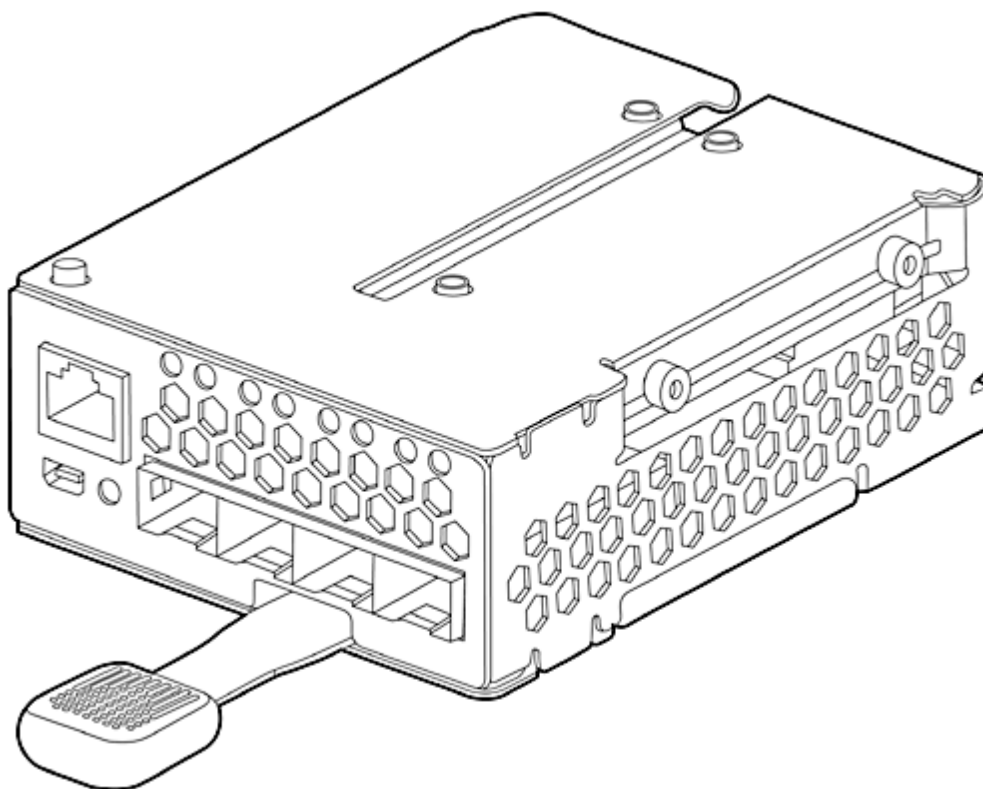


Overview

The Brocade 4Gb SAN Switch for the HP p-Class BladeSystem delivers a new paradigm for server to storage network connectivity. IT organizations now have the ability to lower cost, minimize deployment time, and save precious rack space through the integration of Fibre Channel switching into the HP BladeSystem. Server connectivity to the switch is built into the BladeSystem chassis backplane eliminating cabling and small form factor interconnects (SFP). The Brocade 4Gb SAN Switch plugs into the back of the HP BladeSystem chassis resulting in a zero foot print Fibre Channel connection solution. It installs quickly and easily into the GbE2 Interconnect Switch for HP p-Class BladeSystem or the Cisco Gigabit Ethernet Switch module for HP p-Class BladeSystem and provides seamless integration into existing or planned Brocade-based storage networking fabrics. The new Access Gateway feature enables fabric interoperability, greater scalability and simplified management.



Brocade 4Gb SAN Switch

Overview

Key Features and Benefits

- **Integrated design**
 - Consolidation of enterprise components saves cost and space
 - Shared power and cooling
 - Zero foot print
- **Fibre channel connections between the servers and switch reside within BladeSystem chassis**
 - Associated costs for FC cables and SFPs are eliminated
 - Faster time to deploy, just plug the switch into the chassis
 - Minimal external cabling
 - Fully compatible with HP StorageWorks B-series switches
- **4Gbps SAN facing ports**
 - New high speed bandwidth capability
 - Supports Brocade trunking technology
 - Auto-sensing recognizes 2Gb & 1Gb fabric devices
- **Fabric interoperability and scalability**
 - Brocade Access Gateway enables interoperability with any supported SAN fabric and eliminates domain considerations
- **Broad range of management tools**
 - Supports all Brocade Fabric OS based applications
 - SMI compliant for server based SAN management applications
- **Redundant switches (2) per BladeSystem**
 - Each server blade has a redundant path to the fabric resulting in highly available solution for SAN connectivity
 - Enables use of multipathing software for an automated failover solution
- **Employs same technology as stand alone Brocade switches**
 - Leverages same hardware and firmware
- **Available in base, Full Fabric, or Power Pack models**
 - Choose what features and management options make the best sense for your application

Models

Brocade 4Gb SAN Switch for HP p-Class BladeSystem, Base	A7533A*
Brocade 4Gb SAN Switch for HP p-Class BladeSystem, Full Fabric	A7534A*
Brocade 4Gb SAN Switch for HP p-Class BladeSystem, Power Pack	A7535A*

*NOTE: #0D1 will appear after this part number on your sales order when factory integration is indicated.

Product Highlights

Advanced Fabric Services

- ISL Trunking (optional)*
- Hardware Enforced Zoning *
- WebTools
- Fabric Watch (optional)*
- Advanced Performance Monitoring (optional)*

* Not supported in Brocade Access Gateway mode.

Manageability

- WebTools
- Fabric Manager (optional)
- Advanced Performance Monitoring (optional)
- API
- SNMP
- SMI

Interoperability

Brocade Access Gateway, a feature enabled in Fabric OS v5.2.1b and later, enables Brocade blade server SAN switches to interoperate with other SAN fabrics running supported firmware. While in Brocade Access Gateway mode, the device must also be connected to an NPIV-enabled edge switch or director. Supported edge environments are listed in the Brocade Fabric OS® release notes.

Software Components, Standard

Access Gateway*

Included with Fabric OS v5.2.1b and later, Brocade Access Gateway Mode enables seamless connectivity for Brocade blade server SAN switches to any supported SAN fabric, enhances scalability, and simplifies manageability. Utilizing N_Port ID Virtualization (NPIV) standards, Brocade Access Gateway eliminates switch/domain considerations.

* Brocade Access Gateway mode does not support many switch-related features, including the Power Pack bundle. Please refer to the Fabric OS v5.2.1b Release Notes and Access Gateway Administrator's Guide for details.

Frame Filtering

An ASIC based capability that enables new applications and features. The switch has the ability to "view" the first 64-bytes of the Fibre Channel frame. At this time, Frame Filtering enables advanced capabilities such as Advanced Zoning and Advanced Performance Monitoring (optional).

Advanced Zoning

WWN Zoning and Access Control are enforced by hardware that provides the same simple administration previously enforced only with software. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.

Web Tools

Enables organizations to monitor and manage single Fibre Channel switches and small SAN fabrics. Tasks can be performed through a Java-capable Web browser from a standard laptop, desktop PC or workstation from any location within the enterprise.

Product Highlights

Software Components, Optional

Brocade 4Gb SAN Switch for HP p-Class BladeSystem, Power Pack

The Brocade 4Gb SAN Switch Power Pack Software includes*:

- ISL Trunking
- Advanced Performance Monitoring
- Extended Fabrics
- Fabric Watch

* Not supported in Access Gateway mode.

ISL Trunking

For high performance enhanced Trunking, this optional license logically groups up to four E-ports to provide a high bandwidth trunk between two Brocade or HP B-Series switches. Each switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 16 Gb when routing connections between 4Gb capable switches). Connections are load-balanced across the individual links, which comprise the logical trunk group. Each switch can have a total of one 4-port Trunk group.

Fabric Watch

Fabric Watch enables each switch to monitor the SAN for potential faults-and automatically alert network managers to problems before they become failures. Fabric Watch tracks a variety of SAN fabric elements, events, and counters. Monitoring fabric-wide events, ports, SFPs, and environmental parameters permits early fault detection and isolation as well as performance measurement. Each switch in the SAN needs its own Fabric Watch license.

Advanced Performance Monitoring

This enabling technology helps administrators monitor and watch specific fabric metrics from a SID (Source ID) to a DID (Destination ID), so they can fine-tune and scale the fabric more efficiently. Plus, Advanced Performance Monitoring includes the ability for early warning detection of hot spots within the fabric, a powerful tool for maintaining overall balanced performance.

Extended Fabrics

Extends all of the scalability, reliability, and performance benefits of Fibre Channel Storage Area Networks (SANs) beyond the native 10 km distance specified by the Fibre Channel standard.

Secure Fabric OS

Secure Fabric OS™ is available only on the B-Series platform and is the only solution that provides protection for both management access and switch-to-switch authentication. This comprehensive security solution for SAN fabrics provides policy-based security protection for more predictable change management, assured configuration integrity and reduced risk of downtime. Secure Fabric OS protects the network by using the strongest, enterprise-class security methods available, including digital certificates and digital signatures, multiple levels of password protection, strong password encryption and Public Key Infrastructure (PKI)-based authentication, and 128-bit encryption of the switch's private key used for digital signatures. With its flexible design, Secure Fabric OS enables organizations to customize SAN security to meet specific policy requirements. In addition, Secure Fabric OS works in conjunction with Advanced Zoning to further secure access to the SAN, simplify storage management, and reduce provisioning time.

Fabric Manager - not included with Power Pack

Fabric Manager is a highly scalable, Java-based application that manages multiple switches and multiple fabrics (up to eight) in real time, helping SAN administrators with SAN configuration, monitoring, dynamic provisioning, and daily management. SAN administrators gain rapid access to critical SAN information across multiple personality fabrics, including both Fabric OS SANs and enhanced Secure Fabric OS SANs.

Product Highlights

BladeSystem compatibility

NOTE: The Brocade 4Gb SAN Switch must be deployed with p-Class BladeSystem infrastructure and will only work with the BL p-Class Server Enclosure with Enhancements.

Servers	ProLiant BL20pG2 ProLiant BL20pG3 ProLiant BL25p ProLiant BL30p ProLiant BL35p ProLiant BL40p ProLiant BL45p Integrity BL60p
ProLiant BL p-Class Server Blade Enclosures	BL p-Class Server Blade Enclosure with enhanced backplane components
ProLiant BL p-Class Ethernet Switches	Cisco Gigabit Ethernet Switch Module for HP p-Class BladeSystem HP ProLiant BL p-Class GbE2 Ethernet Switch

Service and Support, HP Care Pack, and Warranty Information

Warranty (1-1-1) Hardware Warranty - One-year on-site warranty, normal business hours, next business day response, installation not included.

NOTE: The hardware warranty covers firmware and embedded non-saleable software. Saleable software carries its own warranty, please see below.

Software Warranty: HP warrants only that the software media will be free of physical defects for a period of ninety (90) days from delivery.

EXCLUSIVE REMEDY: The entire liability of HP and its suppliers and your exclusive remedy for software that does not conform to this Limited Warranty shall be the repair or replacement of the defective media. This warranty and remedy are subject to your returning the defective media during the warranty period to HP in the country in which you obtained the software.

HP Service & Warranty Support HP Service & Warranty Support Additional Warranty protection and/or HP Installation packages can be purchased.

NOTE: Certain restrictions and exclusions apply. Consult the Customer Support Center for details. HP provides a one-year, hardware limited warranty, fully supported by a worldwide network of resellers and service providers.

In addition, available service offerings include a full range of HP Care Pack packaged hardware and software services:

- Installation
- Extended coverage hours and enhanced response times
- System management and performance services

For more information on warranty and support options, please visit our Web site at:
<http://www.hp.com/hps/tech/storage/supp/>.

Software Product Services

- Stand-alone telephone support
- Rights to new license version
- Media and documentation updates

Hardware Product Services

- Installation services
- On-site maintenance (includes warranty support)
- Response time upgrades during the warranty period
- Post-warranty coverage

HP Care Pack Services Warranty Upgrade Options Service offerings include a full range of Customer HP Care Pack services for both hardware and software services:

- Response - Upgrade on-site response from next business day to same day 4-hours
- Coverage - Extend hours of coverage from 5 days x 9 hours to 7 days x 24 hours
- Duration - Select duration of coverage for a period of 1, 3, or 5 years

Additional Warranty protection and/or HP Installation packages can be purchased.

NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details

Service and Support, HP Care Pack, and Warranty Information

HP Care Pack Information

HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.

- HP Care Pack is not available for less than the product's warranty duration.
- HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required.
- HP Care Pack services are prepaid.

For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:

<http://h18005.www1.hp.com/services/carepaq/index.html>

Additional Services

Implementation service, SAN Architecture service. For more information on service options, please visit our Web site at: <http://www.hp.com/go/san>.

Configuration Information

Step 1 – Base Configurations

Select one:

Model Name	Model Description	Part Number
Brocade 4GB SAN Switch, base	(1) 4Gb SAN Switch; two (2) 4Gb SFPs; one (1) FC Signal Conditioning Card; one (1) serial cable; one (1) mini USB to serial adapter; WebTools license; Zoning license; documentation - supports connectivity to a maximum of 2 Brocade switches	A7533A
Brocade 4GB SAN Switch, Full Fabric	(1) 4Gb SAN Switch; two (2) 4Gb SFPs; one (1) FC Signal Conditioning Card; one (1) serial cable; one (1) mini USB to serial adapter; WebTools license; Zoning license; documentation - supports full fabric connectivity	A7534A
Brocade 4GB SAN Switch, Power Pack	(1) 4Gb SAN Switch; two (2) 4Gb SFPs; one (1) FC Signal Conditioning Card; one (1) serial cable; one (1) mini USB to serial adapter; WebTools license; Zoning license; documentation - supports full fabric connectivity and includes Power Pack features and management tools (see software components, optional)	A7535A

Step 2 – Additional Options

Select each type of required options with quantities specified:

Model Name	Model Description	Part Number
Hardware:		
4Gb Optical Transceivers (SFPs)	Short wave 4Gb - 150M 2Gb - 300M 1Gb - 500M	A7446B
2Gb Optical Transceivers (SFPs)	Long Wave, 4Gb - 10km Short Wave, 300 m, 2X, FC Long Wave - 10 km Long Wave - 35 km	AE493A A6515A A6516A 300836-B21
Optical cables	LC-LC for between 2GB or 4GB Fibre Channel devices 2 m LC-LC Multi-Mode Fibre Channel Cable 5 m LC-LC Multi-Mode Fibre Channel Cable 15 m LC-LC Multi-Mode Fibre Channel Cable 30 m LC-LC Multi-Mode Fibre Channel Cable 50 m LC-LC Multi-Mode Fibre Channel Cable LC-SC for between a 1-Gb and 2/4Gb Fibre Channel devices 2 m LC-SC Multi-Mode Fibre Channel Cable 5 m LC-SC Multi-Mode Fibre Channel Cable 15 m LC-SC Multi-Mode Fibre Channel Cable	221692-B21 221692-B22 221692-B23 221692-B26 221692-B27 221691-B21 221691-B22 221691-B23

Configuration Information

Software:

Full Fabric Upgrade license	For upgrading Base switches to Full Fabric	T4261A
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Power Pack Software Bundle	For upgrading Base or Full Fabric switches to Power Pack Includes bundled license for:	T3573A
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- ISL Trunking
- Advanced Performance Monitoring
- Fabric Watch
- Extended Fabrics

Optional Software	Fabric Watch	324504-B21
	ISL Trunking Kit	324506-B21
	Advanced Performance Monitoring	324507-B21
	Extended Fabrics	324505-B21
	Fabric Manager, v5.x Enterprise Edition	T4269A
	Fabric Manager, v5.x Base Edition (10 domains)	T4270A
	Fabric Manager, v4 to v5 Enterprise License Upgrade	T4272A
	Fabric Manager, v4 to v5 Base License Upgrade	T4271A
	Fabric Manager, v5 Base to v5 Enterprise License Upgrade	T4273A
	Secure Fabric OS	332924-B21

Technical Specifications

Fibre Channel ports	8 internal 1-2Gb server ports, 4 external 4Gb auto-sensing ports (ships with two 4Gb SFPs)		
Device support and Scalability guidelines	http://h18006.www1.hp.com/products/storageworks/san/documentation.html		
Performance	4 GB/sec line speed, full duplex		
Certified maximum	Certified maximum information available at: http://h18006.www1.hp.com/products/storageworks/san/documentation.html		
Interoperability	4/8 SAN Switch, SAN Switch 8, SAN Switch 16, 4/16 SAN Switch, SAN Switch 8-EL, SAN Switch 2/8V, SAN Switch 16-EL, SAN Switch 2/16N FF, SAN Switch 2/32, 4/32 SAN Switch, Core Switch 2/64, SAN Director 2/128, 4/256 SAN Director		
Switch core	Non-blocking		
Fabric latency	<2 µ sec. with no contention, cut-through routing		
Maximum frame size	2112-byte payload		
Classes of service	Class 2, Class 3, Class F (inter-switch frames)		
Port types	FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port)		
Data traffic types	Fabric switches support unicast, multicast (256 groups), and broadcast		
Media types	Small Form-Factor Pluggable (SFP)		
Laser	Short-wave and long-wave transceivers (SFP's)		
Fabric services	Simple Name Server, Registered State Change Notification (RSN), Alias Server (multicast); and Zoning, Web Tools. Optional Fabric Watch, Extended Fabrics, and Remote Switch		
Options	SFP media		
Supported software	Telnet, SNMP, WebTools, Brocade Zoning, SES (optional), Fabric Watch, Extended Fabrics, Remote Switch		
Management access	10/100 Ethernet (RJ-45), serial port		
Diagnostics	POST and embedded online/offline diagnostics		
Dimensions	Depth	4.493 in (7.5" including locking handle and connector pins)	
	Height	1.525 in	
	Width	3.410 in	
	Weight	0.80 lb	
Environment	Temperature	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-13° to 158° F (-25° to 70° C)
	Relative Humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)
	Vibration	Operating	5 G, 5-500-5 Hz
		Non-operating	2 G, 5-5 kHz
Altitude	Up to 9,800 ft (3,000 m)		
Shock	80 G, 2.5 ms, half sine		
EMI	FCC Class A ICES-003 Class A AS/NZS 3548 Class A VCCI Class A		
Safety	UL/CUL Listed Accessory CE		

Technical Specifications

Fibre Channel Standards And Revisions	FC-FG Rev 3.5
	FC-AL Rev. 4.5
	FC-FLA Rev 2.7
	FC-PLDA Rev 2.1
	FC-PH-2 Rev 7.4
	FC-GS-2 Rev 5.3
	FC-PH-3 Rev 9.4
	FC-SW Rev 3.3
	FC-AL-2 Rev. 7.0
	FC-PH Rev 4.3

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

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