

Overview

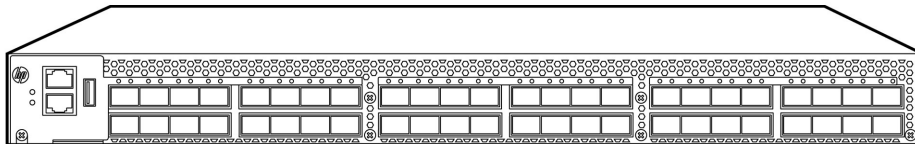
To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data center networks. In addition, the move toward cloud computing, which promises greater efficiency and a more service-oriented business model, means that these networks will face even greater demands.

The HP SN6000B Fibre Channel Switch meets the demands of hyper-scale, private cloud storage environments by delivering market-leading 16 Gb Fibre Channel technology and capabilities that support highly virtualized environments. Designed to enable maximum flexibility and investment protection, the SN6000B Switch is configurable in 24, 36, or 48 ports and supports 4, 8, 10, or 16 Gbps speeds in an efficiently designed 1U package. It also provides a simplified deployment process and a point-and-click user interface—making it both powerful and easy to use. The SN6000B Switch offers low-cost access to industry-leading Storage Area Network (SAN) technology while providing "pay-as-you-grow" scalability to meet the needs of an evolving storage environment.

The SN6000B is available in five models:

- HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch
- HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch
- HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch
- HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch
- HP StoreFabric SN6000B 16Gb Bundled Fibre Channel switch

Power Pack+ includes additional software: Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced 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.



What's New

- HP StoreFabric SN6000B 16Gb Bundled Fibre Channel switch
- New RoHS compliant HP SAN switches

NOTE: Restriction of Hazardous Substances Directive or RoHS is a directive adopted by the European Union that restricts the use of certain hazardous materials in the manufacture of various types of electronic and electrical equipment. The RoHS compliant products with new part numbers listed in this document are functionally equivalent to the corresponding products with old part numbers and are fully interchangeable.

Features and Benefits

Key Features and Benefits

- Delivers 16 Gbps performance with up to 48 ports in an energy-efficient, 1U form factor, providing maximum flexibility for diverse deployment and cooling strategies
- Features Ports on Demand (PoD) capabilities for fast, easy, and cost-effective scaling from 24 to 48 ports in 12-port increments
- Provides a flexible, simple, and easy-to-use SAN solution with industry-leading technology
- Supports highly virtualized, private cloud storage with multi-tenancy and non-stop operations
- Offers best-in-class port density and scalability for midrange enterprise SAN switches, along with redundant, hot-pluggable components and non-disruptive software upgrades
- Metro cloud connectivity features including integrated DWDM and dark fiber support (optional license)
- In-flight compression and encryption included providing efficient link utilization and security.
- Yields exceptional price/performance value, exceeding comparable Ethernet storage-based alternatives
- Unique Bundle model: The HP StoreFabric SN6000B 16Gb Bundled Fibre Channel switch model facilitates ease of ordering by offering the HP SN6000B 48/24 Fibre channel switch along with twenty-four 16Gb optical transceivers in one package. The HP StoreFabric SN6000B 16Gb Bundled Fibre Channel switch model is offered at a lower price than the sum of the list prices of the HP SN6000B 48/24 Fibre Channel switch and the 16Gb optical transceivers

Models

HP SN6000B 16Gb FC Switch Models

HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch	QR481B
HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch	QK754B
HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch	QR480B
HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch	QK753B
HP StoreFabric SN6000B 16Gb 48/24 Bundled Fibre Channel Switch	C8R08A

Product Highlights

SN600B 16Gb FC Switch

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 24, 36, or 48-ports in a 1U enclosure
- Provides 4 Gb/s, 8 Gb/s, 10 Gb/s, 16 Gb/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 16 Gb/s switches up to 128 Gb/s

* 16 Gb/s ISL performance can be obtained between two 16 Gb/s switches.

Configuration Support

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

High-availability features

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

Advanced Fabric Services

- Hardware Enforced Zoning
- Frame Filtering
- Built-in Web browser management tools
- Enhanced Group Management (EGM)
- HP B-series SAN Network Advisor software (optional)

Cabinet Support

- HP (22U, 36U and 42U) 9000 and 10000 G1 Series, (25U, 33U and 41U) HP System/e, and the 22U, 36U, and 42U HP 10000 G2 Series

NOTE: To order factory integration, add OD1 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

EGM

Enhanced Group Management (EGM) is a FOS license that is included with all B-Series switches and enables multi-switch operations. It helps automate operations across multiple switches to save time and streamline repetitive operations, which are typically prone to error. EGM drives consistency across fabrics, while minimizing the risk associated with potential downtime due to configuration mismatches. EGM provides streamlined troubleshooting for more effective fabric monitoring and diagnosis.

HP SAN Network Advisor Professional, Professional Plus, and Enterprise enable EGM functionality. Customers have EGM functionality enabled within the hardware product and need only to make the decision around which management application is right for them.

In-flight Compression and Encryption

In-flight compression optimizes network performance within the data center and over long-distance links. Data is compressed at the source and uncompressed at the destination. Performance varies by data type, but generally achieve 2:1 compression with minimal impact on performance. Compression can be used in conjunction with in-flight encryption.

In-flight encryption minimizes the risk of unauthorized access for traffic within the data center and over long-distance links. It is switch-to-switch encryption, not device or data-at-rest encryption. Data is encrypted at the source and decrypted at the destination. Encryption and decryption are performed in hardware using the AES-GCM-256 algorithm, minimizing any impact on performance. Encryption can be used in conjunction with in-flight compression. This is complementary to data-at-rest encryption provided by the Encryption SAN Switch and the Encryption Blade for B-series SAN Directors.

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.

Product Highlights

Server Application Optimization

Server Application Optimization (SAO) license improves overall application performance for physical servers and virtual machines. SAO, when deployed with B-Series Fibre Channel HBAs, extends B-Series Adaptive Networking from the B-series SAN fabric to the server infrastructure. This delivers application-level, fine-grain Quality of Service (QoS) management to the HBAs and related server applications.

Solution Requirements:

- SAO license must be installed on the edge (server connected) switch
- Adaptive Networking (AN) license must be installed on the edge (server connected) switch
- SAO requires B-series HBA installed in the server

Software Components, Optional

SN600B 16Gb Switch Power Pack+ Software Bundle

The Power Pack+ Software Bundle comes with the SN600B16Gb 48/48 Power Pack+ Switch and SN600B 16Gb 48/24 Power Pack+ Switch or as an optional software bundle for the SN600B 16Gb 48/48 FC Switch, the SN600B 48/24 FC Switch and the SN600B Bundled Fibre Channel switch. It includes the following:

- Fabric Vision
- Fabric Watch
- Advanced Performance Monitor
- Extended Fabric
- ISL Trunking

Fabric Vision

Fabric Vision offers innovative diagnostic, monitoring and management capabilities to help accelerate new application deployments, address SAN problems before they impact operations and reduce operational costs. It includes

- **Monitoring and Alerting Policy Suite:** A policy-based monitoring tool with pre-built rules and automation that simplifies fabric-wide threshold configuration and monitoring.
- **Flow Vision:** A comprehensive tool that enables administrators to identify, monitor, and analyze specific application data flows without using taps to ensure optimized performance
- **Health and performance dashboard:** A single customizable screen displayed in HP SAN Network Advisor that contains all critical SAN information for convenient review and analysis

Fabric Vision will be included by default in all HP StoreFabric B-series Fibre Channel switches and Directors bundled with Power Pack+ (with FOS 7.2.0a and later). In all other cases, Fabric Vision can be enabled on HP StoreFabric B-series Fibre Channel switches and Directors in any one of the following ways

- Application of the Fabric Vision LTU (FOS 7.2.0a and later)
- Application of the Power Pack+ LTU (FOS 7.2.0a and later)
- Upgrading existing Switch/Director loaded with Power Pack+ to FOS 7.2.0a or later
- Upgrading existing Switch/Director loaded with both Advanced Performance Monitor (APM) and Fabric Watch (FW) licenses to FOS 7.2.0a or later

Product Highlights

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.

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 16Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 128Gb) when routing connections between 16Gb switches. Connections are load-balanced across the individual links, which comprise the logical trunk group.

Integrated Fibre Channel Extension

Integrated SAN extension over native Fibre Channel provide metro connections up to 100 km including support for 10 Gbps Fibre Channel over Dense Wavelength Division Multiplexing (DWDM) and dark fiber. This license enables support on the first eight (8) ports of the switch.

SAN Network Advisor Professional

HP SAN Network Advisor Professional is a server based management application available at no-charge that comes with B-series SAN Switches and includes the following features:

- Allows management of a single Fabric OS (FOS) fabric (up to a 1,000 B-Series switch ports)
- Performs group switch management beyond the scope of Web Tools
- Does not offer management for the DC SAN Backbone Director, the SN8000B Director, or FICON

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

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

Product Highlights

SAN Network Advisor Enterprise and Professional+

HP SAN Network Advisor Enterprise and Professional+ are the enterprise-class products that support FOS products. SAN Network Advisor Enterprise provides complete B-series Directors Management including enterprise-class features/environments such as FICON, Fibre Channel Routing, FCIP, adaptive networking, etc while SAN Network Advisor Professional+ provides the same feature set except for support for the DC SAN Backbone Director, SN800B 8-Slot Director, and FICON.

SAN Network Advisor Enterprise delivers unprecedented scalability, up to 24 fabrics and 9,000 switch ports, while SAN Network Advisor Professional+ scales to 4 SAN Fabrics and 2560 switch ports. There is an upgrade available from SAN Network Advisor Professional Plus to SAN Network Advisor Enterprise.

Integrated Routing

Integrated Routing is an optional license which provides native Fibre Channel Routing (FCR) on a per-port basis, rather than limiting routing ports to those on a dedicated routing switch or 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

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.

Service and Support

Technology Services for increased uptime, productivity and ROI

TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best—the experienced professionals at HP Services.

Protect your business beyond warranty

Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business—by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

What HP Storage Technology Services can do for you

HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care—from technology support to complex migrations to complete managed services.

Choose the right level of support, deployment and integration services

HP support recommendations are designed to help you enhance technology operations and lower risk—and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs—Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network—plus, a full set of infrastructure services designed to power a Converged Infrastructure.

Service and Support

Optimized Care - delivers best performance and stability through deployment and proactive management practices

Choose either:

HP Critical Advantage Level 3 Service - Choose this service when you need an end-to-end infrastructure support solution that encompasses server, operating system, hypervisor, storage, and network. It's the level of support well suited for business-critical applications running on virtualized and x86 infrastructures. (Includes 60 Critical Advantage flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf>

Or:

3-Year HP Critical Service - Designed for environments where downtime cannot be tolerated, HP monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated critical support escalation resources.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf>

Standard Care - maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support

Choose either:

HP Critical Advantage Level 2 Service - Opt for end-to-end infrastructure support including server, operating system, hypervisor, storage, and network in an environment running business critical applications on virtualized and x86 infrastructures. (Includes 30 Critical Advantage flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf>

Or:

3-Year HP Proactive 24 Service - This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf>

Plus:

HP Proactive Select - Choose from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. (Includes 30 Proactive Select flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf>

Basic Care - Minimum recommended support

3-Year HP Proactive 24 Service - This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf>

Implement right from the start

Whichever level of care you select, it includes:

HP Enhanced Implementation Service for SANs-HP delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-8527EN.pdf>

Service and Support

Remote Support Tools

HP Insight Remote Support - Count on proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis, and problem resolution, all available at no extra charge if you have an existing warranty, service agreement, or HP Care Pack Service with HP.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf>

Additional service to meet your needs

HP Assessment Service for SANs - We offer customized technical and operational guidance to customers employing HP storage subsystems and the interconnecting storage area network (SAN), with recommendations to help improve availability levels and ongoing environment management.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA1-2941ENW.pdf>

For more information

www.hp.com/services/storage

To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at www.hp.com/go/lookuptool

Family Information

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base	8/80 SAN Switch and 8/80 SAN Switch Power Pack+	SN6000B 16Gb FC Switch and SN6000B 16Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec	8Gbit/sec	16Gbit/sec
Aggregate device bandwidth	128 - 384 Gbit/sec full duplex	256 - 384 Gbit/sec full duplex	768 - 1280 Gbit/sec full duplex	768 - 1536 Gbit/sec full duplex
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide			
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA			
FC Ports	8 Enabled 24 Max	16 Enabled 24 Max	48 Enabled 80 Max	24 or 48 Enabled 48 Max
SFP	B-series	B-series	B-series	B-series
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
Adaptive Networking	Included	Included	Included	Included
Form factor	1U	1U	2U	1U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes	Yes
Hot plug fans	No	No	Yes	Yes (integrated with power supply)

Features	8/24 Bundled FC Switch	SN6000B 16Gb Bundled FC Switch
Targeted Environment	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	384 - 768 Gbit/sec full duplex
Aggregate device bandwidth	256 - 384 Gbit/sec full duplex	16Gbit/sec
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide	
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA	
FC Ports	16 Enabled 24 Max	24 or 48 Enabled 48 Max
SFP	B-series, 16 units included in the box	B-series, 24 units included in the box

Family Information

Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Included	Included
Form factor	1U	1U
Zoning Software	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	Yes
Hot plug fans	No	Yes (integrated with power supply)

Features	1606 Extension SAN Switch	Encryption SAN Switch
Targeted Environment	Data Centers	Data Centers
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec
Ethernet	1Gbit/sec Ethernet	N/A
Aggregate device bandwidth		512 Gbit/sec full duplex
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide	
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA	
FC Ports	4 or 16 Enabled 16 Max	32 Enabled 32 Max
Ethernet Ports	2 or 6 Enabled 6 Max	N/A
SFP	B-series	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Optional Upgrade
Adaptive Networking	Included	Included
Form factor	1U	2U
Zoning Software	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes
Hot plug fans	Yes	

Family Information

Features	SN8000B 8-Slot SAN Director Power Pack+	SN8000B 4-Slot SAN Director and 4-Slot SAN Director Power Pack+	DC SAN Backbone Director Power Pack+	DC04 SAN Director and DC04 SAN Director Power Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers	Traditional Data Centers	Traditional Data Centers
Port Bandwidth	Up to 16Gbit/sec	Up to 16Gbit/sec	8Gbit/sec	8Gbit/sec
Aggregate device bandwidth	16.4 Tbit/sec full duplex	8.2 Tbit/sec full duplex	4.1 Tbit/sec full duplex	2 Tbit/sec full duplex
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide			
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA			
Ports	Up to 512 SFP	Up to 256 SFP	Up to 512	Up to 256
SFP	B-series	B-series	B-series	B-series
Advanced Trunking	Included with Power Pack	Included with Power Pack or Optional Upgrade	Included with Power Pack+	Included with Power Pack+ or Optional
Adaptive Networking	Included	Included	Included	Included
Form factor	14U	9U	14U	9U
Zoning Software	Yes (included)	Yes (included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes	Yes	Yes
Hot plug fans	Yes	Yes	Yes	Yes

Features	Brocade 16Gb SAN Switch for HP c-Class BladeSystem	Brocade 8Gb SAN Switch for HP c-Class BladeSystem	B-Series Multi-protocol Router Blade	B-Series Multi-protocol Extension Blade
Targeted Environment	Datacenters, Workgroups, Departments	Workgroups, Departments	Data Centers	Data Centers
Port Bandwidth	16Gbit/sec	8Gbit/sec	4 Gbit/sec FC Ethernet: 1 Gbit/sec	8 Gbit/sec FC Ethernet: 1 or 10 Gbit/sec
Aggregate device bandwidth	896 Gbit/sec full duplex	384 Gbit/sec full duplex	N/A	N/A
OS Support	NOTE: Please Refer to SAN Design Guide http://www.hp.com/go/sandesign or http://www.hp.com/go/sandesignguide			
Storage system Support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA			
Ports	12 external /16 internal	4 or 8 external / 8 or 16 internal	18 ports: 16 FC and 2 Gigabit Ethernet	16 8Gb FC and 10 1GbE or 2 10GbE
SFP	B-series	B-series	HP	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Optional Upgrade to chassis	Optional Upgrade to chassis

Family Information

Adaptive Networking	Included	Included	Included	Included
Form factor	Embedded	Embedded	Blade in 4/256, DC SAN Back, or DC04 SAN Dir	Blade in SN8000B and DC SAN Directors
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in director chassis	Yes, in director chassis
Hot plug fans	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in director chassis	Yes, in director chassis

Configuration Information

Step 1 - Base Configuration

Select one:

Model	Model Description	Part Number
SN6000B 16Gb 48/48 Power Pack+ FC Switch	<p>16Gb 48/48 FC Switch with 48 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, SAN Network Advisor Professional, Brocade EZ Switch, and Power Pack+ software of Adaptive Networking, ISL Trunking, Extended Fabric, Advanced Performance Monitoring, Server Application Optimization, and Fabric Watch.</p> <p>NOTE: Requires optical transceivers listed below.</p>	QR481B
SN6000B 16Gb 48/24 Power Pack+ FC Switch	<p>16Gb 48/48 FC 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, SAN Network Advisor Professional, Brocade EZ Switch, and Power Pack+ software of Adaptive Networking, ISL Trunking, Extended Fabric, Advanced Performance Monitoring, Server Application Optimization, and Fabric Watch.</p> <p>NOTE: Requires optical transceivers listed below.</p>	QK754B
SN6000B 16Gb 48/48 FC Switch	<p>16Gb 48/48 FC Switch with 48 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, Brocade EZ Switch, Advanced Zoning and SAN Network Advisor Professional.</p> <p>NOTE: Requires optical transceivers listed below.</p>	QR480B
SN6000B 16Gb 48/24 FC Switch	<p>16Gb 48/48 FC 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, Brocade EZ Switch, Advanced Zoning, and SAN Network Advisor Professional.</p> <p>NOTE: Requires optical transceivers listed below.</p>	QK753B
SN6000B 16Gb Bundled Fibre Channel Switch	<p>16Gb 48/48 FC Switch with 24 active ports; rackmount kit; twenty-four 16Gb optical transceivers, 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, Brocade EZ Switch, Advanced Zoning, and SAN Network Advisor Professional.</p> <p>NOTE: Twenty-four 16Gb optical transceivers (QK724A) are included in the package with this switch model.</p>	C8R08A
SN6000B 16Gb 24-48 12-port FC Upgrade LTU	<p>12 port upgrade license for SN6000B 16Gb 48/24 Power Pack FC Switch (QK754B), SN6000B 16Gb 48/24 FC Switch (QK753B) and the SN6000B 16Gb Bundled Fibre Channel Switch (C8R08A)</p>	TC356A

Configuration Information

Step 2 - Options

	Model Description	Part Number																				
Fibre Channel Transceivers	HP B-series 16Gb SFP+ Short Wave Transceiver	QK724A																				
	HP 8Gb Short Wave B-series FC SFP+ 1 Pack	AJ716B*																				
	HP B-series 16Gb Long Wave 25km Fibre Channel SFP+ 1 Pack	H6Z29A																				
	*NOTE: AJ716A is not supported with the SN6000B 16Gb FC Switch																					
	<table border="1"> <thead> <tr> <th>Distance - Maximum</th> <th>HP Standard OM2 Cable</th> <th>HP Standard OM3 Cable</th> <th>HP PremierFlex OM3+ Cable</th> <th>HP PremierFlex OM4 Cable</th> </tr> </thead> <tbody> <tr> <td>16Gb performance:</td> <td>35 meters</td> <td>100 meters</td> <td>100 meters</td> <td>125 meters</td> </tr> <tr> <td>8Gb performance:</td> <td>50 meters</td> <td>150 meters</td> <td>150 meters</td> <td>190 meters</td> </tr> <tr> <td>4Gb performance:</td> <td>150 meters</td> <td>380 meters</td> <td>380 meters</td> <td>400 meters</td> </tr> </tbody> </table>	Distance - Maximum	HP Standard OM2 Cable	HP Standard OM3 Cable	HP PremierFlex OM3+ Cable	HP PremierFlex OM4 Cable	16Gb performance:	35 meters	100 meters	100 meters	125 meters	8Gb performance:	50 meters	150 meters	150 meters	190 meters	4Gb performance:	150 meters	380 meters	380 meters	400 meters	
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	HP B-series 16Gb SFP+ Long Wave 10km Transceiver	QK725A																				
	HP 8Gb Long Wave B-series 10km Fibre Channel 1 Pack SFP+ Transceiver	AJ717A																				
	HP B-series 8Gb Extended Long Wave 25km Fibre Channel SFP+ Transceiver 1 Pack	AW538A																				
	HP B-series 10Gb SFP+ Short Range Transceiver	QK726A																				
	HP B-series 10Gb SFP+ Long Range Transceiver	QK727A																				
USB	HP B-series 2G USB Drive	AK864B																				
Optical Cables	HP PremierFlex OM4+ Fiber Optic Cables																					
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A																				
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A																				
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A																				
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A																				
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A																				
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A																				
	HP OM3 LC-LC Optical Cables																					
	HP LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A																				
	HP LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A																				
	HP LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A																				
	HP LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A																				
	HP LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A																				
	HP LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A																				
HP LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A																					

Configuration Information

Step 3 - Optional Software*

* For Fabric OS (FOS) minimum requirements, please refer to: <http://spock.corp.hp.com/>

Software for SN6000B 16Gb FC Switch	HP B-series SAN Network Advisor Enterprise LTU	TC352A
	HP B-series SAN Network Advisor Professional Plus LTU	TC353A
	HP B-series SAN Network Advisor Professional Plus Upgrade LTU	TC354A
	HP B-series 24-40-port SAN Switch Power Pack+ Upgrade LTU	T5522A
	NOTE: The Power Pack+ Software Bundle kit includes Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced Performance Monitor.	
	NOTE: Adaptive Networking and Server Application Optimization features are included by default in the switch firmware (FOS 7.2.0a or later) and do not require a separate license	
	HP StoreFabric B-series 8Gb and 16Gb Mid Range Switch Fabric Vision LTU	TC510A
	Extended Fabric SAN Switch 2/32	313458-B21
	Fabric Watch SAN Switch 2/32	313454-B21
	Advanced Performance Monitor SAN Switch 2/32	313450-B21
	ISL Trunking SAN Switch 2/32	313452-B21
	HP SN6000B 10Gb 24-48 Port Integrated Fibre Channel Extension LTUNOTE: (enables 10Gb FC for first eight ports)	TC358A
	HP B-series 24-40-port SAN Switch Integrated Routing RTU	T5528A
	HP Intelligent Infrastructure Analyzer Software v2 LTU	TC472A
	HP Intelligent Infrastructure Analyzer Software v2 E-LTU	TC472AAE

Technical Specifications

System Architecture	Fibre Channel ports	Switch mode (default): 24-, 36-, and 48-port configurations (12-port increments through Ports on Demand [PoD] licenses); universal (E, F, M, D, EX) ports
	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	<ul style="list-style-type: none">● 4/256 SAN Director● 4/64 SAN Switch● 4/32 SAN Switch● 4/32B SAN Switch● 4/8 SAN Switch● 4/16 SAN Switch● 8/8 SAN Switch● 8/24 SAN Switch● 8/40 SAN Switch● 8/80 SAN Switch● Encryption SAN Switch● 2408 FCoE Converged Network Switch● 1606 Extension SAN Switch● DC04 SAN Director● DC SAN Backbone Director● SN8000B 8-Slot SAN Backbone Director● SN8000B 4-Slot SAN Director● SN6500B Fibre Channel Switch● SN3000B Fibre Channel Switch● Brocade 4Gb SAN Switch for HP c-Class BladeSystem● Brocade 8Gb SAN Switch for HP BladeSystem c-Class● HP 400 MP-Router
	Performance	Auto-sensing of 4, 8, and 16 Gbps port speeds; 10 Gbps and optionally programmable to fixed port speed.
	ISL Trunking	Frame-based trunking with up to eight 16 Gbps ports per ISL trunk; up to 128 Gbps per ISL trunk. Exchange-based load balancing across ISLs with DPS included in Fabric OS. There is no limit to how many trunk groups can be configured in the switch.
	Aggregate bandwidth	1536 Gbit/sec full duplex
	Fabric latency	Latency for locally switched ports is 700 ns; encryption/compression is 5.5 sec per node; Forward Error Correction (FEC) adds 400 ns between E_Ports (enabled by default).
	Maximum frame size	2112-byte payload
	Classes of service	Class 2, Class 3, Class F (inter-switch frames)
	Port types	D_Port (Diagnostic Port), E_Port, EX_Port, F_Port, M_Port (Mirror Port); self-discovery based on switch type (U_Port); optional port type control Access Gateway mode: F_Port and NPIV-enabled N_Port
	Data traffic types	Fabric switches supporting unicast

Technical Specifications

	Media types	Hot-pluggable, B-Series Branded Small Form Factor Pluggable (SFP), LC connector; Short-Wave Laser (SWL), Long-Wave Laser (LWL); distance depends on fiber-optic cable and port speed. Supports SFP+ (16/10/8 Gbit/sec) optical transceivers.
	USB	One USB port for system log file downloads or firmware upgrades
	Fabric services	Advanced Performance Monitoring (APM) (including Top Talkers for E_Ports, F_Ports, and Fabric mode); Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Bottleneck Detection; Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB credit recovery; Brocade Fabric Watch; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Server Application Optimization (SAO); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric)
	Extension	Fibre Channel, in-flight compression (Brocade LZ0) and encryption (AES-GCM-256); integrated 10 Gbps Fibre Channel for DWDM MAN connectivity
	Options	SFP media, USB Device
Management	Management software supported	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools, APM, Fabric Watch; SAN Network Advisor Enterprise or SAN Network Advisor Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities
	Management access	10/100 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45), and one USB port
	Diagnostics	D_Port offline diagnostics, including electrical/ optical loopback, link traffic/latency/distance; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart port mirroring (SPAN port), optics health monitoring, power monitoring, RAStracE logging, and Rolling Reboot Detection (RRD)
Mechanicals	Enclosure	Back-to-front airflow; power from back; 1U
	Size	Width: 438 mm (17.23 in.) Height: 43 mm (1.7 in.) Depth: 443 mm (17.45 in.)
	System Weight	9.16 kg (20.20 lb) with two power supply FRUs, without transceivers
Environment	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 (9,842 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
	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
Power	Power Supply	Dual, hot-swappable redundant power supplies with integrated system cooling fans

Technical Specifications

AC input	85 V to 264 V ~5 A to 2.5 A
Input line frequency	47 Hz to 63 Hz
Power Consumption	110 watts with all 48 ports populated with 16 Gbps SWL optics 72 watts for empty chassis with no optics

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