



Cisco Nexus 5020 Switch: Simplifying Data Center Transformation



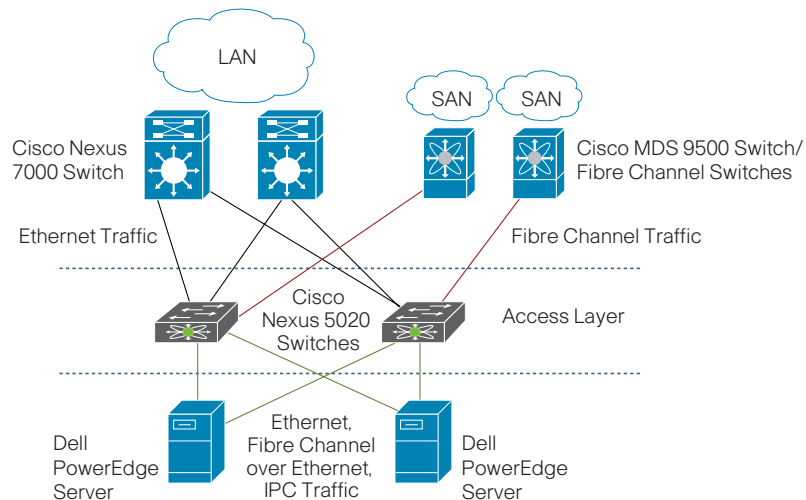
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At-A-Glance

Cisco Nexus 5020 Switch Features

The Cisco® Nexus™ 5020 Switch, part of the Cisco Nexus family of data center-class switches, delivers an innovative architecture to simplify data center transformation by enabling a high-performance, standards-based Ethernet unified fabric. The platform consolidates separate local-area network (LAN), storage area network (SAN), and server cluster network environments into a single unified fabric. Backed by a broad ecosystem of industry-leading technology partners, the Cisco Nexus 5020 Switch is designed to meet the challenges of the next-generation data centers including dense multsocket, multicore, virtual machine optimized services, where infrastructure sprawl and increasingly demanding workloads are commonplace. Figure 1 shows the position of the Cisco Nexus 5020 Switch in one scenario in the network.

Figure 1. Cisco Nexus 5020 Switch in the Data Center Network



Data Center Transformation with the Cisco Nexus 5020 Switch

- **Total cost of ownership (TCO)** reduction through data center infrastructure simplification
- Data center **consolidation** with investment protection for existing Dell PowerEdge server, network, storage, and facilities assets
- Increased **business agility** through virtual machine optimized services
- Enhanced **business resilience** through higher levels of operational continuity
- **Ease of deployment** and alignment with existing operational models and best practices in the data center

Total Cost Reduction with Unified Fabric

The Cisco Nexus 5020 Switch provides a unified fabric over 10 Gigabit Ethernet for LAN, SAN, and cluster traffic. This unification enables consolidation and higher 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.

The Cisco Nexus 5020 Switch simplifies cable management, allowing hosts to connect to any network through a unified Ethernet interface and enabling faster rollout of new applications and services.

Innovations in the Cisco Nexus 5020 Switch

- **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
- **Cisco Data Center Ethernet**, a main component of Cisco Data Center 3.0 architecture, with features including Layer 2 multipathing, which increases scalability in the data center
- **Optional unified fabric** with Fibre Channel over Ethernet (FCoE) for I/O consolidation, reducing power and cabling requirements and simplifying data center networks especially for SAN consolidation Fibre Channel
- **Virtual machine** optimized services for higher asset utilization, simplified server connections, rapid server provisioning, security, and quality of service (QoS)

Protect Investment and Operational Best Practices

The Cisco Nexus 5020 Switch lets customers take advantage of the cost and functional benefits of a unified fabric while protecting their investments in existing network, storage, and Dell PowerEdge server assets. The platform supports end-to-end, role-based security with Cisco TrustSec implemented in the hardware.

The Cisco Nexus 5020 Switch can be easily inserted into an existing data center network to provide immediate benefits without causing disruption or rework of existing design and operational best practices.

Cisco Data Center Ethernet

Cisco Data Center Ethernet provides a suite of standards-based extensions to existing Ethernet, making Ethernet lossless, which is critical in a converged environment where it must flawlessly carry storage traffic. This lossless characteristic is required to successfully deploy FCoE, but it is also of value for other types of data center traffic such as Dell EqualLogic iSCSI, video, multicast, and other critical traffic flows. Additionally, Cisco Data Center Ethernet simplifies the Layer 2 topology in the data center, improving the stability and manageability of the data center network.



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Optional Fibre Channel over Ethernet (FCoE)

FCoE is an open standards-based protocol designed to transport Fibre Channel protocols over Ethernet. It involves straightforward encapsulation of Fibre Channel into Ethernet. FCoE eliminates the need for separate switches, cabling, adapters, and transceivers for each class of traffic, dramatically reducing power consumption and helping reduce both capital and operational expenses for businesses.

Virtual Machine Optimized Services

Virtualization is the cornerstone of the Cisco Data Center 3.0 architecture because it increases the utilization of the resources in the data center. The Cisco Nexus 5020 Switch is designed to support virtualization and virtual machine mobility by mapping virtual machines to network profiles, allowing network services to be allocated at per-virtual machine granularity centrally from the unified fabric. This cohesive capability to move virtual machines and network profiles together eases manageability and increases isolation. Further, consistent network and security policies can be enabled centrally over the unified fabric.

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

- Operational Manageability
 - Simpler, more resilient Layer 2 network
 - Preservation of management best practices
- Transport Flexibility
 - FCoE-based unified fabric
 - Virtual machine optimized services
 - Lossless 10 Gigabit Ethernet and Cisco Data Center Ethernet
- Infrastructure Scalability
 - Reduced power and cooling demands
 - Nonblocking capacity of more than 1 terabit per second (Tbps)

Cisco Nexus 5020 Switch

- Two rack-unit (2RU), 10 Gigabit Ethernet, and FCoE switch with 1.04 Tbps throughput
- Up to 56 ports: 40 fixed 10 Gigabit Ethernet ports with Small Form-Factor Pluggable Plus (SFP+) connectors and two expansion slots (Figure 2)

Expansion Modules

- An Ethernet module with six SFP+ ports per module that support 10 Gigabit Ethernet, Cisco Data Center Ethernet, and FCoE
- A Fibre Channel module with 8 ports of 1-/2-/4-Gbps native FC through SFP+ ports
- A Fibre Channel plus Ethernet module with four ports of 10 Gigabit Ethernet, Cisco Data Center Ethernet and FCoE via SFP+ interface, and four ports of 1-/2-/4-Gbps native Fibre Channel connectivity via SFP interface

Figure 2. Cisco Nexus 5020 Switch and Expansion Modules



Expansion Module Options for the Cisco Nexus 5020

The Cisco Nexus 5020 is equipped to support expansion modules that can be used to increase the number of 10 Gigabit Ethernet, Cisco Data Center Ethernet, and FCoE ports or connect to Fibre Channel SANs with 1-/2-/4-Gbps Fibre Channel switch ports, or both. The Cisco Nexus 5020 supports any combination of two modules from the following offerings:

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

Data Center-Class Operating System

The Cisco Nexus 5020 is based on Cisco NX-OS Software, which provides superior availability, operational efficiency, and security in enterprise data center environments.

Management

The Cisco Nexus 5020 supports the standard Cisco command-line interface (CLI), role-based access control, Cisco Fabric Manager, and standard interfaces for Simple Network Management Protocol (SNMP) and XML.



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Table 1. Cisco Data Center Ethernet Features and Benefits

Cisco Data Center Ethernet Feature	Business Benefit
Priority Flow Control (PFC)	<ul style="list-style-type: none"> Simplifies management of multiple traffic flows over a single network link Creates lossless behavior for Ethernet by allowing class-of-service (CoS)-based flow control
Bandwidth Management	Enables consistent management of QoS at the network level by providing consistent scheduling of different traffic types (IP, storage, etc.)
Data Center Bridging Exchange (DCBX) Protocol	Simplifies network deployment and reduces configuration errors by providing autonegotiation of Cisco Data Center Ethernet features between the NIC and the switch and between switches
Congestion Management (Backward Congestion Notification [BCN])	Pushes congestion to network edges, providing better control over QoS (future release); the Nexus Cisco 5000 Series hardware supports a precursor to IEEE 802.1Qau called BCN, which will be made available based on availability of other system components, such as adapters and core switches and routers
Layer 2 Multipathing	<ul style="list-style-type: none"> Allows active-active uplinks from access switch Increases network performance and Layer 2 domain scale

Table 2. Additional Switch Features and Benefits

Feature	Business Benefit
FCoE	<ul style="list-style-type: none"> Transparently encapsulates Fibre Channel packets into Ethernet Enables I/O consolidation at the rack level by significantly reducing network-related cabling, power, and cooling
Delayed Drop	<ul style="list-style-type: none"> Uses the Ethernet Pause mechanism to absorb short-term traffic bursts, improving network resiliency and reliability Can be configured on a per-traffic-flow basis
Hardware-based Cisco VN-Link	<ul style="list-style-type: none"> Allows the switch to take ownership of virtual machine NICs (vNICs) Hardware ASIC implementation for 10 Gbps performance

Table 3. Transceiver and SFP+s

Cisco Catalyst 5020 Transceiver Modules	Part Number
10GBase SR SFP+ optic	SFP-10G-SR
10GBase Copper SFP+ (Twinax) cable 1 meter	SFP-H10GB-CU1M
10GBase Copper SFP+ (Twinax) cable 3 meter	SFP-H10GB-CU3M
10GBase Copper SFP+ (Twinax) cable 5 meter	SFP-H10GB-CU5M

Table 4. Ordering Information

Product Name	Part Number
Nexus 5020 Chassis. 40-port 10 GE 2RU switch with 5 fan modules, 1 power supply, and accessory kit	N5K-5020BF-D-WO
Nexus 5000 6-port 10 Gigabit Ethernet Module (requires SFP+ options)	N5K-M1600
Optional second power supply. Nexus 5020 1200W AC Power Supply	N5K-PAC-1200W

For More Information

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