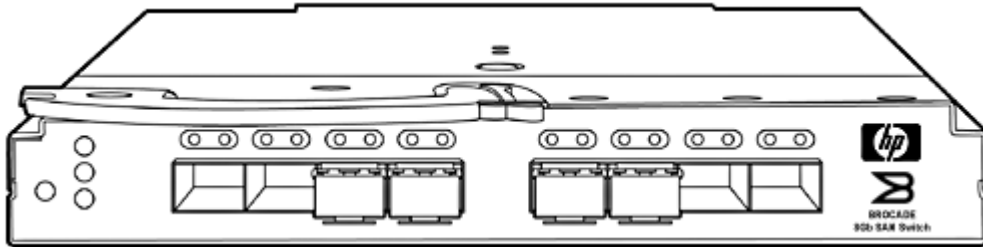*Overview*

The Brocade 8Gb SAN Switch for HP BladeSystem c-Class delivers an easy to manage embedded Fibre Channel switch with 8 Gbps performance. The Brocade 8Gb SAN Switch hot-plugs into the back of the HP BladeSystem c-Class Enclosure. The integrated design frees up rack space, enables shared power and cooling, and reduces cabling and small form-factor pluggables. Enhanced trunking support with external switches provides higher bandwidth to enable demanding applications such as server virtualization. New features in the Power Pack+ option enable you to manage data flow to maintain optimized application performance. The 12 or 24 auto-sensing ports support lower bandwidth components for investment protection and an upgrade license enables you to 'pay as you grow'. The Brocade 8Gb SAN Switch saves space and cost, significantly simplifies the SAN environment, enables easier deployment and management, and delivers the performance required for emerging higher throughput applications.

Brocade 8Gb SAN Switch

Integrated SAN connectivity	● Enables data center consolidation with HP BladeSystem c-Class through a state-of-the-art zero-footprint design while lowering cost through shared power and cooling, fewer cables and SFPs, and a reduction in space.
Next generation 8 Gbps storage networking	● Enables support of virtualized environments and other emerging technologies through high-speed technology that doubles the performance of the storage network. Both internal and external facing ports auto-sense lower bandwidth components for flexibility and investment protection (2, 4, or 8 Gb).
Non-blocking architecture	● Includes connection speed support for all ports to provide a high-performance system with aggregate bandwidth of up to 384 Gbps (24 ports x 8 Gbps x 2 for full duplex).
ISL Trunking performance enhancements	● Now providing support for up to a single trunk made up of all eight SAN ports for a total of up to 64 Gbps balanced throughput. Trunking of the SAN-facing ports with external Brocade or HP StorageWorks B-series switches provides a high-bandwidth solution while lowering costs through fewer SFPs and cables. F-Port Trunking supported in Access Gateway mode.
Adaptive Networking Services	● Enables organizations to better manage data flows and meet service level agreements while maintaining optimized application performance in virtual environments with new Adaptive Networking services, including Adaptive Fabric Quality of Service, Traffic Isolation, and Ingress Rate Limiting.
Access Gateway mode	● Employs N_Port ID Virtualization (NPIV), an ANSI T11 standard, to enable interoperability with other SAN fabrics and eliminate domain considerations while improving SAN scalability.

Overview

Broad range of management tools and SMI-s conformance	● Integrates with HP Onboard Administrator for BladeSystem, HP Systems Insight Manager, and HP Storage Essentials and leverages HP B-series management and monitoring tools. An SMI-s API enables the use of industry standard interfaces to integrate management with other applications.
Available in three models with a scalable licensing option	● Available in 12-port, 24-port and 24-port Power Pack+ Full Fabric models. Choose the features and management options that make sense for your needs. In addition, enables 'pay as you grow' scalability for easy, scalable growth in dynamic business environments with a non-disruptive 12-port upgrade for the 12-port model.

Product Highlights

Advanced Fabric Services	- Hardware Enforced Zoning (included)* - Dynamic Path Selection (included)* - WebTools (included) - Enhanced Group Management (EGM) - Power Pack+ fabric services software bundle (optional) - Adaptive Networking* - ISL Trunking - Fabric Watch* - Extended Fabrics* - Server Application Optimization (SAO)** - Advanced Performance Monitoring* - Secure Fabric OS (included in base FOS)* - Data Center Fabric Manager (optional) * Not supported in Brocade Access Gateway mode. ** Brocade 804 8Gb FC HBA for HP c-Class BladeSystem required.
Manageability	- WebTools (included) - Enhanced Group Management (EGM) - Advanced Performance Monitoring (optional Power Pack+ upgrade) - HP OnBoard Administrator (included with HP BladeSystem) - HP Systems Insight Manager (included with HP BladeSystem) - HP Storage Essentials (optional) - API - SNMP - SMI
Interoperability	Brocade Access Gateway, a feature enabled in Fabric OS v5.2.1b and later, enables Brocade embedded 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 embedded SAN switches to other supported SAN fabrics, 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 most features in the Power Pack+ bundle. Please refer to the Fabric OS v5.2.1b (or later) Release Notes and Access Gateway Administrator's Guide for details.
Frame Filtering	A special B-Series 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).

Product Highlights

Advanced Zoning	Zoning (Port and Worldwide Name), as well as Access Control, are enforced by hardware within the ASIC that provides the same simple administration previously enforced only with software. Hardware enforcement enables the highest level of zoning enforcement without any impact to performance. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.
WebTools - included in Brocade Fabric OS	Enables organizations to monitor and manage single Fibre Channel switches and monitor 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.
EGM	Enhanced Group Management (EGM) is a FOS license that is included with all B-Series switches and enables multi-switch operations. It helps automate operations across multiple switches to save time and streamline repetitive operations, which are typically prone to error. EGM drives consistency across fabrics, while minimizing the risk associated with potential downtime due to configuration mismatches. EGM provides streamlined troubleshooting for more effective fabric monitoring and diagnosis.
	Data Center Fabric Manager Professional, Professional Plus and Enterprise enable EGM functionality. Customers have EGM functionality enabled within the hardware product and need only to make the decision around which Data Center Fabric Manager application is right for them.
Dynamic Path Selection	Improves performance by dynamically routing data traffic across multiple links and trunk groups.
Secure Fabric OS - included in Brocade Fabric OS	Secure Fabric OS features have been fully integrated into the base Fabric OS since v5.3.0. These comprehensive security features for SAN fabrics provide policy-based security protection for more predictable change management, assured configuration integrity and reduced risk of downtime. Security methods supported include 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. These features enable organizations to customize SAN security to meet specific policy requirements and work in conjunction with Advanced Zoning to further secure access to the SAN, simplify storage management, and reduce provisioning time.

Software Components, Optional

Power Pack+ Software Bundle	The Power Pack+ Software Bundle includes:

- Adaptive Networking*
- ISL Trunking
- Advanced Performance Monitoring*
- Server Application Optimization (SAO)**
- Extended Fabrics*
- Fabric Watch*

* Not supported in Access Gateway mode
** Brocade 804 8Gb FC HBA for HP c-Class BladeSystem required.

Product Highlights

Adaptive Networking Services	This suite of tools optimizes fabric behavior and ensures ample bandwidth for mission-critical applications. The tools currently include Quality of Service (QoS), Ingress Rate Limiting, Traffic Isolation, and Top Talkers. By assigning zones a high, medium, or low priority, QoS allocates bandwidth in the event of congestion to expedite high-priority traffic and keep all traffic flowing. Ingress Rate Limiting restricts data flow from less-critical hosts at preset bandwidths. Traffic Isolation assigns high-bandwidth data flows to specific ISLs. And Top Talkers measures the top bandwidth-consuming traffic in real time for a specific physical or virtual device, or end to end across the fabric.
ISL Trunking	For high performance and seamless failover, this optional license logically groups up to eight E-ports (switch mode) or F-ports (Access Gateway mode) to provide a high bandwidth trunk between two Brocade or HP StorageWorks B-Series switches. Each switch needs its own license. The fabric operating system views the trunk as a single, high bandwidth ISL resource (up to 64 Gbps when routing connections between 8 Gbps capable switches). Connections are load-balanced across the individual links, which comprise the logical trunk group.
Fabric Watch	Fabric Watch enables each switch to monitor the health of 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 application data traffic 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 maximizing SAN performance.
Extended Fabrics	Extends the native Fibre-Channel traffic up to 590 km. Extended Fabrics increases 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.
Server Application Optimization	Server Application Optimization (SAO) license improves overall application performance for physical servers and virtual machines. SAO, when deployed with Brocade Fibre Channel HBAs, extends Brocade Adaptive Networking from the Brocade SAN fabric to the server infrastructure. This delivers application-level, fine-grain Quality of Service (QoS) management to the HBAs and related server applications. Solution Requirements: ● SAO license must be installed on the edge (server connected) switch ● Adaptive Networking (AN) license must be installed on the edge (server connected) switch ● SAO requires Brocade <> HBA installed in the server

Product Highlights

Data Center Fabric Manager Professional

HP StorageWorks Data Center Fabric Manager Professional is a server based management application available at no-charge and comes with B-series SAN Switches and includes the following features:

- Allows management of a single Fabric OS (FOS) fabric (up to a 1,000 B-Series switch ports) at a time
- Performs group switch management beyond the scope of Web Tools
- Does not offer management of the DC SAN Backbone Director

It is targeted for SMB customers that use FOS based SAN fabrics and require a management solution for smaller SANs based on a single fabric.

SMB customers that initially start off with Data Center Fabric Manager Professional and have a small SAN environment may over time feel the need for an enterprise-class product (Data Center Fabric Manager Enterprise) as their environments start to grow in size and complexity, and as they start to uptake more enterprise-class functionality (such as Fibre Channel Routing, FCIP, etc.). A non-disruptive upgrade path is available from Data Center Fabric Manager Professional to Data Center Fabric Manager Professional Plus and Enterprise.

Data Center Fabric Manager Enterprise and Professional Plus

HP StorageWorks DCFM Enterprise and Professional+ are the enterprise-class products that support FOS and M-EOS products. HP DCFM Enterprise provides complete DC SAN Backbone Director management including enterprise-class features/environments such as FICON, Fibre Channel Routing, FCIP, adaptive networking, etc while HP DCFM Professional+ provides the same feature set except for support for the DC SAN Backbone Director and FICON.

HP DCFM Enterprise delivers unprecedented scalability, up to 24 fabrics and 9,000 switch ports, while HP DCFM Professional+ scales to 4 SAN Fabrics and 2560 switch ports.

Both offerings provide brand-new features including Adaptive Networking features for quality of service, ingress rate limiting and traffic isolation zones.

While DCFM provides increased functionality, not all features available in FM are available in DCFM Enterprise and Professional+, and some functions may operate differently. Please refer to the Migration and Transition guide for additional information.

Product Highlights

BladeSystem compatibility

The Brocade 8Gb SAN Switch for HP BladeSystem c-Class must be deployed within the HP BladeSystem c-Class infrastructure and is compatible only with HP BladeSystem c-Class Enclosures.

HP ProLiant Servers ProLiant BLc server blades

HP Integrity Servers Integrity BLc server blades

HP Mezzanine FC HBAs Brocade 804 8Gb FC HBA**
         Emulex LPe 1205-HP 8Gb FC HBA*
         Emulex LPe1105-HP 4Gb FC HBA
         QLogic QMH2562 8Gb FC HBA*
         QLogic QMH2462 4Gb FC HBA

         * 8Gb Mezzanine FC HBA support with the Brocade 8Gb SAN Switch requires HP StorageWorks FOS v6.2.0d or later. Please refer to 8Gb Mezzanine FC HBA Product QuickSpecs for server support details.
         ** Brocade 804 8Gb FC HBA requires FOS v6.3.1c or 6.4.0b or higher

HP BladeSystem c-Class Enclosures HP BladeSystem c7000 and c3000 Enclosures

Switch interoperability

HP StorageWorks B-Series Switches, Directors, and Routers	8 Gb Switches and Directors	- Embedded switch for HP StorageWorks 4400 Enterprise Virtual Array 8/8 SAN Switch 8/24 SAN Switch 8/40 SAN Switch - Encryption SAN Switch - DC04 SAN Director 8/80 SAN Switch - DC SAN Backbone Director
	4 Gb Switches and Directors	- Brocade 4Gb SAN Switch for HP c-Class BladeSystem - Brocade 4Gb SAN Switch for HP p-Class BladeSystem 4/8 SAN Switch 4/16 SAN Switch 4/32 SAN Switch 4/32B SAN Switch 4/64 SAN Switch 4/256 SAN Director
	2 Gb Switches and Directors	- SAN Switch 2/8V - SAN Switch 2/16N - SAN Switch 2/16V - SAN Switch 2/32 - Core Switch 2/64 - SAN Director 2/128
	Virtual Connect	- HP Virtual Connect 4Gb Fibre Channel Module for HP c-Class BladeSystem - HP Virtual Connect 8Gb 24-port Fibre Channel Module - HP Virtual Connect 8Gb 20-port Fibre Channel Module

Product Highlights

Multi-Protocol Routers and Gateways	● Multi-protocol Extension Blade ● 10/24 Blade for DC SAN Directors ● 1606 Extension SAN Switch ● 2408 FCoE Converged Network Switch ● Multi-Protocol Router Blade

* Supported in the same fabric with Brocade 8Gb SAN Switch for HP BladeSystem c-Class, but not directly connected.

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.
Services Included with Product Purchase	The Power Pack+ Software Bundle includes one year of HP standard business hours, standard business days Software Support (includes software technical support and software product and documentation updates).
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 The embedded SAN switches for HP BladeSystem c-Class are not covered under the BladeSystem Enclosure Care Packs; the SAN switches carry separate Care Packs. SAN Switch Care Pack service level support should always be uplifted to match existing storage or server service levels. NOTE: The HP Care Pack service part numbers below covers the Brocade 8/12c SAN Switch & Brocade 8/24c SAN Switch Hardware Services On-site Service

Service and Support, HP Care Pack, and Warranty Information

Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	UE436E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE437E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE438E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE439E
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 4 Years, Electronic	UE440E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 4 Years, Electronic	UE441E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 4 Years, Electronic	UE442E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 4 Years, Electronic	UE443E
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 5 Years, Electronic	UE444E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 5 Years, Electronic	UE445E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 5 Years, Electronic	UE446E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 5 Years, Electronic	UE447E
Hardware Installation, Electronic	U5988E

NOTE: The HP Care Pack service part numbers below covers the Brocade 8/24c SAN Switch Power Pack+

Hardware Services On-site Service

Support Plus

Onsite HW support, 8am-9pm, M-F, 4hr response and SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, 3 Years, Electronic	UL246E
Onsite HW support, 8am-9pm, M-F, 4hr response and SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, 4 Years , Electronic	UL248E
Onsite HW support, 8am-9pm, M-F, 4hr response and SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, 5 Years , Electronic	UL250E

Support Plus 24 - Recommended

Onsite HW support 24x7, 4hr response and SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, 3 Years, Electronic	UL247E
Onsite HW support 24x7, 4hr response and SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, 4 Years, Electronic	UL249E
Onsite HW support 24x7, 4hr response and SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, 5 Years, Electronic	UL251E

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. **Support Plus 24 is the recommended service for this product.** ● 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://h20219.www2.hp.com/services/cache/10950-0-0-225-121.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
HP B-Series 8/12c SAN Switch BladeSystem c-Class	(1) 8 Gb SAN Switch; 12 ports enabled for any combination (internal and external); two (2) short wave 8 Gb SFP+s; full fabric connectivity; documentation	AJ820A*
HP B-Series 8/24c SAN Switch BladeSystem c-Class	(1) 8 Gb SAN Switch; 24 ports enabled (16 internal, 8 external); four (4) short wave 8 Gb SFP+s; full fabric connectivity; documentation	AJ821A*
HP B-Series 8/24c SAN Switch Pwr Pk+ BladeSystem c-Class	(1) 8 Gb SAN Switch; 24 ports enabled (16 internal, 8 external); four (4) short wave 8 Gb SFP+s; full fabric connectivity; documentation and includes Power Pack+ Bundle and management tools (see software components, optional)	AJ822A*
	* #0D1 may appear after this part number on your sales order when factory integration is indicated.	

Step 2 – Additional Options

Select each type of required options with quantities specified:

Hardware:

Model Name	Model Description	Part Number
8 Gb Optical Transceivers (SFP+s)	Short Wave: HP 8Gb SW B-series FC SFP+	AJ716A
	Long Wave: HP 8Gb Long Wave B-series 10km FC SFP+ 1 Pack	AJ717A
	Extended Long Wave: HP 8Gb Long Wave B-series 25km FC SFP+ 1Pack	AW538A
4 Gb Optical Transceivers (SFPs)	Short Wave: HP 4Gb SW B-series FC SFP	AJ715A
	Long Wave : HP 4Gb LW B-series 10km FC SFP	AK870A
	Long Wave : HP 4Gb LW B-series 35km FC SFP 1 Pack	AN211A
Optical cables	**PremierFlex OM3+ type cables**	
	0.5m PremierFlex LC/LC Multi-Mode Optical Cable	BK837A
	1m PremierFlex LC/LC Multi-Mode Optical Cable	BK838A
	2m PremierFlex LC/LC Multi-Mode Optical Cable	BK839A
	5m PremierFlex LC/LC Multi-Mode Optical Cable	BK840A
	15m PremierFlex LC/LC Multi-Mode Optical Cable	BK841A
	30m PremierFlex LC/LC Multi-Mode Optical Cable	BK842A
	50m PremierFlex LC/LC Multi-Mode Optical Cable	BK843A
	LC-LC for between 4/8 Gb and 4/8 Gb Fibre Channel devices	
	.5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ833A
	1 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ834A
	2 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ835A
	5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ836A
	15 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ837A

Configuration Information

	30 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ838A
	50 m LC-LC Multi-Mode OM3 Fibre Channel Cable	AJ839A
	LC-LC for between 2/4/8 Gb and 2/4/8 Gb Fibre Channel devices	
	2 m LC-LC Multi-Mode Fibre Channel Cable	221692-B21
	5 m LC-LC Multi-Mode Fibre Channel Cable	221692-B22
	15 m LC-LC Multi-Mode Fibre Channel Cable	221692-B23
	30 m LC-LC Multi-Mode Fibre Channel Cable	221692-B26
	50 m LC-LC Multi-Mode Fibre Channel Cable	221692-B27

Software:

Power Pack+ Software Bundle	For upgrading Full Fabric 8 Gb switches to Power Pack+. Includes bundled license for:	T5521A

- Adaptive Networking
- ISL Trunking
- Advanced Performance Monitoring
- Fabric Watch
- Server Application Optimization*
- Extended Fabrics

* Brocade 804 8Gb FC HBA for HP c-Class BladeSystem required for support.

Optional Software	HP Brocade 8/12c SAN Switch 12-port Upgrade LTU	T5517A
	8-24 Port Adaptive Networking	T5524A
	Server Application Optimization	TA756A
	Fabric Watch	324504-B21
	8-24 Port ISL Trunking	T5527A
	Advanced Performance Monitoring	324507-B21
	Extended Fabrics	324505-B21
	Data Center Fabric Manager Enterprise	T5542A
	Data Center Fabric Manager Professional Plus	TA754A
	Data Center Fabric Manager Professional Plus Upgrade	TA755A

Family Comparison

Features	4/256 SAN Director and 4/256 SAN Director Power Pack	Brocade 8Gb SAN Switch for HP BladeSystem c-Class	HP 400 Multi-protocol Router	B-Series Multi-protocol Router Blade
Targeted Environment	Data Centers	Workgroups, Departments	Workgroups, Departments	Data Centers
Port Bandwidth	4 Gbit/sec	8 Gbit/sec	4 Gbit/sec Ethernet: 1 Gbit/sec	4 Gbit/sec Ethernet: 1 Gbit/sec
Aggregate device bandwidth	3.264Tbit/sec end-to-end	384 Gbit/sec end-to-end	128 Gbit/sec end to end	N/A
Storage system support	MA8000 EMA12000/ EMA16000, EVA,XP,VA, MSA	MSA, EVA, XP	MSA, EVA, XP	MSA, EVA, XP
Ports	Up to 384 SFP	4 or 8 external / 8 or 16 internal	18 ports: 16 FC and 2 Gigabit Ethernet	18 ports: 16 FC and 2 Gigabit Ethernet
Cascading support	Yes	Yes	Yes	Yes
Advanced Trunking	Included with Power Pack or Optional Upgrade	Optional Upgrade	Optional Upgrade	Optional Upgrade to chassis
Form factor	14U	Embedded	1U	Blade in Director
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes, in BladeSystem Enclosure	Yes	Yes, in director chassis
Hot plug fans	Yes	Yes, in BladeSystem Enclosure	Yes	Yes, in director chassis
Enterprise Backup Solution (EBS) support	Yes	Yes	Yes	Yes

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base	8/40 SAN Switch and 8/40 SAN Switch Power Pack+	8/80 SAN Switch and 8/80 SAN Switch Power Pack+	DC SAN Backbone Director Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Data Centers
Port Bandwidth	8 Gbit/sec	8 Gbit/sec	8 Gbit/sec	8 Gbit/sec	8 Gbit/sec
Aggregate device bandwidth	128 - 384 Gbit/sec end-to-end	256 - 384 Gbit/sec end-to-end	384 - 640 Gbit/sec end-to-end	768 - 1280 Gbit/sec end-to-end	6.5Tbit/sec end-to-end
OS Support	NOTE: Please Refer to SAN Design Guide: http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide				
Storage system support	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA	MA8000 EMA12000/ EMA16000 EVA , XP, VA, MSA
Ports	8 SFP Enabled 24 SFP Max	16 SFP Enabled 24 SFP Max	24 SFP Enabled 40 SFP Max	48 SFP Enabled 80 SFP Max	Up to 384 SFP
Cascading support	Yes	Yes	Yes	Yes	Yes

Family Comparison

Advanced Trunking	Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Form factor	1U	1U	1U	2U	14U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes	Yes	Yes
Hot plug fans	No	No	Yes	Yes	Yes
Enterprise Backup Solution (EBS) support	Yes	Yes	Yes	Yes	Yes

QuickSpecs

Technical Specifications

Fibre Channel ports	Brocade 8/12c SAN Switch model: 12 - 8 Gb ports in any internal/external port combination (ships with two 8 Gb short wave SFP+s) Brocade 8/24c SAN Switch models: 16 internal 8 Gb ports and 8 external 8 Gb auto-sensing ports (ships with four 8 Gb short wave SFP+s)		
Device support and Scalability guidelines	http://h18006.www1.hp.com/products/storageworks/san/documentation.html		
Performance	8 Gb/sec line speed, full duplex		
Certified maximum	Certified maximum information available at: http://h18006.www1.hp.com/products/storageworks/san/documentation.html		
Switch core	Non-blocking		
Fabric latency	700 nSec. Latency increases as input port speed is lower than the output port speed.		
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 supporting unicast and broadcast		
Media types	Hot-pluggable, B-Series Branded Small Form Factor Pluggable (SFP), LC connector; Short-Wave Laser (SWL), Long-Wave Laser (LWL); Extended Long-Wave Laser (ELWL); distance depends on fiber-optic cable and port speed. Supports SFP (4/2/1 Gbit/sec) and/or SFP+ (8/4/2 Gbit/sec) optical transceivers.		
Laser	Short-wave, long-wave, and extended long wave laser transceivers (SFP's) are supported		
Fabric services	Simple Name Server, Registered State Change Notification (RSCN). Includes Advanced WebTools Enhanced group Management and Advanced Zoning. Optional fabric services include: Adaptive Networking, Fabric Watch, ISL Trunking, Advanced Performance Monitoring, and Extended Fabrics.		
Options	SFP media, port upgradeable licensing, advanced management software licensing		
Supported software	Telnet, SNMP (FE MIB, FC Management MIB), HP Systems Insight Manager, HP Storage Essentials, HP Onboard Administrator for BladeSystem, Advanced WebTools, Enhanced Group Management, , Advanced Zoning, Data Center Fabric Manager, Fabric Watch, and Advanced Performance Monitoring		
Management access	WebTools, SMI-s provider, SNMP, Telnet, and Secure Telnet		
Diagnostics	POST and embedded online/offline diagnostics		
Dimensions	Depth	11.00 in. (with handle protrusion)	
	Height	1.13 in.	
	Width	7.63 in.	
	Weight	Approx. 2.91 lb - without media	
Environment	**System Inlet Temperature**	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305m (1.8°F per every 1000ft) above sea level to a maximum of 3050m (10,000ft), no direct sustained sunlight. Maximum rate of change is 10°C/Hr (18°F/Hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/Hr (36°F/Hr).

Technical Specifications

Relative Humidity	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Vibration	Operating	1 G, 10-500 Hz, 60 minutes per axis
	Non-operating	2 G, 10-500 Hz, 30 minutes
Shock	Operating	Half-sine-wave shock, 40 G, 2 ms duration, in each direction of three mutually perpendicular axes.
	Non-operating	Half-sine-wave shock, 140 G, 2 ms duration, in each direction of three mutually perpendicular axes; and square-wave shock up to 80 G, 180 inches/s velocity change, in each direction of three mutually perpendicular axes.

EMI
CFR 47 Subpart B of Part 15 of the FCC Rules, Class A level
CISPR22 Class A
EN55022 Class A
VCCI Class A ITE
AS/NZS 3548 Class A
CNS 13438 Class A
EMC Directive (89/336/EEC) for CE Marking in European Union

Safety
Underwriters Laboratories, UL60950
Canadian Standards Association, CSA60950
TUV Rheinland of North America, EN60950
Nemko, EN60950
Low Voltage Directive (73/23/EEC) for CE Marking in European Union

Fibre Channel Standards And Revisions
- FC-AL-2 INCITS 332: 1999
- FC-GS-5 ANSI INCITS 427: (includes the following.)
  - FC-GS-4 ANSI INCITS 387: 2004
- FC-IFR INCITS 1745-D, revision 1.03 (under development)
- FC-SW-4 INCITS 418:2006 (includes the following)
  - FC-SW-3 INCITS 384: 2004
- FC-VI INCITS 357: 2002
- FC-TAPE INCITS TR-24: 1999
- FC-DA INCITS TR-36: 2004 (includes the following)
  - FC-FLA INCITS TR-20: 1998
  - FC-PLDA INCIT S TR-19: 1998
- FC-MI-2 ANSI/INCITS TR-39-2005
- FC-PI INCITS 352: 2002
- FC-PI-2 INCITS 404: 2005
- FC-PI-4 INCITS 1647-D, revision 7.1 (under development)
- FC-FS-2 ANSI/INCITS 424:2006 (includes the following)
  - FC-FS INCITS 373: 2003
- FC-LS INCITS 433: 2007

Technical Specifications

- FC-BB-3 INCITS 414: 2006 (includes the following)
  - FC-BB-2 INCITS 372: 2003
- FC-SB-3 INCITS 374: 2003 (replaces FC-SB ANSI X3.271: 1996; FC-SB-2 INCITS 374: 2001)
- RFC 2625 IP and ARP Over FC
- RFC 2837 Fabric Element MIB
- MIB-FA INCITS TR-32: 2003
- FCP-2 INCITS 350: 2003 (replaces FCP ANSI X3.269: 1996)
- SNIA Storage Management Initiative Specification (SMI-S) Version 1.2 (includes the following)
  - SNIA Storage Management Initiative Specification (SMI-S) Version 1.03 ISO standard IS24775-2006. Replaces (ANSI INCITS 388: 2004)
  - SNIA Storage Management Initiative Specification (SMI-S) Version 1.1.0
  - SNIA Storage Management Initiative Specification (SMI-S) Version 1.2.0