



## Product Brief

Intel® Enterprise Blade Server Family

### Brocade\* 4Gb SAN Switch Module (SBCEBFCW4)

#### Key Features

- 10-port switch with seven internal ports to blade servers and three external uplinks
- Non-disruptive upgrade of the 10-port switch to 15 or 20 ports using a ports-on-demand software license key
- Support for connectivity to 2Gb and 4Gb Intel® Blade Server Fibre Channel Expansion Cards
- Simplified SAN deployment and administration through Brocade WEBTOOLS
- Advanced Zoning support for increased SAN security and simplified configuration
- Full forward and backward compatibility with the Brocade SilkWorm\* family of products.

### Intel® Blade Server Fibre Channel Expansion Card, 4 Gbps (SBEFCM4) Key Features

- 1Gb, 2Gb, or 4Gb dual-channel Qlogic Fibre Channel Host Bus Adapter (HBA)
- Small form-factor card
- Remote boot support
- Backward compatibility with the 2Gb Brocade SAN Switch Module and the Intel® Optical Pass-thru Module

# 4Gb Fibre Channel SAN Solution for Intel® Enterprise Blade Servers

Intel® Enterprise Blade Servers now support 4Gb Fibre Channel connectivity for mission-critical applications requiring high-performance storage. This industry-leading SAN solution features a Brocade\* 4Gb SAN Switch Module, based on the Brocade SilkWorm\* family of products, and a 4Gb Intel® Blade Server Fibre Channel Expansion Card—both designed to seamlessly integrate into an existing 1Gb or 2Gb SAN environment. The solution offers:



- **Enhanced performance and expanded switch connectivity.** The 4Gb SAN solution delivers significantly higher performance than a 2Gb SAN to meet the most demanding applications.
- **Simplified deployment and administration.** Integrated Brocade WEB Tools centralize administration and simplify fabric management.
- **Flexible, affordable scalability.** The 10-port 4Gb SAN Switch Module is ideal for small-to-medium (SMB) deployments. A ports-on-demand option, activated by a software license key, allows the switch module to be easily upgraded to 15 or 20 ports.
- **Investment protection.** The 4Gb SAN Switch Modules integrate seamlessly into a Brocade SAN environment insuring backward compatibility with existing 2Gb SAN fabrics.
- **Lower cost of ownership.** The 4Gb SAN Switch Module is integrated into the blade server chassis and directly connects to the Fibre Channel Expansion Cards on the blade server without requiring expensive cables and optical modules.
- **Easier servicing.** The integrated cable-less SAN configuration makes server and network servicing easier, while reducing data center clutter.

### Optional Advanced Fabric Services for the Brocade 4Gb SAN Switch

Advanced fabric services are implemented as software upgrades, allowing customers to incrementally take advantage of new capabilities to help address their most challenging SAN requirements.

Features	Benefits
<b>Inter-Switch Link (ISL) Trunking</b>	<ul style="list-style-type: none"> <li>• Supports up to two ISLs for a total bandwidth of 12-Gbps per trunk to reduce congestion between switches and enhance performance and reliability</li> </ul>
<b>Advanced Performance Monitoring</b>	<ul style="list-style-type: none"> <li>• Increases end-to-end visibility into the SAN fabric to detect potential problems earlier</li> <li>• Improves performance tuning and resource optimization</li> </ul>
<b>Extended Fabrics</b>	<ul style="list-style-type: none"> <li>• Extends the scalability, reliability, and performance of 4Gb SANs beyond 10 kilometers for disaster recovery applications</li> </ul>
<b>Secure Operating System</b>	<ul style="list-style-type: none"> <li>• Enables centralized, policy-based security management for simplified and consistent control</li> <li>• Helps provide robust protection against unauthorized access, loss or corruption of data</li> </ul>
<b>Fabric Watch</b>	<ul style="list-style-type: none"> <li>• Enables efficient configuration and management of Brocade fabrics</li> <li>• Provides monitoring and alerting capabilities for critical SAN events</li> </ul>

## Brocade\* 4Gb SAN Switch Module (SBCEBFCSW4) Specifications

Fibre Channel Standards	
Standards Compliance	FC-GS-4 ANS INCITS 387, FC-SW-3 INCITS 384, FC-VI INCITS 357, FC-TAPE INCITS TR-24, FC-DA INCITS TR-36, FC-PI INCITS 352, FC-PI-2 INCITS 404, FC-FS INCITS 373, FC-BB-2 INCITS 372, FC-SB-3 INCITS 374, IPFC RFC 2625, Fabric Element MIB RFC 2837, MIB-FA INCITS TR-32, FCP-2 INCITS 350, ANS INCITS 388
Switch Specifications	
Number of Fibre Channel Ports	10-port switch: 7 internal 2/4Gb ports to blade servers, 3 external 1/2/4Gb auto-sensing ports. The 10-port switch can be non-disruptively upgraded to 15 or 20 ports using a ports-on-demand software key: <ul style="list-style-type: none"> <li>15-port switch: 9 internal 2/4Gb ports and 6 external 1/2/4Gb ports</li> <li>20-port switch: 14 internal 2/4Gb ports and 6 external 1/2/4Gb ports</li> </ul>
External Port Type	Configured as Fabric port (F_port), Expansion port (E_port), 1Gb, 2Gb or 4Gb auto-detect SFP ports
Internal Port Type	Configured as Fabric port (F_port), speed auto-negotiation between 2 Gbps and 4 Gbps.
Classes of Service	Class 2 and Class 3 Fibre Channel services
Buffer Credits	288 credits shared across 20 ports, 140 max. credits per port
Media Type	SFP module LC connector, Short-Wavelength Laser (SwL), Long-Wavelength Laser (LwL)
Fabric Port Speed	1, 2 or 4 Gbps line speed, full duplex
Maximum Frame Size	2112-byte payload
Fabric Latency	1.2 µsec with no contention, cut-through routing at 4 Gbit/s
Fabric Point-to-Point Bandwidth	2 Gbps or 4 Gbps at full duplex
Fabric Aggregate Bandwidth	160 Gbit/sec
Non-blocking Architecture	Includes simultaneous wire speed support for all ports
Fabric Services	<ul style="list-style-type: none"> <li>Advanced Zoning (standard)</li> <li>ISL Trunking (optional)</li> <li>Advanced Performance Monitoring (optional)</li> <li>Fabric Watch (optional)</li> <li>Extended Fabrics (optional)</li> <li>Advanced Secure Operating System (optional)</li> </ul>
Switch Maintainability	
Diagnosis	Power-on self test (POST) is performed on all functional components except the SFP module. Port operational tests include internal, external, and online tests.
User Interface	LED indicators

Fabric Management	
Management Methods	<ul style="list-style-type: none"> <li>Web interface via Advanced Web Tools</li> <li>Command-line interface (CLI) through Telnet</li> <li>Application program interface (API)</li> <li>Management information base (MIB)</li> </ul>
Switch Simple Network Management Protocol (SNMP) Agent	Enables a network management workstation to receive configuration values, traffic information and Fibre Channel failure data through SNMP and an Ethernet* interface.

Safety Compliance	
USA:	UL 60950-1, First Edition
Canada:	cUL CSA 22.2. No. 60950-1, First Edition
Europe:	<ul style="list-style-type: none"> <li>Low Voltage Directive, 73/23/EEC</li> <li>TUV Bauart Approved to EN60950:2000</li> </ul>
International:	CB Report to IEC 60950 3rd Edition with all International Deviations

Electromagnetic Compatibility (EMC)	
USA:	FCC Part 15, Class A
Canada:	ICES-003 issue 3, Class A
Europe:	<ul style="list-style-type: none"> <li>EN55022:1998 +A1:2000 + A2:2003, Class A, ITE Specific Radiated and Conducted Emissions</li> <li>EN55024: ITE Specific Immunity</li> </ul>
Japan:	VCCI/3/99.05 Class A
Australia/New Zealand:	AS/NZS CISPR 22
Korea:	RRL Approved
Russia:	Gost Approved
Other International:	CISPR 22:1997

Shortwave Laser Multi-mode SFP Module at 4/2/1 Gbps	
Connector	LC-LC Fibre Channel cable
Color Coding	Beige or black exposed connector surfaces
Distance	<ul style="list-style-type: none"> <li>100-M5-SN-I: 500 meters (1640.42 ft) maximum using 50 micron fiber</li> <li>200-M5-SN-I: 300 meters (984.25 ft) maximum using 50 micron fiber</li> <li>400-M5-SN-I: 150 meters (492.06 ft) maximum using 50 micron fiber</li> <li>100-M6-SN-I: 500 meters (1640.42 ft) maximum using 62.5 micron fiber</li> <li>200-M6-SN-I: 300 meters (984.25 ft) maximum using 62.5 micron fiber</li> <li>400-M6-SN-I: 150 meters (492.06 ft) maximum using 62.5 micron fiber</li> </ul>

Longwave Laser SFP Module Single Mode at 4 Gbps	
Connector	LC-LC Fibre Channel cable
Color Coding	Blue exposed connector surfaces
Distance	400SM-LC-L (9 µm single mode): 2 meters (6.6 ft) to 10 kilometers (6.21 miles)

## Intel® Blade Server Fibre Channel Expansion Card, 4 Gbps (SBEFCM4) Specifications

Fibre Channel Standards	
Standards Compliance	FC-GS-2, FC-GS-3, FC-PH, SCSI-FCP, IP, FC-TAPE, FC-PLDA, FC-FS, FC-PH2
Host Bus Adapter Specifications	
Number of Fibre Channel ports	2 ports
Port Type	F
Port Characteristics	1Gb, 2Gb or 4Gb auto-detect
Key Features	<ul style="list-style-type: none"> <li>4Gb FC increases aggregate throughput rate to 1.6 Gbps in full-duplex mode</li> <li>200K I/Os per second (IOPS) allow high I/O transfer rates</li> <li>Intelligent interleaved Direct Memory Access (IDMA)</li> <li>Out-of-order frame reassembly (OoOFR) reduces congestion and I/O transmissions</li> <li>Multi-ID and N_Port virtualization allows a single port to acquire multiple N_Port IDs</li> </ul>

Safety Compliance	
USA:	UL 60950-3rd Edition/CSA 22.2
Canada:	cUL certified-3rd Edition/CSA 22.2. No. 60950-for Canada (product bears the single cUL mark for U.S. and Canada)
Europe:	TUV/VDE IEC 60950-1/EN 60950-1
International:	TUV/CB Report to IEC 60950 3rd Edition with all International Deviations

Electromagnetic Compatibility (EMC)	
USA:	FCC Part 15, Class B
Canada:	ICES-003 issue 3
Europe:	EN55022:1998, Class A, ITE Specific Radiated and Conducted Emissions
Japan:	VCCI/3/99.05 Class A
Australia/New Zealand:	AS/NZS CISPR 22:2002
Korea:	MIC Notice NO. 2001-115, 2001-116
Russia:	Gost Approved
Other International:	CISPR 22:1997

For current product information about the Intel® Enterprise Blade Server Family, visit:  
[www.intel.com/go/blades](http://www.intel.com/go/blades)

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