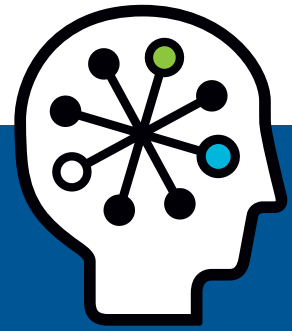




HP StorageWorks B-Series infrastructure

Family data sheet



The HP B-Series directors and switches are the most widely used SAN solutions in the industry, with over 3 million ports deployed. The HP B-Series offers the industry's complete SAN solution portfolio, from embedded to enterprise.

The HP StorageWorks 4/8 Base SAN Switch and 4/8 SAN Switch offer affordable, flexible 4 Gb connectivity to help small and mid-size organizations deploy SANs and grow easily with their storage needs.



HP StorageWorks 4/8 SAN Switch

HP StorageWorks 4/8 Base SAN Switch and 4/8 SAN Switch

The HP StorageWorks 4/8 Base SAN Switch and 4/8 SAN Switch offer 4 Gb connectivity for entry-level storage area networks (SAN) and the ability to grow to larger core-to-edge SAN environments. The simplicity and ease-of-use advantages of these switches, help increase administrator productivity and lower management costs. The switches deliver eight (upgradeable to 16) high-performance auto-sensing 1, 2 or 4 Gb Fibre Channel ports. An optional four-port activation license increases the number of active ports to 12 or 16 ports.

The 4/8 Base model provides single-switch connectivity for a new, simple SAN installation which connects to storage and servers only. The 4/8 SAN Switch can also scale to full multi-switch SAN configurations. The optional PowerPack software bundle provides the SAN administrator with additional enterprise tools to monitor the health and enhance network performance. In addition, PowerPack provides the ability to extend native Fibre Channel connectivity to over 100 km. This reliable switch platform provides:

- **Pay-as-you grow affordable scalability**

- Enables easy deployment, management and integration into a wide range of IT environments
- Enhances port scalability from eight to 12 or 16 ports in four port increments

- Facilitates SAN scalability from single-switch to full fabric connectivity
- Provides the ability to start small and grow storage network in a non-disruptive manner

- **Investment protection**

- Enables backward and forward compatibility
- Supports full inter-operability with existing B-Series switches
- Offers auto-sensing performance from 1 Gb, 2 Gb to 4 Gb

- **Increased efficiency to manage business growth**

- Increases performance and functionality for SANs at an entry-level price
- Offers advantages of low-cost device connectivity and powerful capabilities, making SAN technology accessible and affordable
- Facilitates lower power consumption than other SAN switches
- Increases operational efficiency and staff productivity

The HP StorageWorks 4/16 SAN Switch and 4/16 SAN Switch PowerPack models provide the flexibility, manageability, and performance features that enterprises need to build powerful, flexible storage SANs and consolidate their data storage capacity.

HP StorageWorks 4/16 SAN Switch and 4/16 SAN Switch PowerPack

HP StorageWorks 4/16 SAN Switch and 4/16 SAN Switch PowerPack deliver affordable and flexible 4 Gb connectivity for storage area networks (SANs). The new interconnects can be incorporated into an extensive core fabric or placed at the edge of the SAN infrastructure. The simplicity and ease-of-use features of these switches help increase administrator productivity, while decreasing management costs.

Both switches deliver 16 high-performance auto-sensing 1, 2 or 4 Gb Fibre Channel ports. In addition, the 4/16 SAN switch and 4/16 SAN Switch PowerPack are fully non-blocking, and provide 128 Gb switching (4 Gb full duplex) bandwidth. Providing full SAN scaling capabilities, and using less than half the power of alternative switch solutions, both 4/16 models are ideal for new and existing SAN installations.

The HP StorageWorks 4/16 SAN Switch and 4/16 SAN Switch PowerPack also support Access Gateway mode which reduces traditional heterogeneous switch-to-switch inter-operability challenges by utilizing N_Port ID Virtualization (NPIV) standards to present Fibre Channel server connections as logical devices to SAN fabrics. Attaching through NPIV-enabled edge switches or directors, Access Gateway connects servers to Brocade, McDATA, Cisco, or other SAN fabrics seamlessly.

Besides offering high levels of security, scalability, and manageability, the 4/16 SAN Switch PowerPack provides the SAN administrator with the necessary tools to monitor the health and network performance. Coupled with the ability to extend native Fibre Channel connectivity to over 100 km, is the PowerPack's ability to integrate into HP Storage Essentials. This enables the SAN administrator to

manage the entire environment through a single pane of glass. Small form factor pluggable optical transceivers (SFPs) are available separately.

These comprehensive switches facilitate:

- **Control**—Centralized management tools increase administrator's efficiency
- **Superior performance**—Switch supports 4 Gb per port with nearly complete non-blocking performance
- **Investment protection**—Reduced administrative overhead and low incremental cost allow you to upgrade and scale as needs evolve
- **Value**—Reduced operating expenses and improved environmental performances through lower power consumption and cooling requirements.
- **Advanced availability**—Hot-code activation provides the ability to perform software upgrades with 100 percent application uptime and non-disruption to data traffic
- **Increased efficiency**—Lower power consumption and cooling requirements reduce operating expenses and improve environmental performances
- **Agility**—Access Gateway Mode enables easy deployment into any SAN fabric
- **Flexibility**—PowerPack software tools provide the capability to monitor hot spots and address potential issues proactively; PowerPack includes ISL Trunking, Fabric Watch, Extended Fabric, and Advanced Performance Monitoring



HP StorageWorks 4/16 SAN Switch

The 4/32B SAN Switch and 4/32B SAN Switch PowerPack provide the flexible building blocks customers need to deploy highly scalable, highly available, and easily manageable storage area networks in Adaptive Infrastructure deployments.

HP StorageWorks 4/32B SAN Switch and 4/32B SAN Switch PowerPack

The 4/32B SAN Switch is ideal for use as a stand-alone switch in small SANs or as an edge switch in large core-to-edge storage networks.

The switches deliver 16, 24 or 32 high-performance auto-sensing 1, 2 or 4 Gb Fibre Channel ports. The 4/32B SAN Switch base model ships with 16 active ports. Ports can be activated in eight-port increments with the purchase of a ports-on-demand upgrade license. The 4/32B SAN Switch integrates easily into the installed base of B-Series SANs. It provides non-blocking data transfer and increased application data throughput.

The 4/32B SAN Switch utilizes current B-Series management and monitoring software tools to enhance operational efficiencies and improve SAN investment.

In addition, it simplifies enterprise SAN deployment by combining higher edge switch port density with enhanced scalability, performance and reliability. Advanced Fabric services, including PowerPack, are either pre-configured on the switch or are available as an optional upgrade.

The 4/32B SAN Switch offers:

- **Advanced availability**—Offers redundant, integrated, hot-swappable, removable power supplies and cooling units, ideal for supporting corporate infrastructure implementations

- **Improved total cost of ownership (TCO)**—Integrated Power supply/FAN unit reduces overall FRU count, lowers power dissipation, and reduces cooling requirements as compared to the 4/32 SAN Switch. This results in an improved TCO
- **Efficiency**—Provides ports-on-demand capability for instant scalability and “pay-as-you-grow” value
- **Superior performance**—Features superior 4 Gb performance per port for strategic, data-intensive applications
- **Stability**—Provides investment protection as the device is forward and backward compatible with the entire family of 2 Gb and 4 Gb B-Series switches and directors
- **Adaptability**—Offers four Gb technology with auto-sensing capabilities to recognize 1, 2 or 4 Gb devices
- **Compatibility**—Works seamlessly with all B-Series FC Core, Director and SAN switch products
- **Flexibility**—PowerPack software tools provide the capability to monitor hot spots and address potential issues proactively, and provide the ability to extend native Fibre Channel distances to over 500 km; PowerPack includes ISL Trunking, Fabric Watch, Extended Fabrics, and Advanced Performance Monitoring



HP StorageWorks 4/32B SAN Switch

The HP StorageWorks 4/64 SAN Switch and 4/64 SAN Switch PowerPack are the highly expandable switches available in the market and provide affordable high-density connectivity for high-performance midsize to large storage area networks.

HP StorageWorks 4/64 SAN Switch and 4/64 SAN Switch PowerPack

The HP StorageWorks 4/64 SAN Switch and 4/64 SAN Switch PowerPack switches offer affordable, high density connectivity for a high-performance SAN. The new switches can be incorporated into an extensive core fabric or placed at the edge of the SAN. They deliver 32, 48 or 64 high-performance auto-sensing 1, 2 or 4 Gb Fibre Channel ports. The 4/64 SAN Switch base model ships with 32 active ports. Ports can be activated in 16-port increments with the purchase of an upgrade license.

Storage networking features that include redundant, removable power supplies and cooling, make the switches ideal for supporting corporate infrastructure implementations. The 4/64 SAN Switch includes Web management tools, and hardware and software enforced Zoning. The 4/64 SAN Switch PowerPack provides the SAN administrator with advanced enterprise tools to monitor the health and network performance while providing enhanced levels of security, scalability, and manageability. PowerPack also provides the ability to extend native Fibre Channel connectivity to over 500 km and the foundation for integration into HP Storage Essentials.



HP StorageWorks 4/64 SAN Switch

This highly available switch offers:

- **Performance**—Superior 4 Gb performance makes it ideal for strategic, data-intensive applications. It offers increased network performance with enhanced ISL Trunking, which enables a high-speed data path up to 32 Gb
- **Affordable scalability**—Utilizes ports-on-demand capabilities that provide fast, easy, and cost-effective scalability from 32 to 64 ports in 16-port increments. This solution provides a modular “pay-as-you-grow” approach that supports cost-effective business growth and easy upgrades
- **High availability**—Non-disruptive software upgrades (hot code load and activation), as well as redundant, hot-swappable, removable power supplies and cooling units, make this the ideal solution for supporting corporate infrastructure implementations
- **Investment protection and flexibility**—The 4/64 SAN Switch is forward and backward compatible with the entire family of 1, 2 or 4 Gb B-Series switches and directors
- **Ease of management**—Current B-Series management and monitoring software tools are utilized to improve operational efficiencies and provide a wise SAN investment. It is fully integrated with HP SAN Management tools
- **Increased consolidation**—A high-density port count in a single-domain switch for exceptional scalability, performance and reliability, simplifies enterprise SAN deployment

The physical integration of the Brocade 4Gb SAN Switch within the HP BladeSystem significantly simplifies deployments and increases flexibility and performance, while reducing costs through rack consolidation, reduced cabling and fewer SFPs.

The Brocade 4Gb SAN Switch for HP c-Class BladeSystem

As members of the B-Series family of Fibre Channel switches, the Brocade 4Gb SAN Switches for HP c-Class BladeSystem deliver the latest technology from HP for connecting HP BladeSystem to Fibre Channel SANs. IT managers have the capability to consolidate multiple HP servers, Fibre Channel switches, and Ethernet switches into a single platform for better connectivity to the networked infrastructure. This integration of technology results in space and cost savings facilitated by the reduction of physical components, significant simplification of the SAN environment, outstanding performance, and easier deployments. Through advances in technology, Brocade Fibre Channel switching technology has been physically designed to plug into the back of the HP c-Class BladeSystem, resulting in a zero-footprint integrated SAN solution. Cabling between components, which once had to be done manually by IT staff, is now integrated into the HP BladeSystem, reducing time-to-deploy and administrative man-hours. These space-saving switches provide:

• Simplicity

- Plug and play
- Faster deployment
- Fewer elements to manage with reductions in SFPs, cables, and rack space
- Simpler SAN environment/management
- Integrated design with blade enclosure to decrease complexity and reduce costs (zero footprint, shared power and cooling and reduction in external cabling)

• Flexibility

- Fully compatible with HP StorageWorks B-Series and Brocade switches
- Standards-based
- Fabric inter-operability with Brocade Access Gateway Technology
- Multi-speed support with 1 Gb, 2 Gb or 4 Gb per second auto-sensing
- Broad range of management options, SMI-compliant
- Redundancy for high availability requirements, up to six switches/enclosure
- Support of hot-code activation for non-disruptive firmware updates
- Enhanced scalability with Brocade Access Gateway
- Higher levels of reliability

• Value

- Outstanding 4 Gb performance
- Support for Brocade Trunking, providing up to 16 Gb of direct SAN connectivity in a single logical ISL pipe
- Affordable
- Investment protection
- Lower deployment costs from reduced cables, SFPs, and rack space



Brocade 4Gb SAN Switch for HP c-Class BladeSystem

The HP StorageWorks 4/256 SAN Director and 4/256 SAN Director PowerPack are industry-leading director-class switches, which deliver high-availability and outstanding scalability in a modular and flexible architecture. They provide the foundation for an enterprise SAN that integrates seamlessly into an always-on Internet infrastructure.

HP StorageWorks 4/256 SAN Director and 4/256 SAN Director PowerPack

The HP StorageWorks 4/256 SAN Director and the HP StorageWorks 4/256 SAN Director PowerPack provide high-availability and high-performance features required in mission-critical data center SAN implementations. With up to 384 ports of connectivity in a single domain, the 4/256 SAN director offers flexible scalability for large core-to-edge SAN architectures. The 4/256 director supports blades for Fibre Channel Routing, FCIP SAN extension, and iSCSI. It also supports the B-series 10/6 Fibre Channel blade, providing 10 Gbit/sec Fibre Channel data transfer for specific types of data-intensive storage applications. The wide range of blade options enable the 4/256 SAN Director to deliver next-generation performance with faster fabric services and unique investment protection. The 4/256 SAN Director hardware and software architectures support “five-nines” availability with hot-swappable FRUs and redundant central processors. Reliability and availability features facilitate non-disruption when upgrading hardware and software.

The 4/256 SAN Director PowerPack includes the 4/256 Director switch with specially priced value-added management software. The new director lowers the total cost of ownership (TCO) of deploying and operating SAN infrastructures. It helps improve data center efficiency by providing significant operational savings on power and cooling related to other SAN solutions. With higher port density than previous directors, the 4/256 delivers more efficient use of expensive data center floor space. The director is 1, 2 or 4 Gb auto-sensing protects customer investment by being fully backward compatible with the entire B-Series family of fabric switches and director switches.



HP StorageWorks 4/256 SAN Director

These high performance switches achieve:

- **Control**—Multi-switch fabric tools facilitate easy configuration and monitoring convenient Power Pack options
- **Efficiency**—Provide up to 384 concurrently active 4 or 8 Gbit/sec full duplex ports in a single domain 14U rack-mount enclosure
- **Superior performance**—Leading-edge 4 Gb, 8 Gb, and 10 Gb Fibre Channel and FICON enhance performance
- **Flexibility**—Offer 16-port, 32-port and 48-port 4 Gb blades for superior scalability; 16-port 8 Gb blade for superior performance; 6-port 10 Gb blade for high speed dark fiber and/or DWDM
- **Manageability**—Integrate fully with HP System Insight Manager (SIM) and Storage Essentials software suites
- **Investment protection**—Deliver standards-based interoperability with existing FC switches and integrating seamlessly into 1, 2 or 4 Gb fabrics.
- **Advanced availability**—Offer supporting “five-nines” availability with such advantages as hot-swappable field-replaceable units (FRUs), redundant control processors, stable failover, and concurrent hardware and software upgrades
- **Flexibility**—PowerPack software tools provide the capability to monitor hot spots and address potential issues proactively; PowerPack includes ISL Trunking, Fabric Watch, Extended Fabric, and Advanced Performance Monitoring
- **Expandable capability**—The MP Router blade adds the ability to link devices across Fibre Channel fabrics and provide GigE links within the chassis
- **Lower TCO**—The new iSCSI Blade enables organizations to integrate low cost Ethernet connected servers into 4/256 SAN Director by using the iSCSI protocol

The HP StorageWorks DC SAN Backbone Director PowerPack is a highly advanced B-series director-class switch and provides the backbone for evolving Storage Area Networks (SANs) in mission-critical environments. It supports an intelligent, scalable, and application-centric approach to enterprise data management.

HP StorageWorks DC SAN Backbone Director PowerPack

The HP StorageWorks DC SAN Backbone Director PowerPack provides the backbone for evolving Storage Area Networks (SANs) in mission-critical environments. It enables the merging of diverse types of networks including client/server, virtual server cluster, extension, and SANs to improve server and storage utilization, simplify management, reduce costs, and support non-disruptive growth.

DC SAN Director is the highest performing director with a 6 Tb backplane providing a new class of infrastructure for the data center. It improves energy efficiency by combining higher bandwidth with lower power consumption. DC SAN Director facilitates server and storage expansion for open and mainframe environments, delivering scalability with up to 768 ports in a dual chassis configuration with the use of Inter-Chassis Links (ICLs). Furthermore, it provides investment protection for increased ROI by supporting existing and emerging protocols, including 8 Gb/s Fibre Channel, Fibre Channel over Ethernet (FCoE) (ready), 10 Gigabit Ethernet, FCIP, and FICON.

The PowerPack set of tools monitor the network's health and performance. Adaptive Networking provides traffic management applications which deliver application-aware management of fabric resources while enabling integration with HP Storage Essentials Management tools.

• Offers high performance with:

- 4x the system bandwidth then the 4/256 SAN Director for future data center needs
- 6 Tb backplane for and per-port routing reduces over subscription
- Up to 64 Gb/s of bandwidth per Inter Switch Link (ISL) Trunk

• Supports high scalability with:

- 768 ports in a dual chassis configuration with the use of Inter Chassis Links (ICLs)
- Consolidation of physical fabrics into virtualized infrastructures
- Partitioning for flexible management

• Delivers flexible Multi-Protocol Connectivity with:

- Fibre Channel, FCIP, FICON, Routing (ready), FCoE (ready)
- Single platform for Fibre Channel and IP connectivity

• Facilitates improved data access with:

- “Five nines” availability
- Adaptive Networking for application-based traffic management
- Non-disruptive upgrade of hardware and software

• Provides investment protection with:

- Forward and backward compatibility with B-series installed base
- Inter-operability with M-series portfolio
- 1/2/4/8/10 Gb auto-sensing connectivity



HP StorageWorks DC SAN Backbone Director PowerPack

The HP StorageWorks Multi-Protocol Routers enable large organizations to derive more value from the SAN infrastructure by providing the ability to connect SAN islands and share resources, without the risk, cost and complexity of merging them into a single large fabric.

For many organizations, the storage infrastructure has evolved into a set of multiple disconnected SAN islands, increasing complexity and costs. The HP StorageWorks B-Series Multi-Protocol (MP) Routers enable organizations to derive more value from the SAN infrastructure by providing the ability to connect SAN islands and share resources, without the risk and complexity of merging them into a single large fabric, both for FCIP and native Fibre Channel connectivity. The resulting modular SAN design provides a more scalable, flexible, and stable infrastructure that is not limited by distance, rather it helps in increasing the business value of the SAN infrastructure.

The HP B-Series MP Routers provide two types of SAN services: (1) FC-FC Subnet Routing Service for SAN island consolidation and (2) FCIP and FC Tunneling Service for SAN extension over distance. These services provide new options for connecting SAN islands and extending SAN benefits over multiple networks, to larger SAN sizes and across longer distances. Key advantages of this approach include:

- Simplifying SAN design, implementation, and management through centralization
- Providing a seamless and dependable way to share resources across multiple SANs without the complexity of physically merging those SANs
- Creating a more unified SAN environment with easier interconnection and support for SANs and SAN resources purchased from different storage vendors
- Reducing disruptions created by events such as data migration, storage or server consolidation, migration to production environments, and application rebalancing between fabrics
- Extending those benefits over long distances with high-performance FCIP services

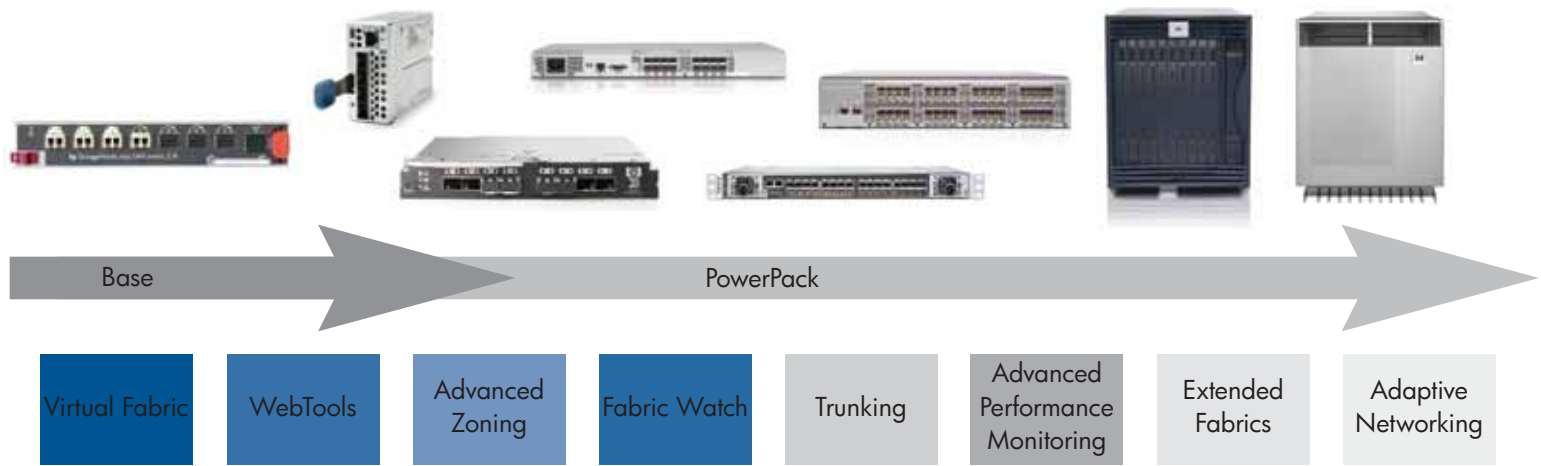
The HP StorageWorks 400 Multi-Protocol Router offers these benefits in the convenient packaging of a stand-alone product. Coming as an option for the HP StorageWorks 4/256 SAN Director and DC SAN Backbone Director, the HP MPR blade is able to provide these SAN services with the performance and high-availability characteristics of the director platform. The ability to offer these benefits in multiple form factors provides outstanding flexibility to meet multiple customer requirements.

More specifically, the HP MP Routers help:

- **Improve the value of SANs by**
 - Reducing the cost and effort of SAN design, implementation, and management
 - Enabling greater utilization of data networks
 - Integrating with HP B-Series products and management tools for investment protection
- **Provide outstanding scalability and operational flexibility through**
 - Hierarchical routing of architectures for increased SAN scalability (supports thousands of ports and thousands of shared devices)
 - Maintenance of fabric isolation for improved operational stability
 - Non-disruptive integration to the SAN environment
- **Deliver superior performance with**
 - Excellent 4 Gb Fibre Channel routing services
 - Performance-enhanced FCIP services with compression and up to eight FCIP tunnels per gigabit Ethernet port
 - The ability to run applications at line-rate speeds



HP StorageWorks Multi-Protocol Router



Optional software

Virtual Fabric

Available in B-Series Fabric OS Version 5.2 and greater, the Virtual Fabric feature provides the ability to logically partition a single physical B-Series SAN fabric into multiple logical fabrics. A Virtual Fabric is a collection of device ports that may be managed separately from the rest of the SAN fabric. Virtual Fabrics are designed to facilitate more efficient SAN operations, especially with regard to improved security, resource sharing, and consolidation.

Fabric Manager

Fabric Manager is a highly scalable, Java-based application that manages multiple switches and multiple fabrics 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.

Adaptive Networking

Adaptive Networking (AN)—only available with the DC SAN Backbone Director—is a family of technologies which allow flexible control of traffic movement within the fabric that delivers application-aware management of fabric resources. AN applications may be used with multiple protocols and multiple classes of service. It enables the fabric to allocate shared resources dynamically as changes occur in the requirements of virtualized elements—such as servers, networks, and storage—in the data center. If congestion occurs (or is predicted), the fabric can adjust bandwidth and other resources automatically according to defined service levels—hence, to make sure that higher-priority workloads receive, the resources they need.

Fabric Watch

Fabric Watch enables each switch to monitor the SAN for potential faults and alerts, network managers to problems automatically before they occur. Fabric Watch tracks a variety of SAN fabric elements, events and counters. Monitoring fabric-wide events, ports, SFPs and environmental parameters facilitates 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 technology helps administrators monitor and watch, specific fabric metrics from a SID (Source ID) to a DID (Destination ID). It helps them fine-tune and scale the fabric more efficiently. In addition, the Advanced Performance Monitoring possesses the ability to detect hot spots within the fabric which makes it a powerful tool to maintain overall balanced performance.

Extended Fabric

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

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 switches. Each four Gb switch needs its own license. The switch-operating system views the trunk as a single, high bandwidth resource (up to 32 Gb) when routing connections between 4 Gb switches. Connections are load-balanced across the individual links that comprise the logical trunk group.

Technical specifications



HP StorageWorks 4/8 Base SAN Switch



HP StorageWorks 4/8 SAN Switch

Hardware features	Rack-mount kit Firmware version 5.x	Rack-mount kit Firmware version 5.x
Power supply/fans	Fixed power supply	Fixed power supply
Form factor	1U	1U
Port types	Universal self-configuring ports (F, FL, E)	Universal self-configuring ports (F, FL, E)
Software features	<ul style="list-style-type: none"> • Advanced Zoning • WebTools 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric
Fabric	1-Switch Fabric Limit upgradeable to Full Fabric	Full Fabric
What's included*	HP StorageWorks SAN switches—Switch, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation instructions), Advanced Zoning and WebTools, serial cable, standard and PDU power cords	

For ordering information, please see QuickSpecs http://h18000.www1.hp.com/products/quickspecs/12345_div/12345_div.html

*SFP should be ordered separately for the 4/8 SAN Switch models.

Technical specifications



HP StorageWorks 4/16 SAN Switch



HP StorageWorks 4/16 SAN Switch PowerPack

Hardware features	Rack-mount kit Firmware version 5.x	Rack-mount kit Firmware version 5.x
Power supply/fans	Fixed power supplies, fans	Fixed power supplies, fans
Form factor	1U	1U
Port types	Universal self-configuring ports (F, FL, E)	Universal self-configuring ports (F, FL, E)
Software features	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Access Gateway 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Access Gateway • PowerPack: <ul style="list-style-type: none"> —Advanced Performance Monitoring —Fabric Watch —ISL Trunking —Extended Fabric
Fabric	Full Fabric	Full Fabric
What's included*	HP StorageWorks SAN switches —Switch, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation instructions); Advanced Zoning and WebTools; serial cable; standard and PDU power cords	

For ordering information, please see QuickSpecs http://h18000.www1.hp.com/products/quickspecs/12343_div/12343_div.html

*SFP should be ordered separately for the 4/16 SAN Switch models.

*PowerPack additionally includes: Fabric Watch, Trunking 8, Advanced Performance Monitoring, Extended Fabrics

Technical specifications



HP StorageWorks 4/32B SAN Switch

HP StorageWorks 4/32B SAN Switch PowerPack

HP StorageWorks 4/64 SAN Switch

HP StorageWorks 4/64 SAN Switch PowerPack

Hardware features	Rack-mount kit Firmware version 5.x	Rack-mount kit Firmware version 5.x	Rack-mount kit Firmware version 5.x	Rack-mount kit Firmware version 5.x
Power supply/fans	Integrated, redundant, hot-swappable, removable power/fan units	Integrated, redundant, hot-swappable, removable power/fan units	Redundant, hot-swappable, removable power supplies and cooling units	Redundant, hot-swappable, removable power supplies and cooling units
Form factor	1U	1U	2U	2U
Port types	<ul style="list-style-type: none"> • Universal self-configuring ports (E, F and FL) • 16 installed, 32 ports maximum with 8-port upgrades 	<ul style="list-style-type: none"> • Universal self-configuring ports (E, F and FL) • 32 installed, 32 ports maximum 	<ul style="list-style-type: none"> • Universal self-configuring ports (E, F and FL) • 32 ports active, 64 ports maximum with 16-port upgrades 	<ul style="list-style-type: none"> • Universal self-configuring ports (E, F and FL) • 32 ports active, 64 ports maximum with 16-port upgrades
Software features	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric • PowerPack: <ul style="list-style-type: none"> —Advanced Performance Monitoring —Extended Fabric —Fabric Watch —ISL Trunking 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric • PowerPack: <ul style="list-style-type: none"> —Advanced Performance Monitoring —Extended Fabric —Fabric Watch —ISL Trunking
What's included*	HP StorageWorks SAN switches —Switch, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation instructions); Advanced Zoning and WebTools; serial cable; standard and PDU power cords			

For ordering information, please see QuickSpecs http://h18000.www1.hp.com/products/quickspecs/12712_div/12712_div.html
http://h18000.www1.hp.com/products/quickspecs/12482_div/12482_div.html

*SFP should be ordered separately for the 4/32B and 4/64 SAN Switch models.

Technical specifications



Brocade 4Gb SAN Switch for HP c-Class BladeSystem

Brocade 4Gb SAN Switch for HP c-Class BladeSystem PowerPack

Performance	4 Gb	4 Gb
Maximum ports	24	24
Minimum ports	12	24
Port types	Universal self-configuring ports (FL, F, E, N)	Universal self-configuring ports (FL, F, E, N)
Aggregate switch bandwidth	192 Gb (end-to-end)	192 Gb (end-to-end)
Protocol support	Fibre Channel	Fibre Channel
Blade type supported	HP c-Class BladeSystem	HP c-Class BladeSystem
High-availability features	Redundant switches per BladeSystem	Redundant switches per BladeSystem
Management features	WebTools; Advanced Zoning; Virtual Fabric; Access Gateway	WebTools; Advanced Zoning; Virtual Fabric; Access Gateway; PowerPack: ISL Trunking, Advanced Performance Monitoring, Fabric Watch, Extended Fabrics
Form factor	Embedded	Embedded
Media types	Small form-factor pluggable (SFP) transceivers	Small form-factor pluggable (SFP) transceivers
Upgradeability	Scalable licensing with 12 additional ports for 12-port model; maximum 24 ports. PowerPack upgrade	N/A
Models available	12-Port Full Fabric, 24-Port Full Fabric	24-Port Full Fabric PowerPack
Optional software	ISL Trunking, Advanced Performance Monitoring, Extended Fabrics, Fabric Watch, Fabric Manager Enterprise Edition, Fabric Manager Base (10 Domains edition), Secure Fabric OS	Fabric Manager Enterprise Edition, Fabric Manager Base (10 Domains edition), Secure Fabric OS
Dimensions (HxWxL)	11" x 1.13" x 7.63"	11" x 1.13" x 7.63"
Product weight (lbs)	Approximately 2.85 lb	Approximately 2.85 lb
Warranty	1 year parts, 1 year labor, 1 year onsite	1 year parts, 1 year labor, 1 year onsite
What's included*	One 4 Gb SAN Switch with up to 16 internal ports and up to 8 fabric ports enabled; two or four short wave 4 Gb SFPs; WebTools license; Zoning license; Access Gateway, Full Fabric connectivity; documentation; PowerPack model includes licensed PowerPack software features.	

For ordering information, please see QuickSpecs http://h18000.www1.hp.com/products/quickspecs/12480_div/12480_div.html
http://h18006.www1.hp.com/products/quickspecs/12484_div/12484_div.html

*PowerPack additionally includes: Fabric Watch, ISL Trunking, Advanced Performance Monitoring, Extended Fabrics

Technical specifications



HP StorageWorks 4/256 SAN Director

HP StorageWorks 4/256 SAN Director PowerPack

HP StorageWorks DC SAN Backbone Director PowerPack

Hardware features	Rack-mount kit, industry-standard hot-pluggable small form factor optical transceivers, 4 GB 16-port Director Blade (A7990A), 4 GB 32-port Director Blade (A7991A), Firmware version 5.x, 4 GB 48-port Director Blade (AG561A), 8 Gb 16-port Director Blade (AK858A), 10 Gb 6-port Director Blade (AK861A), B-Series iSCSI Blade (AG671A), B-Series Multi-Protocol Router Blade (AG461A)	Rack-mount kit, industry-standard hot-pluggable small form factor optical transceivers, 4 GB 16-port Director Blade (A7990A), 4 GB 32-port Director Blade (A7991A), Firmware version 5.x, 4 GB 48-port Director Blade (AG561A), 8 Gb 16-port Director Blade (AK858A), 10 Gb 6-port Director Blade (AK861A), B-Series iSCSI Blade (AG671A), B-Series Multi-Protocol Router Blade (AG461A)	Rack-mount kit, industry-standard hot-pluggable small form factor optical transceivers, 8 Gb 16-port Director Blade (AK858A), 8 Gb 32 port Director Blade (AK859A), Firmware version 6.0.0b or higher, 8 Gb 48 port Director Blade (AK860A), 10 Gb 6-port Director Blade (AK861A), B-Series Multi-Protocol Router Blade (AG461A)
Power supply/fans	Two hot-swappable power supplies and three hot-swappable cooling units	Two hot-swappable power supplies and three hot-swappable cooling units	Two hot-swappable power supplies and three hot-swappable cooling units
Form factor	14U	14U	14U
Port types	<ul style="list-style-type: none"> • Universal self-configuring ports (F, FL, E) • 384 ports maximum with 48-port FC blades 	<ul style="list-style-type: none"> • Universal self-configuring ports (F, FL, E) • 384 ports maximum with 48-port FC blades 	<ul style="list-style-type: none"> • Universal self-configuring ports (F, FL, E) • 384 ports maximum with 48-port FC blades • 768 ports maximum in a dual chassis configuration requires ICL Bundle Kit (AK862A)
Software features	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric • PowerPack: <ul style="list-style-type: none"> —Advanced Performance Monitoring —Extended Fabrics —Fabric Watch —ISL Trunking 	<ul style="list-style-type: none"> • Advanced Zoning • WebTools • Full Fabric • Virtual Fabric • PowerPack: <ul style="list-style-type: none"> —Advanced Performance Monitoring —Adaptive Networking —Extended Fabrics —Fabric Watch —ISL Trunking
What's included*	<p>HP StorageWorks SAN Directors—Director chassis, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation instructions); Advanced Zoning and WebTools, serial cable, standard and PDU power cords. Fibre Channel, iSCSI, and Multi-Protocol Router Blades must be ordered separately.</p> <p>HP StorageWorks DC SAN Backbone Director—Director chassis, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation instructions); Advanced Zoning, WebTools, PowerPack bundle, serial cable, standard and PDU power cords. Fibre Channel, iSCSI, and Multi-Protocol Router Blades must be ordered separately.</p>		

For ordering information, please see QuickSpecs http://h18000.www1.hp.com/products/quickspecs/12344_div/12344_div.html
http://h18000.www1.hp.com/products/quickspecs/12993_div/12993_div.html

Technical specifications



HP StorageWorks B-Series iSCSI Director Blade



HP StorageWorks B-Series Multi-Protocol (MP) Router Blade



HP StorageWorks 400 Multi-Protocol (MP) Router

Hardware features	Industry-standard hot-pluggable small form factor optical transceivers, Firmware version 5.x	Industry-standard hot-pluggable small form factor optical transceivers, Firmware version 5.x	Industry-standard hot-pluggable small form factor optical transceivers, Firmware version 5.x
Power supply/fans	N/A	N/A	Redundant power supplies
Form factor	Blade for director chassis	Blade for director chassis	2U
Port types	<ul style="list-style-type: none"> Fibre Channel (E, F, FL, EX) and Gigabit Ethernet 18 ports (16 FC and 2 Ethernet) 	<ul style="list-style-type: none"> Fibre Channel (E, F, FL, EX) and Gigabit Ethernet 18 ports (16 FC and 2 Ethernet) 	<ul style="list-style-type: none"> Fibre Channel (E, F, FL, EX) and Gigabit Ethernet 18 ports (16 FC and 2 Ethernet)
Software features	<ul style="list-style-type: none"> Simple Name Server, Registered State Change Notification (RSCN) and iSCSI Gateway Service Fabric services include the FC-FC Routing Service, FCIP Tunneling Service, Advanced Zoning, and WebTools 	<ul style="list-style-type: none"> Simple Name Server, Registered State Change Notification (RSCN) and iSCSI Gateway Service Fabric services include the FC-FC Routing Service, FCIP Tunneling Service, Advanced Zoning, and WebTools 	<ul style="list-style-type: none"> Simple Name Server, Registered State Change Notification (RSCN) and iSCSI Gateway Service Fabric services include the FC-FC Routing Service, FCIP Tunneling Service, Advanced Zoning, and WebTools
What's included*	All other HP StorageWorks SAN switches and directors —Switch, accessory kit (rack-mount kit, enterprise safety and regulatory information, installation guide), Advanced Zoning, and WebTools, serial cable, standard and PDU power cords		

For ordering information, please see QuickSpecs http://h18006.www1.hp.com/products/quickspecs/12483_div/12483_div.html
http://h18006.www1.hp.com/products/quickspecs/12484_div/12484_div.html

*SFP should be ordered separately for the Multi-Protocol Routers.

Warranty and included services

Hardware warranty

HP provides a one-year, hardware limited warranty, fully supported by a worldwide network of resellers and service providers. It includes one-year parts; one-year onsite (normal business hours, next-business-day response) and one-year labor, basic installation not included.

NOTE: The hardware warranty covers firmware and embedded non-saleable software.

Software warranty

HP warrants only that the software media will be free of physical defects for a period of 90 days from delivery. For more information about HP Global Limited Warranty and Technical Support, visit www.hp.com/products/storageworks/warranty

HP Care Pack services

HP Care Pack services offer upgraded service levels to extend and expand your standard product warranty with easy-to-buy, easy-to-use support packages, which help you make the most of your hardware and software investments. They let you choose the support levels that meet your business requirements, from basic to mission-critical. Hence, helping you contain total cost of ownership.

HP Care Pack warranty extensions can be purchased along with HP products to cost-effectively upgrade or extend your warranty. For many products, post-warranty HP Care Pack Services are available when your original warranty has reached expiry. For more information on these services, contact your local HP representative, authorized HP business partner or visit www.hp.com/services/storage_carepacks

HP Factory Express

HP Factory Express is a portfolio of more than 50 flexible and robust pre-priced, customized, and integrated factory configuration and deployment services—supporting HP products from the desktop to the data center with Microsoft® Windows®, Linux and HP-UX 11i. To learn more, visit www.hp.com/go/factory-express

Additional HP support services

HP Services provides a broad spectrum of services to commercial and enterprise customers. It includes performance and availability services such as proactive mission-critical services. In addition, it offers support management services for deployment of the entire IT infrastructure, including HP and multi-vendor environments. For more information on these services, contact your HP representative, authorized HP business partner or visit www.hp.com/hps/storage

Education services

HP offers a variety of training methods to fit your needs including traditional instructor-led courses at one of our 120 training centers worldwide. Furthermore, it offers onsite training that is customized to your needs in your facility or even Remotely Assisted Instruction Learning (RAIL) that combines the excellent traditional classroom training (including its live instructor and labs) with the excellent online training (no traveling required). If you like learning on your own schedule, at your own pace, make use of e-learning opportunities on the award-winning HP IT Resource Center, a “learning community” with extensive on-demand resources that can be accessed 24x7. For more information on these services, contact your HP representative, authorized HP business partner or visit www.education.hp.com/curr-storsan.htm

HP Financial services

HP Financial Services provides innovative financing and financial asset management programs to help customers cost-effectively acquire, manage, and ultimately retire their HP solutions. For more information on these services, please contact your HP representative or visit www.hp.com/go/hpfinancialservices

For more information

To quickly find the HP storage products that fit your specific needs, visit www.hp.com/go/product-selector

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For more information, visit www.hp.com/go/san

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