Cisco Nexus 5000 Series Data Center Class Switches and Cisco Nexus 2000 Series Fabric Extenders

PB462134

The Cisco® Nexus™ 5000 Series Switches are a family of low-latency, line-rate, 10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE) switches for data center applications. The Cisco Nexus 2000 Series Fabric Extenders extend the internal switching fabric of the Cisco Nexus switches to remote devices to provide highly scalable, cost-effective, and simplified server-access connectivity.

The Cisco Nexus 5000 Series, part of the Cisco Nexus Family of data center–class switches, delivers an innovative architecture that simplifies data center transformation. These switches deliver high-performance, standards-based Ethernet and FCoE that enables the consolidation of LAN, SAN, and cluster network environments onto a single Unified Fabric. Backed by a broad group of industry-leading complementary technology vendors, the Cisco Nexus 5000 Series is designed to meet the challenges of next-generation data centers, including dense multisocket, multicore, virtual machine–optimized deployments, where infrastructure sprawl and increasingly demanding workloads are commonplace.

The Cisco Nexus 2000 Series Fabric Extenders comprise a new category of data center products that provides a universal server-access platform. Scaling across a multitude of Gigabit Ethernet, 10 Gigabit Ethernet, Unified Fabric, rack, and blade server environments, the Cisco Nexus 2000 Series Fabric Extenders are designed to simplify data center architecture and operations. Working in conjunction with Cisco Nexus switches, the Cisco Nexus 2000 Fabric Extenders architecture delivers a cost-effective and efficient way to support today's Gigabit Ethernet environments while allowing seamless migration to 10 Gigabit Ethernet, virtual machine-aware Unified Fabric technologies.

Cisco Nexus 5000 Series Hardware Features

- The Cisco Nexus 5000 Series cut-through switching architecture supports line-rate 10 Gigabit Ethernet with low-latency and predictable performance on all ports. These switches also support 10/1 Gigabit Ethernet mode on a subset of the fixed ports to provide connectivity for Gigabit Ethernet attached servers and network devices.
- The Cisco Nexus 5000 Series supports Fibre Channel over Ethernet that enables consolidation of LAN, SAN and cluster traffic onto a single, Unified Fabric, which greatly simplifies network infrastructure, increases flexibility and reduces costs. By connecting to existing Fibre Channel storage arrays, FCoE protects existing storage investments while simplifying in-rack cabling and reducing power and cooling overhead.
- Cisco Nexus 5000 Series supports standards-based IEEE Data Center Bridging (DCB) capabilities that allows the switches to support multiple traffic classes—LAN, SAN, and cluster—over the same link, while retaining individual traffic treatment.
- In addition to standard 10 Gigabit network interface cards (NICs), the Cisco Nexus 5000 Series supports standards-based Fibre Channel over Ethernet consolidated network adapters (CNAs) that combine Ethernet NICs and Fibre Channel host bus adapters (HBAs). These CNAs make the transition to a Unified Fabric transparent and consistent with existing practices, management software, and operating system drivers.
- The Cisco Nexus 5000 Series is compatible with third-party integrated transceivers and Twinax cabling solution that delivers very low latency at a low cost, making the product line an excellent match for cluster environments.

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- The Cisco Nexus 5000 Series is designed for data center environments, with front-to-back cooling and network ports in the rear, bringing switching into close proximity to servers and making cable runs short and simple.
- The Cisco Nexus 5000 Series is highly serviceable, with N+1 redundant, hot-pluggable power and fan modules. Its software is based on data center–class Cisco NX-OS Software for high reliability and ease of management.
- Cisco Nexus 5000 Series Switches have built-in Cisco TrustSec in the hardware, enabling support for end-to-end security and role-based access control lists (RBACLs)—future.

The Cisco Nexus 5000 Series is built around two custom components: a unified crossbar fabric and a unified port controller application-specific integrated circuit (ASIC). Each Cisco Nexus 5000 Series Switch contains a single unified crossbar fabric ASIC and multiple unified port controllers to support fixed ports and expansion modules within the switch.

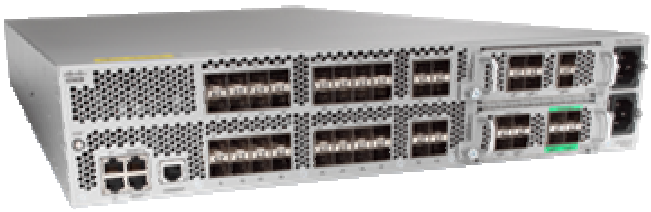
The unified port controller provides an interface between the unified crossbar fabric ASIC and the network media adapter and makes forwarding decisions for Ethernet, Fibre Channel, and FCoE frames. The ASIC supports the overall cut-through design of the switch by transmitting packets to the unified crossbar fabric before the entire payload has been received. The unified crossbar fabric ASIC is a single-stage, nonblocking crossbar fabric capable of meshing all ports at wire speed. The unified crossbar fabric offers superior performance by implementing quality-of-service (QoS) aware scheduling for unicast and multicast traffic. Moreover, the tight integration of the unified crossbar fabric with the unified port controllers helps ensure low-latency lossless fabric for ingress interfaces requesting access to egress interfaces.

Cisco Nexus 5020 56-Port Switch

The Cisco Nexus 5020 Switch is a two rack-unit (2RU), 10 Gigabit Ethernet/FCoE access-layer switch built to provide 1.04 terabits per second (Tbps) throughput with very low latency (Figure 1). It has:

- Forty fixed 10 Gigabit Ethernet/FCoE Small Form Factor Pluggable Plus (SFP+) ports
- Two expansion module slots that can be configured to support up to 12 additional 10 Gigabit Ethernet/FCoE ports, up to 16 Fibre Channel ports, or a combination of both
- One serial console port and one out-of-band 10/100/1000-Mbps Ethernet management port
- 1+1 redundant, hot-pluggable, dual-sensing power supplies
- 4+1 redundant, hot-pluggable fan modules, providing highly reliable front-to-back cooling

Figure 1. Cisco Nexus 5020, Supporting 40 Fixed 10 Gigabit Ethernet/FCoE Ports and Two Expansion Module Slots



Cisco Nexus 5010 28-Port Switch

The Cisco Nexus 5010 Switch is a 1RU, 10 Gigabit Ethernet/FCoE access-layer switch built to provide more than 500 Gigabits per second (Gbps) throughput with very low latency (Figure 2). It has:

- Twenty fixed 10 Gigabit Ethernet/FCoE SFP+ ports

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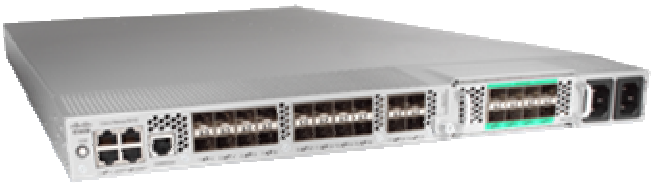
- One expansion module slot that can be configured to support up to 6 additional 10 Gigabit Ethernet/FCoE ports, up to 8 Fibre Channel ports, or a combination of both
- One serial console port and one out-of-band 10/100/1000-Mbps Ethernet management port
- 1+1 redundant, hot-pluggable, dual-sensing power supplies
- 1+1 redundant, hot-pluggable fan modules, providing highly reliable front-to-back cooling

Figure 2. Cisco Nexus 5010, Supporting 20 Fixed 10 Gigabit Ethernet/FCoE Ports and One Expansion Module Slot



Cisco Nexus 5000 Series Expansion Modules

The Cisco Nexus 5000 Series is equipped to support four expansion module options that can be used to increase the number of 10 Gigabit Ethernet/FCoE ports, connect to Fibre Channel SANs, or both. The Cisco Nexus 5010 supports a single module, with the Cisco Nexus 5020 supporting any combination of two modules from the following offerings (Figure 3):

- An Ethernet module that provides 6 10 Gigabit Ethernet/FCoE ports using an SFP+ interface.
- A Fibre Channel plus Ethernet module that provides 4 10 Gigabit Ethernet/FCoE ports using an SFP+ interface, and 4 ports of 1/2/4-Gbps native Fibre Channel connectivity using an SFP interface.
- A Fibre Channel module that provides 8 ports of 1/2/4-Gbps native Fibre Channel using an SFP interface for transparent connectivity with existing Fibre Channel networks.
- A Fibre Channel module that provides 6 ports of 1/2/4/8-Gbps native Fibre Channel using and SFP+ interface for transparent connectivity with existing Fibre Channel networks

Figure 3. Cisco Nexus 5000 Series Expansion Modules

Cisco Nexus 2000 Series Fabric Extenders

The Cisco Nexus 2000 Series Fabric Extenders comprise a new category of data center products that provides a universal server-access platform that scales across a multitude of Gigabit Ethernet, 10 Gigabit Ethernet, Unified Fabric, rack, and blade server environments. The Cisco Nexus 2000 Series Fabric Extenders are designed to simplify data center architecture and operations by meeting the business and application needs of a data center. Working in conjunction with Cisco Nexus switches, the Cisco Nexus 2000 Series Fabric Extenders deliver a cost-effective and efficient way to support today's Gigabit Ethernet environments while allowing seamless migration to 10 Gigabit Ethernet, virtual machine–aware Unified Fabric technologies.

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Cisco Nexus 2148T Fabric Extender

The first product in the Cisco Nexus 2000 Series is the Cisco Nexus 2148T Fabric Extender (Figure 4). A Cisco Nexus 2148T connected to a Nexus 5000 Series system acts as a single managed entity, with the Cisco Nexus 5000 Series system providing the supervisory functions of the control plane and the Cisco Nexus 2148T inheriting the characteristics of connected Cisco Nexus 5000 Series ports. The Cisco Nexus 2148T supports the following features:

- Operation as a remote I/O module, extending the internal fabric of the Cisco Nexus 5010 and 5020 Switches for low-cost port-count expansion
- Zero-touch provisioning, including configuration and upgrade
- 48 Gigabit Ethernet server access ports with RJ-45 connectors
- Four 10 Gigabit Ethernet uplink ports using SFP+ short-reach (SR) and long-reach (LR) optical or CX1 direct-attach copper interconnects
- Compact 1RU form factor
- Front-to-back cooling compatible with data center hot-aisle and cold-aisle designs, with all switch ports at the rear of the unit in close proximity to server ports
- 1+1 redundant, hot-pluggable, dual-sensing power supplies
- Hot-swappable fan trays
- All user-serviceable components accessible from the front panel

Figure 4. Cisco Nexus 2148T Fabric Extender Provides 48 Gigabit Ethernet Server Ports in a Compact 1RU Chassis

Cisco NX-OS Software Overview

The Cisco NX-OS Software is a data center–class operating system built with modularity, resiliency, and serviceability at its foundation. Based on the industry-proven Cisco MDS 9000 SAN-OS Software, Cisco NX-OS helps ensure continuous availability and sets the standard for mission-critical data center environments. The self-healing design of Cisco NX-OS makes transparent, zero-impact operations a reality and enables exceptional operational flexibility.

Focused on the requirements of the data center, Cisco NX-OS provides a robust and rich feature set that meets the Ethernet and storage networking requirements of both current and future-generation data centers. Cisco NX-OS provides a completely modular, standards-based OS that provides advanced troubleshooting and diagnostics capabilities (Cisco Generic Online Diagnostics [GOLD] and Smart Call Home) and management capabilities through a command-line interface (CLI) like that of the Cisco IOS® Software, an XML interface, and Simple Network Management Protocol (SNMP) MIBs. Ethernet and IEEE Data Center Bridging features are included in the base software; Fibre Channel and FCoE require a storage services license to enable the feature sets.

Availability

The Cisco Nexus 5000 Series and the Cisco Nexus 5000 Series expansion modules are immediately orderable and are shipping today. The Cisco Nexus 2148T Fabric Extender will be orderable from February 2009, with first customer shipment (FCS) in March 2009.

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Ordering Information

Table 1 provides ordering information for the Cisco Nexus 5000 Series, and Table 2 provides ordering Information for the Cisco Nexus 2000 Series Fabric Extenders.

Table 1. Ordering Information for Cisco Nexus 5000 Series

Part Number	Description
Chassis	
N5K-C5010P-BF	Cisco Nexus 5000 1RU Chassis No PS, 2 Fan Modules, 20 Ports (Requires SFP+)
N5K-C5020P-BF	Cisco Nexus 5000 2RU Chassis No PS, 5 Fan Modules, 40 Ports (Requires SFP+)
Fan Modules	
N5K-C5010-FAN=	Cisco Nexus 5010 Fan Module, Spare
N5K-C5020-FAN=	Cisco Nexus 5020 Fan Module, Spare
Power Supplies	
N5K-PAC-550W(=)	Cisco Nexus 5010 PSU Module, A/C, 110-240VAC 550W
N5K-P1-BLNK(=)	Cisco Nexus 5010 PSU Module, Blank Slot Cover
N5K-PAC-750W(=)	Cisco Nexus 5020 PSU module, 100-240VAC 750W
N5K-PAC-1200W(=)	Cisco Nexus 5020 PSU Module, A/C, 100-240VAC 1200W
N5K-P2-BLNK(=)	Cisco Nexus 5020 PSU Module, Blank Slot Cover
Software Licenses	
N5010-SSK9(=)	Nexus 5010 Storage Protocol Services License
N5020-SSK9(=)	Nexus 5020 Storage Protocol Services License
N5000FMS1K9(=)	Nexus 5000 Fabric Manager Server License
Expansion Modules	
N5K-M1600(=)	Cisco Nexus 5000 1000 Series Module 6-Port 10 Gigabit Ethernet (Requires SFP+)
N5K-M1404(=)	Cisco Nexus 5000 1000 Series Module 4x10GE 4xFC 4/2/1 (Requires SFP+, SFP)
N5K-M1008(=)	Cisco Nexus 5000 1000 Series Module 8xFC 4/2/1 (Requires SFP)
N5K-M1060(=)	Cisco Nexus 5000 1000 Series Module 6xFC 8/4/2/1 (Requires SFP+ for 8/42, SFP for 4/2/1)
N5K-M1-BLNK(=)	Cisco Nexus 5000 1000 Series Expansion Module Blank
Software	
N5KUK9-413N2.1(=)	Cisco Nexus 5000 Base OS Software Release 4.1(3)N1(1)—latest release
Transceivers and Cables	
SFP-10G-SR(=)	10GBASE-SR SFP+ Module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-H10GB-CU1M(=)	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M(=)	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M(=)	10GBASE-CU SFP+ Cable 5 Meter
GLC-T(=)	1000BASE-T SFP
GLC-SX-MM(=)	GE SFP, LC connector SX transceiver
GLC-LH-SM(=)	GE SFP, LC connector LX/LH transceiver
SFP-GE-T	1000BASE-T SFP (NEBS 3 ESD)
SFP-GE-S	1000BASE-SX SFP (DOM)
SFP-GE-S	1000BASE-LX/LHS FP (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

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Part Number	Description
DS-SFP-FC8G-LW(=)	8Gbps Fibre Channel-LW SFP+, LC
Accessory Kit	
N5010-ACC-KIT=	Cisco Nexus 5010 Accessory Kit, Spare
N5020-ACC-KIT=	Cisco Nexus 5020 Accessory Kit, Spare
Power Cords	
CAB-N5K6A-NA(=)	Cisco Nexus N5000 AC Power Cable, 6A, 250V, North America, 2.5m (NEMA 6-15 Plug)
CAB-AC-250V/13A(=)	Cisco Nexus N5000 AC Power Cable, 13A, 250V, North America, 2.5m (NEMA L6-20 Plug)
CAB-C13-C14-JMPR(=)	Cisco Nexus N5000 AC Power Cable, 6A, 250V, Power Strip Type (IEC C14 Plug)
SFS-250V-10A-AR(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Argentina, 2.5m
CAB-9K10A-AU(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Australia, 2.5m
SFS-250V-10A-CN(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, China, 2.5m
CAB-9K10A-EU(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Europe, 2.5m
SFS-250V-10A-ID(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, India, 2.5m
SFS-250V-10A-IS(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Israel, 2.5m
CAB-9K10A-IT(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Italy, 2.5m
CAB-9K10A-SW(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, Switzerland, 2.5m
CAB-9K10A-UK(=)	Cisco Nexus N5000 AC Power Cable, 10A, 250V, United Kingdom, 2.5m
CAB-9K12A-NA(=)	Power Cord, 125VAC 15A NEMA 5-15 Plug, North America, 2.5m
CAB-C13-CBN(=)	Cabinet Jumper Power Cord, 250 VAC 16A, C14-C13 Connectors

Table 2. Ordering Information for Cisco Nexus 2000 Series Fabric Extenders

Part Number	Description
Chassis	
N2K-C2148T-1GE	Cisco Nexus 2000 Series 1GE Fabric Extender, 1PS, 1 Fan Module, 48x1G-BaseT + 4x10GE (req SFP+)
Fan Modules	
N2K-C2148T-FAN=	Cisco Nexus 2000 FEX 1GE Fan Module, spare
Power Supplies	
N2K-PAC-200W(=)	Cisco Nexus 2000 FEX 1GE 200W Power supply
N2K-P1-BLNK=	Cisco Nexus 2000 FEX 1GE Power supply Blank, spare
Transceivers and Cables	
SFP-10G-SR(=)	10GBASE-SR SFP+ Module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-H10GB-CU1M(=)	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M(=)	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M(=)	10GBASE-CU SFP+ Cable 5 Meter
Accessory Kit	
N2K-C2148T-ACC=	Cisco Nexus 2000 FEX 1GE Accessory Kit, spare
Power Cords	
CAB-N5K6A-NA(=)	Power Cord, 210/220V 30A North America
CAB-AC-250V/13A(=)	Power Cord for North America, 125VAC/13A
CAB-C13-C14-JMPR(=)	Recessed receptical AC power cord 27
CAB-9K12A-NA(=)	Power Cord, 125VAC 15A NEMA 5-15 Plug, North America
CAB-C13-CBN(=)	Cabinet Jumper Power Cord, 250 VAC 16A, C14-C13 Connectors
SFS-250V-10A-AR(=)	SFS Power Cord - 250V, 10A - Argentina
CAB-9K10A-AU(=)	Power Cord, 250VAC 10A 3112 Plug, Australia

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Part Number	Description
SFS-250V-10A-CN(=)	SFS Power Cord - 250V, 10A - PRC
CAB-9K10A-EU(=)	Power Cord, 250VAC 10A CEE 7/7 Plug, EU
SFS-250V-10A-ID(=)	SFS Power Cord - 250V, 10A - S. Africa, UAE, India
CAB-IND-10A(=)	10A Power cable for India
SFS-250V-10A-IS(=)	SFS Power Cord - 250V, 10A - Israel
CAB-9K10A-IT(=)	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy
CAB-9K10A-SW(=)	Power Cord, 250VAC 10A MP232 Plug, SWITZ
CAB-9K10A-UK(=)	Power Cord, 250VAC 13A BS1363 Plug (13 A fuse), UK

Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 5000 Series and the Cisco Nexus 2000 Series Fabric Extenders 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 operational 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 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 5000 Series Switches. Spanning the entire network lifecycle, Cisco Services help maximize investment protection, optimize network operations, support migration, and strengthen your IT expertise.

Warranty

The Cisco Nexus 5000 Series Switches and the Cisco Nexus 2000 Series Fabric Extenders have a 1-year limited hardware warranty. This warranty includes hardware replacement with a 10-day turnaround from receipt of a return materials authorization (RMA).

For More Information

- Cisco Nexus 5000 Series: http://www.cisco.com/go/nexus5000
- Cisco Nexus 2000 Series Fabric Extenders: http://www.cisco.com/go/nexus2000

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