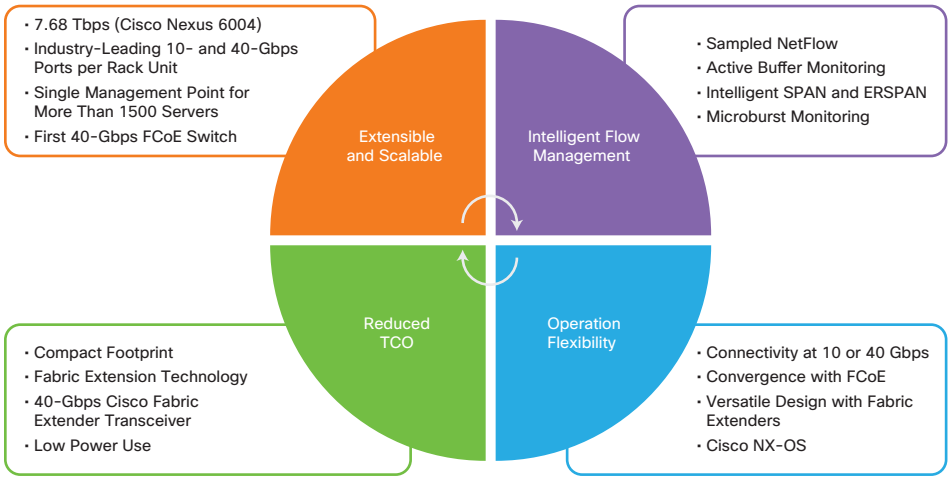
Cisco Nexus 6000 Series Switches

Cisco Nexus 6000 Series Switches Portfolio

The Cisco Nexus® Family, Cisco's flagship switching product line in the data center, has been the benchmark for innovation in the networking industry. Complementing the existing Cisco Nexus Family switches, the Cisco Nexus 6000 Series is an important component of the Cisco® Unified Data Center architecture. The Cisco Nexus 6004 and 6001 Switches extend the industry-leading innovations and versatility of the Cisco Nexus Family with high 40-Gbps, 10-Gbps, and Fibre Channel over Ethernet (FCoE) port density; an energy-efficient small form factor; low latency; multilayer services; and the choice of front-to-back or back-to-front cooling. With its scalability and performance, the Cisco Nexus 6000 Series is designed for a broad range of traditional data center and large-scale virtualized cloud deployments. The Cisco Nexus 6000 Series also uses the Cisco NX-OS Software operating system to offer the intelligent flow management and operation flexibility required in data center deployments (Figure 1).

Figure 1. Introducing the Cisco Nexus 6000 Series



The Cisco Nexus 6000 Series provides a platform for customers to build a robust data center fabric that can scale significantly to accommodate data center growth in future years.

Challenges

The Cisco Nexus 6000 Series architecture with new innovations delivers the infrastructure needed to support cloud deployments and data centers optimized for virtualization. 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 6000 Series addresses these challenges with scalability and performance that make this platform well suited to meeting the current and future needs of the data center. The Cisco Nexus 6000 Series with front-to-back or back-to-front cooling supports efficient data center hot- and cold-aisle designs. The Cisco Nexus 6004 Switch helps data centers operate within their space, power, and cooling parameters. The Cisco Nexus 6004 addresses the needs of high-frequency trading (HFT) applications by delivering port-to-port latency of about 1 microsecond using cut-through switching technology.

Cisco Nexus 6001 and 6004 Switches

The Cisco Nexus 6004 Switch (Figure 2) is a four-rack-unit (4RU) 10 and 40 Gigabit Ethernet and FCoE switch offering up to 7.68 terabits per second (Tbps) of throughput switching performance and up to 96 x 40-Gbps ports per fully populated system. The Cisco Nexus 6004 is also equipped with four expansion modules to accommodate network growth. The expansion modules provide 12 ports of 40-Gbps Gigabit Ethernet and FCoE ports using a Quad Small Form-Factor Pluggable (QSFP) interface. With all four expansion modules installed, the Cisco Nexus 6004 delivers 96 ports of QSFP connectivity. The Cisco Nexus 6004 can also support up to 384 ports of Enhanced SFP (SFP+) connectivity using breakout cables. Each port on the chassis can operate in either 1 x 40 Gigabit Ethernet or 4 x 10 Gigabit Ethernet mode. The Cisco Nexus 6004 supports grid redundancy and 3+3 redundancy through the use of six power supplies. When PortChannels are applied to FCoE Inter-switch links (ISLs), the Cisco Nexus 6004 provides up to 640 Gbps of storage throughput, nearly six times the throughput of traditional storage ISLs.

Figure 2. Cisco Nexus 6004 Chassis

The Cisco Nexus 6001 (Figure 3) is a 1RU switch with 48 fixed 10 Gigabit Ethernet SFP+ and four fixed 40 Gigabit Ethernet QSFP+ ports used as uplinks. The Cisco Nexus 6001 is a multipurpose switch that is excellent for top-of-rack (ToR) access and leaf node switching supporting 1 and 10 Gigabit Ethernet servers. The Cisco Nexus 6001 offers power supply grid redundancy and 1+1 redundancy through the use of two power supplies.

Figure 3. Cisco Nexus 6001 Chassis

The Cisco Nexus 6004 and 6001 use a custom-built application-specific integrated circuit (ASIC) to deliver Layer 2 and Layer 3 features at line rate. Using the state-of-the-art Cisco ASICs, the Cisco Nexus 6000 Series supports the large buffer capacity and low latency between ports required for latency-sensitive environments. Cisco Nexus 6000 Series Switches support industry-leading fabric extender architecture with Cisco Nexus 2000 Series Fabric Extenders and the Cisco Nexus B22 Blade Fabric Extender, In-Service Software Upgrade (ISSU), and Cisco FabricPath. Operating efficiency and programmability are enhanced on the Cisco Nexus 6000 Series through advanced analytics, Power-On Auto-Provisioning (POAP), and Python Tool Command Language (TCL) scripting.

The Cisco Nexus 6004 in a 4RU form factor quadruples performance and density and massively boosts bandwidth with the introduction of true 40 Gigabit Ethernet. The Cisco Nexus 6001 delivers 1.5 times the density in a 1RU form factor with additional true 40 Gigabit Ethernet. Table 1 lists performance and scalability enhancements in the Cisco Nexus 6000 Series.

Table 1. Primary Performance and Scalability Enhancements

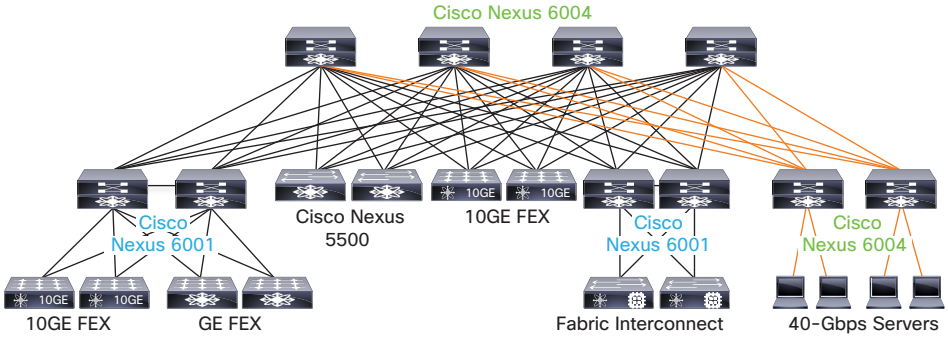
Product Feature	Cisco Nexus 6000 Series Scale*
MAC address table	256K MAC and /Address Resolution Protocol (ARP) addresses (flexible)
IP unicast routes	32K (IPv4) or 8K (IPv6)
IP hosts	128K (IPv4) or 64K (IPv6)
IP multicast routes	32K (IPv4) or 16K (IPv6)
VLANs	4K
Access control lists (ACLs)	4K (flexible)
Internet Group Management Protocol (IGMP) snooping groups	32K
Virtual Routing and Forwarding (VRF) instances	4K
Buffer	25 million per 3 x 40-Gbps QSFP+ or 12 x 10-Gbps SFP+
Cisco Switched Port Analyzed (SPAN)	31; 16 can be Encapsulated Remote SPAN (ERSPAN)

Hardware capability
* 1K =1024

The comprehensive feature set of the Cisco Nexus 6004 make it well suited for direct-attach 10 Gigabit Ethernet access and high-density fabric extender aggregation deployments, leaf and spine architectures, and compact aggregation to build scalable Cisco Unified Fabric in the data center. The Cisco Nexus 6001 is the right choice for ToR deployments such as direct-attach 10 Gigabit Ethernet server-access and fabric extender aggregation deployments and leaf and spine designs to build scalable Cisco Unified Fabric in data centers.

The Cisco Nexus 6004 can be an aggregation point for Cisco Nexus 2200 platform fabric extenders, a connectivity point for 40 Gigabit Ethernet servers, and an aggregation or spine node for Cisco Nexus 5500 platform switches, Cisco Nexus 6001 Switches, and other Cisco Nexus 6004 Switches. The Cisco Nexus 6001 can be deployed as an access or leaf node providing connectivity to servers, Cisco Nexus 2200 platform fabric extenders, and Cisco Unified Computing System™ (Cisco UCS®) fabric interconnects (Figure 4).

Figure 4. Cisco Nexus 6000 Series Deployment Scenarios



Benefits

In today's data centers, IT is tasked with building business agility while lowering total cost of ownership (TCO). The Cisco Nexus 6000 Series can adapt to increasing bandwidth demands with low power use and a compact space profile, reducing capital expenditures (CapEx) and operating expenses (OpEx). The Cisco Nexus 6000 Series with high port density, lossless Ethernet, line-rate performance, and very low latency is well suited to meet the growing demands in the data center with a common Ethernet-based fabric in physical and virtual data center deployments. The Cisco Nexus 6000 Series is excellent for customers who have standardized on the fabric extender architecture, warranty coverage, and technical service options.

The Cisco Nexus 6000 Series comes with a Cisco 90-day hardware warranty. Adding a contract for a technical service offering such as Cisco SMARTnet® Service to your device coverage provides access to the Cisco Technical Assistance Center (TAC) and can provide a variety of hardware replacement options to meet critical business needs, updates for licensed OS software, and registered access to the extensive Cisco.com knowledge base and support tools.

For More Information

For more information about Cisco warranties, go to www.cisco.com/go/warranty.

For information about Cisco Technical Services, go to www.cisco.com/go/ts.

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