DATA SHEET

CISCO SFS 7008 INFINIBAND SERVER SWITCH

Consolidate. Reduce costs. Streamline. These are today's datacenter demands. Ever since the mainframe began being disaggregated in the 1980s, some expected the promise of commodity servers and storage to make the difference, but many things stayed the same, and some things became worse. Price-performance became better, but the mainframe's high-speed backplane was replaced with networks with higher latency. Price per device was driven lower, but administrators were forced to manage a proliferating number of devices. Today, the need remains: data center architects want to take the best advantage of server and storage commoditization trends, without sacrificing control or performance. There has to be a better way.

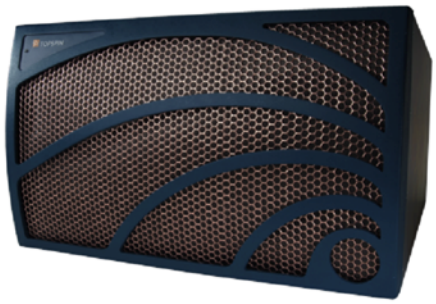
PRODUCT OVERVIEW

The Cisco SFS 7008 InfiniBand Server Switch provides a new class of data center infrastructure that interconnects discreet server resources together into a high performance 10Gbps, low-latency fabric. It brings many of the mainframe "backplane" technologies to commodity servers, including Remote Direct Memory Access (RDMA) for transmitting large amount of data with very little overhead, as well as very low latency (<4 usec user-space latency). These technologies enable commodity servers to be combined into effective high-performance clusters and grids, creating the kind of collective performance required for enabling the trend towards commoditization.

In addition to high performance computing, InfiniBand also offers the performance, security and control required for utility computing. The SFS 7008 interconnects servers via a high-performance, unified fabric, and when combined with SFS 3000 Multifabric Server Switches, enables shared pools of I/O and storage resources that can be mapped together by VFrame Server Fabric Virtualization Software to deliver virtual "compute services".

The Cisco SFS 7008 InfiniBand Server Switch (Figure 1) is a director-class switch designed for mission-critical environments. It has full bi-sectional bandwidth (1.92 Tbps) across 96 20-Gbps full duplex (read and write), ports and embedded fabric management in a 6-rack-unit (6-RU) chassis. The Cisco SFS 7008 is a perfect building block for server fabrics from tens to thousands of nodes. With fully redundant, hot-swappable components, the Cisco SFS 7008 is an ideal component for building scalable and highly available clusters for high-performance computing, scientific, and enterprise applications.

Figure 1. Cisco SFS 7008 InfiniBand Server Switch



BENEFITS

The Cisco SFS 7008 offers the following customer benefits:

- 96 ports of nonblocking 10-Gbps (4X) InfiniBand server connectivity with full bi-sectional bandwidth (1.92 Tbps).
- Cisco Rapid Service Architecture allows service and replacement of all active electronics without removing cables
- Director-class high availability and stateful failover eliminates service disruptions
- Intelligent switch with embedded fabric management, capable of running clusters of thousands of nodes
- Comprehensive performance and fabric diagnostics tools in a fully managed switch
- Integration with Cisco SFS 7000 Series InfiniBand server switches and Cisco SFS 3000 Series multifabric server switches for a wide range of storage, and WAN and LAN connectivity options

FEATURES

The following features are included with the Cisco SFS 7008:

- High-performance, ultra low-latency switched 10-Gbps server interconnect
- 96 ports of nonblocking 10-Gbps or 20-Gbps full duplex (4X) InfiniBand
- 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 and synchronized fabric managers in a single chassis that allow recovery for system errors
- In-depth systems diagnostics of and automatic recovery from many system errors

RAPID SERVICE ARCHITECTURE

The Cisco SFS 7008 is designed to be an aggregation switch for the server clusters or grids, providing performance and scalability with director-class uptime. In medium and large clusters, 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, on the opposite side of the cables that are connected to the back. This allows switch modules to be replaced without detaching a single cable—a powerful concept when all 96 ports are cabled and a component needs to be quickly serviced. This architecture improves mean time to repair (MTTR) from hours to minutes. Also, the switch can maintain multiple system-image versions and automate rolling upgrades and rollback between the redundant system management CPUs. The Cisco SFS 7008 can tolerate and recover from an internal fabric management error without any service interruption. This reliability is further enhanced by the switch's ability to automatically upgrade any FRUs that are inserted into the switch, always keeping the entire system in sync.

FABRIC INTELLIGENCE

The Cisco SFS 7008 provides comprehensive fabric and chassis management running on powerful CPUs in the switch. It automatically detects, isolates, and recovers from failures at the component level. Each FRU actively reports in real-time health checks, including detection of potential problems such as rising temperature or internal error rates. A full suite of system-level diagnostic health checks assesses the health of all components, proactively notifying the administrator. In addition, the Cisco SFS 7008 provides out-of-service in-depth diagnostics that test and exercise every component in the system.

The Cisco SFS 7008 also includes dual, redundant instances of the embedded Cisco Fabric Manager. The Fabric Manager is intelligently synchronized across redundant management controllers, facilitating stateful failover if a switch fault occurs—without any system interruptions. The

Cisco SFS 7008 quickly identifies and isolates trouble areas, or “hot spots.” This capability is complemented with full performance monitoring, including graphing bandwidth utilization and error rates in real time.

UPGRADE TO 30 GBPS (12X) INFINIBAND

The removable line interface modules (Figure 2) in the Cisco SFS 7008 help enable a smooth upgrade path to 30 Gbps (12X) InfiniBand capability. Each module slot supports up to four nonblocking 12X InfiniBand ports at 30 Gbps. Up to 32 12X ports may be configured per Cisco SFS 7008 chassis. 12X support helps enable high-bandwidth connectivity to next-generation servers. The technology is also applicable for uplinking multiple switches when deploying multiple-tier switch fabrics for medium-to-large clusters. The flexible Cisco switch architecture accommodates next-generation technology and provides an upgrade path for InfiniBand users without requiring the purchase of all new infrastructures.

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

PRODUCT SPECIFICATIONS

Table 1 describes the systems architecture for the Cisco SFS 7008. Tables 2 and 3 list the mechanical and environmental specifications, and Table 4 lists the management features.

Table 1. Systems Architecture

Cards, Ports, Slots	• Up to 96 ports nonblocking 10 Gbps (4X) InfiniBand or up to 32 ports nonblocking 12X InfiniBand • 8 slots, each taking a 12-port 4X or 4-port 12X InfiniBand line card • Copper or optical interfaces • One RS-232 serial port, one Ethernet management port per management module (2 per switch)
Performance	All ports nonblocking and wire-speed, 1.92-Tbps aggregate bandwidth (96 ports x 10 Gbps x bi-directional)
Chassis	• 6-RU, 19-inch rack-mountable chassis • Passive mid-plane design with cable connections on opposite side of active components • All modules hot-swappable
Switch Fabric Module	• Up to 6 per system • Hot-swappable FRU • Operational status, active fabric controller, and alert LEDs

Line Interface Module	• Up to 8 per system • 12 ports 10-Gbps (4X) InfiniBand or 4 ports 30-Gbps (12X) InfiniBand • 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
Management Module	• Up to 2 per system • TopspinOS 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	• Up to 2 per system • Redundant, hot-swappable FRU • Total power requirement: < 600W • Operation-status and alert LEDs
Fan Module	• Up to 2 per system • Cooling: front to back • Redundant, hot-swappable FRU • Operation-status and alert LEDs

Table 2. Mechanical Specifications

Mounting	Mountable in a standard 19-inch Electronic Industries Alliance (EIA) rack
Size	• Standard 19-inch rack-mountable • 6-RU height (10.5 inches) • 24-inch depth
Air Flow	Front to back
Weight	60–110 lbs, based on configuration

Table 3. Environmental Specifications

Temperature	• Operating: 32 to 107°F (0 to 42°C) • Storage: –40 to 158°F (–40 to 70°C)
Altitude	• Operating: 10,000 feet • Storage: 40,000 feet
Humidity	• Operating: 8 to 80% non-condensing • Storage 5 to 90% non-condensing
Shock	• Operating 5G, 11-ms half-sine wave • Storage 10G, 11-ms half-sine wave

Vibration	• Operating .25G, 5–300 Hz 15 min. • Storage 0.5G, 5–300 Hz 15 min.
Power	• 90–264 V AC automatic-ranging, 47–63 Hz • Maximum power dissipation < 600W

Table 4. Management Features

Operating System	TopspinOS
Subnet Management	Embedded and redundant for reliable, plug-and-play deployments
Network Management	• Easy configuration, monitoring, and maintenance in-band and out-of-band • Java-based Element Manager GUI • Web-based systems management GUI • Command-line interface (CLI) through Telnet, Secure Shell Version 2 (SSH v2) Protocol, and RS-232
Management Framework	• Supports Simple Network Management Protocol Version 2 (SNMPv2) and v3 for management framework integration • Secure management: SSH v2, SSL, SNMPv3, RADIUS

SERIES OF PRODUCTS

The Cisco SFS 7008 Server Switch is part of a complete family of server switches including the Cisco SFS 3000 Series multifabric server switches and Cisco SFS 7000 Series InfiniBand server switches.

ORDERING INFORMATION

To place an order, visit the Cisco Ordering Home Page. Table 5 lists the ordering information for the Cisco SFS 7008.

Table 5. Ordering Information

Product Name	Part Number
Cisco SFS 7008 InfiniBand Server Switch, 48 InfiniBand ports (standard)	SFS-7008-4X048-S
Cisco SFS 7008 InfiniBand Server Switch, 72 InfiniBand ports (standard)	SFS-7008-4X072-S
Cisco SFS 7008 InfiniBand Server Switch, 96 InfiniBand ports (standard)	SFS-7008-4X096-S

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FOR MORE INFORMATION

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