Cisco Nexus 5600 Platform Switches

Product Overview

In today's data centers, virtualization deployments have become commonplace, and this trend is increasing rapidly with the availability of 10 Gigabit Ethernet servers at attractive prices. The combination of increased adoption of these servers and applications with higher bandwidth requirements is increasing the need for dense 10 and 40 Gigabit Ethernet switching. Moreover, data center architecture is changing as application environments create new demands for IT infrastructure. Application workloads are deployed across a mix of virtualized and nonvirtualized 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 is the third generation of industry's leading Data Center Server-Access Nexus 5000 series of switches. Cisco Nexus 5600 is the successor of industry's most widely adopted Cisco Nexus 5500 series switches that maintain all the existing Nexus 5500 features including LAN/SAN convergence (Unified Ports, FCoE), Fabric Extenders (FEX) and Fabric Path, but in addition brings integrated line-rate Layer 2/3 with true 40GE support, Cisco's Dynamic Fabric Automation (DFA) innovation, NVGRE, VxLAN bridging & routing capability, network programmability & visibility, deep buffers and significantly higher scale & performance for highly virtualized, automated, and cloud environments. The Cisco Nexus® 5600 platform switches include both 1RU and 2RU switches built to overcome these challenges with a flexible, agile and energy efficient design. The Cisco Nexus 5600 platform switches are an important component of the Cisco Unified Data Center architecture, complementing existing Cisco Nexus switches. The Cisco Nexus 5600 platform switches are energy-efficient switches that offer 10 and 40 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE), providing integrated Layer 2 and 3 features at wire speed, and low latency of approximately 1 microsecond for any packet size. With a choice of front-to-back (port-side exhaust) and back-to-front (port-side intake) airflow options, the Cisco Nexus 5600 platform switch is designed for a broad range of traditional data center and large-scale virtualized cloud deployments.

The Cisco Nexus 5600 platform with Cisco® NX-OS Software operating system provides customers with features and capabilities that are widely deployed in data centers around the world. Cisco NX-OS Software 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.

Models and Configurations

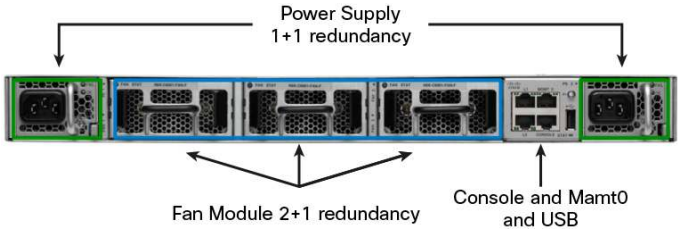
The Cisco 5600 platform switches come in these configurations:

- **Cisco Nexus 5672UP Switch:** The Cisco Nexus 5672UP (Figure 1) is a 1RU 10 and 40 Gigabit Ethernet switch offering wire-speed performance for up to seventy-two 10 Gigabit Ethernet ports (using Quad Small Form-Factor Pluggable [QSFP] breakout cables). Cisco Nexus 5672UP Switches are Layer 2 and 3 non-blocking 10 and 40 Gigabit Ethernet and FCoE-capable switches with up to 1.44 terabits per second (Tbps) of internal bandwidth. The Cisco Nexus 5672UP offers 48 fixed 1 Gigabit and 10 Gigabit Ethernet ports of which 16 ports can be unified ports (UP). The 16 unified ports provide 8/4/2-Gbps Fibre Channel as well as 10/40 Gigabit Ethernet and FCoE connectivity options. The Cisco Nexus 5672UP also offers 6 ports of 40 Gbps using QSFP transceivers for Ethernet and FCoE support. The Cisco Nexus 5672UP has three fan modules and two power supplies. The Cisco Nexus 5672UP is VXLAN ready, with VXLAN support in bridging and routing modes, on all ports at line rate, enabling the migration of virtual machines between servers across Layer 3 networks.

Figure 1. Cisco Nexus 5672UP Switch (Port View)

The Cisco Nexus 5672UP platform is constructed with the components shown in Figure 2 below. The Cisco Nexus 5672UP has two 1+1 redundant, hot-swappable power supplies and three, hot-swappable independent fans with support for 2+1 redundancy.

Figure 2. Cisco Nexus 5672UP Switch Front View



The Cisco Nexus 5672UP supports both Front-to-rear and reversible airflow options for flexible mounting

- **Cisco Nexus 56128P Switch:** The Cisco Nexus 56128P is a 2RU switch (figure 3) that supports 2.56 Tbps of bandwidth across 48 fixed 1 Gigabit and 10 Gigabit Ethernet SFP+ ports, and four 40-Gbps QSFP+ ports (Figure 3). The Cisco Nexus 56128P offers two expansion slots to support 24 ports of 10 Gigabit Ethernet and FCoE or 8/4/2-Gbps Fibre Channel and two ports of 40 Gigabit Ethernet using QSFP optics.

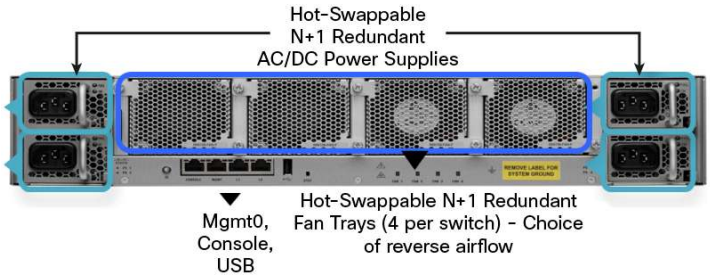
Figure 3. Cisco Nexus 56128P Port View (Rear)

The Cisco Nexus 56128P (figure 4) also offers two slots for a Generic Expansion Modules (GEM). The GEM for the Cisco Nexus 56128P provides 24 ports 10G Ethernet/FCoE or 2/4/8G Fibre Channel and 2 ports 40 Gigabit QSFP+ Ethernet/FCoE ports. The expansion module supports native 40 Gigabit Ethernet on the QSFP+ ports. The expansion module is supported on the Cisco Nexus 56128P chassis only and can be populated in either of the two expansion slots.

Figure 4. Cisco Nexus 56128P Generic Expansion Module (GEM)

The Cisco Nexus 56128P platform is constructed with the components shown in Figure 3 below. The Cisco Nexus 56128P has four N+1 redundant, hot-swappable powersupplies and four N+1 redundant, hot-swappable independent fans. The Cisco Nexus 56128P supports both Front-to-rear and reversible airflow options

Figure 5. Cisco Nexus 56128P Generic Expansion Module (GEM)



The Cisco Nexus 56128P is VXLAN ready, with VXLAN support 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 platform, organizations can quickly and easily upgrade existing data centers through advanced optics that 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). Additionally, the platform can be deployed in 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 2000 Series 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 switches:

- **Optimization for virtualization and cloud deployments:** Today, high-performance servers deployed in the cloud can support many more virtual machines and workloads than ever before. The requirement to deploy new servers on demand puts additional strain on the network fabric. The Cisco Nexus 5600 platform switches address this challenge by providing scalability and performance, making it an excellent platform 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 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 of as low as 25 percent utilization. This capability allows the switch 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 5600 platform switches support a 25-MB packet buffer shared by every 3 ports of 40 Gigabit Ethernet or every 12 ports of 10 Gigabit Ethernet. The flexible buffer management capability allows for dynamic tuning of the shared and dedicated buffer size 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 PortChannel and enhanced Bidirectional Protocol-Independent Multicast (Bidir-PIM) support. The switch also supports IP-based forwarding for IGMP snooping.

Applications

The Cisco Nexus 5600 platform supports a number of application scenarios, making it a versatile data center option.

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

Following are some common fabric extender Cisco Nexus 2000 Series and Cisco Nexus 5600 platform deployment options:

- 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 5600 platform switch 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
- Mixed Gigabit Ethernet 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 10GBASE-T Fabric Extender
- 1/10GBASE-T server connectivity with ease of migration from 1 to 10GBASE-T and effective reuse of structured cabling
- Gigabit Ethernet 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 switches provide unique value as a high-density fabric extender aggregation platform. For example, they can be used in conjunction with the Cisco Nexus 2248PQ, 2232PP, 2248TP, and 2232TM-E 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 a Cisco Nexus 5600 platform switches using 10 Gigabit Ethernet, providing a single point of management for blade server deployments.

Table 1 lists the fabric extenders that are supported with the Cisco Nexus 5600 platform switches. Please refer to the Cisco Nexus 2200 platform data sheets and release notes for more information about the products.

Table 1. Supported Fabric Extenders

Fabric Extender	Description
Cisco Nexus 2224TP	24x 100/1000BASE-T host interfaces and 2x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP	48x 100/1000BASE-T host interfaces and 4x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP-E	48x 100/1000BASE-T host interfaces and 4x 10 Gigabit Ethernet fabric interfaces (SFP+; 32 MB shared buffer)
Cisco Nexus 2232PP	32x 1/10 Gigabit Ethernet and FCoE host interfaces (SFP+) and 8x 10 Gigabit Ethernet and FCoE fabric interfaces (SFP+)
Cisco Nexus 2248PQ	48x 1/10GE SFP+ host interface and 4x 40G (16x 10G SFP+) network interfaces
Cisco Nexus 2232TM	32x 1/10GBASE-T host interfaces and 8x 10 Gigabit Ethernet (SFP+) uplink modules
Cisco Nexus 2232TM-E	32x 1/10GBASE-T host interfaces and 8x 10 Gigabit Ethernet (SFP+) uplink modules (lower power consumption and improved bit error rate [BER])
Cisco Nexus B22HP	16x 1/10GBASE-KR internal host interfaces and 8x 10 Gigabit Ethernet fabric interfaces (SFP+; network interfaces)
Cisco Nexus B22F	16x 10GBASE-KR internal host interfaces and 8x 10 Gigabit Ethernet fabric interfaces (SFP+; network interfaces)
Cisco Nexus B22DELL	16x 10 G BASE-KR internal host interfaces and 8x 10 Gigabit Ethernet fabric interfaces (SFP+) Network Interfaces
Cisco Nexus B22IBM	14x 1 and 10 Gigabit Ethernet BASE-KR internal host interfaces and 8x 10 Gigabit Ethernet fabric (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 non-blocking fabrics to accommodate different applications, creating patterns of heavy east-west and north-south traffic. The Cisco 5600 platform switches are well suited as a leaf or spine node in a Layer-2 or -3 fabric design. Leaf-and-spine layer designs using high-density and low-latency switches lead to flatter network architecture, allowing connections scaling 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 non-blocking, low-latency fabric, forwarding packets between leafs. 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 switches can be deployed as Layer 2 or Layer 3 spine or leaf switches, providing a high degree of design flexibility.

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 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. 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, Internet Small Computer System Interface [iSCSI], and Network-Attached Storage [NAS]) over a simplified infrastructure based on lossless 10- and 40-Gigabit Ethernet.

High-Performance Computing

The Cisco Nexus 5600 platform 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.

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

Cisco NX-OS Software is a purpose-built data center operating system designed for performance, resiliency, scalability, manageability, and programmability. Cisco NX-OS 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. Cisco's enhanced fabric solution allows the transparent integration of the virtual and physical devices on a unified network. In addition, users can use the comprehensive Cisco NX-OS service set to create unique innovations for customized solutions. With its MIBs, native XML interface, and command-line interface (CLI) like that of Cisco IOS® Software, Cisco NX-OS provides drastically simplified management for the devices in which it runs.

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

Cisco Prime Data Center Network Manager

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

- Unified fabric visibility and topology display with VMware vSphere integration shows 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 implement best practices.
- Role-based access control (RBAC) secures devices and provides 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 2 lists the specifications for the Cisco Nexus 5600 platform switches. Please check software release notes for feature support information.

Table 2. Product Specifications

Performance
• Cisco Nexus 5672UP: Layer 2 and 3 hardware forwarding at 1.44 Tbps • Cisco Nexus 5672UP: Layer 2 and 3 hardware forwarding at 2.56 Tbps • Support for up to 256,000 combined entries of MAC addresses and APR 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 12x 10 Gigabit Ethernet SFP+ interfaces • Line-rate traffic throughput on all ports in layer 2 and layer 3 mode
Interfaces
• Cisco Nexus 5672UP: 32 fixed 1/10 Gigabit Ethernet SFP+ ports, 16 fixed SFP+ unified ports, and 6 fixed 40 Gigabit Ethernet QSFP+ ports with 10 and 40 Gigabit Ethernet FCoE support on all respective ports and 2/4/8G Fibre Channel on all the unified ports • Cisco Nexus 56128P: 48 fixed 1/10 Gigabit Ethernet SFP+ ports with 4x 40 Gigabit Ethernet QSFP+ fixed ports and two expansion slots • Expansion module: 24UP SFP+ ports plus 2x 40 Gigabit Ethernet QSFP+ ports • 40 Gigabit Ethernet ports can be converted to 10 Gigabit Ethernet interfaces through QSFP+ breakout cable • Fabric 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 access control list (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 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 24 fabric extenders (Layer 2) with each switch

Layer 3 Features
• Layer 3 interfaces: Routed ports, switch 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 Virtual Routing and Forwarding (VRF) entries • Support for up to 4096 VLANs • Equal-Cost Multipathing (ECMP) up to 64 ways • 4000 flexible ACL entries • Routing protocols: Static, Routing Information Protocol Version 2 (RIPv2), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First Version 2 (OSPFv2), and Border Gateway Protocol (BGP) • IPv6 routing protocols: Static, OPFv3, BGPv6, and EIGRPv6 • IPv6 VRF-lite • BFD support: OSPFv2, BGPv4, EIGRP, VRFs • Policy-Based Routing (IPv4 and IPv6) • Hot-Standby Router Protocol (HSRP) and Virtual Router Redundancy Protocol (VRRP) • IPdirect broadcast • vPC+ Routing Protocol Peering • ACL: Routed ACL with Layer 3 and 4 options to match ingress and egress ACL • Multicast: Protocol Independent Multicast Version 2 (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 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/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-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 Address Resolution Protocol (ARP) Inspection • IP source guard

- DHCP relay (up to 32 destinations)
- Ethernet Port Security
- IPv6 RACL, PACL, and VACL
- iSCSI TLV

High-Availability Features

- 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 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 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)
- Cisco Call Home
- Cisco Smart Call Home
- Default Interface
- Cisco Fabric Manager
- Cisco DCNM
- CiscoWorks LAN Management Solution (LMS)

Data Center Bridging

- CEE- and IEEE-compliant priority flow control (PFC; per-priority Pause frame support: IEEE 802.1Qbb)
- PFC link distance support: 300m
- CEE-compliant Data Center Bridging Exchange (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 Data Center Network Manager-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 3 lists the power supply properties of the Cisco Nexus 5600 platform.

Table 3. Power Supply Properties

AC Power Supply Properties	Cisco Nexus 5600 Platform
Typical operating power	750W
Maximum power	1100W
Input voltage	94 to 240 VAC
Frequency	47 to 63 Hz
Efficiency	94% (at 50% load)
RoHS compliance	Yes
Hot swappable	Yes
Front-to-back air flow power supply (port-side exhaust)	Yes
Back-to-front air flow power supply (port-side intake airflow)	Yes

Environment

Table 4 lists the environment properties of the Cisco Nexus 5600 platform.

Table 4. Environment Properties

Property	Cisco Nexus 5600 Platform
Physical (height x width x depth)	Cisco Nexus 5672UP: 1.75 x 17.3 x 30 in. (4.4 x 43.9 x 76.2 cm) Cisco Nexus 56128P: 3.5 x 17.3 x 30 (8.8 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	Cisco Nexus 5672UP: 32 lb (2 power supplies) Cisco Nexus 56128P: 60 lb (2 expansion modules and 4 power supplies)

For the latest software release information and recommendations, please see the product bulletin at http://www.cisco.com/go/nexus5600.

Regulatory Standards Compliance

Table 5 summarizes regulatory standards compliance for the Cisco Nexus 5600 platform.

Table 5. 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 6 lists the transceivers supported for 1 and 10 Gigabit Ethernet connectivity, and Table 7 lists the 40 Gigabit Ethernet QSFP+ transceivers supported.

Table 6. Cisco Nexus 5600 Platform 1 and 10 Gigabit Ethernet SFP+ Transceiver Support Matrix

Cisco SFP	Description
FET-10G	10-Gbps SFP+ module for Cisco Nexus 2000 Series to Cisco Nexus 5000 Series connectivity
Cisco SFP-10G-SR	10GBASE-SR SFP+ module (multimode fiber [MMF])
Cisco SFP-10G-LR	10GBASE-LR SFP+ module (single-mode fiber [SMF])
Cisco SFP-10G-ER	10GBASE-ER-SFP+ module (SMF)
Cisco SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1m (Twinax cable)
SFP-H10GB-CU1.5M	10GBASE CU SFP+ cable, 1.5m (passive Twinax cable)
SFP-H10GB-CU2M	10GBASE CU SFP+ cable, 2m (passive Twinax cable)
SFP-H10GB-CU2.5M	10GBASE CU SFP+ cable, 2.5m (passive Twinax cable)
Cisco SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3m (Twinax cable)
Cisco SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5m (Twinax cable)
Cisco SFP-H10GB-ACU7M	10GBASE-CU SFP+ cable 7m (active Twinax cable)
Cisco SFP-H10GB-ACU10M	10GBASE-CU SFP+ cable 10m (active Twinax cable)
Cisco GLC-T	1000BASE-T SFP
GLC-ZX-SM	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, dual LC/PC connector
Cisco GLC-SX-MM	Gigabit Ethernet SFP, LC connector SX transceiver (MMF)
Cisco GLC-SX-MMD	Gigabit Ethernet SFP, LC connector SX transceiver (MMF), extended temperature range and digital optical monitoring (DOM)
Cisco GLC-LH-SM	Gigabit Ethernet SFP, LC connector LX/LH transceiver (SMF)
Cisco GLC-LH-SMD	Gigabit Ethernet SFP, LC connector LX/LH transceiver (SMF), extended temperature range and digital optical monitoring (DOM)
Cisco SFP-GE-T	1000BASE-T SFP, extended temperature range
Cisco SFP-GE-S	Gigabit Ethernet SFP, LC connector SX transceiver (MMF), extended temperature range and digital optical monitoring (DOM)
Cisco SFP-GE-L	Gigabit Ethernet SFP, LC connector LX/LH transceiver (SMF), extended temperature range and DOM

Table 7. Cisco Nexus 5600 Platform 40 Gigabit Ethernet QSFP+ Transceiver Support Matrix

Cisco QSFP	Description
QSFP-40G-SR4	40GBASE-SR4 QSFP module, MMF, 100m
QSFP-40G-CSR4	40GBASE Extended CSR4 QSFP module, MMF, 300m
QSFP-40G-LR4	40GBASE Extended LR4 QSFP module, LC connector, 10 km
QSFP-4SFP10G-CU1M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 1m
QSFP-4SFP10G-CU3M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 3m
QSFP-4SFP10G-CU5M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ passive direct-attach copper transceiver assembly, 5m
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, 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

Cisco QSFP	Description
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-40G-SR-BD	Cisco QSFP40G BiDi short-reach transceiver

The platform supports an innovative Twinax copper cabling solution that connects to standard QSFP connectors for in-rack use, and optical cabling for longer cable runs (Table 8)

For in-rack or adjacent-rack cabling, the Cisco Nexus 5600 platform supports QSFP+ direct-attach 40 Gigabit Ethernet copper cables, an innovative 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 1.5 watts (W) of power per transceiver and introduce approximately 0.1 microsecond of latency per link.

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 8. Cisco Nexus 5600 Platform Cabling Support Matrix

Connector (Media)	Cable	Distance	Maximum Power Consumption	Transceiver Latency
QSFP CU copper	Twinax	1m 3m 5m	Approximately 1.5W	Approximately 0.25 microsecond
QSFP ACU copper	Active Twinax	7m 10m	Approximately 1.5W	Approximately 0.1 microsecond
QSFP SR4 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
QSFP LR4 SMF	SMF	10 km	Approximately 3.5W	Approximately 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 1.5 dB.
[*3] 125m over OM4 fiber is with an engineered link with 1 dB budget for connector loss.
[*4] 150m over OM4+ fiber is an engineered link with 1 dB budget for connector loss. One of the recommended fibers for OM4+ is Panduit's Signature Core Fiber. Please refer to the following link for additional information: http://www.panduit.com/en/signature-core.

Ordering Information

Table 9 presents ordering information for the Cisco Nexus 5600 platform switches. Note that you can order the Cisco Nexus 2200 platform fabric extenders either separately or along with the Cisco Nexus 5600 platform.

Table 9. Ordering Information

Part Number	Description
Chassis	
N5K-C5672UP	Cisco Nexus 5672UP 1RU, 32 p 10G SFP+, 16 Unified Ports, 6p 40G QSFP+
N5K-C5672UP=	Cisco Nexus 5672UP 1RU, 32 p 10G SFP+, 16 Unified Ports, 6p 40G QSFP+, Spare
N5K-C56128P	Cisco Nexus 56128P 2RU, 48x 10G SFP+, 6 x 40G QSFP+ Fixed Ports
N5K-C56128P=	Cisco Nexus 56128P 2RU, 48x 10G SFP+, 6 x 40G QSFP+ Fixed Ports, Spare

Part Number	Description
Fan Modules	
N5672-FAN-F	Cisco Nexus 5672UP Fan Module, Front-to-Back (Port Side Exhaust) Airflow
N5672-FAN-F=	Cisco Nexus 5672UP Fan Module, Front-to-Back (Port Side Exhaust) Airflow, spare
N5672-FAN-B	Cisco Nexus 5672UP Fan Module, Back-to-Front (Port Side intake) Airflow
N5672-FAN-B=	Cisco Nexus 5672UP Fan Module, Back-to-Front (Port Side Intake) Airflow, spare
N56128-FAN-F	Cisco Nexus 56128P Fan Module, Front-to-Back (Port Side Exhaust) Airflow
N56128-FAN-F=	Cisco Nexus 56128P Fan Module, Front-to-Back (Port Side Exhaust) Airflow, spare
N56128-FAN-B	Cisco Nexus 56128P Fan Module, Back-to-Front (Port Side intake) Airflow
N56128-FAN-B=	Cisco Nexus 56128P Fan Module, Back-to-Front (Port Side Intake) Airflow, spare
Expansion Modules	
N56-M24UP2Q	Nexus 56128P Expansion Module, 24x 10G SFP+ UP, 2 x QSFP+ fixed ports
N56-M24UP2Q=	Nexus 56128P Expansion Module, 24x 10G SFP+ UP, 2 x QSFP+ fixed ports, Spare
Power Supplies	
N55-PDC-1100W=	Cisco Nexus 6001/5600 PSU Front-to-Back Airflow module spare, D/C, - 40 to -72VDC, 1100W
NXA-PAC-1100W(=)	Cisco Nexus 6001/5600 Platinum PSU Front-to-Back Airflow module spare, A/C, 100-240V, 1100W
NXA-PAC-1100W-B(=)	Cisco Nexus 6001/5600 Platinum PSU Back-to-Front Airflow module spare, A/C, 100-240V, 1100W
Software	
N56UK9-701N1.1	Nexus 5600 Base OS Software Rel 7.0(0)N1(1)
N56UK9-701N1.1=	Nexus 5600 Base OS Software Rel 7.0(0)N1(1), 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-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-40G-SR-BD	Cisco QSFP40G BiDi Short-reach Transceiver
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)

Part Number	Description
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	
N56128-ACC-KIT=	Cisco Nexus 56128P Chassis Accessory Kit, spare
N5672-ACC-KIT=	Cisco Nexus 5672UP 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 SMARTnet® Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home service capability, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 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.

For More Information

- Cisco Nexus 5600 platform switches: http://www.cisco.com/go/nexus5600.
- 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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