MODELS

hp StorageWorks SAN Switch 2/32 power pak

hp StorageWorks SAN switch 2/32 power pak
311026-B21

hp StorageWorks Fabric Manager
313455-B21
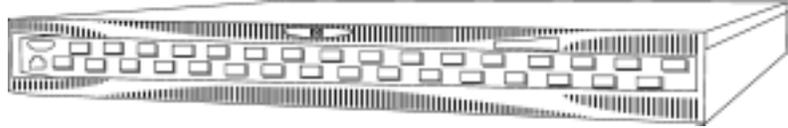
OVERVIEW

The HP StorageWorks SAN switch 2/32 power pak provides the configuration flexibility, manageability, scalability, and performance needed by corporate storage network infrastructures. The SAN Switch 2/32 is the switch platform that companies choose for the most powerful, flexible storage network fabrics. The SAN Switch 2/32 power pak is the choice when you need all this configuration flexibility, manageability, scalability, and performance in one neat package. The SAN Switch 2/32 power pak comes packaged with the SAN switch 2/32 hardware and all the supported software features, at a very attractive price.

Whether these switches are incorporated into an expansive core fabric or tactically placed at the edge, this switch delivers the performance of 2 Gb technologies and the ability to support very large fabric implementations.

The SAN Switch 2/32 power pak offers storage networking features not found in any other switch, such as hardware Zoning and ISL Trunking. It also includes redundant power supplies, cooling and hot plug optics; making it ideal for supporting medium to large corporate infrastructure implementations where redundant fabrics are part of the network design. Designed to the Fibre Channel standard, it is capable of operating independently or in core/edge fabrics.

With the Power Pak you get all the capability to unlock the power of your SAN and ensure you have all the features you will need to meet the ever-changing SAN requirements of a growing enterprise.

HP StorageWorks SAN Switch 2/32 Power Pak

Customer benefits include:
- **Investment Protection** – compatible with existing 1 Gb SANs, may be used in a mixed 1 Gb and 2 Gb SAN or as part of an all 2 Gb SAN infrastructure.
- **Scalability** - enables customers to grow very large SAN fabrics with a larger number of user ports. Especially when used in conjunction with StorageWorks Core switches.
- **Higher Return on Investment** - Easier to use and manage and supports a broad suite of new Intelligent Fabric Services, which simplify SAN design, network expansion, and administration of large SANs.
- **Reliability** - features include redundant power supplies and fans, and hot-swappable components.
- **Smaller Footprint -** high-density packaging provides 32-ports in a 1.5U high enclosure for data centers with constrained rack space

  ** NOTE: – The first generation of StorageWorks Fibre Channel 8/16 port switches running the 1.x firmware stream will not interoperate with 2 Gb switches.
       – 2 Gb switches will operate at a 1 Gb performance level if connected to 1 Gb external connections and 1 Gb HBAs.

Configuration Support
http://www.Configuration Support

Feature List:
- **Compete software feature bundle** – includes the complete line of Fabric OS software features normally offered separately at one very special price.
- **Industry leading performance** - the SAN Switch 2/32 Power Pak provides high performance with all ports capable of operating at 1 and 2 Gb (full-duplex) to enable 64 Gb switch throughput.
- **Intelligence within the switch** - improves security and manageability, a wire-speed Frame Filtering engine is built directly into the SAN Switch 2/32 Power Pak, third-generation ASIC technology.
- **Scalability** - enables customers to build very large SAN fabrics. Especially when used in conjunction with StorageWorks core switches.
- **Easy to use centralized storage management tools** – supports a broad suite of new Intelligent Fabric Services, which simplify design, administration, and management of a large SAN.
- **Interoperability** – compatible with existing 1Gb SANs, may be used in a mixed 1 Gb and 2 Gb SAN or as part of an all 2 Gb SAN infrastructure.
- **Reliability** - features include redundant power supplies and fans, and hot-swappable components.
- **High-density packaging** – 32-ports in a 1.5U high enclosure for data centers with constrained rack space and automatic port rerouting.

PRODUCT HIGHLIGHTS

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 32-ports in a 1.5U enclosure and up to 384-ports in a single 42U cabinet, facilitating manageable SAN fabrics composed of thousands of ports
- Meets enterprise level availability requirements with redundant, hot pluggable components, no-single-points-of-failure within the switch
- Provides 1 Gb and 2 Gb operation today with seamless extension to 10 Gb in the future
- Employs Inter-Switch Link (ISL) Trunking to provide a high-speed data path between switches

High-availability features

- Redundant hot swappable N+1 cooling Fans (three units Standard).
- Redundant, hot swappable power supplies (two units Standard).
- Field replaceable Motherboard
- Enhanced Fault Detection Logic. Parity protection on all data paths and system memory.

Advanced Fabric Services

- ISL Trunking
- Hardware and Software Enforced Zoning
- Frame Filtering
- Built-in Web browser management tools
- Fabric monitoring, fault detection and isolation
- End-to-End Performance monitoring and analysis
- Extended Fabric Support
- Remote Switch Support

SOFTWARE COMPONENTS, STANDARD

Frame Filtering (standard)

An ASIC based capability in the 2 Gb family of SAN switches 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 (standard)

In the 2 Gb generation of switches, WWN Zoning and Access Control are enforced by hardware providing the same simple administration that was previously only enforced with software. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.

Web Tools (standard)

WEB TOOLS is an intuitive and easy-to-use graphical interface that enables organizations to monitor and manage Brocade SilkWorm Fibre Channel Fabric Switches and small Brocade SAN fabrics. Using a JAVA-capable Web browser from standard laptops, desktop PCs, or workstations from any location within the enterprise SAN administrators can perform management tasks.

Advanced Performance Monitor, SAN switch 2/32 (Standard)

This enabling technology provides the ability to monitor and watch specific fabric metrics from a SID (Source ID) to a DID (Destination ID), creating a method to be able to fine-tune and scale your fabric more efficiently. Performance Monitoring also allows the ability to have an early warning detection of hot spots within the fabric providing a powerful tool for maintaining overall balanced performance.

Fabric Watch, SAN switch 2/32 (Standard)

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.

SOFTWARE COMPONENTS, STANDARD *(continued)*

ISL Trunking, SAN switch 2/32 (Standard)

High performance enhanced trunking: License logically groups up to four E-ports to provide a high bandwidth trunk between two switches. Each 2 Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 8 Gb) when routing connections between switches. Connections are load-balanced across the individual links, which comprise the logical trunk group. Each 16-port switch can have a total of four separate 4-port trunk groups.

Extended Fabric, SAN switch 2/32 (Standard)

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. Required with future use of Very Long Distance SFPs and/or wavelength division multiplexing (WDM or DWDM)

Remote Switch, SAN switch 2/32 (Standard)

Extends all of the benefits of Fibre Channel Storage Area Networks (SANs) by providing WAN connectivity for solutions using Routers to connect remote SANs together.

SOFTWARE COMPONENTS, OPTIONAL

Fabric Manager (Optional) **313455-B21**

Fabric Manager is a highly scalable, JAVA-based management station application that manages multiple switches and multiple fabrics (up to eight) in real time. Fabric Manager assists SAN administrators with the configuration, monitoring, dynamic provisioning, and daily management of SANs. Fabric Manager helps to lower the cost of SAN ownership by intuitively facilitating SAN management tasks. It enables the global integration and execution of processes across multiple fabrics and provides SAN administrators with rapid access to critical SAN information across multiple personality fabrics, including both Fabric OS SANs and enhanced Secure Fabric OS SANs.

SERVICE AND SUPPORT, CUSTOMER CARE PACKAGES AND WARRANTY INFORMATION

Warranty

(1-1-1) One year warranty, 5X8 on-site next business day response, Additional Warranty protection can be purchased.

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

HP Installation and CarePaq Services

HP Services provides a three-year, limited warranty, fully supported by a worldwide network of resellers and service providers, toll-free 7x24 hardware technical phone support for the duration of the warranty. In addition, available service offerings include a full range of Customer Care packages for both hardware and software services:

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

HP Service and Warranty Support

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

SERVICE & SUPPORT, CUSTOMER CARE PACKAGES AND WARRANTY INFORMATION *(continued)*

Software Product Services
- Stand-alone telephone support
- Rights to a new license
- 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

For additional hardware installation and maintenance information please refer to the URLs listed below:
http://www.Hardware and Installation Services
http://www.CarePaq Installation Services

Warranty Upgrade Options
- 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.

Customer Care Information and Installation Services

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

- Customer Care packages are defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage.
- Customer Care packages are not available for less than the products warranty duration.
- Customer Care packages 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.
- Customer Care packages services are prepaid.

- FM-**XHW-36   3 years, 9x5, Next Business Day On-Site Coverage
- FM-**4HR-36   3 years, 9x5, 4 -Hour Response On-Site Coverage
- FM-**724-36   3 years, 24x7, 4-Hour response On-Site Coverage
- FM-**INS-IN   Hardware Installation

For additional Customer Care (hardware & software) information, as well as orderable part numbers, please refer to the URL listed below:
http://www.Hardware and Software CarePaq Information.

CONFIGURATION INFORMATION

STEP 1 – HP STORAGEWORKS SAN SWITCH 2/32 POWER PAK CONFIGURATION

Select one:

Model Number	Part Number	Model Description
StorageWorks SAN Switch 2/32 Power Pak 311026-B21		SAN switch 2/32 Power Pak, SAN Switch 2/32-32 port switch; rackmount kit; accessory kit (manuals on CD, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, Advanced Fabric OS, Advanced Web Tools and Advanced Zoning, Fabric Watch, Advanced Performance Monitor, Extended Fabrics, ISL Trunking and Remote Switch software. Includes serial cable.

STEP 2 – ADDITIONAL OPTIONS

Optical Transceivers	Short Wave 2Gb Transceivers – 300m (SFP)	300834-B21
	Long Wave 2Gb Transceivers – 10km (SFP)	300835-B21
	Long Wave 2Gb Transceivers – 35km (SFP)	300836-B21

2 Gb/s optical cables	**(LC-LC for between two 2 Gb/s devices)**	
	2m LC-LC Multi-Mode Fibre Channel Cable	221692-B21
	5m LC-LC Multi-Mode Fibre Channel Cable	221692-B22
	15m LC-LC Multi-Mode Fibre Channel Cable	221692-B23
	30m LC-LC Multi-Mode Fibre Channel Cable	221692-B26
	50m LC-LC Multi-Mode Fibre Channel Cable	221692-B27
	(LC-SC for between a 1 Gb/s and a 2 Gb/s device)	
	2m LC-LC Multi-Mode Fibre Channel Cable	221691-B21
	5m LC-LC Multi-Mode Fibre Channel Cable	221691-B22
	15m LC-LC Multi-Mode Fibre Channel Cable	221691-B23
	30m LC-LC Multi-Mode Fibre Channel Cable	221691-B26
	50m LC-LC Multi-Mode Fibre Channel Cable	221691-B27

STEP 3 – OPTIONAL SOFTWARE

	Fabric Manager	313455-B21

CONFIGURATION INFORMATION *(continued)*

STEP 4 – OPTIONAL SERVICES

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-VI Rev 1.5
	FC-PH-2 Rev 7.4	FC-GS-2 Rev 5.3	FC-PH-3 Rev 9.4	FC-SW Rev 3.3	IPFC RFC 2625
	FC-AL-2 Rev. 7.0	FC-PH Rev 4.3			
Fibre Channel ports	32 universal ports				
Scalability	Full fabric architecture 239 switches maximum				
Certified maximum	Refer to SAN Design Guide for current configuration information				
Interoperability	SAN SWITCH 8, SAN SWITCH 16, SAN SWITCH 8-EL, SAN SWITCH 16-EL, INTEGRATED /32, INTEGRATED /64B, CORE SWITCH 2/64				
Performance	2.125 Gb per/sec line speed, full duplex				
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, 2Gb up to 975 ft/300 m; long-wave up to 6.2 mi/10 km				
Fabric services	Simple Name Server, Registered State Change Notification (RSN), Alias Server (multicast); and Zoning, WEB TOOLS. Fabric Watch, Performance Monitor				
Hardware Options	SFP media (Transceivers Optional, offered separately) Small form-factor pluggable (SFP); short wavelength (SWL) up to 0.18 mi (300 m), long wavelength (LWL) up to 6.2 mi (10 km); distance depends on fiber-optic cable and port speed				
Supported software	Telnet, SNMP, WEBTOOLS, Zoning, Fabric Watch, Fabric Manager 3.0 & higher				
Management access	10/100 Ethernet (RJ-45), serial port				
Diagnostics	POST and embedded online/offline diagnostics				

TECHNICAL SPECIFICATIONS

Fibre Channel ports	32-ports, universal (E, F, and FL); up to eight 16-port Fibre Channel modules
Scalability	Full fabric architecture: 239 switches maximum
Performance	1.063 Gb line speed, full duplex; 2.125 Gb line speed, full duplex; auto-sensing of 1 Gb and 2 Gb port speeds; optionally programmable to fixed port speed; speed matching between 1 Gb and 2 Gb ports
ISL Trunking	Up to four 2.125 Gb ports per ISL Trunk; to 8.5 Gb per ISL Trunk
Aggregate bandwidth	512 Gb end-to-end
Switch latency	<2.1 μsec any port to any port at 2 Gb, cut-through routing
Maximum frame size	2112-byte payload
Frame buffers	108 per 4-port group, dynamically allocated
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); optional port type control
Data traffic types	Fabric Switches supporting unicast, multicast (255 groups), and broadcast
Media types	Hot pluggable, industry-standard small form factor pluggable (SFP), LC connector; Short-Wavelength Laser (SWL), up to 1,640 ft/500 m; Long-Wavelength Laser (LWL), up to 6.2 mi/10 km; distance depends on fiber optic cable and port speed (optional)
Fabric services	Simple Name Server; Registered State Change Notification (RSCN); Alias Server (multicast); Brocade Advanced Zoning; WEB TOOLS; Fabric Watch; ISL Trunking; Advanced Performance Monitoring

TECHNICAL SPECIFICATIONS *(continued)*

High Availability	Motherboard	Field Replaceable Unit	
	Input power	Dual AC inputs	
	Chassis power	Redundant AC-DC power supply modules	
	Cooling	Three blower assembly modules (two operational required)	
Management	Management	Telnet; SNMP (FE MIB, FC Management MIB);	
		WEB TOOLS; Fabric Watch; Fabric Access layer	
Management access	10/100 Ethernet (RJ-45), in-band over Fibre Channel (requires fabric); two serial ports (DB-9) per control processor module		
Diagnostics	POST and embedded online/offline diagnostics		
Mechanical Specifications	Mounting	Rackmountable in a standard 19-inch (48.26 cm) EIA rack; Telco-style mid-mounting available	
	Ports per rack	42U rack	
	Enclosure	Rear panel-to-door airflow	
	Width	16.87 in/42.855 cm	
	Height	2.58 in/6.55 cm 1.5U	
	Depth	23.06 in/58.564 cm	
	Weight	35.8 lb/16.24 kg — with dual power supplies	
Environment	Temperature	Operating	50°F to 104°F/10°C to 40°C
		Non-operating	-13°F to 158°F/-25°C to 70°C
	Humidity	Operating	20% to 85% non-condensing at 104° F/40° C
	Altitude	0 to 3 km	
	Shock	20 g, 6 ms, half sine	
	Vibration	Operating	0.5 g p-p, 5 to 500 Hz
		Non-operating	2.0 g, 5 to 500 Hz
	Heat dissipation		
Power	Supported power range	Nominal	100–240 VAC; 5.0 amp maximum
	Frequency	47 to 63 Hz	
Scalability	Refer to the following URL: StorageWorks SAN		

PRODUCT COMPATIBILITY

Controllers

NOTE: Please refer to the SAN Design Guide for latest configuration support. **StorageWorks SAN**.

- HSG80 – ma8000, ema12000/16000
- HSV- 110 - Enterprise Virtual Array, all models
- MSA1000
- RA4100
- XP256
- XP512/XP48
- XP1024/XP128
- VA7100
- VA7400

PRODUCT COMPATIBILITY *(continued)*

Controller Software

- ACS Version 8.6-4 and higher
- VCS Version 1.02, VCS Version 2.x
- MSA1000 Version 1.x
- XP256 52.49.12.01/00
- XP512/XP48 Firmware 01.16.40.00/03
- XP1024/XP128 Firmware Version 21.01.24.00/00

Host Bus Adapters

- lp8000
- lp952
- lp9002
- Cambex
- jni1063
- ql2200
- ql2200F
- cpq64
- 5158A

For additional adapters refer to SAN compatibility matrix

Operating Systems

- Windows® NT®
- Windows 2000
- Tru64 UNIX®
- OpenVMS
- Solaris™
- HP-UX
- IBM AIX
- Caldera® Linux®
- Red Hat® Linux
- SuSE® Linux
- NetWare®
- SGI IRIX

   Operating System Version Support

   http://www.StorageWorks SAN

SAN Management Appliance

- Enterprise Management Tools

PRODUCT COMPATIBILITY *(continued)*

Power and Packaging

- 36U high StorageWorks Cabinets
- 42U high StorageWorks 9000 Cabinets

* **NOTE**: Temporary power and packaging restrictions apply: Only 12, SAN Switch 2/32 Power Pak units per cabinet.

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