• Cisco Nexus 6004 supports 40 Gigabit Ethernet QSFP+ ports

Power Supply

Table 6 lists the Cisco Nexus 6004 power supply properties.

Table 6. Power Supply Properties

AC Power Supply Properties	Cisco Nexus 6004
Typical operating power	2800W
Maximum power	3300W
Input voltage	94 to 240 VAC
Frequency	47 to 63 Hz
Efficiency	98% (50 to 100% load)
RoHS compliance	Yes
Hot-swappable	Yes
Heat dissipation	11260 BTU/hr (3300W)
Front-to-back air flow power supply (port-side exhaust airflow)	Yes
Back-to-front air flow power supply (port-side intake airflow)	Yes

Environment

Table 7 lists the environmental properties of the Cisco Nexus 6004.

Table 7. Environmental Properties

Property	Cisco Nexus 6004
Physical (H x W x D)	6.97 x 17.3 x 30 in. (17.7 x 43.9 x 76.2 cm)
Operating temperature	32 to 104℉ (0 to 40℃)
Nonoperating (storage) temperature	-40 to 158℉ (-40 to 70℃)
Humidity	5 to 95% (noncondensing)
Altitude	0 to 10,000 ft (0 to 3000m)

Weight

Table 8 lists the Cisco Nexus 6004 switch weight.

Table 8. Weight

Component	Weight
Cisco Nexus 6004 with three 1100W power supplies, two expansion modules, and four fan modules	111 lb or 50.3 kg
Cisco Nexus 6004 with three 1100W power supplies and four fan modules	100 lb or 45.3 kg

Software Requirements

The Cisco Nexus 6004 supports Cisco NX-OS Software Release 6.0 and later. Cisco NX-OS interoperates with any networking operating system that conforms to the networking standards mentioned in this data sheet. For the latest software release information and recommendations, please refer to the product bulletin at http://www.cisco.com/go/nexus6000.

Regulatory Standards Compliance

Table 9 summarizes regulatory standards compliance for the Cisco Nexus 6004.

Table 9. 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

Specification	Description
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The product is compliant with RoHS 6 with exceptions for leaded ball grid array (BGA) balls and lead press-fit connectors.

Ordering Information

Table 10 presents ordering information for the Cisco Nexus 6004. Note that you can order the Cisco Nexus 2200 platform fabric extenders either separately or with the Cisco Nexus 6004 Switch.

Table 10. Ordering Information

Part Number	Description
Chassis	
N6004-B-24Q	Nexus 6004 EF chassis 24 x 40GE Ports/FCoE Bundle; 6PSU, 4 FAN
Fan Modules	
N6K-C6004-FAN-F	Cisco Nexus 6004 Fan Module, Front-to-Back, port side exhaust Airflow
N6K-C6004-FAN-F=	Cisco Nexus 6004 Fan Module, Front-to-Back, port side exhaust Airflow, spare
N6K-C6004-FAN-B=	Cisco Nexus 6004 Fan Module, Back-to-Front, port side intake Airflow, spare
Power Supplies	
N55-PAC-1100W	Cisco Nexus 5500/6000 PSU module, (port side exhaust airflow) 100-240VAC 1100W
N55-PAC-1100W=	Cisco Nexus 5500/6000 PSU module, (port side exhaust airflow) 100-240VAC 1100W, Spare
N55-PAC-1100W-B	Cisco Nexus 5500/6000 PSU module, port side intake (back to front) airflow 100-240VAC 1100W
N55-PAC-1100W-B=	Cisco Nexus 5500/6000 PSU module, port side intake (back to front) airflow 100-240VAC 1100W, Spare
NXA-PAC-1100W(=)	Cisco Nexus 5500/6000 Platinum PSU Front-to-Back Airflow module spare, A/C, 100-240V, 1100W
NXA-PAC-1100W-B(=)	Cisco Nexus 5500/6000 Platinum PSU Back-to-Front Airflow module spare, A/C, 100-240V, 1100W
N55-PDC-1100W	Cisco Nexus 5500/6000 PSU module, DC 1100W
N55-PDC-1100W=	Cisco Nexus 5500/6000 PSU module, DC 1100W, Spare
Miscellaneous	
N6K-C6004-M-BLNK	Nexus 6004 Blank Module Cover
N6K-C6004-M-BLNK=	Nexus 6004 Blank Module Cover, spare
N6K-PS-BLANK	Nexus 6004 Power Supply Blank Cover
N6K-PS-BLANK=	Nexus 6004 Power Supply Blank Cover, spare
Software	
N6KUK9-602N1.1	Nexus 6000 Base OS Software Rel 6.0(2)N1(1)
N6KUK9-602N1.2	Nexus 6000 Base OS Software Rel 6.0(2)N1(2)
N6KUK9-602N1.2=	Nexus 6000 Base OS Software Rel 6.0(2)N1(2), spare
N6KUK9-602N1.2a	Nexus 6000 Base OS Software Rel 6.0(2)N1(2a)
N6KUK9-602N1.2a=	Nexus 6000 Base OS Software Rel 6.0(2)N1(2a), spare
N6KUK9-602N2.1	Nexus 6000 Base OS Software Rel 6.0(2)N2(1)
N6KUK9-602N2.1=	Nexus 6000 Base OS Software Rel 6.0(2)N2(1), spare
N6KUK9-700N1.1	Nexus 5600/6000 Base OS Software Rel 7.0(0)N1(1)
N6KUK9-700N1.1=	Nexus 5600/6000 Base OS Software Rel 7.0(0)N1(1), spare

Part Number	Description
Expansion Modules	
N6004-M12Q	Nexus 6004 Module 12Q 40GE Ethernet/FCoE
N6004-M12Q=	Nexus 6004 Module 12Q 40GE Ethernet/FCoE, Spare
N6004-M12Q	Nexus 6004 EF Chassis Module 12Q 40GE Ethernet/FCoE
N6004-M12Q=	Nexus 6004 EF Chassis Module 12Q 40GE Ethernet/FCoE, Spare
N6004X-M20UP	Nexus 6004 EF Chassis Module 20P 10GE Eth/FCoE OR 8/4/2G FC
N6004X-M20UP=	Nexus 6004 EF Chassis Module 20P 10GE Eth/FCoE OR 8/4/2G FC, Spare
Cables and Optics	
QSFP-40G-SR4	40GBASE-SR4 QSFP module, (multi-mode fiber, MMF at 100m)
QSFP-40G-CSR4	40GBASE Extended CSR4 QSFP module, (multi-mode fiber, MMF at 300m)
QSFP-40G-LR4	Cisco 40GBASE-LR4 QSFP+ transceiver module for SMF, duplex LC connector
QSFP-4x10G-AC7M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 7-meter, active
QSFP-4x10G-AC10M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 10-meter, active
QSFP-H40G-CU1M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 1-meter, passive
QSFP-H40G-CU3M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 3-meter, passive
QSFP-H40G-CU5M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 5-meter, passive
QSFP-H40G-ACU7M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 7-meter, active
QSFP-H40G-ACU10M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 10-meter, active
QSFP-4SFP10G-CU1M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 1 meter
QSFP-4SFP10G-CU3M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 3 meter
QSFP-4SFP10G-CU5M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 5 meter
QSFP-40G-SR-BD	Cisco QSFP40G BiDi Short-reach Transceiver
FET-40G	40G Line Extender for FEX
FET-10G	10G Line Extender for FEX (with breakout cable)
CVR-QSFP-SFP10G=	Cisco 40GBASE QSFP to SFP+/SFP Adapter (QSA) for 1G (GLC-T, SX/LH and 10G-LR connectivity
Power Cords	
CAB-250V-10A-AR	AC Power Cord - 250V, 10A - Argentina (2.5 meter)
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia (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-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU (2.5 meter)
CAB-IND-10A	10A Power cable for India (2.5 meter)
CAB-250V-10A-IS	AC Power Cord - 250V, 10A - Israel (2.5 meter)
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy (2.5 meter)
CAB-250V-10A-ID	AC Power Cord - 250V, 10A, South Africa (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)
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America (2.5 meter)
CAB-AC-250V/13A	North America, NEMA L6-20 250V/20A plug-IEC320/C13 receptacle (2.0 meter)
CAB-N5K6A-NA	Power Cord, 200/240V 6A North America (2.5 meter)
CAB-C13-CBN	Cabinet Jumper Power Cord, 250 VAC 10A, C14-C13 Connectors (0.7 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)

Part Number	Description
Accessory Kit	
N6K-C6004-ACC-KIT	Nexus 6004 Chassis Accessory Kit
N6K-C6004-ACC-KIT=	Nexus 6004 Chassis Accessory Kit, spare

Warranty

The Cisco Nexus 6004 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).

Service and Support

Cisco offers a wide range of services to accelerate your success with the Cisco Nexus 6004. Cisco Services people, processes, tools, and partners are focused on helping you increase operational efficiency. 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 to Cisco network experts and award-winning resources. With Cisco SMARTnet, use the Smart Call Home service feature, which delivers proactive diagnostics and real-time alerts on your Cisco Nexus 6004. Spanning the entire network lifecycle, Cisco Services offerings span the network lifecycle to protect your investment protection, optimize operations, support migrations, and strengthen your IT expertise.

For More Information

- Cisco Nexus 6000 Series Switches: http://www.cisco.com/go/nexus6000
- Cisco Nexus 2000 Series Fabric Extenders: http://www.cisco.com/go/nexus2000
- Cisco NX-OS Software: http://www.cisco.com/go/nxos

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