

Cisco SFS 7008P InfiniBand Server Switch

The Cisco® SFS 7008P InfiniBand Server Switch sets the standard for 10 Gbps (4X), low-latency InfiniBand switching for building high-performance clusters using industry-standard servers.

High-performance computing (HPC) applications that solve complex, computationally intensive problems are widely deployed within academic and research communities and enterprises as they deliver significant business benefits. A key 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 7008P InfiniBand Server Switch is a new class of data center infrastructure that delivers scalable, high-performance, low-latency server switching to enable industry-standard servers to form high-performance clusters and grids that deliver the full potential of HPC applications.

The Cisco SFS 7008P InfiniBand Server Switch (Figure 1), with the embedded Cisco InfiniBand Subnet Manager, is a director-class switch designed for mission-critical environments. The Cisco SFS 7008P is a 6-rack-unit (6-RU) chassis that supports non-blocking forwarding (1.92 Tbps) across 96 10-Gbps full duplex ports. The low-latency, non-blocking architecture combined with Rapid Service Architecture that supports fully redundant, hot-swappable components makes the Cisco SFS 7008P ideal for building scalable and highly available clusters for high-performance computing applications.

Figure 1. Cisco SFS 7008P InfiniBand Server Switch



BENEFITS

The Cisco SFS 7008P offers the following customer benefits:

- 96 ports of non-blocking 10-Gbps (4X) InfiniBand server connectivity with full bisectional bandwidth (1.92 Tbps)
- Powered ports to enable flexible copper and optical interface configurations
- Cisco Rapid Service Architecture to allow service and replacement of all active electronics without removing cables
- Director-class high availability and stateful failover, eliminating service disruption
- InfiniBand 1.2 Compliant
- Embedded Cisco InfiniBand Subnet Manager enables convenient “plug and play” operation for small clusters that can scale to support large HPC clusters
- Optional external high-performance Cisco Subnet Manager for very large HPC environments
- Comprehensive performance and fabric diagnostics tools in a fully managed switch
- Easy configuration, monitoring, and maintenance in-band and out-of-band

FEATURES

The following features are included with the Cisco SFS 7008P:

- High-performance, ultra low-latency switched 10-Gbps server interconnect
- 96 non-blocking, 10-Gbps full duplex (4X) InfiniBand ports
- Full bisectional bandwidth (1.92 Tbps)
- Rapid Service Architecture where all field-replaceable units (FRUs) are redundant and hot-swappable
- Passive mid-plane chassis that does not require any cables to be removed to service active components
- Dual redundant Cisco InfiniBand Subnet Managers with stateful switchover (SSO) to enable graceful recovery from system errors
- In-depth systems diagnostics and automatic recovery from many system errors

FABRIC DENSITY AND SCALABILITY

The Cisco SFS 7008P is an 8-slot chassis that supports twelve 10-Gbps ports per slot (Figure 2). The Cisco SFS 7008P can support up to 96 10-Gbps (4X) non-blocking InfiniBand ports. When combined with other Cisco SFS 7000 Series InfiniBand switches, the Cisco SFS 7008P provides the foundation for building very large HPC clusters consisting of thousands of nodes to support the most demanding HPC applications.

RAPID SERVICE ARCHITECTURE

The Cisco SFS 7008P delivers the performance, scalability, and director-class uptime required for the most demanding HPC environments. Minimizing downtime requires rapid hardware serviceability and software upgrades. With fully redundant power, cooling, and system management, every switch component is hot-swappable and supports automatic failover. The Cisco SFS Rapid Service Architecture provides a passive mid-plane chassis design that isolates all active electronics on the front of the chassis, while all cable connections are located at the back. The Rapid Service Architecture allows switch modules to be replaced without detaching a single cable to reduce the mean time to repair (MTTR) from hours to minutes.

The Cisco SFS 7008P can also maintain multiple system-image versions and automate rolling upgrades and rollback between the redundant system management CPUs. The Cisco SFS 7008P can tolerate and recover from an internal fabric management error without any service interruption. Reliability is further enhanced by its ability to automatically upgrade any FRUs that are inserted into the switch to help ensure that the entire system configuration is always synchronized. The embedded Cisco InfiniBand Subnet Manager constantly synchronizes operational information with other Cisco InfiniBand Subnet Managers within the network so that if any one switch fails, another subnet manager can assume active subnet manager responsibility.

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 GUI that enables the Cisco SFS 7008P to be deployed in a ready-to-use fashion in the network within minutes. The Cisco SFS 7008P 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 7008P offers sophisticated system and network management capability that simplifies monitoring, diagnostics, and maintenance. Its comprehensive management capability quickly identifies and isolates trouble areas, or “hot spots.” Each 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 7008P also supports a full complement of real-time performance monitoring capabilities, including graphing of bandwidth utilization and error rates, to give systems administrators an unprecedented view of fabric performance. The Cisco SFS 7008P includes dual, redundant instances of the embedded Cisco InfiniBand Subnet Manager that provides rapid re-routing in the event of a path failure or switch failure, maintaining maximum availability on the InfiniBand network. These are synchronized across redundant management controllers, facilitating graceful switchover if a switch fault occurs—without any system interruptions.

VALUE

The Cisco SFS 7008P is IBTA 1.2 standards-compliant, and is interoperable with other IBTA standards-compliant InfiniBand products. The embedded Cisco InfiniBand Subnet Manager can manage InfiniBand switch networks consisting of thousands of nodes. Optionally, the standalone, high-performance Cisco InfiniBand Subnet Manager enables the Cisco SFS 7008P to scale to support the largest InfiniBand switch networks. To access IP and storage resources, the Cisco SFS 7008P and Cisco SFS 3000 Ethernet and Fiber Channel gateways provide transparent IP and storage connectivity between high-performance InfiniBand server clusters and Cisco Catalyst® 6000 Series Switch-based LANs and Cisco MDS 9000 Family switch-based SANs.

Figure 2. Cisco SFS 7008P Back Side, with Switch Ports and Redundant Power and Management



COMPLETE SERVER SWITCHING SOLUTION

The Cisco SFS 7008P is 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 10-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 7008P shares common switch software with all the other Cisco SFS 7000 and SFS 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 7008P. Tables 2 and 3 list the mechanical and environmental specifications, and Table 4 lists the management features.

Table 1. Systems Architecture

Feature	Description
Cards, Ports, Slots	<ul style="list-style-type: none">• Up to 96 ports non-blocking 10 Gbps (4X) InfiniBand• 8-slot chassis• Copper or optical interfaces• One RS-232 serial port, one Ethernet management port per management module (2 per switch)
Performance	<ul style="list-style-type: none">• Non-blocking, wire-speed performance: 1.92-Tbps aggregate bandwidth (96 ports x 10 Gbps full duplex)• 50% blocking fabric option available
Chassis	<ul style="list-style-type: none">• 6-RU, 19-inch rack-mountable chassis• Passive mid-plane design with cable connections on opposite side of active components• All modules hot-swappable• InfiniBand 1.2 compliant• RoHS compliant
Switch Fabric Module	<ul style="list-style-type: none">• Up to 6 per system• Hot-swappable FRU• Operational status, active fabric controller, and alert LEDs
Line Interface Module	<ul style="list-style-type: none">• Up to 8 per system• 12 ports 10-Gbps (4X) InfiniBand• Power ports support 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

Feature	Description
Management Module	<ul style="list-style-type: none"> • Up to 2 per system • Topspin OS fabric and chassis management, including performance monitoring and system diagnostics • InfiniBand v1.2 compliant management • Redundant, synchronized, hot-swappable fabric management • 10/100 Ethernet and RS-232 console ports • System-status and alert LEDs,
Power Supply	<ul style="list-style-type: none"> • Up to 2 per system • Redundant, hot-swappable FRU • Total power requirement: < 600W • Operation-status and alert LEDs
Fan Module	<ul style="list-style-type: none"> • Up to 2 per system • Cooling: front to back • Redundant, hot-swappable FRU • Operation-status and alert LEDs

Table 2. Mechanical Specifications

Feature	Description
Mounting	<ul style="list-style-type: none"> • Mountable in a standard 19-inch Electronic Industries Alliance (EIA) rack
Size	<ul style="list-style-type: none"> • Standard 19-inch rack-mountable • 6-RU height (10.5 inches) • 24-inch depth
Air Flow	<ul style="list-style-type: none"> • Front to back
Weight	<ul style="list-style-type: none"> • 60–110 lbs, based on configuration

Table 3. Environmental Specifications

Feature	Description
Temperature	<ul style="list-style-type: none"> • Operating: 32 to 107°F (0 to 42°C) • Storage: –40 to 158°F (–40 to 70°C)
Altitude	<ul style="list-style-type: none"> • Operating: 10,000 feet • Storage: 40,000 feet
Humidity	<ul style="list-style-type: none"> • Operating: 8 to 80% non-condensing • Storage 5 to 90% non-condensing
Shock	<ul style="list-style-type: none"> • Operating 5G, 11-ms half-sine wave • Storage 10G, 11-ms half-sine wave

Feature	Description
Vibration	<ul style="list-style-type: none"> Operating .25G, 5–300 Hz 15 min. Storage 0.5G, 5–300 Hz 15 min.
Power	<ul style="list-style-type: none"> 90–264 V AC automatic-ranging, 47–63 Hz Maximum power dissipation < 600W

Table 4. Management Features

Feature	Description
Operating System	<ul style="list-style-type: none"> Topspin OS
Subnet Management	<ul style="list-style-type: none"> Embedded and redundant for reliable, plug-and-play deployments
Network Management	<ul style="list-style-type: none"> Easy configuration, monitoring, and maintenance in-band and out-of-band Java-based Element Manager GUI Web-based systems management GUI CLI through Telnet, SSHv2, and RS-232
Management Framework	<ul style="list-style-type: none"> Supports Simple Network Management Protocol Version 2 (SNMPv2) and v3 for management framework integration Secure management: SSHv2, SSL, SNMPv3, RADIUS

SERIES OF PRODUCTS

The Cisco SFS 7008P is 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 7008P.

Table 5. Ordering Information

Part Number	Product Name and Description
SFS7008P	<p>Cisco SFS 7008P InfiniBand Server Switch</p> <ul style="list-style-type: none"> 48-96 4X InfiniBand 10-Gbps or 20-Gbps full duplex (read and write) ports (field upgradeable) 50% blocking or fully nonblocking design with a 1.92 terabits per second (Tbps) backplane and less than 600-ns port-to-port cut through latency Excellent building block for enterprise grids with unified I/O and Cisco VFrame Server Fabric Virtualization software Director-class high availability and stateful failover of all critical components SFS Rapid Service Architecture that allows service and replacement of all active electronics without removing cables Intelligent switch with embedded fabric management, capable of running clusters of thousands of nodes 6-RU modular chassis, with 4-post rack mounting kit optional

Part Number	Product Name and Description
SFS7008P=	Cisco SFS 7008P Switch Chassis (field-replaceable unit [FRU]) <ul style="list-style-type: none"> • Replacement chassis with no line cards
SFS-7008-K9=	Cisco SFS 7008P Switch Chassis (field-replaceable unit [FRU]) <ul style="list-style-type: none"> • Replacement chassis with no line cards
SFS-7008P-HA	Cisco SFS 7008P InfiniBand Server Switch High-Availability Package, includes: <ul style="list-style-type: none"> • Cisco SFS 7008P Switch Fabric Upgrade Kit (non-blocking fabric) • Cisco SFS 7008P Management Interface Module • Cisco SFS 7008P Power Supply • Cisco SFS 7008P Fan Tray
SFS7008P-MFMU	Cisco SFS 7008P Management I/O Upgrade Kit
SFS7008P-SFMU	Cisco SFS 7008P Switch Fabric Upgrade Kit
SFS7008P-PWRU	Cisco SFS 7008P Switch Power Supply Upgrade Kit
SFS7008P-FANU	Cisco SFS 7008P Fan Upgrade Kit
SFS7008P-SFM-K9=	Cisco SFS 7008P Switch Fabric Module, with management <ul style="list-style-type: none"> • Fits in any of the switch fabric module slots in the Cisco SFS 7008P
SFS-X7008P-04X12=	Cisco SFS 7008P InfiniBand 4X 12-Powered-Port Line Card <ul style="list-style-type: none"> • Line card with 12 powered ports of 10-Gbps 4X InfiniBand
SFS7008P-MFM-K9=	Cisco SFS 7008P Management Interface Module <ul style="list-style-type: none"> • Management card for the Cisco SFS 7008P chassis • Add an additional management card for redundant management
PWR-SFS7008P=	Cisco SFS 7008P Power Supply and Cooling Module <ul style="list-style-type: none"> • Replacement power supply for Cisco SFS 7008P chassis • Add an extra power supply to a Cisco SFS 7008P chassis for redundant power
SFS-7008P-CHID=	Cisco SFS 7008P Chassis ID Card (FRU) <ul style="list-style-type: none"> • Replacement chassis ID module for Cisco SFS 7008P chassis
SFS-7008P-SBLNK=	Cisco SFS 7008P SFM Blanking Panels <ul style="list-style-type: none"> • Set of blanking panels for Cisco SFS 7008P switch fabric module line cards • Suitable for temporarily removing Cisco SFS 7008P FRUs while the switch stays in operation
SFS-7008P-PBLNK=	Cisco SFS 7008P Power Supply Blanking Panels <ul style="list-style-type: none"> • Set of blanking panels for Cisco SFS 7008P power supplies • Suitable for temporarily removing Cisco SFS 7008P FRUs while the switch stays in operation
SFS-7008P-FBLNK=	Cisco SFS 7008P Fan Module Blanking Panels <ul style="list-style-type: none"> • Set of blanking panels for Cisco SFS 7008P fan modules • Suitable for temporarily removing Cisco SFS 7008P FRUs while the switch stays in operation
SFS-7008P-MBLNK=	Cisco SFS 7008P Management I/O Blanking Panels <ul style="list-style-type: none"> • Set of blanking panels for Cisco SFS 7008P management I/O line cards • Suitable for temporarily removing Cisco SFS 7008P FRUs while the switch stays in operation

Part Number	Product Name and Description
SFS-7008P-RKIT=	Cisco SFS 7008P Rail Kit (FRU) (Option) <ul style="list-style-type: none"> • Optional rail kit specially designed for mounting Cisco SFS 7008P in a rack • Very solid and suitable for rack-based shipping
CAB-SFS7008P-SER=	Cisco SFS 7000 Series Serial Cable Kit <ul style="list-style-type: none"> • Replacement serial cable kit for Cisco SFS 7000 Series switches

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FOR MORE INFORMATION

For more information about the Cisco SFS 7008P visit <http://www.cisco.com> or contact your local account representative.



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