Cisco Nexus 5000 Series Switches

Switches to Simplify Data Center Transformation

Cisco Nexus® 5000 Series Switches, part of the unified fabric component of the Cisco® Data Center Business Advantage (DCBA) architectural framework, deliver an innovative architecture to simplify data center transformation by enabling a high-performance, standards-based, multi-protocol, multi-purpose, Ethernet-based fabric.

They help consolidate separate LAN, SAN, and server cluster network environments into a single Ethernet fabric. Backed by a broad system of industry-leading technology partners, Cisco Nexus 5000 Series Switches are designed to meet the challenges of next-generation data centers, including the need for dense multisocket, multicore, virtual machine–optimized services, in which infrastructure sprawl and increasingly demanding workloads are commonplace.

Cisco Nexus 5000 Series Switches provide:

- Architectural flexibility to support diverse business and application needs
- Infrastructure simplicity to decrease the total cost of ownership (TCO)Increased agility and flexibility for traditional deployments with easy migration to virtualized, unified, or high-performance computing (HPC) environments Enhanced business resilience with greater operational continuity Capability to use existing operational models and administrative domains for easy deployment

Cisco Nexus 5000 Series Switches provide a unified, converged fabric over 10 Gigabit Ethernet for LAN, SAN, and cluster traffic. This unification enables network consolidation and greater utilization of previously separate infrastructure and cabling, reducing by up to 50 percent the number of adapters and cables required and eliminating redundant switches. This infrastructure displacement also lowers power and cooling costs significantly, especially for rack-optimized servers similar to blade servers.

Cisco Nexus 5000 Series Switches simplify cable management, allowing hosts to connect to any network through a unified Ethernet interface and enabling faster rollout of new applications and services.

Main Features

- High-performance, low-latency 10 Gigabit Ethernet, delivered by a cut-through switching architecture, for 10 Gigabit Ethernet server access in next-generation data centers
- Fibre Channel over Ethernet (FCoE)–capable switches that support emerging IEEE Data Center Bridging (DCB) standards to a deliver a lossless Ethernet service with no-drop flow control
- Unified ports that support Ethernet, Fibre Channel, and FCoE
- A variety of connectivity options: Gigabit, 10 Gigabit (fiber and copper), FCoE, and Fibre Channel
- Converged fabric with FCoE for network consolidation, reducing power and cabling requirements and simplifying data center networks, especially for SAN consolidation of Fibre Channel
- Virtual machine–optimized services for higher asset utilization, simplified server connections, rapid server provisioning, security, and quality of service (QoS)

Main Benefits

- **Investment protection and operation best practices:** With Cisco Nexus 5000 Series Switches, customers can take advantage of the cost and functional benefits of a unified converged fabric while protecting their investments in existing network, storage, and server assets. Cisco Nexus 5000 Series Switches can easily be inserted into an existing data center network to provide immediate benefits without causing disruption or revision of existing design and operation best practices
- **End-to-end FCoE:** FCoE is an open standards–based protocol that encapsulates Fibre Channel over Ethernet, eliminating the need for separate switches, cabling, adapters, and transceivers for each class of traffic.This feature dramatically decreases power consumption and reduces both capital expenditures (CapEx) and operating expenses (OpEx) for businesses

- **Multi-hop FCoE:** Cisco Unified Fabric unites data center and storage networks to deliver a single high-performance, highly available and scalable network. Cisco now delivers end-to-end data center convergence from server to storage by delivering new director-class, multi-hop Fibre channel over Ethernet (FCoE) capability for the Nexus 7000 and MDS 9500 platforms, adding to existing FCoE functionality on the Nexus 5000 switches. With the industry's broadest selection of standards-based FCoE switches, Cisco provides Unified Fabric support to both the access and core network layers, supporting all storage traffic (Fibre Channel, FCoE, iSCSI, and NAS) over simplified infrastructure based on loss-less 10-Gigabit Ethernet
- **Virtual machine-optimized services:** Cisco Nexus 5000 Series Switches are designed to support virtualization and virtual machine mobility by mapping virtual machines to network profiles, allowing network services to be allocated on a per–virtual machine basis centrally from the unified fabric. This capability to move virtual machines and network profiles together eases manageability, increases isolation, and enables consistent network and security policies

Part of the Cisco Nexus Family of Data Center–Class Switches

Cisco Nexus 5000 Series Switches are part of the Cisco Nexus Family of switches, offering:

- Operational manageability
  - Simpler, more resilient Layer 2 and 3 networks – Preservation of management best practices
- Transport flexibility
  - End-to-end FCoE-based converged fabric – Fibre Channel
  - Virtual machine–optimized services
  - Lossless Ethernet service with no-drop flow control
- Infrastructure scalability
  - Reduced power and cooling demands
  - Nonblocking capacity of approximately 2 terabits per second (Tbps)

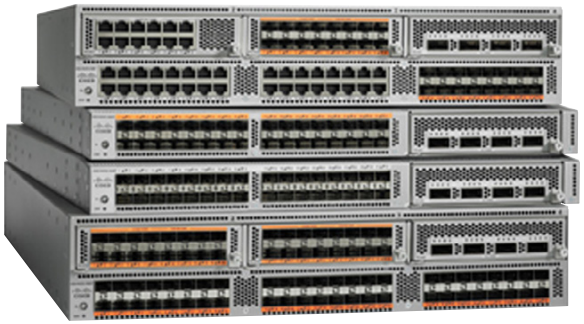
Cisco Nexus 5000 Series Switches are based on the Cisco NX-OS Software, which provides a networking foundation that delivers efficiency, resiliency, virtualized services, and extensibility.

Cisco Nexus 5000 Series Switches

Figure 1 shows the Cisco Nexus 5000 Series Switches, sum-marized here:

- Cisco Nexus 5596UP Switch
  - Two-rack-unit (2RU) 1/10 Gigabit Ethernet and FCoE switch offering up to throughput of 1.92 terabits per second (Tbps)
  - Up to 96 ports: 48 fixed "unified"1/10-Gbps Enhanced Small Form-Factor Pluggable (SFP+) Ethernet and FCoE ports and three expansion slots
  - Expansion modules:
    - 160-Gbps Layer 3 routing engine
    - 16-port unified port module: 1/10-Gbps SFP+ Ethernet and FCoE or 1/2/4/8-Gbps native Fibre Channel
- Cisco Nexus 5596T Switch
  - Two-rack-unit (2RU) 1/10 Gigabit Ethernet and FCoE switch offering up to throughput of 1.92 terabits per second (Tbps)
  - Up to 96 ports: 32 fixed ports of 10G Base-T and 16 fixed "unified" 1/10-Gbps Enhanced Small Form-Factor Pluggable (SFP+) Ethernet and FCoE ports and three expansion slots
  - Expansion modules:
    - 160-Gbps Layer 3 routing engine
    - 12-port 1/10G Base-T ports
    - 16-port "unified" port module: 1/10-Gbps SFP+ Ethernet and FCoE or 1/2/4/8-Gbps native Fibre Channel
- Cisco Nexus 5548UP Switch
  - 1RU 10 Gigabit Ethernet and FCoE switch offering up to 960-Gbps throughput
  - Nexus 5548UP switch version provides up to 48 ports: 32 fixed "unified" 1/10-Gbps SFP+ Ethernet and FCoE ports and one expansion slot
  - Expansion modules:
    - 160-Gbps Layer 3 routing engine
    - 16-port unified port module: 1/10-Gbps SFP+ Ethernet and FCoE or 1/2/4/8-Gbps native Fibre Channel

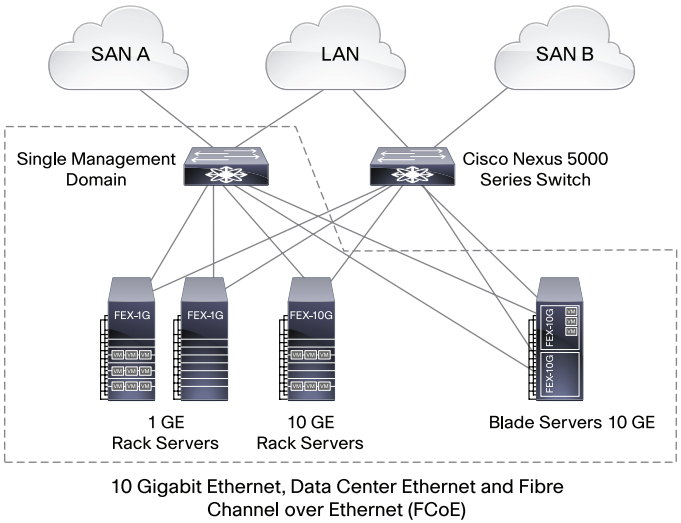
Figure 1. Cisco Nexus 5000 Series Switches



Cisco Nexus 2000 Series Fabric Extenders

Cisco Nexus 2000 Series Fabric Extenders provide a highly scalable and flexible server networking solution. The Cisco Nexus 2000 Series extends the capabilities and benefits offered by upstream Cisco Nexus switches and provides a virtualization-aware unified server-access architecture that scales across a multitude of 100-Mbps Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, unified fabric, and rack and blade server environments, helping reduce costs for data center deployments (Figure 2).

Figure 2. Cisco Nexus 2000 Series Fabric Extenders Extend the Capabilities of Cisco Nexus Switches to Gigabit Ethernet, 10 Gigabit Ethernet, and Unified Fabric Environments



The Cisco Nexus 2000 Series in conjunction with the Cisco Nexus 5000 Series delivers a unified fabric over lossless Ethernet for LAN, storage, and HPC traffic. Unified fabric at the server access layer provides cost benefits through infrastructure reduction (CapEx savings) and infrastructure simplification (OpEx savings). The Cisco Nexus 2000 Series has four fabric extender models (Figure 3):

- **Cisco Nexus 2232TM-E 1/10GBASE-T Fabric Extender:** 1RU form-factor switch that provides 32 1/10GBASE-T server ports and 8 10GbE SFP+ uplink ports
- **Cisco Nexus 2232PP 10GE Fabric Extender:** 1RU form-factor switch that provides 32 1/10 Gigabit Ethernet (IEEE DCB and FCoE capable) SFP+ server ports and 8/10 Gigabit Ethernet (IEEE DCB and FCoE-capable) SFP+ uplink ports
- **Cisco Nexus 2224TP GE Fabric Extender:** 1RU form-factor switch that provides 24 Fast Ethernet and Gigabit Ethernet (100/1000BASE-T) server ports and 2/10 Gigabit Ethernet uplink ports
- **Cisco Nexus 2248TP-E GE Fabric Extender:** 1RU form-factor switch that provides 48 Fast Ethernet and Gigabit Ethernet (100/1000BASE-T) server ports and 4/10 Gigabit Ethernet uplink ports
- **Cisco Nexus 2248PQ Fabric Extender:** 1RU form-factor switch that provides 48 fixed ports of 1/10 Gigabit Ethernet interfaces for server connectivity and up to 4/40 GE QSFP+ uplink interfaces

Figure 3. Cisco Nexus 2000 Fabric Extenders

For More Information

- Cisco Nexus 5000 Series Switches: http://www.cisco.com/go/nexus5000
- 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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