Data Sheet

Cisco SFS 7012D and 7024D InfiniBand Server Switches

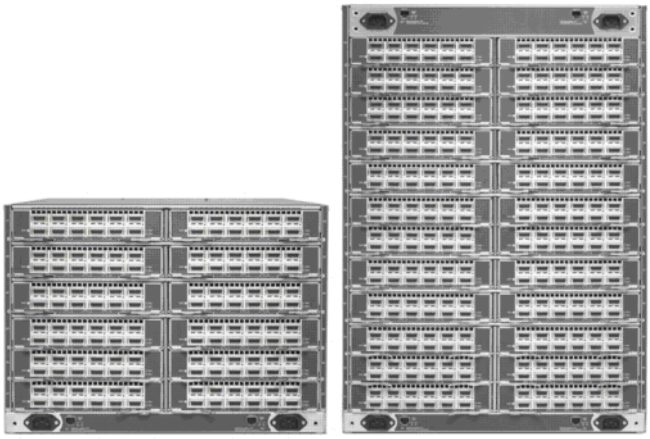
The Cisco® SFS 7012D and 7024D InfiniBand Server Switches set the standard for high-density, low-latency, 4X DDR and SDR InfiniBand switching for building high-performance clusters.

High-performance computing (HPC) applications that solve complex, computationally intensive problems are widely deployed within academic and research communities and enterprises because they deliver significant business benefits. An important enabler for the broad adoption of HPC applications is the practice of clustering multiple industry-standard servers using a high-speed network to provide supercomputer performance, at a fraction of the cost of traditional supercomputers.

PRODUCT OVERVIEW

The Cisco SFS 7012D and 7024D (Figure 1) provide nonblocking switching for up to 144 and 288 InfiniBand 4X ports respectively. Each port can operate in double data rate (DDR) mode, which delivers 20 Gbps, or single data rate (SDR) mode, which delivers 10 Gbps for server or inter-switch link connectivity. The Cisco SFS 7012D supports fully redundant, hot-swappable components that are ideal for building large-scale, highly available clusters for HPC applications. The Cisco SFS 7012D and 7024D are optimized for very large, high-density HPC environments and deliver nonblocking, high-bandwidth, low-latency switching in a cost-effective form factor.

Figure 1. Cisco SFS 7012D and 7024D InfiniBand Server Switches



BENEFITS

The Cisco SFS 7012D and 7024D offer the following benefits:

- 144 or 288 InfiniBand 4X 20-Gbps (DDR) or 10-Gbps (SDR) autosensing ports
- Comprehensive performance and fabric diagnostics tools in a fully managed switch
- High-performance, industry standards-based InfiniBand interconnect technology
- Integration with other Cisco SFS 7000 Series InfiniBand Server Switches
- Easy configuration, monitoring, and maintenance in-band and out-of-band

FEATURES

The following features are included with the Cisco SFS 7012D and 7024D:

- Up to 288 ports of nonblocking, InfiniBand 4X 20-Gbps (DDR) or 10-Gbps (SDR) connectivity with full bisectional bandwidth
- Supports DDR-to-SDR switching capability for investment protection and higher server densities
- Command-line interface (CLI), Web, and Java-based systems management options
- Powered ports to enable flexible copper and optical interface configurations
- Hot-swappable components, including online insertion and removal (OIR), redundant fans, and power supplies
- InfiniBand 1.0a and 1.1 compliant
- Standalone Cisco High-performance Subnet Manager

FABRIC DENSITY AND SCALABILITY

The Cisco SFS 7012D and 7024D are among the highest-density InfiniBand switches in the industry today. With 12 InfiniBand 4X SDR/DDR ports per slot, these switches can support up to 144 or 288 nonblocking InfiniBand 4X ports at either 20- or 10-Gbps respectively within a single chassis for server and inter-switch connectivity. When combined with other Cisco SFS 7000 Series InfiniBand Server Switches, the Cisco SFS 7012D and 7024D provide the foundation for building very large HPC clusters consisting of thousands of nodes to support the most demanding HPC applications.

HIGH RELIABILITY AND AVAILABLITY

The Cisco SFS 7012D and 7024D deliver the performance, scalability, and director-class uptime required for the most demanding HPC environments. Minimizing downtime requires rapid hardware serviceability and software upgrades. The Cisco SFS 7012D and 7024D are optimized for reliability and availability and support hot-swappable components to help eliminate downtime and maximize the availability of the cluster or compute environment. This includes hot-pluggable, redundant fan trays and power supplies that can be field-upgraded without requiring the switch to power down.

SIMPLIFIED MANAGEMENT

Configuration, remote management, monitoring, diagnostics, and updates are supported through Telnet, Secure Shell Protocol Version 2 (SSHv2), and serial command-line interface (CLI) as well as a powerful, fully featured, browser-based GUI that enables the Cisco SFS 7012D and 7024D to be deployed in a ready-to-use fashion in the network within minutes. The Cisco SFS 7012D and 7024D can be managed using the Cisco SFS management suite or with existing network management systems using standard protocols such as Simple Network Management Protocol (SNMP), with supported SNMPv3 security.

FABRIC INTELLIGENCE

The Cisco SFS 7012D and 7024D offer sophisticated system and network management capability that simplifies monitoring, diagnostics, and maintenance. The comprehensive management capability quickly identifies and isolates trouble areas, or "hot spots." Each field-replaceable unit (FRU) supports a full suite of system-level diagnostic health checks that assess the health of all components to detect potential problems, such as rising temperature or internal error rates, and report these anomalies in real time to proactively notify the system administrator. The Cisco SFS 7012D and 7024D also support a full complement of real-time performance monitoring, including graphing of bandwidth utilization and error rates, to give system administrators an unprecedented view of fabric performance.

VALUE

The Cisco SFS 7012D and 7024D support autosensing of InfiniBand 4X DDR or SDR attached devices and also support the capability to forward packets between DDR and SDR connections to provide better utilization of system resources and investment protection for existing InfiniBand 4X devices. For example, the Cisco SFS 7012D can support 96 InfiniBand 4X SDR server connections with 48 DDR uplinks to the InfiniBand fabric core, which provides nonblocking uplink capacity and high-density server connectivity. The Cisco SFS 7012D and 7024D are IBTA 1.0a and 1.1 standards-compliant, and are interoperable with other IBTA standards-compliant InfiniBand products. The high-performance Cisco InfiniBand Subnet Manager and Cisco SFS 7012D and 7024D deliver the performance required to build the largest InfiniBand switch networks.

COMPLETE SERVER SWITCHING SOLUTION

The Cisco SFS 7012D and 7024D are a part of the Cisco SFS 7000 Series of InfiniBand Server Switches which, combined with the Cisco Catalyst® 6000 Series Switches and Cisco MDS 9000 Series Switches, deliver a comprehensive, industry-leading data center switching solution. The Cisco SFS solution also includes integrated Ethernet and Fiber Channel gateway modules, and 20-Gbps InfiniBand host channel adapters (HCAs) with a complete suite of upper-layer protocols: IP over InfiniBand, Messaging Passing Interface (MPI), Sockets Direct Protocol (SDP), SCSCI RDMA Protocol (SRP), and user Data Access Provider Layer (uDAPL). The Cisco SFS 7012D and 7024D share common switch software with all the other Cisco SFS 7000 and 3000 Series server switches, offering a clear growth path while protecting existing investments.

PRODUCT SPECIFICATIONS

Table 1 describes the systems architecture for the Cisco SFS 7012D and 7024D. Tables 2 and 3 list the mechanical and environmental specifications, and Table 4 lists the management features.

Table 1. Systems Architecture

	Cisco SFS 7012D	Cisco SFS 7024D
Cards, Ports, Slots	• Up to 144 nonblocking InfiniBand 4X autosensing DDR/SDR ports • 12 slots, each taking a 12-port 4X InfiniBand line card • Copper or optical interfaces • One RS-11 serial port, one Ethernet management port	• Up to 288 nonblocking InfiniBand 4X autosensing DDR/SDR ports • 24 slots, each taking a 12-port 4X InfiniBand line card • Copper or optical interfaces • Two RS-11 serial ports, two Ethernet management ports
Performance	• All ports nonblocking and wire-speed, 5.76-Tbps aggregate bandwidth (144 ports x 20 Gbps x bidirectional)	• All ports nonblocking and wire-speed, 11.5-Tbps aggregate bandwidth (288 ports x 20 Gbps x bidirectional)
Chassis	• 7RU, 19-inch rack-mountable chassis • Passive mid-plane design with cable connections on opposite side of active components • All modules hot-swappable • IBTA 1.0a and 1.1 standards-compliant • Restrictions on Hazardous Substances (RoHS)-compliant	• 14RU, 19-inch rack-mountable chassis • Passive mid-plane design with cable connections on opposite side of active components • All modules hot-swappable • IBTA 1.0a and 1.1 standards-compliant • RoHS-compliant
Switch Fabric and Management Module	• Up to 3 per system • 1 switch fabric management module required; 2 possible for high availability • Up to 3 per system for nonblocking switching and high availability • Hot-swappable FRU • Operation status, active fabric controller, and alert LEDs	• Up to 6 per system • 2 switch fabric management modules required; 4 possible for high availability • Up to 6 per system for nonblocking switching and high availability • Hot-swappable FRU • Operation status, active fabric controller, and alert LEDs

	Cisco SFS 7012D	Cisco SFS 7024D
Line Interface Module	• Up to 12 per system • 12 dual-speed DDR/SDR 4X InfiniBand Ports • Supports hot-pluggable optical media converter on a port-by-port basis • Physical connection and traffic LEDs for each port • Hot-swappable FRU • Port status, operation status, and alert LEDs	• Up to 24 per system • 12 dual-speed DDR/SDR 4X InfiniBand Ports • Supports hot-pluggable optical media converter on a port-by-port basis • Physical connection and traffic LEDs for each port • Hot-swappable FRU • Port status, operation status, and alert LEDs
Power Supply	• Up to 6 per system • Redundant, hot-swappable FRU • 350W per power supply • Operation status and alert LEDs	• Up to 12 per system • Redundant, hot-swappable FRU • 350W per power supply • Operation status and alert LEDs
Fan Module	• Up to 4 fan trays (2 fans per tray) per system • Cooling: front to back • Redundant, hot-swappable FRU • Operation status and alert LEDs	• Up to 8 fan trays (2 fans per tray) per system • Cooling: front to back • Redundant, hot-swappable FRU • Operation status and alert LEDs

Table 2. Mechanical Specifications

	Cisco SFS 7012D	Cisco SFS 7024D
Mounting	Mountable in a standard 19-inch Electronic Industries Alliance (EIA) rack	Mountable in a standard 19-inch EIA rack
Size	• Standard 19-inch rack-mountable • 7RU height (12.25 inches) • 25.75-inch depth	• Standard 19-inch rack-mountable • 14RU height (24.5 inches) • 25.75-inch depth
Air Flow	Front to back	Front to back
Weight	65–110 lbs, based on configuration	100–200 lbs, based on configuration

Table 3. Environmental Specifications

	Cisco SFS 7012D	Cisco SFS 7024D
Temperature	• Operating: 50 to 113°F (10 to 45°C) • Storage: –40 to 167°F (-40 to 75°C)	• Operating: 50 to 113°F (10 to 45°C) • Storage: –40 to 167°F (-40 to 75°C)
Altitude	• Operating: 10,000 ft • Storage: 40,000 ft	• Operating: 10,000 ft • Storage: 40,000 ft
Humidity	• Operating: 20 to 80% non-condensing • Storage: 5 to 90% non-condensing	• Operating: 20 to 80% non-condensing • Storage: 5 to 90% non-condensing
Shock	• Operating: 5G maximum, 11 ms half-sine wave; 10G maximum, 5 ms half-sine wave • Storage: 10G maximum, 11 ms half-sine wave	• Operating: 5G maximum, 11 ms half-sine wave; 10G maximum, 5 ms half-sine wave • Storage: 10G maximum, 11 ms half-sine wave
Vibration	• Operating: 0.50G maximum, 3–200 Hz, 15 min (Sinusoidal); 1.02Grms, 3-axis, bottom/top, left/right, front/back (random) • Storage: 0.50G maximum, 3–200 Hz, 15 min (Sinusoidal); 2.09Grms, 3-axis, bottom/top, left/right, front/back (random)	• Operating: 0.50G maximum, 3–200 Hz, 15 min (Sinusoidal); 1.02Grms, 3-axis, bottom/top, left/right, front/back (random) • Storage: 0.50G maximum, 3–200 Hz, 15 min (Sinusoidal); 2.09Grms, 3-axis, bottom/top, left/right, front/back (random)
Power	• 90–264 V AC automatic-ranging, 47-63 Hz, 350W maximum per power supply	• 90–264 V AC automatic-ranging, 47–63 Hz, 350W maximum per power supply

Table 4. Management Features

	Cisco SFS 7012D	Cisco SFS 7024D
Subnet Management	• External subnet manager for scalable deployments	• External subnet manager for scalable deployments
Network Management	• Easy configuration, monitoring, and maintenance in-band and out-of-band • Web-based systems management GUI • CLI through Telnet, SSHv2, and serial console	• Easy configuration, monitoring, and maintenance in-band and out-of-band • Web-based systems management GUI • CLI through Telnet, SSHv2, and serial console
Management Framework	• Supports Simple Network Management Protocol Version 2 (SNMPv2)	• Supports SNMPv2

SERIES OF PRODUCTS

The Cisco SFS 7012D and 7024D are part of a complete family of server switches including the Cisco SFS 7000 Series InfiniBand Server Switches, Cisco SFS 3000 Series Multifabric Server Switches, and Cisco InfiniBand PCI-X and PCI Express Host Channel Adapters.

ORDERING INFORMATION

To place an order, visit the Cisco Ordering Home Page. Table 5 lists the ordering information for the Cisco SFS 7012D and 7024D.

Table 5. Ordering Information

Part Number	Description
SFS-7012D	Cisco SFS 7012D InfiniBand Server Switch, 144-port chassis
SFS-7024D	Cisco SFS 7024D InfiniBand Server Switch, 288-port chassis
SFSX7012/24D-4X12	Cisco SFS 7012D/7024D InfiniBand 4X 12-Port Line Card
SFS-7012/24D-FM	Cisco SFS 7012D/7024D Switch Fabric Module – no management
SFS-7012/24D-MM-K9	Cisco SFS 7012D/7024D Switch Fabric Module – with management
PWR-SFS7012/24P	Cisco SFS 7012D/7024D Power Supply

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FOR MORE INFORMATION

For more information about the Cisco SFS 7012D and 7024D visit http://www.cisco.com or contact your local account representative.

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