Cisco Nexus 5600 Platform 40-Gbps Switches

Product Overview

The increasing number of applications requiring greater bandwidth and the availability of less expensive 10-Gbps servers are fueling a growing demand for dense 10 and 40 Gigabit Ethernet switches. At the same time, data center architecture is evolving in response to new demands on the IT infrastructure. Application workloads are being deployed across a mix of virtualized and physical server and storage infrastructure, requiring a network infrastructure that provides consistent connectivity, security, and visibility across a range of bare-metal, virtualized, and cloud computing environments.

The Cisco Nexus® 5600 platform Gigabit Ethernet switches are the third generation of the Cisco Nexus 5000 Series Switches: the leading data center server access switches. The Cisco Nexus 5600 platform, the successor to the widely adopted Cisco Nexus 5500 platform, maintains all the existing Cisco Nexus 5500 platform features, including LAN and SAN convergence (unified ports and Fibre Channel over Ethernet [FCoE]), fabric extenders, and Cisco® FabricPath. In addition, the Cisco Nexus 5600 platform offers integrated line-rate Layer 2 and 3 capabilities with true 40 Gigabit Ethernet support, Cisco's programmable fabric innovation, Network Virtualization Using Generic Routing Encapsulation (NVGRE), Virtual Extensible LAN (VXLAN) bridging and routing capabilities, excellent network programmability and visibility, large buffer capacity, and significantly greater scale and performance for highly virtualized, automated, and cloud environments.

The Cisco Nexus 5600 platform 40-Gbps switches include 1-rack-unit (1RU), 2RU, and 4RU configurations for a flexible, agile, and energy-efficient design. The Cisco Nexus 5600 platform complements existing Cisco Nexus switches and is an important component of the Cisco Unified Data Center architecture. The platform offers 10 and 40 Gigabit Ethernet and FCoE with integrated Layer 2 and 3 features at wire speed. It also offers low latency: approximately 1 microsecond for any packet size. With a choice of port-side intake and fan-side intake airflow options to align with cold-aisle and hot-aisle placement within the data center, the Cisco Nexus 5600 platform 40-Gbps switches are designed for a broad range of traditional data center and large-scale virtualized cloud deployments.

The Cisco Nexus 5600 platform with the Cisco NX-OS Software operating system provides customers with features and capabilities that are widely deployed in data centers around the world. NX-OS is a purpose-built data center operating system designed for performance, resiliency, scalability, manageability, and programmability. It meets Ethernet and storage networking requirements, providing a robust and comprehensive feature set that can meet the demanding requirements of virtualization and automation in present and future data centers.

The Cisco Nexus 5600 platform is designed for top-of-rack (ToR) and middle-of-row (MoR) deployment in data centers that support enterprise applications, service provider hosting, and cloud computing environments. The Cisco Nexus 5600 platform delivers dense 40 Gigabit Ethernet switching that is well suited for cloud, big data, and virtualized environments.

Models and Configurations

The Cisco 5600 platform 40-Gbps switches come in multiple configurations:

- **Cisco Nexus 5624Q Switch:** The Cisco Nexus 5624Q (Figure 1) is a 1RU switch that supports 1.92 terabits per second (Tbps) of bandwidth across 12 fixed 40-Gbps Enhanced Quad Small Form-Factor Pluggable (QSFP+) ports and 12 additional 40-Gbps QSFP+ ports supported through an expansion module. The Cisco Nexus 5624Q can also support up to ninety-six 10 Gigabit Ethernet ports with the use of breakout cables.

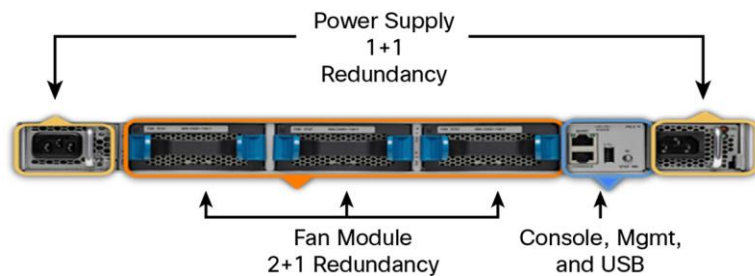**Figure 1.**   Cisco Nexus 5624Q Switch (Port-Side View)

The Cisco Nexus 5624Q offers a hot-swappable generic expansion module (GEM) for an additional twelve 40 Gigabit Ethernet ports (Figure 2).

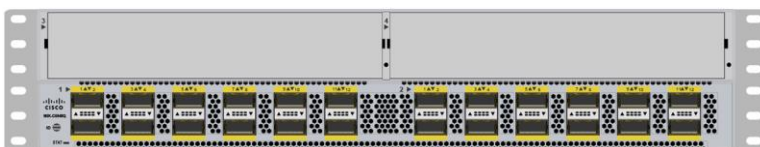**Figure 2.**   Cisco Nexus 5624Q and 5648Q Generic Expansion Module
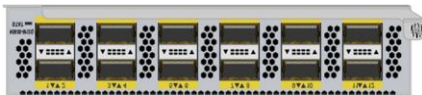
The Cisco Nexus 5624Q offers three fan modules for 2+1 redundancy and two power supplies for 1+1 redundancy (Figure 3), and supports both port-side intake and fan-side intake airflow options for flexible mounting.

Figure 3.   Cisco Nexus 5624Q Switch (Fan-Side View)

- **Cisco Nexus 5648Q Switch:** The Cisco Nexus 5648Q (Figure 4) is a 2RU switch that supports 3.84 Tbps of bandwidth across 24 fixed 40-Gbps QSFP+ ports and 24 additional 40-Gbps QSFP+ ports with the use of two expansion modules. The Cisco Nexus 5648Q can also support up to 192 10 Gigabit Ethernet ports with the use of breakout cables.

Figure 4.   Cisco Nexus 5648Q Switch (Port-Side View)

The Cisco Nexus 5648Q with two expansion slots offers support for an additional twenty-four 40 Gigabit Ethernet ports using a hot-swappable GEM, as shown in Figure 2. The Cisco Nexus 5624Q and 5648Q share the same expansion module.

The Cisco Nexus 5648Q offers three fan modules for 2+1 redundancy and four power supplies for 2+2 redundancy (Figure 5), and supports both port-side intake and fan-side intake airflow options for flexible mounting.

Figure 5.   Cisco Nexus 5648Q Switch (Fan-Side View)
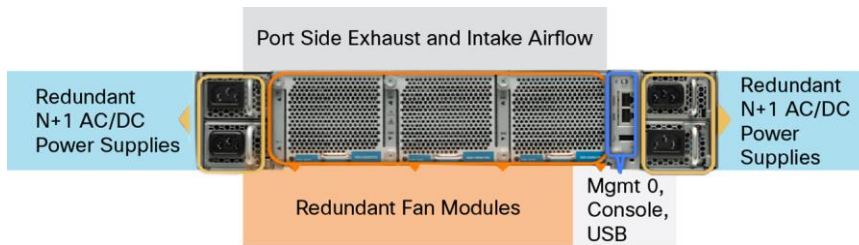
Using Cisco Fabric Extender Technology and cost-effective optics that allow the use of existing 10 Gigabit Ethernet fiber (a pair of multimode fiber strands), the Cisco Nexus 5624Q and 5648Q offer an optimal form factor for organizations upgrading their infrastructure from 10 Gbps to 40 Gbps. Please see the Cisco 40 Gigabit Modules QSFP data sheet for more details.

- **Cisco Nexus 5696Q Switch:** The Cisco Nexus 5696Q (Figure 6) is a 4RU 10 and 40 Gigabit Ethernet switch with the industry's highest port density. Its compact, energy-efficient form factor offers eight line-card expansion-module (LEM) slots to support 40 Gigabit Ethernet and FCoE, 10 Gigabit Ethernet and FCoE, and 8/4/2-Gbps Fibre Channel, making it the most versatile switch in the Cisco Nexus 5600 platform. The Cisco Nexus 5696Q supports 7.68 Tbps of bandwidth across 96 ports of 40 Gbps when fully loaded.

Figure 6.   Cisco Nexus 5696Q Switch with Eight 12-Port 40-Gbps Expansion Modules (Port-Side View)

Cisco Nexus 5696Q expansion modules offer multiple interface options with the chassis base. The Cisco Nexus 5696Q supports a 40 and 10 Gigabit Ethernet LEM with QSFP+ optics. Each 40 Gigabit Ethernet expansion module (Figure 7) provides 12 ports of 40 Gigabit Ethernet and FCoE ports using a QSFP interface, or 48 ports of 10 Gbps using breakout cables. With all eight expansion modules installed, the Cisco Nexus 5696Q delivers 96 ports of QSFP or 384 ports of 10 Gigabit Ethernet (SFP+) using breakout cables. All expansion modules are hot swappable.

Figure 7.   12-Port 40-Gbps Line-Card Expansion Module

The Cisco Nexus 5696Q also offers a unified expansion module (Figure 8). that supports 1 and 10 Gigabit Ethernet SFP+, Fibre Channel at 8/4/2 Gbps, and 10-Gbps FCoE. The unified port LEM offers twenty 10-Gbps SFP+ ports with support for up to 160 ports in a fully loaded system.

Figure 8.   20-Port 10-Gbps Unified Port Line-Card Expansion Module

The Cisco Nexus 5696Q also supports a 100 Gigabit Ethernet expansion module (Figure 9) that supports 100 Gigabit Ethernet with CXP optics. The 100 Gigabit Ethernet LEM offers four 100-Gbps CXP ports with support for up to 32 ports in a fully loaded system. The 100-Gbps LEM module does not support breakout cables.

Figure 9.   4-Port 100-Gbps Line-Card Expansion Module

The Cisco Nexus 5696Q offers four fan modules for 2+2 redundancy and six power supplies for 3+3 redundancy (Figure 10), and supports both port-side intake and fan-side intake airflow options for flexible mounting.

Power-supply grid redundancy is not supported when the Cisco Nexus 5696Q is populated with more than four of the 100-Gbps LEM.

Figure 10.   Cisco Nexus 5696Q Switch (Fan-Side View)
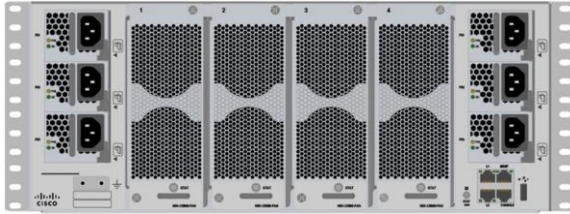
Integrated Layer 2 and 3 features enhance performance to deliver low-latency wire speed of approximately 1 microsecond for any packet size. The Cisco Nexus 5696Q maintains wire-speed performance for a fully loaded system for Ethernet and FCoE traffic. The Cisco Nexus 5696Q also supports 1-Gbps connectivity using adapters that convert QSFP to SFP or SFP+, offering additional flexibility.

The Cisco Nexus 5600 platform 40-Gbps switches support VXLAN in bridging and routing modes on all ports at line rate, enabling the migration of virtual machines between servers across Layer 3 networks.

With the Cisco Nexus 5600 40-Gbps platform, organizations can quickly and easily upgrade existing data centers through advanced Cisco bidirectional (BiDi) optics, which enable the use of existing 10 Gigabit Ethernet fiber (a pair of multimode fiber strands) to carry 40 Gigabit Ethernet to the aggregation layer or to the spine (in a leaf-and-spine configuration) without requiring any change to the existing cabling infrastructure. Additionally, the platform can be deployed in middle-of-row MoR or end-of-row (EoR) configurations to meet the 10 and 40 Gigabit Ethernet connectivity requirements of multiple racks or pods.

Used with Cisco Nexus 2200 and 2300 platform fabric extenders, the switches can support even more servers in a collapsed access- and aggregation-layer design that supports 1 and 10 Gigabit Ethernet connectivity across multiple racks.

Features and Benefits

The following are some of the primary features of the Cisco Nexus 5600 platform 40-Gbps switches:

- **Optimization for virtualization and cloud deployments:** Today, high-performance servers deployed in the cloud can support more virtual machines and workloads than ever before. But deploying new servers on demand puts additional strain on the network fabric. The Cisco Nexus 5600 platform 40-Gbps switches address this challenge by providing scalability and performance, making the platform excellent for meeting current and future needs.

- **Density and resilience:** Built for today's data centers, the switches are designed just like the servers they support. Ports and power connections are at the rear, close to server ports, helping keep cable lengths as short as possible and delivering to rack servers benefits traditionally offered only on blade servers. Hot-swappable power and fan modules can be accessed from the front panel, where status lights offer an at-a-glance view of switch operation. Front-to-back or back-to-front cooling is consistent with server designs, supporting efficient data center hot- and cold-aisle designs. Serviceability is enhanced with all customer-replaceable units accessible from the front panel.

- **Energy efficiency:** The Cisco Nexus 5600 platform 40-Gbps switches help data centers operate within their space, power, and cooling parameters while reducing their carbon footprints. The switch power supplies are also capable of maintaining 90 percent efficiency at load conditions as low as 25 percent utilization. This capability allows the switches to make efficient use of power while still being appropriately sized to support the conditions of a full system load.
- **Low latency:** Cut-through switching enables these switches to support approximately 1 microsecond of port-to-port latency for any packet size with features enabled.
- **Intelligent Cisco Switched Port Analyzer (SPAN) and Encapsulated SPAN (ERSPAN):** SPAN and ERSPAN can be used for troubleshooting and robust monitoring of traffic. The SPAN and ERSPAN capabilities are nondisruptive, with only extra bandwidth capacity used for SPAN and ERSPAN traffic. Enhancements include more efficient allocation of bandwidth to SPAN and ERSPAN traffic whereby any fabric bandwidth not used for data traffic can be allocated to SPAN or ERSPAN traffic. The switch can support up to 31 line-rate SPAN and ERSPAN sessions.
- **Flexible buffer management:** The Cisco Nexus 5600 platform 40-Gbps switches support a 25-MB packet buffer shared by every 3 ports of 40 Gigabit Ethernet or every 12 ports of 10 Gigabit Ethernet. Each 100G port has a dedicated 25-MB packet buffer. The flexible buffer management capability allows dynamic tuning of the sizes of the shared and dedicated buffers in the event of congestion.
- **Multicast enhancements:** Line-rate Layer 2 and 3 multicast throughput for all frame sizes is also supported on these switches. They offer optimized multicast replication through the fabric and at the egress point. Support is provided for 32,000 multicast routes and for Internet Group Management Protocol (IGMP) snooping tables in hardware. Multicast enhancements include flow-based hashing for multicast traffic over a port channel and enhanced Bidirectional Protocol-Independent Multicast (Bidir-PIM) support. The switch also supports IP-based forwarding for IGMP snooping.

For a complete list of the latest software features supported on the Cisco Nexus 5600 platform, refer to the product bulletin available at
https://www.cisco.com/c/en/us/products/collateral/switches/nexus-5000-series-switches/bulletin-c25-735319.html.

Applications

The Cisco Nexus 5600 platform 40-Gbps switches support a number of application scenarios, making the platform a versatile data center option.

Cisco Fabric Extender Architecture: High-Density Fabric Extender Aggregator

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]). FEX Technology is based on the emerging standard IEEE 802.1BR. Designing the network using FEX Technology provides flexibility, reduced cabling infrastructure, and a single point of management, helping customers scale their networks. When Cisco Nexus 5600 platform 40-Gbps switches are part of a fabric that includes Cisco Nexus 2200 or 2300 platform fabric extenders, use these fabric extenders in single- or dual-connected mode using enhanced virtual port channel (vPC+) technology to two upstream Cisco Nexus 5600 platform 40-Gbps switches. Servers or end hosts can connect to single or dual Cisco Nexus 2200 and 2300 platform fabric extenders using network interface card (NIC) teaming when the parent Cisco Nexus 5600 platform 40-Gbps switch has vPC+ enabled.

Following are some common deployment options using the Cisco Nexus 2200 and 2300 platform fabric extenders and Cisco Nexus 5600 platform switches:

- Rack servers with 100 Megabit Ethernet, 1 Gigabit Ethernet, or 10 Gigabit Ethernet NICs; the fabric extender can be physically located at the top of the rack, and the Cisco Nexus 5600 platform 40-Gbps switches can reside in the middle or at the end of the row, or the fabric extender and the Cisco Nexus 5600 platform switch can both reside in the middle or at the end of the row
- Rack servers with 10 Megabit Ethernet NICs full duplex mode connected using the Cisco Nexus 2248TP-E Fabric Extender in conjunction with the Cisco Nexus 5600 platform
- Mixed 1 and 10 Gigabit Ethernet environments in which rack servers are running at either speed in the same rack or in adjacent racks
- 10 Gigabit Ethernet and FCoE deployments using servers with converged network adapters (CNAs) for unified fabric environments with the Cisco Nexus 2232PP 10GE and Cisco Nexus 2232TM-E 10GE Fabric Extenders
- 1/10GBASE-T server connectivity with ease of migration from 1 to 10GBASE-T and effective reuse of structured cabling
- 1 and 10 Gigabit Ethernet blade servers with pass-through blades
- Low-latency, high-performance computing environments
- Virtualized access

In addition to these options, the Cisco Nexus 5600 platform provides unique value as a high-density fabric extender aggregation platform. For example, the switches can be used in conjunction with the Cisco Nexus 2348UPQ, 2348TQ, 2332TQ, 2248PQ, 2232PP, 2248TP-E, 2232TM-E, 2232TM, 2248TP and 2224TP Fabric Extenders as a high-density switching system, consolidating 10 Gigabit Ethernet connections in a single management plane. In addition, a variety of blade fabric extender options can be aggregated into Cisco Nexus 5600 platform 40-Gbps switches using 10 Gigabit Ethernet, providing a single point of management for blade server deployments.

Table 1 lists the fabric extenders that are supported by the Cisco Nexus 5600 platform 40-Gbps switches. Please refer to the Cisco Nexus 2200 and 2300 platform data sheets and release notes for more information about the products and the minimum software releases for support.

Table 1. Supported Fabric Extenders

Fabric Extender	Description
Cisco Nexus 2332TQ	32 x 1/10GBASE-T port host interfaces (SFP+) and up to 4 QSFP+ 10/40 Gigabit Ethernet fabric interfaces; FCoE supports up to 30m with Category 6a or 7 cables
Cisco Nexus 2348TQ	48 x 1/10BASE-T port host interfaces (SFP+) and up to 6 QSFP+ 10/40 Gigabit Ethernet fabric interfaces; FCoE supports up to 30m with Category 6a or 7 cables
Cisco Nexus 2348UPQ	48 x 1/10 Gigabit Ethernet and unified port host interfaces (SFP+) and up to 6 QSFP+ 10/40 Gigabit Ethernet fabric interfaces
Cisco Nexus 2224TP	24 x 100/1000BASE-T host interfaces and 2 x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP	48 x 100/1000BASE-T host interfaces and 4 x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP-E	48 x 100/1000BASE-T host interfaces and 4 x 10 Gigabit Ethernet fabric interfaces (SFP+; 32-MB shared buffer)
Cisco Nexus 2232PP	32 x 1/10 Gigabit Ethernet and FCoE host interfaces (SFP+) and 8 x 10 Gigabit Ethernet and FCoE fabric interfaces (SFP+)
Cisco Nexus 2248PQ	48 x 1/10 Gigabit Ethernet SFP+ host interface and 4 x 40 Gigabit Ethernet (16 x 10 Gigabit Ethernet SFP+) 32 x 48 x 1/10 Gigabit Ethernet and FCoE host interfaces (SFP+) and 4 x 10 Gigabit Ethernet and FCoE fabric interfaces

Fabric Extender	Description
Cisco Nexus 2232TM	32 x 1/10GBASE-T host interfaces and 8 x 10 Gigabit Ethernet (SFP+) uplink modules
Cisco Nexus 2232TM-E	32 x 1/10GBASE-T host interfaces and 8 x 10 Gigabit Ethernet (SFP+) uplink modules (lower power consumption and improved bit error rate [BER])
Cisco Nexus B22HP	16 x 1/10GBASE-KR internal host interfaces and 8 x 10 Gigabit Ethernet fabric interfaces (SFP+; network interfaces)
Cisco Nexus B22F	16 x 10GBASE-KR internal host interfaces and 8 x 10 Gigabit Ethernet fabric interfaces (SFP+; network interfaces)
Cisco Nexus B22DELL	16 x 10 G BASE-KR internal host interfaces and 8 x 10 Gigabit Ethernet fabric interfaces (SFP+; network interfaces)
Cisco Nexus B22IBM	14 x 1/10GBASE-KR internal host interfaces and 8 x 10 Gigabit Ethernet fabric interfaces (SFP+ network interfaces

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

Data center designs are evolving, with customers seeking to build large-scale nonblocking fabrics to accommodate different applications, creating patterns of heavy east-west and north-south traffic. The Cisco 5600 platform 40-Gbps switches are well suited as leaf or spine nodes in a Layer 2 or 3 fabric design. Leaf-and-spine designs using high-density and low-latency switches lead to flatter network architecture, allowing connections that scale from hundreds to more than 10,000 servers with high bidirectional bandwidth and helping ensure low-latency fabric with a low hop count. The spine switches create a nonblocking, low-latency fabric, forwarding packets between leaf switches. The leaf switches provide connectivity to servers. Use of a highly meshed architecture helps ensure the highest possible network availability with little impact on customer traffic in the event of a failure. The Cisco Nexus 5600 platform 40-Gbps switches can be deployed as Layer 2 or 3 spine or leaf switches, providing a high degree of design flexibility (Figure 11).

Figure 11.   Leaf-and-Spine Architecture
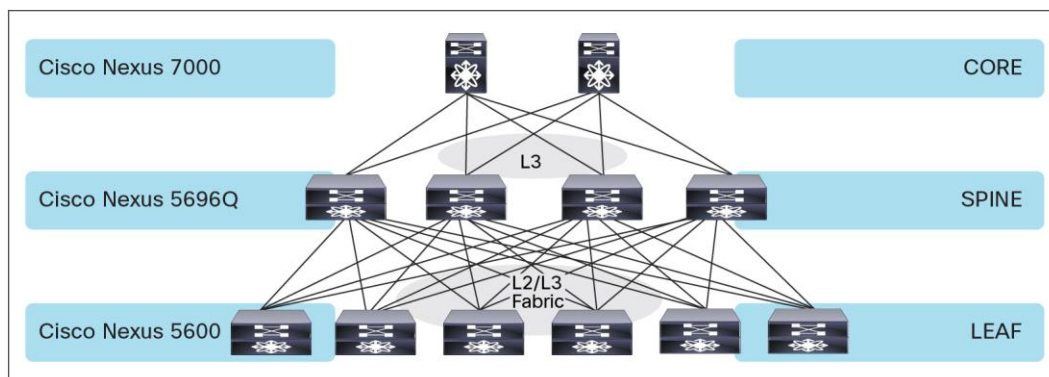
Multihop FCoE

Cisco Unified Fabric combines data center and storage networks to deliver a single high-performance, highly available, and scalable network. With the Cisco Nexus 5600 platform 40-Gbps switches, Cisco can support end-to-end data center convergence, from the server to storage, by delivering multihop FCoE capability in the data center. The FCoE capability complements the existing FCoE function on the Cisco Nexus 5600 platform 40-Gbps switches. With this broad selection of standards-based FCoE switches, Cisco provides unified fabric support to both the access and core network layers, supporting all storage traffic (FCoE, Small Computer System Interface over IP [iSCSI], and network-attached storage [NAS]) over a simplified infrastructure based on lossless 10 and 40 Gigabit Ethernet (Figure 12).

Figure 12. Multihop FCoE Design
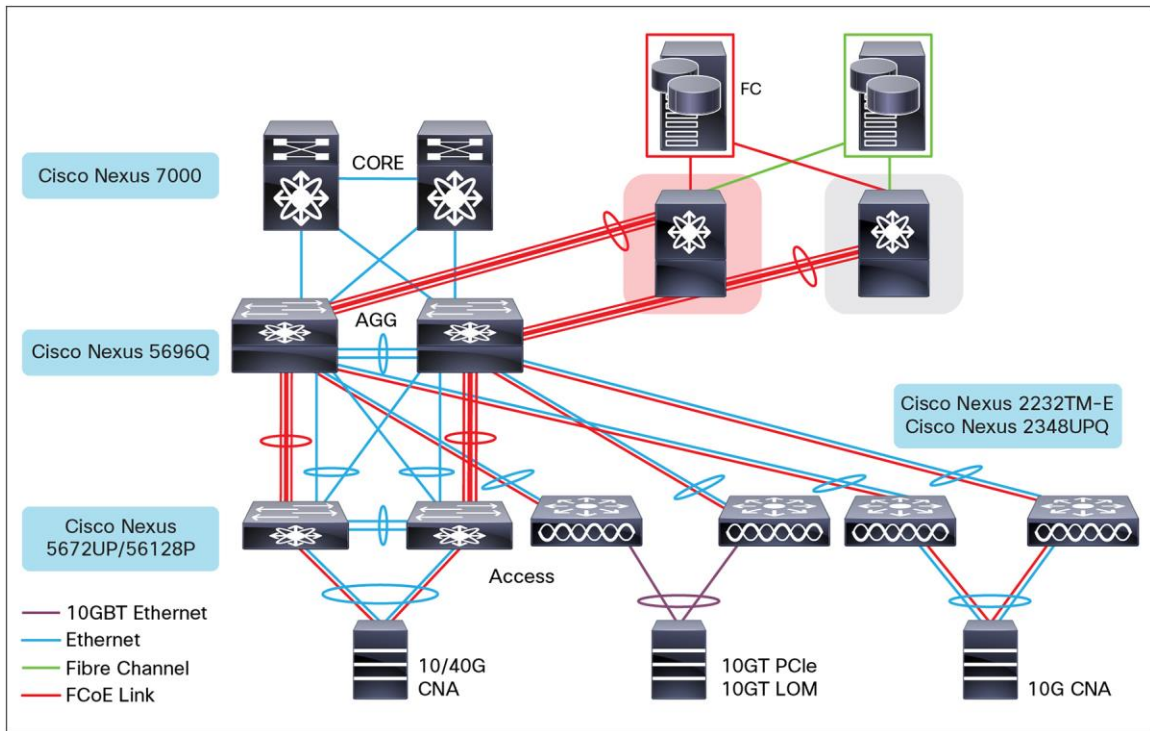
High-Performance Computing

The Cisco Nexus 5600 platform 40-Gbps switches can be deployed as high-density Small Form-Factor (SFF) access-layer switches to consolidate a large number of 10 Gigabit Ethernet servers in deployments that call for only a small number of hops from the server to the upstream network to reduce latency. They have a high density of 10 Gigabit Ethernet ports per rack unit, approximately 1 microsecond of latency port to port for any packet size, integrated line-rate Layer 2 and 3 features, scalability, and integrated data analytics with programmability. They address the needs of high-performance computing (HPC) and high-frequency trading (HFT) environments, for which InfiniBand solutions lack management visibility and high performance of bulk data transfers across traditional applications (Figure 13).

Figure 13. High-Performance Computing Design
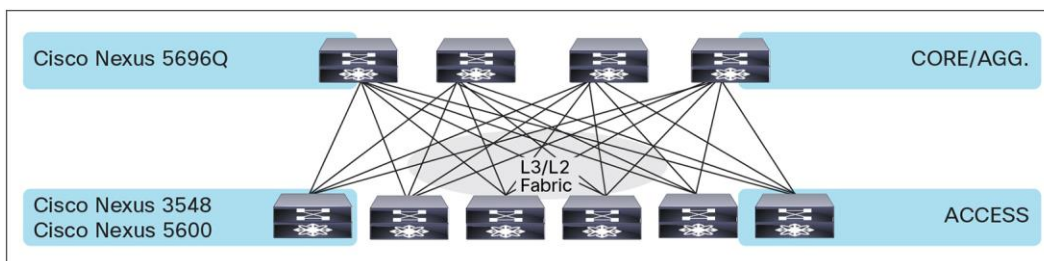
The capability to function in all these capacities helps protect investments in the data center with a deployment model in which additional features can be enabled, as they are needed.

Cisco NX-OS Software Overview

The software on the Cisco Nexus 5600 switches offers flexibility and a comprehensive feature set while remaining 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 2 lists the software packaging and licensing available to enable various advanced features.

Table 2. Software Packaging and Licensing for Cisco Nexus 5600 Platform 40-Gbps Switches

License	Chassis Based or Port Based	Part Number	Supported Features
Cisco Nexus 5696Q, Nexus 5648Q and 5624Q Layer 3 Base Software License	Chassis	N56-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 5696Q, Nexus 5648Q and 5624Q Layer 3 Enterprise (LAN) Software License	Chassis	N56-LAN1K9	Advanced Layer 3 features: Full EIGRP, OSPF, Border Gateway Protocol (BGP), and Virtual Route Forwarding Lite (VRF-Lite)
Cisco Nexus 5696Q, Nexus 5648Q and 5624Q FCoE NPV License	Chassis	N56-FNPV-SSK9	FCoE N-Port Virtualizer (NPV) features supported on Cisco Nexus 5696
Cisco Nexus 5696Q Enhanced Layer 2 Software License	Chassis	N5696-EL2-SSK9	FabricPath supported on Cisco Nexus 5696
Cisco Nexus 5648Q Enhanced Layer 2 Software License	Chassis	N5648Q-EL2-SSK9	FabricPath supported on Cisco Nexus 5648
Cisco Nexus 5624Q Enhanced Layer 2 Software License	Chassis	N5624Q-EL2P-SSK9	FabricPath supported on Cisco Nexus 5624
Cisco Nexus 5600 VM-FEX Software License	Chassis	N56-VMFEX9	Data Center VM-FEX supported on Cisco Nexus 5696
Cisco Nexus 5696Q Software Bundle Chassis	Chassis	N5696-SBUN-P1	LAN, Enhanced Layer 2, Layer 3 Basic, Layer 3 Advanced, Data Center VM-FEX, and Fibre Channel and FCoE storage features per chassis; Cisco Prime™ Data Center Network Manager (DCNM)
Cisco Nexus 5648Q Software Bundle Chassis	Chassis	N5648Q-SBUN-P1	LAN, Enhanced Layer 2, Layer 3 Basic, Layer 3 Advanced, Data Center VM-FEX, and Fibre Channel and FCoE storage features per chassis; Cisco Prime DCNM
Cisco Nexus 5624Q Software Bundle Chassis	Chassis	N5624Q-SBUN-P1	LAN, Enhanced Layer 2, Layer 3 Basic, Layer 3 Advanced, Data Center VM-FEX, and Fibre Channel and FCoE storage features per chassis; Cisco Prime DCNM
Cisco Nexus 5696Q, Nexus 5648Q and 5624Q Storage Protocols Services License: 40 Gigabit Ethernet	Port	N56-4Q-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 4 ports of 40 Gigabit Ethernet
		N56-12Q-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 12 ports of 40 Gigabit Ethernet
		N56-48Q-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 48 ports of 40 Gigabit Ethernet (Cisco Nexus 5696Q only)
Cisco Nexus 5600 Storage Protocols Services License: 10 Gigabit Ethernet	Port	N56-16P-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 16 ports of 10 Gigabit Ethernet
		N5696-20P-SSK9	Fibre Channel and FCoE and FCoE NPV features supported on any 20 ports of 10 Gigabit Ethernet or 12 ports of 40 Gigabit Ethernet (Cisco Nexus 5696Q only)

License	Chassis Based or Port Based	Part Number	Supported Features
Cisco Nexus 5696Q DFA Bundle	Chassis	N5696-DFA-BUN-P1	LAN, Enhanced Layer 2 DCNM-LAN
Cisco Nexus 5648Q DFA Bundle	Chassis	N5648Q-DFA-BUN-P1	LAN, Enhanced Layer 2 DCNM-LAN
Cisco Nexus 5624Q DFA Bundle	Chassis	N5624Q-DFA-BUN-P1	LAN, Enhanced Layer 2, DCNM-LAN

For a complete list of all the features and benefits of NX-OS, please see
https://www.cisco.com/en/US/prod/collateral/iosswrel/ps9494/ps9372/data_sheet_c78-652063.html.

Cisco ONE Software

Licenses can be purchased individually for each feature as shown in Table 2 or through Cisco ONE™ Software for Data Center Networking which is available for the Cisco Nexus 5600 platform.

Cisco ONE Software provides a new way for customers to purchase, consume, and use our infrastructure software. It offers a simplified consumption model focused on common customer scenarios for the data center, WAN, and LAN.

Cisco ONE Software and services provide customers with four main benefits:

- Software suites that address typical customer use scenarios at an attractive price
- Investment protection of software purchases through software services-enabled license portability
- Access to ongoing innovation and new technology with Cisco Software Support Service (SWSS)
- Flexible licensing models to smoothly distribute the customer's software spending over time

For ordering information for Cisco ONE Software for the Cisco Nexus 5600 platform switches, please click here.

Cisco Prime Data Center Network Manager

Cisco Prime DCNM provides LAN and SAN management capabilities for the Cisco Nexus and Cisco MDS 9500 Families. Cisco Prime DCNM provides a GUI that reduces OpEx compared to traditional command-line interface (CLI) methods and allows efficient operation control, monitoring, provisioning, and troubleshooting for your NX-OS devices. The main features include the following:

- Unified fabric visibility and topology display with VMware vSphere integration shows the connectivity from the virtual machine to the VMware ESX host and to the switch and the storage array.
- Event aggregation and filtering helps you quickly find the information you need and identify network problems.
- Deployment wizards and user-modifiable templates help you implement best practices.
- Role-based access control (RBAC) helps secure devices and provide appropriate delegation.
- Integrated domain dashboards, health monitoring, reporting, change tracking, and user auditing provides comprehensive management capabilities.
- Trend monitoring of ports and traffic allow you to optimize your existing resources and anticipate new resource requirements.

Specifications

Table 3 lists the specifications for the Cisco Nexus 5600 platform switches. Please check software release notes at https://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus5600/sw/release/notes/7x/Nexus5600_Release_ Notes_7x.html for a complete list of features supported.

Table 3.   Product Specifications

Performance
• Cisco Nexus 5624Q: Layer 2 and 3 hardware forwarding at 1.92 Tbps; 1428 mpps (64-byte packets) • Cisco Nexus 5648Q: Layer 2 and 3 hardware forwarding at 3.84 Tbps; 2856 mpps (64-byte packets) • Cisco Nexus 5696Q: Layer 2 and 3 hardware forwarding at 7.68 Tbps; 5713 mpps (64-byte packets) • Support for up to 256,000 combined entries of MAC addresses and Address Resolution Prototol (ARP) entries • Low-latency of approximately 1 microsecond using cut-through forwarding for predictable, consistent traffic latency regardless of packet size, traffic pattern, or features enabled on 40 and 10 Gigabit Ethernet interfaces • 25-MB buffer per 12 x 10 Gigabit Ethernet SFP+ interfaces or 3 x 40 Gigabit Ethernet QSFP interfaces • Line-rate traffic throughput on all ports in Layer 2 and 3 mode

Interfaces
Cisco Nexus 5696Q • Up to 96 x 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 with QSFP breakout cable • 1 Gigabit Ethernet interface through a QSFP-to-SFP and SFP+ adapter (QSA) • Fabric extension through the Cisco Nexus 2200 and 2300 platforms Cisco Nexus 5648Q • Up to 48 ports of 40 Gigabit Ethernet and FCoE with base chassis and 2 expansion modules • Up to 192 ports of 10 Gigabit Ethernet interface with breakout cable • Fabric extension through the Cisco Nexus 2200 and 2300 platforms Cisco Nexus 5624Q • Up to 24 ports of 40 Gigabit Ethernet and FCoE with base chassis and 1 expansion module • Up to 96 ports of 10 Gigabit Ethernet interface with breakout cable • Fabric extension through the Cisco Nexus 2200 and 2300 platforms

Layer 2 Features
• Layer 2 switch ports and VLAN t • Layer 2 switch ports and VLAN trunks • IEEE 802.1Q VLAN encapsulation • Support for up to 4000 VLANs • Support for up to 4000 ACL entries • Rapid Per-VLAN Spanning Tree Plus (PVRST+) (IEEE 802.1w compatible) • Multiple Spanning Tree Protocol (MSTP) (IEEE 802.1s): 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 port channel 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
- FabricPath
- EvPC and vPC+ with FabricPath
- Adapter FEX
- Data Center VM-FEX
- Support for up to 48 fabric extenders (Layer 2) with Cisco Nexus 5696Q, and 24 fabric extenders (Layer 2) with Cisco Nexus 5648Q and 5624Q
- RDMA over Converged Ethernet (RoCE) using Data Center Bridging (DCB) support (DCB Exchange [DCBX] no drop and priority flow control [PFC])

Layer 3 Features

- Layer 3 interfaces: Routed ports, switch virtual interface (SVI), port channels, subinterfaces, and port channel 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, Open Shortest Path First Version 2 (OSPFv2), BGP, and Intermediate System-to-Intermediate System (IS-IS)
- IPv6 routing protocols: Static, OPFv3, BGPv6, and EIGRPv6
- IPv6 VRF-lite
- BFD support: OSPFv2, BGPv4, EIGRP, and VRF instances
- Policy-based routing (IPv4 and IPv6)
- HSRP and VRRP
- IP direct broadcast
- vPC+ routing protocol peering
- 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
- Unicast Reverse Path Forwarding (uRFP) with ACL; strict and loose modes
- Jumbo frame support (up to 9216 bytes)
- Support for up to 24 fabric extenders (Layer 3) on each Cisco Nexus 5600 platform switch

Quality of Service (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 and ARP hardware carving
- MQC CoS marking
- Per-port virtual output queuing
- CoS-based egress queuing
- Egress strict-priority queuing
- Egress port-based scheduling: Deficit Weighted Round-Robin (DWRR)
- Control-Plane Policing (CoPP): IPv4 and IPv6

Security

- Ingress ACLs (standard and extended) on Ethernet and virtual Ethernet ports
- Standard and extended Layer 2 ACLs: MAC addresses, protocol type, etc.
- Standard and extended Layer 3 and 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 RACL, PACL, and VACL
- iSCSI type-length-value (TLV)

High-Availability Features

- Cisco In-Service Software Upgrade (ISSU) for Layer 2
- Hot-swappable field-replaceable power supplies and fan modules
- N+1 and N+N power redundancy
- N+1 fan module redundancy

Management

- Switch management
- Switch management using 10/100/1000-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
- Configuration rollback
- Secure Shell 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 (physical, port channel, 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)
- Cisco Call Home
- Cisco Smart Call Home
- Default Interface
- Cisco Fabric Manager
- Cisco Prime DCNM
- CiscoWorks LAN Management Solution (LMS)

Data Center Bridging

- CEE- and IE
- EE-co
- CEE- and IEEE-compliant PFC (per-priority Pause frame support: IEEE 802.1Qbb)

  link distance support: 20 km at 10-Gbps and 3 km at 40 Gbps
- CEE-compliant
- DCBX Protocol

  CEE- and IEEE-compliant enhanced transmission selection

FCoE Features (Require 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, VF, and VNP
- 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
- 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 Prime DCNM-SAN
- Storage Management Initiative Specification (SMI-S)
- Boot from SAN over vPC and Enhanced vPC (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

Power Supply

Table 4 lists the power supply properties of the Cisco Nexus 5600 platform.

Table 4.   Power Supply Properties

Power Supply Properties	N55-PAC-1100W	N55-PDC-1100W	NXA-PAC-1100W	NXA-PHV-1100W
Typical operating power	650 watts (W)	650W	650W	650W
Maximum power	1100W	1100W	1100W	1100W
Input voltage	94 to 264 VAC	-40 to -72 VDC	94 to 264 VAC	• 90 to 305 HVAC • 192 to 400 HVDC
Frequency	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Efficiency	92% /88% (50%/100% load) @230VAC	88%/85% (50%/100% load)	94% /91% (50%/100% load) @230VAC	94% /91% (50%/100% load) @230VAC
RoHS compliance	Yes	Yes	Yes	Yes
Hot-swappable	Yes	Yes	Yes	Yes
Heat dissipation	45 BTU/hr	260 BTU/hr	45 BTU/hr	170 to 130 BTU/hr
Front-to-back (fan-side intake) air flow power supply	Yes	Yes	Yes	Yes
Back-to-front (port-side intake) air flow power supply	Yes	No	Yes	Yes

Environment

Table 5 lists the environment properties of the Cisco Nexus 5600 platform.

Table 5.   Environment Properties

Property	Cisco Nexus 5600 Platform
Physical (height x width x depth)	• Cisco Nexus 5696Q: 6.97 x 17.3 x 30 in. (17.7 x 43.9 x 76.2 cm) • Cisco Nexus 5648Q: 3.5 x 17.3 x 30 in. (8.9 x 43.9 x 76.2 cm) • Cisco Nexus 5624Q: 1.75 x 17.3 x 30 in. (4.4 x 43.9 x 76.2 cm)
Operating temperature	32 to 104°F (0 to 40°C)
Nonoperating (storage) temperature	-40 to 158°F (-40 to 70°C)
Humidity	5 to 95% (noncondensing)
Altitude	0 to 10,000 ft (0 to 3000m)
Weight	• Cisco Nexus 5624Q: 32 lb (2 power supplies)Cisco Nexus 5649Q: 62.5 lb (chassis, 3 fans, 4 power supply units (PSUs), and 2 GEMs) • Cisco Nexus 5696Q: 111 lb (3 power supplies, 4 fans, and 2 LEMs)

For the latest software release information and recommendations, please see the product bulletin at https://www.cisco.com/c/en/us/products/switches/nexus-5000-series-switches/index.html.

Regulatory Standards Compliance

Table 6 summarizes regulatory standards compliance for the Cisco Nexus 5600 platform.

Table 6.   Regulatory Standards Compliance: Safety and EMC

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	• UL 60950-1 Second Edition • CAN/CSA-C22.2 No. 60950-1 Second Edition • EN 60950-1 Second Edition • IEC 60950-1 Second Edition • AS/NZS 60950-1 • GB4943
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The product is RoHS 6 compliant with exceptions for leaded ball grid array (BGA) balls and lead press-fit connectors.

Cisco Nexus 5600 Platform Transceiver and Cabling Options

The Cisco Nexus 5600 platform supports a wide variety of 1, 10, and 40 Gigabit Ethernet connectivity options. Table 7 lists the 40 Gigabit Ethernet QSFP+ transceivers supported, Table 8 lists the transceivers supported for 1 and 10 Gigabit Ethernet and Fiber Channel connectivity, and Table 9 lists the transceiver supported for 100 Gigabit Ethernet connectivity.

Table 7.   Cisco Nexus 5600 Platform 40-Gbps Switches Transceiver Support Matrix

Cisco QSFP+	Description
QSFP-40G-SR4	40GBASE-SR4 QSFP module (multimode fiber [MMF] at 100m)
QSFP-40G-SR4-S	40GBASE-SR4 QSFP module, MPO connector, enterprise class
FET-40G	40-Gbps line extender for FEX
QSFP-40G-CSR4	40GBASE extended CSR4 QSFP module (MMF at 300m)
QSFP-4X10G-LR-S	QSFP 4x10G Transceiver Module, SM MPO, 10KM, Enterprise-Class (5696Q only)
QSFP-40G-LR4	40GBASE-LR4 QSFP+ transceiver module for SMF, duplex LC connector
QSFP-40G-LR4-S	QSFP 40GBASE-LR4 module, LC connector, 10 km, enterprise class
WSP-Q40GLR4L	40GBASE-LR4L QSFP codule for SMF
QSFP-40G-ER4	40GBASE-ER4 QSFP+ transceiver module for SMF, duplex LC connector
QSFP-40G-SR-BD	QSFP40G BiDi short-reach transceiver
QSFP-4SFP10G-CU1M	40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 1m
QSFP-4SFP10G-CU3M	40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 3m
QSFP-4SFP10G-CU5M	40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 5m
QSFP-4x10G-AC7M	40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 7m, active
QSFP-4x10G-AC10M	40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 10m, active

Cisco QSFP+	Description
QSFP-H40G-CU1M	40GBASE-CR4 QSFP+ direct-attach copper cable, 1m, passive
QSFP-H40G-CU3M	40GBASE-CR4 QSFP+ direct-attach copper cable, 3m, passive
QSFP-H40G-CU5M	40GBASE-CR4 QSFP+ direct-attach copper cable, 5m, passive
QSFP-H40G-ACU7M	40GBASE-CR4 QSFP+ direct-attach copper cable, 7m, active
QSFP-H40G-ACU10M	40GBASE-CR4 QSFP+ direct-attach copper cable, 10m, active
QSFP-4X10G-AOC1M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 1m
QSFP-4X10G-AOC2M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 2m
QSFP-4X10G-AOC3M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 3m
QSFP-4X10G-AOC5M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 5m
QSFP-4X10G-AOC7M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 7m
QSFP-4X10G-AOC10M	40GBASE-AOC QSFP to 4 SFP+ active optical breakout cable, 10m
QSFP-H40G-AOC1M	40GBASE-AOC QSFP direct-attach active optical cable, 1m
QSFP-H40G-AOC2M	40GBASE-AOC QSFP direct-attach active optical cable, 2m
QSFP-H40G-AOC3M	40GBASE-AOC QSFP direct-attach active optical cable, 3m
QSFP-H40G-AOC5M	40GBASE-AOC QSFP direct-attach active optical cable, 5m
QSFP-H40G-AOC7M	40GBASE-AOC QSFP direct-attach active optical cable, 7m
QSFP-H40G-AOC10M	40GBASE-AOC QSFP direct-attach active optical cable, 10m

Table 8.   Cisco Nexus 5600 Platform 1 and 10 Gigabit Ethernet SFP and SFP+ Transceiver Support Matrix

Cisco SFP and SFP+	Description
CVR-QSFP-SFP10G	40GBASE QSFP to SFP+ and SFP adapter (QSA) for 1 Gbps (GLC-T, SX/LH), 10G-SR/LR/ER connectivity
GLC-T	1000BASE-T standard
GLC-SX-MMD	1000BASE-SX short wavelength; with digital optical monitoring (DOM)
GLC-EX-SMD	1000BASE-EX long wavelength; with DOM
GLC-LH-SMD	1000BASE-LX/LH long wavelength; with DOM
GLC-ZX-SMD	1000BASE-ZX long wavelength; with DOM
SFP-GE-T	1000BASE-T NEBS 3 ESD
DS-SFP-FC4G-SW	4-Gbps Fibre Channel-SW SFP, LC (Cisco Nexus 5696Q UP LEM only)
DS-SFP-FC4G-LW	4-Gbps Fibre Channel-LW SFP, LC (Cisco Nexus 5696Q UP LEM only)
DS-SFP-FC8G-SW	8-Gbps Fibre Channel-SW SFP+, LC (Cisco Nexus 5696Q UP LEM only)
DS-SFP-FC8G-LW	8-Gbps Fibre Channel-LW SFP+, LC (Cisco Nexus 5696Q UP LEM only)
FET-10G	10-Gbps line extender for FEX (with breakout cable)
SFP-10G-SR	10GBASE-SR SFP+ module for MMF
SFP-10G-SR-S	10GBASE-SR SFP module, enterprise class
SFP-10G-LR	10GBASE-LR SFP+ module for SMF
SFP-10G-LR-S	10GBASE-LR SFP module, enterprise class
SFP-10G-ER	10GBASE-ER SFP+ module for SMF
SFP-10G-ER-S	10GBASE-ER SFP module, enterprise class
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1m, passive
SFP-H10GB-CU1.5M	10GBASE-CU SFP+ cable 1.5m, passive
SFP-H10GB-CU2M	10GBASE-CU SFP+ cable 2m, passive
SFP-H10GB-CU2.5M	10GBASE-CU SFP+ cable 2.5m, passive
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3m, passive
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5m, passive

Cisco SFP and SFP+	Description
SFP-H10GB-ACU7M	10GBASE-CU SFP+ cable 7m, active
SFP-H10GB-ACU10M	10GBASE-CU SFP+ cable 10m, active
SFP-10G-AOC1M	10GBASE-AOC SFP+ cable 1m
SFP-10G-AOC2M	10GBASE-AOC SFP+ cable 2m
SFP-10G-AOC3M	10GBASE-AOC SFP+ cable 3m
SFP-10G-AOC5M	10GBASE-AOC SFP+ cable 5m
SFP-10G-AOC7M	10GBASE-AOC SFP+ cable 7m
SFP-10G-AOC10M	10GBASE-AOC SFP+ cable 10m

Table 9.   Cisco Nexus 5600 Platform 100 Gigabit Ethernet CXP Transceiver Support Matrix

Cisco CXP	Description
CXP-100G-SR12	100GBASE-SR10 (no breakout cable)

The platform supports a Twinax copper cabling solution that connects to standard QSFP connectors for in-rack use, and optical cabling for longer cable runs (Table 10).

For in-rack or adjacent-rack cabling, the Cisco Nexus 5600 platform supports QSFP+ direct-attach 40 Gigabit Ethernet copper cables, a solution that integrates transceivers with Twinax cables into an energy-efficient, low-cost, and low-latency solution. QSFP+ direct-attach 40 Gigabit Twinax copper cables use only 1.5W of power per transceiver and introduce approximately 0.1 microsecond of latency per link.

An alternative to copper cables is fiber, through active optical cables that integrate the transceivers with multimode fiber.

For longer cable runs, the Cisco Nexus 5600 platform supports multimode, short-reach optical QSFP+ transceivers. These optical transceivers use approximately 1.5W per transceiver and have a latency of approximately 0.1 microsecond.

Table 10.   Cisco Nexus 5600 Platform Cabling Support Matrix

Connector (Media)	Cable	Distance	Maximum Power Consumption	Transceiver Latency
SFP+ CU copper	Twinax	1, 1.5, 2, 2.5, 3, and 5m	Approximately 0.1W	Approximately 0.1 microsecond
SFP+ ACU copper	Active Twinax	7 and 10m	Approximately 0.1W	Approximately 0.1 microsecond
SFP+ fiber	Active Optical	1, 2, 3, 5, 7, and 10m		
FET-10G MMF SFP+ SR MMF, SFP+ SR-S MMF	MMF (OM2) MMF (OM3)	82m 100m	1W	Approximately 0.1 microsecond
SFP+ LR SMF SFP+ LR-S SMF	SMF	10 km	1W	Approximately 0.1 microsecond
SFP+ ER SMF SFP+ ER-S SMF	SMF	40 km	1.5W	Approximately 0.1 microsecond
QSFP CU copper	Twinax	1, 3, and 5m	Approximately 1.5W	Approximately 0.25 microsecond
QSFP ACU copper	Active Twinax	7 and 10m	Approximately 1.5W	Approximately 0.1 microsecond
QSFP fiber	Active Optical	1, 2, 3, 5, 7, and 10m		
QSFP SR4 MMF QSFP SR4-S MMF	MMF (OM3) MMF (OM4)	100m 150m	Approximately 1.5W	Approximately 0.1 microsecond
QSFP CSR4 MMF	MMF (OM3) MMF (OM4)	300m 400m	Approximately 1.5W	Approximately 0.1 microsecond

Connector (Media)	Cable	Distance	Maximum Power Consumption	Transceiver Latency
QSFP LR4 SMF QSFP LR4-S SMF	SMF	10 km	Approximately 3.5W	Approximately 0.1 microsecond
QSFP LR4L	MMF	2 km	Approximately 3.5W	Approximately 0.1 microsecond
QSFP ER4 SMF QSFP ER4-S SMF	SMF	40 km	Approximately 3.5W	Approximately 0.1 microsecond
QSFP BIDI	MMF (OM3)[1] MMF (OM4)[2] MMF (OM4+)[3]	100m 125m 150m	Approximately 3.5W	Approximately 0.1 microsecond
CXP SR12	MMF (OM3) MMF (OM4)	100m 150m	Approximately 3.5W	Approximately 0.1 microsecond

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

Ordering Information

Table 11 presents ordering information for the Cisco Nexus 5600 platform 40-Gbps switches. Note that you can order the Cisco Nexus 2200 and 2300 platform fabric extenders either separately or with the Cisco Nexus 5600 platform.

Table 11.   Ordering Information

Part Number	Description
Chassis	
N5K-C5624Q	Nexus 5624Q Chassis 2PSU, 3 FAN, No GEM
N5624-B-24Q	Nexus 5624Q chassis 24 x 40GE Ports/FCoE Bundle; 2PSU, 3 FAN (includes 1 GEM)
N5K-C5648Q	Nexus 5648Q Chassis 4PSU, 3 FAN, No GEM
N5648-B-36Q	Nexus 5648Q chassis 36 x 40GE Ports/FCoE Bundle; 4PSU, 3 FANs, (includes 1 GEM)
N5K-C5696Q	Nexus 5696Q Chassis 6PSU, 4 FAN, No LEMs
N5696-B-24Q	Nexus 5696Q chassis 24 x 40GE Ports/FCoE Bundle; 6PSU, 4 FAN (includes 2 LEMs)
Fan Modules	
N6K-C6001-FAN-B (=)	Cisco Nexus 5624Q Fan Module, Back-to-Front, port side intake Airflow
N6K-C6001-FAN (=)	Cisco Nexus 5624Q Fan Module, Front-to-Back, fan side intake Airflow
N5K-C5648-FAN (=)	Cisco Nexus 5648Q Fan Module, Front-to-Back, fan side intake Airflow
N5K-C5648-FAN-B (=)	Cisco Nexus 5648Q Fan Module, Back-to-Front, port side intake Airflow
N5K-C5696-FAN-B (=)	Cisco Nexus 5696Q Fan Module, Back-to-Front, port side intake Airflow
N5K-C5696-FAN (=)	Cisco Nexus 5696Q Fan Module, Front-to-Back, fan side intake Airflow
Power Supplies	
NXA-PAC-1100W (=)	Cisco Nexus 5500/6000/5600 Platinum PSU Front-to-Back Airflow module, A/C, 100-240V, 1100W
NXA-PAC-1100W-B (=)	Cisco Nexus 5500/6000/5600 Platinum PSU Back-to-Front Airflow module, A/C, 100-240V, 1100W
N55-PDC-1100W (=)	Cisco Nexus 5500/6000/5600 PSU module Front-to-Back Airflow module, DC 1100W
NXA-PAC-1100W(=)	Cisco Nexus 5500/6000/5600 Platinum PSU Front-to-Back Airflow module spare, A/C, 100-240V, 1100W
NXA-PAC-1100W-B(=)	Cisco Nexus 5500/6000/5600 Platinum PSU Back-to-Front Airflow module spare, A/C, 100-240V, 1100W
NXA-PHV-1100W(=)	Cisco Nexus 5500/6000/5600 Platinum HV-AC-DC PS, Front-to-Back Airflow module spare, 1100W
NXA-PHV-1100W-B(=)	Cisco Nexus 5500/6000/5600 Platinum HV-AC-DC PS, Back-to-Front Airflow module spare, 1100W

Part Number	Description
Miscellaneous	
N5600-M-BLNK	Nexus 5624Q/5648Q Blank Module Cover
N5600-M-BLNK=	Nexus 5624Q/5648Q Blank Module Cover
N6K-C5696Q-M-BLNK	Nexus 5696Q Blank Module Cover
N6K-C5696Q-M-BLNK=	Nexus 5696Q Blank Module Cover, spare
N5600-PS-BLANK	Nexus 5624Q/5648Q Power Supply Blank Cover
N5600-PS-BLANK=	Nexus 5624Q/5648Q Power Supply Blank Cover
N5696-PS-BLANK	Nexus 5696Q Power Supply Blank Cover
N5696-PS-BLANK=	Nexus 5696Q Power Supply Blank Cover, spare
Software	
N6KUK9-710N1.1A	Nexus 5600/6000 Base OS Software Rel 7.1(1)N1(1)
N6KUK9-710N1.1A=	Nexus 5600/6000 Base OS Software Rel 7.1(1)N1(1), spare
N6KUK9-704N1.1	Nexus 5600/6000 Base OS Software Rel 7.0(4)N1(1)
N6KUK9-704N1.1=	Nexus 5600/6000 Base OS Software Rel 7.0(4)N1(1), spare
N6KUK9-705N1.1	Nexus 5600/6000 Base OS Software Rel 7.0(5)N1(1)
N6KUK9-705N1.1=	Nexus 5600/6000 Base OS Software Rel 7.0(5)N1(1), spare
N6KUK9-706N1.1	Nexus 5600/6000 Base OS Software Rel 7.0(6)N1(1)
N6KUK9-706N1.1=	Nexus 5600/6000 Base OS Software Rel 7.0(6)N1(1), spare
N6KUK9-707N1.1	Nexus 5600/6000 Base OS Software Rel 7.0(7)N1(1)
N6KUK9-707N1.1=	Nexus 5600/6000 Base OS Software Rel 7.0(7)N1(1), spare
N6KUK9-710N1.1	Nexus 5600/6000 Base OS Software Rel 7.1(0)N1(1), spare
N6KUK9-710N1.1=	Nexus 5600/6000 Base OS Software Rel 7.1(0)N1(1), spare
N56-LAN1K9=	Nexus 5600 Series LAN Enterprise License
N5696-EL2P-SSK9=	Limited Time Promotion-Nexus 5696Q Enhanced Layer 2 License
N56-4Q-P-SSK9=	Nexus 5600 Promo Storage Lic, 4-ports 40G or 16-ports 10G
N56-12Q-P-SSK9=	Nexus 5600 Promo Storage Lic, 12-ports 40G or 48-ports 10G
N56-48Q-P-SSK9=	Nexus 5600 Promo Storage Lic, 48-ports 40G or 192-ports 10G
N5624Q-DFA-BUN-P1=	Nexus 5624 DFA Bundle-Limited Time Promo; LAN, EL2
N5696-DFA-BUN-P1=	Nexus 5696 DFA Bundle-Limited Time Promo; LAN, EL2
N5624Q-SBUN-P1=	Nexus 5624 SBUN-Promo; LAN, 96p 40G Storage, EL2
N5696-SBUN-P1=	Nexus 5696 SBUN-Promo; LAN, 96p 40G Storage, EL2
Expansion Modules	
N5600-M12Q	Nexus 5624Q/5648Q Chassis Module 12Q 40GE Ethernet/FCoE
N5600-M12Q=	Nexus 5624Q/5648Q Chassis Module 12Q 40GE Ethernet/FCoE, Spare
N5696-M12Q	Nexus 5696Q Chassis Module 12Q 40GE Ethernet/FCoE
N5696-M12Q=	Nexus 5696Q Chassis Module 12Q 40GE Ethernet/FCoE, Spare
N5696-M20UP	Nexus 5696Q Chassis Module 20P 10GE Eth/FCoE OR 8/4/2G FC
N5696-M20UP=	Nexus 5696Q Chassis Module 20P 10GE Eth/FCoE OR 8/4/2G FC, Spare
N5696-M4C	Nexus 5696Q Chassis Module 4P 100GE Ethernet
N5696-M4C=	Nexus 5696Q Chassis Module 4P 100GE Ethernet, Spare
Cables and Optics	
QSFP-40G-SR4	40GBASE-SR4 QSFP module, (multi-mode fiber, MMF at 100m)
QSFP-40G-SR4-S	40GBASE-SR4 QSFP Module, MPO Connector, Enterprise-Class
QSFP-40G-CSR4	40GBASE Extended CSR4 QSFP module, (multi-mode fiber, MMF at 300m)

Part Number	Description
QSFP-40G-LR4	Cisco 40GBASE-LR4 QSFP+ transceiver module for SMF, duplex LC connector
QSFP-40G-LR4-S	QSFP 40GBASE-LR4 Module, LC connector, 10km, Enterprise-Class
WSP-Q40GLR4L	Cisco 40GBASE-LR4L QSFP Module for SMF
QSFP-40G-ER4	Cisco 40GBASE-ER4 QSFP+ transceiver module for SMF, duplex LC connector
QSFP-40G-SR-BD	Cisco QSFP40G BiDi Short-reach Transceiver
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-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-4X10G-AOC1M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 1-meter
QSFP-4X10G-AOC2M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 2-meter
QSFP-4X10G-AOC3M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 3-meter
QSFP-4X10G-AOC5M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 5-meter
QSFP-4X10G-AOC7M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 7-meter
QSFP-4X10G-AOC10M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 10-meter
QSFP-H40G-AOC1M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 1-meter
QSFP-H40G-AOC2M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 2-meter
QSFP-H40G-AOC3M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 3-meter
QSFP-H40G-AOC5M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 5-meter
QSFP-H40G-AOC7M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 7-meter
QSFP-H40G-AOC10M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 10-meter
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+ and SFP adapter (QSA) for 1G (GLC-T, SX/LH), 10G-SR/LR/ER connectivity
CXP-100G-SR12	100GBASE-SR10 (No Breakout)
SFP-10G-SR	Cisco 10GBASE-SR SFP+ Module for MMF
SFP-10G-SR-S	10GBASE-SR SFP Module, Enterprise-Class
SFP-10G-LR	Cisco 10GBASE-LR SFP+ Module for SMF
SFP-10G-LR-S	10GBASE-LR SFP Module, Enterprise-Class
SFP-10G-ER	Cisco 10GBASE-ER SFP+ Module for SMF
SFP-10G-ER-S	10GBASE-ER SFP Module, Enterprise-Class
SFP-H10GB-CU1M	Cisco 10GBASE-CU SFP+ Cable 1 Meter, passive
SFP-H10GB-CU1.5M	Cisco 10GBASE-CU SFP+ Cable 1.5 Meter, passive
SFP-H10GB-CU2M	Cisco 10GBASE-CU SFP+ Cable 2 Meter, passive
SFP-H10GB-CU2.5M	Cisco 10GBASE-CU SFP+ Cable 2.5 Meter, passive
SFP-H10GB-CU3M	Cisco 10GBASE-CU SFP+ Cable 3 Meter, passive
SFP-H10GB-CU5M	Cisco 10GBASE-CU SFP+ Cable 5 Meter, passive
SFP-H10GB-ACU7M	Cisco 10GBASE-CU SFP+ Cable 7 Meter, active

Part Number	Description
SFP-H10GB-ACU10M	Cisco 10GBASE-CU SFP+ Cable 10 Meter, active
SFP-10G-AOC1M	Cisco 10GBASE-AOC SFP+ Cable 1 Meter
SFP-10G-AOC2M	Cisco 10GBASE-AOC SFP+ Cable 2 Meter
SFP-10G-AOC3M	Cisco 10GBASE-AOC SFP+ Cable 3 Meter
SFP-10G-AOC5M	Cisco 10GBASE-AOC SFP+ Cable 5 Meter
SFP-10G-AOC7M	Cisco 10GBASE-AOC SFP+ Cable 7 Meter
SFP-10G-AOC10M	Cisco 10GBASE-AOC SFP+ Cable 10 Meter
GLC-T	Cisco 1000BASE-T standard
GLC-SX-MMD	Cisco 1000BASE-SX short wavelength; with DOM
GLC-LH-SMD	1000BASE-LX/LH long-wavelength; with DOM
GLC-EX-SMD	Cisco 1000BASE-EX long-wavelength; with DOM
GLC-ZX-SMD	1000BASE-ZX long wavelength; with DOM
DS-SFP-FC4G-SW	4Gbps Fibre Channel-SW SFP, LC
DS-SFP-FC4G-LW	4Gbps Fibre Channel-LW SFP, LC
DS-SFP-FC8G-SW	8Gbps Fibre Channel-SW SFP+, LC
DS-SFP-FC8G-LW	8Gbps Fibre Channel-LW SFP+, LC
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)
Accessory Kit	
N5672-ACC-KIT	Nexus 5624Q Chassis Accessory Kit
N5672-ACC-KIT=	Nexus 5624Q Chassis Accessory Kit, Spare
N5596-ACC-KIT	Nexus 5648Q/5596 Chassis Accessory Kit
N5596-ACC-KIT=	Nexus 5648Q/5596 Chassis Accessory Kit, Spare
N5696-ACC-KIT	Nexus 5696Q Chassis Accessory Kit
N5696-ACC-KIT=	Nexus 5696Q Chassis Accessory Kit, spare

Warranty

The Cisco Nexus 5600 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).

Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 5600 platform in your data center. The innovative Cisco services are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase operation efficiency and improve your data center network. Cisco Advanced Services uses an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value. Cisco Smart Net Total Care™ 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 Smart Call Home service capability, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 5600 platform switch. Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

Cisco Capital Financing to Help You Achieve Your Objectives

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

For More Information

- Cisco Nexus 5600 platform switches: https://www.cisco.com/c/en/us/products/switches/nexus-5000-series-switches/index.html
- Cisco Nexus 2000 Series Fabric Extenders: https://www.cisco.com/go/nexus2000
- Cisco NX-OS Software: https://www.cisco.com/go/nxos

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