

Overview

The HP StorageWorks 8/40 SAN Switch is ideal for organizations requiring a flexible solution that is forward and backward compatible and will meet rapidly evolving storage requirements, either as a small "building-block" switch for a departmental fabric or as a high-performance edge switch in larger core-to-edge SAN configurations.

The 8/40 SAN Switch is designed for rapidly growing storage requirements in mission-critical environments—combining 1, 2, 4, and 8 Gbit/sec Fibre Channel technology in configurations of 24, 32, or 40 ports in an efficiently designed 1U package. A fully populated 8/40 SAN Switch with 40 ports enabled features a non-blocking architecture at 8 Gbit/sec full duplex to provide an aggregate bandwidth of 680 Gbit/sec. Inter-Switch Link (ISL) trunking can supply up to 64 Gbit/sec of balanced data throughput to reduce congestion and increase bandwidth. The 8/40 SAN Switch also enables organizations to use 4 Gbit/sec SFPs today and upgrade to 8 Gbit/sec SFPs when required.

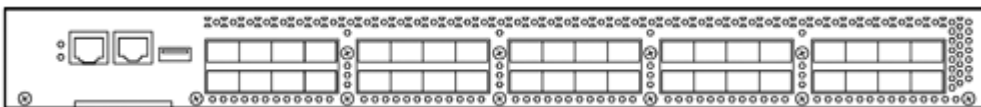
The 8/40 SAN Switch is available in two models with an 8 port upgrade license to add ports non-disruptively:

- HP StorageWorks 8/40 SAN Switch Power Pack+ with 24 enabled ports and value added software
- HP StorageWorks 8/40 SAN Switch with 24 enabled ports (Base)

The 8/40 SAN Switch provides a reliable foundation for disaster recovery and business continuance by employing enterprise-class availability features such as hot-swappable, redundant, and integrated fan and power supply assemblies. Moreover, hot code load and activation help maximize application uptime with faster system upgrades and maintenance to reduce the dependency on scheduled outages. Combined with a wide range of diagnostic and monitoring functions, these capabilities help provide a highly available SAN environment.

As an option for connecting switches in a fabric, the 8/40 SAN Switch provides Fibre Channel Integrated Routing capabilities. Integrated Routing provides native Fibre Channel Routing on a per-port basis rather than limiting routing to special-purpose routing switches or blades. Integrated Routing uses EX_Ports to import/export devices between fabrics, enabling selective device sharing while maintaining remote fabric isolation for higher levels of scalability and fault isolation.

The 8/40 SAN Switch Power Pack+ includes the 8/40 SAN Switch (Base) with additional software: Adaptive Networking, Fabric Watch, ISL Trunking, Extended Fabric, and Performance Monitor. Power Pack+ software provides the SAN administrator with the necessary tools to monitor the health and performance of the network, while also ensuring the highest levels of security, scalability and manageability. Enhanced Power Pack+ capabilities are based on the new Adaptive Networking software, a suite of tools for optimizing fabric behavior and ensuring ample bandwidth for mission-critical applications. Power Pack+ software enables infrastructure management through a single-pane-of-glass.



Features and Benefits

Key Features and Benefits

- Offers best-in-class port density and scalability for midrange enterprise SAN switches
- Delivers full 8 Gbit/sec 1:1 performance for up to 40 ports in an energy-efficient, optimized 1U form factor with an aggregate bandwidth of 680 Gbit/sec
- Increases network performance with enhanced Inter-Switch Link (ISL) Trunking, which enables a high-speed data path up to 64 Gbit/sec
- Protects existing device investments with auto-sensing 1, 2, 4, and 8 Gbit/sec capabilities
- Features Ports on Demand capabilities for fast, easy, and cost-effective scalability from 24 to 40 ports in 8-port increments
- Meets high-availability requirements with redundant, hot-pluggable components, non-disruptive software upgrades, and hot code activation for a wide range of SAN configurations
- Provides Adaptive Networking services, such as Quality of Service (QoS), to help optimize application performance in consolidated, virtual environments
- Leverages intelligent B-series SAN management and monitoring tools to increase operational efficiency and maximize SAN investments

Models

HP StorageWorks 8/40 SAN Switch Models	HP StorageWorks 8/40 Power Pack+ (24) Full Fabric Ports Enabled SAN Switch	AM870A
	HP StorageWorks 8/40 Base (24) Full Fabric Ports Enabled SAN Switch	AM869A
	HP StorageWorks 8/40 SAN Switch 8Gb 8-port Upgrade LTU	T5519A

Product Highlights

8/40 SAN Switch

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 24, 32, or 40-ports in a 1U enclosure
- Meets enterprise level availability requirements with redundant, hot pluggable components, no single-points-of-failure within the switch
- Provides 1 Gb, 2 Gb, 4Gb, 8Gb/s* performance
- Employs optional Inter-Switch Link (ISL) Trunking to provide a high-speed data path between switches which enables a high speed data path between 4Gb/s switches up to 64 Gbit/sec

* Full 8Gb/s end to end storage performance requires 8 Gb/s HBAs, 8Gb/s controllers, and 8Gb/s switches. 8Gb/s ISL performance can be obtained between two 8Gb/s switches.

Configuration Support

<http://h18000.www1.hp.com/products/storageworks/san/documentation.html>

High-availability features

- Integrated redundant, hot swappable cooling fans and power supplies
- Enhanced Fault Detection Logic
- Parity protection on all data paths and system memory

Advanced Fabric Services

- Hardware and Software Enforced Zoning
- Frame Filtering
- Built-in Web browser management tools

Cabinet Support

- HP StorageWorks (22U, 36U and 42U) 9000 and 10000 G1 Series, (25U, 33U and 41U) HP System/e, and the new 42U HP 10000 G2 Series
- NOTE:** To order factory integration, add 0D1 after the part number on your sales order.

Software Components, Standard, Base Models

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.

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

Web Tools is an intuitive and easy-to-use graphical interface that enables organizations to monitor and manage 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

8/40 SAN Switch Power Pack+ Software Bundle The Power Pack+ Software Bundle comes with the 8/80 SAN Switch Power Pack+ or as an optional software bundle for the 8/40 SAN Switch. It includes the following:

- Adaptive Networking
- Fabric Watch
- Advanced Performance Monitor
- Extended Fabric
- ISL Trunking

Adaptive Networking

Adaptive Networking (AN) is an optional family of technologies which allow flexible control of traffic movement within the fabric which deliver application aware management of fabric resources. Applications may be used with multiple protocols and multiple classes of service. It includes the following features:

Ingress Rate Limiting:

Allows the ingress bandwidth of a port to be throttled to a rate lower than negotiated with the SAN node. This could be very useful for enterprises offering stepped levels of service and enforcing SLAs.

Quality of Service (QoS):

Enables zones with high, medium, and low priorities within a fabric on a zone by zone basis. This can be very useful for prioritizing array replication over MANs and WANs over less critical traffic.

Traffic Isolation Zones:

Defines paths through a fabric for some or all nodes. Failover allows a non-preferred path to be used if the preferred fails. TIZs use failover by default but it can be disabled if traffic should stop if a preferred path fails. TIZ can be used to manually map out traffic flows within a fabric based on application, priority, and topology.

Fabric Watch

Fabric Watch is an optional license which 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 Monitor

This optional 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.

Top Talkers is a component of Advanced Performance Monitoring and tracks the top traffic flows for hosts and targets for a switch port or a switch. Top Talkers can help identify the ports that need certain Quality of Service (QoS) attributes or it can help determine portions of the physical topology that need reconfiguration.

Product Highlights

Extended Fabric	Optional license which 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.
ISL Trunking	For high performance enhanced Trunking, this optional license logically groups up to eight E-ports to provide a high bandwidth trunk between two switches. Each 8Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 64Gb) when routing connections between 8G switches. Connections are load-balanced across the individual links, which comprise the logical trunk group.
Fabric Manager	The optional 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.
Integrated Routing	Integrated Routing is an optional license which provides native Fibre Channel Routing (FRC) on a per-port basis, rather than limiting routing ports to those on a dedicated routing blade. Just like traditional FCR, Integrated Routing uses EX_Ports to import/export devices between fabrics, enabling selective device sharing while maintaining remote fabric isolation. Integrated Routing provides architecture flexibility to route on a port-by-port basis, enabling increased scalability and fault isolation.

Service and Support, HP Care Pack, and Warranty Information

Warranty (1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (standard business hours, next business day response) and 1-year labor.

NOTE: The hardware warranty covers firmware and embedded non-saleable software. For extended hardware installation and maintenance information, click the link below:

<http://www.hp.com/hps/carepack/services/>.

NOTE: Certain restrictions and exclusions apply. Consult the Customer Support Center for details. Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

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. The first year of Rights to New License Version and standard business day, standard business hours telephone support is included with the purchase of an HP Power Pack. In order to continue to receive telephone support and Rights to New License Version after the first year, the purchase of a software support contract or Care Pack is required.

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 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.

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

- Stand-alone Telephone Support
- Rights to new version
- Media and documentation updates

Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

Service and Support, HP Care Pack, and Warranty Information

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|----------------------------------|--|
| Hardware Product Services | <ul style="list-style-type: none">● Installation services● On-site Maintenance (includes warranty support)● Response time upgrades during the warranty period● Post-warranty coverage |
|----------------------------------|--|

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| HP Care Pack Services
Warranty Upgrade
Options | <p>Service offerings include a full range of Customer HP Care Pack services for both hardware and software services:</p> <ul style="list-style-type: none">● 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 |
|---|--|

NOTE: Recommended service for these switches is [SUPPORT PULS 24](#)

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

HP Care Pack Information	<p>HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.</p>
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- 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://www.hp.com/hps/carepack/services/>

Additional Services	<p>Installation service; SAN Solution service; SAN-Environmental Support service; SAN Architecture service; Proactive 24</p> <p>For more information on these and other service options, please contact any of our worldwide sales offices or visit our Web site at: http://www.hp.com/hps/support</p>
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Family Information

Features	4/8 SAN Switch Base and 4/8 SAN Switch	4/16 SAN Switch and 4/16 SAN Switch Power Pack	SAN Switch 4/32 and SAN Switch 4/32 Power Pack	4/32B SAN Switch and 4/32B SAN Switch Power Pack	4/64 SAN Switch and 4/64 SAN Switch Power Pack	SAN Director 2/128 and Director 2/128 Power Pack	4/256 SAN Director and 4/256 Power Pack
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Data Centers	Data Centers
Port Bandwidth	4Gbit/sec	4Gbit/sec	4Gbit/sec	4Gbit/sec	4Gbit/sec	2 Gbit/sec	2 Gbit/sec
Aggregate device bandwidth	64 Gbit/sec end-to-end	128 Gbit/sec end-to-end	128-256 Gbit/sec end-to-end	128-256 Gbit/sec end-to-end	256 Gbit/sec end-to-end	512 Gbit/sec end-to-end	2.176Tbit/sec
OS Support	<p>NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide</p>						
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	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA	MA8000 EMA12000/ EMA16000 EVA, XP, VA, MSA
Ports	16 SFP	16 SFP	16 SFP Base 32 Total	16 SFP Base 32 Total	32 SFP Base 64 Total	32 SFP Base 128 Total	256 Total
Cascading support	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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	Included with Power Pack or Optional Upgrade	Included with Power Pack or Optional Upgrade
Form factor	1U	1U	1U	1U	2U	14U	14U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes	Yes (Integrated with power supplies)	Yes	Yes	Yes
Hot plug fans	No	No	Yes	Yes (integrated with fans)	Yes	Yes	Yes
Enterprise Backup Solution (EBS) support	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Family Information

Features	Brocade 4Gb SAN Switch for HP p-Class BladeSystem	Brocade 4Gb SAN Switch for HP c-Class BladeSystem	HP 400 Multi-protocol Router	B-Series Multi-protocol Router Blade
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Data Centers
Port Bandwidth	4 Gbit/sec	4 Gbit/sec	4 Gbit/sec Ethernet: 1 Gbit/sec	4 Gbit/sec Ethernet: 1 Gbit/sec
Aggregate device bandwidth	48 Gbit/sec end-to-end	192 Gbit/sec end-to-end	128 Gbit/sec	N/A
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesinguide			
Storage system support	MSA, EVA, XP	MSA, EVA, XP	MSA, EVA, XP	MSA, EVA, XP
Ports	4 external / 8 internal	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	Optional Upgrade	Optional Upgrade	Optional Upgrade	Optional Upgrade to chassis
Form factor	Embedded	Embedded	1U	Blade in Director
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	No	Yes, in director chassis
Hot plug fans	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	No	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	8Gbit/sec	8Gbit/sec	8Gbit/sec	8Gbit/sec	8Gbit/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/sandesinguide				
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
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

Family Information

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

Configuration Information

Step 1 - Base Configuration

Select one:

Model	Model Description	Part Number
8/40 Power Pack+ (24) Full Fabric Ports Enabled SAN Switch	8/40 SAN Switch with 24 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, and Power Pack+ software of Adaptive Networking, ISL Trunking, Extended Fabric, Advanced Performance Monitoring, and Fabric Watch. NOTE: Requires optical transceivers listed below	AM870A
8/40 Base (24) Full Fabric Ports Enabled SAN Switch	8/40 SAN Switch with 24 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, and base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning. NOTE: Requires optical transceivers listed below	AM869A
8/40 SAN Switch 8Gb 8-port Upgrade LTU	8 port upgrade license for 8/40 Power Pack+ SAN Switch (AM870A) and 8/40 Base SAN Switch (AM869A)	T5519A

Step 2 - Options

Select each type of required options with quantities specified:

	Model Description	Quantity	Part Number
8 Gb Transceivers	HP 8Gb Short Wave B-Series FC SFP+ 1 Pack	1	AJ716A
	Distance		
	8Gb performance:	50 meters	150 meters
	4Gb performance:	150 meters	270 meters
	2Gb performance:	300 meters	500 meters
4 Gb Transceivers	HP 4Gb Short Wave B-Series FC SFP 1 Pack	1	AJ715A
	Distance		
	4Gb performance:	150 meters	270 meters
	2Gb performance:	300 meters	500 meters
	1Gb performance:	500 meters	860 meters
USB	HP 4Gb Long Wave B-Series FC SFP 1 Pack - 10km	1	AK870A
	HP 4Gb Long Wave B-Series FC SFP 1 Pack - 30km	1	AN211A
Optical Cables	2Gb USB Device	1	AK864A
	OM2 LC-LC type cables		
	2 m LC-LC Multi-Mode Fibre Channel Cable	1	221692-B21
	5 m LC-LC Multi-Mode Fibre Channel Cable	1	221692-B22
	15 m LC-LC Multi-Mode Fibre Channel Cable	1	221692-B23
	30 m LC-LC Multi-Mode Fibre Channel Cable	1	221692-B26
	50 m LC-LC Multi-Mode Fibre Channel Cable	1	221692-B27
	OM3 LC-LC type cables		
	.5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ833A
	1 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ834A
	2 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ835A
5 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ836A	

Configuration Information

15 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ837A
30 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ838A
50 m LC-LC Multi-Mode OM3 Fibre Channel Cable	1	AJ839A
LC-SC for between a 1 Gb and a 2 Gb device		
2 m LC-SC Multi-Mode Fibre Channel Cable	1	221691-B21
5 m LC-SC Multi-Mode Fibre Channel Cable	1	221691-B22
15 m LC-SC Multi-Mode Fibre Channel Cable	1	221691-B23
30 m LC-SC Multi-Mode Fibre Channel Cable	1	221691-B26
50 m LC-SC Multi-Mode Fibre Channel Cable	1	221691-B27

Step 3 - Optional Software

Software for 8/40 SAN Switch	Fabric Manager , v5.x Base Edition (10 domains)	T4270A
	Fabric Manager, v5.x Enterprise Edition	T4269A
	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 upgrade license	T4273A
	HP B-series 24-40 Port SAN Switch Power Pack+ Upgrade LTU	T5522A
	NOTE: The Power Pack+ Software Bundle kit includes Adaptive Networking, Fabric Watch, ISL Trunking, Extended Fabric, and Advanced Performance Monitor.	
	Adaptive Networking	T5525A
	Extended Fabric	313458-B21
	Fabric Watch	313454-B21
	Advanced Performance Monitor	313450-B21
	ISL Trunking	313452-B21
	HP B-series 24-40 Port SAN Switch Integrated Routing LTU	T5528A

Fibre Channel Standards And Revisions For Fabric OS 5.2.0 and later, running on associated hardware, Brocade conforms to the following Fibre Channel Standards:

- FC-AL-2 INCITS 332: 1999
- FC-GS-5 ANSI INCITS 427:2006 (Final stages of approval, includes the Following.)
 - FC-GS-4 ANSI INCITS 387: 2004
- FC-IFR revision 1
- 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 INCITS TR-19: 1998
- FC-MI-2 ANSI/INCITS TR-39-2005
- FC-PI INCITS 352: 2002
- FC-PI-2 INCITS 404: 2005
- FC-FS-2 ANSI/INCITS 424:2006 (includes the following)
 - FC-FS INCITS 373: 2003
- FC-LS revision 1.51 (under development)
- FC-BB-3 INCITS 414: 2006 (includes the following)
 - FC-BB-2 INCITS 372: 2003

Configuration Information

- FC-SB-3 INCITS 374: 2003 (replaces FC-SB ANSI X3.271: 1996; FC-SB-2 INCITS 374: 2001)

Technical Specifications

System Architecture	Fibre Channel ports	40 ports, universal (E, F, and FL)
	Scalability	Full fabric architecture: http://h18006.www1.hp.com/products/storageworks/san/documentation.html
	Certified maximum	Refer to SAN Design Guide for current configuration information: http://h18006.www1.hp.com/products/storageworks/san/documentation.html
	Interoperability	SAN Switch 8, SAN Switch 16, SAN Switch 8-EL, SAN Switch 16-EL, SAN Switch 2/8v, SAN Switch 2/16v, SAN Switch 2/16N, SAN Switch 2/16, SAN Switch 2/16-EL, Core Switch 2/64, SAN Switch 2/32, SAN Director 2/128; 4/256 SAN Director; 4/64 SAN Switch ; 4/32 SAN Switch; 4/8 SAN Switch; 4/16 SAN Switch; 8/8 SAN Switch, 8/24 SAN Switch, 8/80 SAN Switch, DC SAN Backbone Director, Brocade 4Gb SAN Switch for HP p-Class BladeSystem; Brocade 4Gb SAN Switch for HP c-Class BladeSystem; MSA SAN Switch 2/8; HP 400 MP-Router; and HP MP-Router
	Performance	1.063 Gbit/sec line speed, full duplex; 2.125 Gbit/sec line speed, full duplex; 4.25 Gbit/sec line speed, full duplex; 8.5 Gbit/sec line speed, full duplex. Auto-sensing of 1 Gbit/sec, 2 Gbit/sec, 4 Gbit/sec ,and 8 Gbit/sec port speeds; optionally programmable to fixed port speed. Speed-matching between 1, 2, 4, and 8 Gbit/sec ports.
	ISL Trunking	Up to eight 8 Gbit/sec ports per ISL trunk; up to 64 Gbit/sec per ISL trunk. There is no limit to how many trunk groups can be configured in the switch.
	Aggregate bandwidth	680 Gbit/sec full duplex (40 ports x 8.5 Gbit/sec x 2)
	Fabric latency	700 nanoseconds with no contention, cut-through routing at 8 Gbit/sec
	Maximum frame size	2112-byte payload
	Classes of service	Class 2, Class 3, Class F (inter-switch frames)
	Port types	FL_Port, F_Port, E_Port, EX_Port, M_Port (Mirror Port), and self-discovery based on switch type (U_Port).
	Data traffic types	Fabric switches supporting unicast, multicast (255 groups), 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.
	USB	One USB port for system log file downloads or firmware upgrades
	Fabric services	Simple Name Server (SNS); Registered State Change Notification (RSCN), NTP v3, Reliable Commit Service (RCS), Dynamic Path Selection (DPS), Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning), NPIV, FDMI, Management Server, FSPF, Fabric Watch; Extended Fabrics; ISL Trunking; Advanced Performance Monitoring, Adaptive Networking (per-data flow QoS, Ingress Rate Limiting, Traffic Isolation, fabric dynamics profiling, application "Top Talkers" report), Integrated Routing, IPFC
	Options	SFP media, USB Device
Management	Management software supported	Telnet; RADIUS,SNMP (FE MIB, FC Management MIB); Advanced WEB TOOLS (optional); Fabric Manager (optional)
	Management access	10/100 Ethernet port (RJ-45); Serial port (RS-232); in-band through Management Server
	Diagnostics	POST and embedded online/offline diagnostics

Technical Specifications

Mechanicals	Enclosure	Back-to-front airflow; power from back; 1U
	Size	Width: 42.88 cm (16.88 inches) Height: 4.30 cm (1.70 inches) Depth: 61.05 cm (24.00 inches)
Environment	System Weight	20.6 lbs with two power supplies, without SFP/SFP+
	Temperature	Operating: 0° to 40° C (32° to 104° F) Non-operating: -25° to 70° C (-13° to 158° F)
	Humidity	Operating: 10 to 85 percent non-condensing
	Altitude	Operating: Up to 3000 meters (9842 feet) Storage: Up to 12 kilometers (39,370 feet)
	Shock	Operating: 20 g, 6 ms half-sine Non-operating: Half sine, 33G 11ms. 3/eg Axis
Airflow	Vibration	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random, 5 to 500 Hz
	Maximum	29 CFM (cu. ft./min)
Power	Nominal	22 CFM
	Maximum output	91 Watts
	System power consumption	91 Watts max, 84 Watts Nominal
	Nominal input voltage	85- 264 VAC, Universal
	Input line frequency	47 - 63 Hz
	Minimum input voltage	85 VAC
Maximum input voltage	264 VAC	

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