

Overview

HP StoreFabric SN6500B Fibre Channel Switch

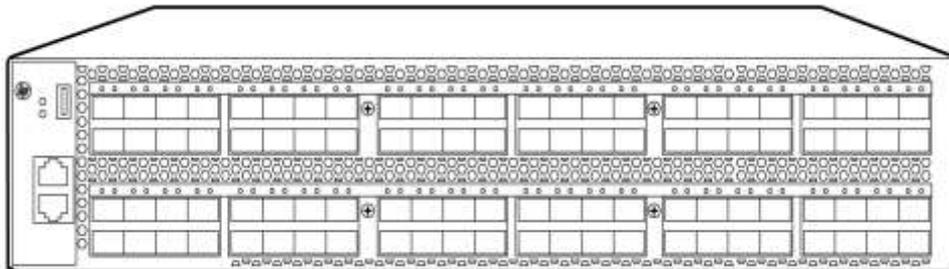
To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data 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 StoreFabric SN6500B 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 SN6500B Switch is configurable in 48, 72 or 96 ports and supports 4, 8 or 16 Gbps speeds in an efficiently designed 2U package. It also provides a simplified deployment process and a point-and-click user interface-making it both powerful and easy to use. The SN6500B Switch is ideal for medium- to large-sized organizations that need a scalable, high-availability solution that will facilitate consolidation and the flexibility to meet rapidly evolving storage requirements

The SN6500B is available in five models:

- HP StoreFabric SN6500B 16Gb 96-port/96-port Active Power Pack+ Fibre Channel Switch
- HP StoreFabric SN6500B 16Gb 96-port/96-port Active Fibre Channel Switch
- HP StoreFabric SN6500B 16Gb 96-port/48-port Active Power Pack+ Fibre Channel Switch
- HP StoreFabric SN6500B 16Gb 96-port/48-port Active Fibre Channel Switch
- HP StoreFabric SN6500B 16Gb 96-port/48-port Active Port Side Air Intake Fibre Channel Switch

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



Features and Benefits

Key Features and Benefits

- Delivers 16 Gbps performance with up to 96 ports in an ultra-dense, optimized 2U form factor
- Features Ports on Demand (PoD) capabilities for fast, easy, and cost-effective scaling from 48 to 96 ports in 24-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 high-end enterprise SAN switches, along with redundant, hot-pluggable components and non-disruptive software upgrades
- In-flight compression and encryption included providing efficient link utilization and security.
- Yields exceptional price/performance value
- Provides Adaptive Networking services such as Quality of Service (QoS) to help optimize application performance in consolidated, virtual environments. The Adaptive Networking and Server Application Optimization (SAO) features are included by default in all SN6500B switch models and do not require a separate license

Models

HP StoreFabric SN6500B 16Gb FC Switch Models	HP StoreFabric SN6500B 16Gb 96/96 Power Pack+ FC Switch	C8R42A
	HP StoreFabric SN6500B 16Gb 96/96 FC Switch	C8R43A
	HP StoreFabric SN6500B 16Gb 96/48 Power Pack+ FC Switch	C8R44A
	HP StoreFabric SN6500B 16Gb 96/48 FC Switch	C8R45A
	HP StoreFabric SN6500B 16Gb 96/48 Port Side Air Intake Fibre Channel Switch	E7X98A

Product Highlights

SN6500B 16Gb FC Switch

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 48, 72, or 96-ports in a 2U enclosure
- Provides 4 Gb/s, 8 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 performance can be obtained between two 16 Gb/s capable devices.

Configuration Support

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

High-availability features

- Two integrated redundant, hot swappable power supplies with three hot-swappable redundant 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 and Intelligent Series racks.
- 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.

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

Product Highlights

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.

Server Application Optimization

Server Application Optimization (SAO) 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.

Product Highlights

Solution Requirements:

- SAO requires B-series HBA installed in the server

Software Components, Optional

SN6500B 16Gb Switch Power Pack+ Software Bundle

The Power Pack+ Software Bundle comes with the SN6500B 16Gb 96/96 Power Pack+ Switch and SN6500B 16Gb 96/48 Power Pack+ Switch or as an optional software bundle for the SN6500B 16Gb 96/96 FC Switch and the SN6500B 96/48 FC Switch. It includes the following:

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

NOTE: Adaptive Networking and Server Application Optimization features are included by default in all four switch configurations and do not require a separate license

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.x 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.x and later*)
- Application of the Power Pack+ LTU (FOS 7.2.x and later*)
- Upgrading existing Switch/Director loaded with Power Pack+ to FOS 7.2.x or later*
- Upgrading existing Switch/Director loaded with both Advanced Performance Monitor (APM) and Fabric Watch (FW) licenses to FOS 7.2.x or later*

*See HP SPOCK for HP supported versions of FOS 7.2.x

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

Product Highlights

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.

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.

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, SN8000B 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

Product Highlights

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

Services to accelerate time to results

HP Storage Services bring you a rich portfolio of consulting and support services designed to add value to our core storage products and solutions. We have the know-how and experience to put storage technology to work for you. We work closely with you as your strategic partner, leveraging our full services portfolio to make sure that everything works to optimize your enterprise.

Choose from services aligned to our storage product offerings and lifecycle. From mission-critical onsite services to innovative web-based remote support, you choose the precise level of attention and support your business demands.

Discover, plan, and design

Choose from a rich portfolio of services to make the most of HP StoreFabric 16Gb, so you can efficiently and affordably consolidate, manage, and extract value from unstructured data. HP Services can help you discover needs and create a plan for simplifying the environment, reducing risk, and maximizing your storage investments

HP Storage Efficiency Analysis - The HP Storage Efficiency Analysis provides customers with a view of their storage infrastructure and operating environment; highlighting recommendations for improvements. The report provides extensive insight about the existing storage environment, opportunities for efficiency gains, asset aging and replacement through interaction with key decision makers

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-6727ENW.pdf>

HP Storage Impact Analysis (SIA): The HP Storage Impact Analysis service provides a 2-4 week discovery engagement with executive summary presentation. The goal of this service is to help provide customers guidance on storage related issues and develop remediation plans.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-1174ENW.pdf>

HP Storage Modernization Service: The HP Storage Modernization service is a 4-6 week service that defines the customers envisioned target storage environment based on a proven solution design methodology. HP architects will quickly perform tool-assisted automatic discovery and facilitate a two-day strategy workshop with all key stakeholders involved in the storage infrastructure initiative

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-4620ENW.pdf>

Deploy and integrate

We can help you configure, set up, and efficiently use your StoreFabric 16Gb, as well as help migrate data, improve capacity utilization, and establish information management standards used across

Service and Support

backup, replication, and archiving needs.

HP Enhanced Implementation Service for SANs - Select this service for complete design and implementation support for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-8527EN.pdf>

HP Storage Data Migration Services - End-to-end data migration service providing seamless discovery, assessment, planning, and design, completely customizable to your organization's storage area network or network attached storage environment and using innovative software to help you migrate to HP storage quickly and efficiently.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf>

HP Storage and Data Residency Service - Strategic augmentation of your current environment with HP resources who become your trusted advisor to provide answers that are right for your storage and backup environment.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-9481ENW.pdf>

HP Proactive Select - A flexible way to purchase services to fit your environment with an extensive menu of HP Proactive Select event and technical services, such as onsite firmware upgrades, health checks, assessments, and education.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf>

Operate and support

Choose the right support to maximize uptime, free up your resources, and achieve improved value-as you get the most out of the existing IT assets while accelerating time-to-revenue.

HP Proactive Care 24x7 - Hardware and software support services designed specifically for your technology with rapid access to Advanced Solution Center Specialists plus firmware and software management and best practice advice
<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

HP Proactive Care Personalized Support - An option-if you have HP Proactive Care- to bring increased personalization of the Proactive Care support experience through the assignment of an Account Service Manager (ASM) who provides IT best practice advice to help address IT issues and projects.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-3446ENW.pdf>

HP Foundation Care 24x7 - HP Foundation Care 24x7 connects you to HP around the clock for assistance on resolving issues with hardware onsite response within four hours and software call back within two hours after opening your case.
<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-0226ENW.pdf>

HP Education Services - Comprehensive training for new, as well as experienced, storage administrators designed to expand your skills and keep you up to speed with the latest storage and virtualization technology from HP Storage.
<http://education.hp.com/curr-storsan.htm>

Optimized Care - Delivers the highest levels of performance and stability Choose from three levels of operate and support care HP Proactive Care 24x7-Plus, 20 credits per year

Service and Support

through deployment and proactive management practices

Additional options -HP Proactive Care Personalized Support (once per Proactive Care support new environment), an additional day of HP Personalized Support, and 10 additional HP Proactive Select credits per year

Basic Care-Minimum recommended support

HP Foundation Care 24x7
Additional options - 10 HP Proactive Select credits per year

Remote Support Automation

HP Automation provides 24x7 coverage, proactive problem prevention, accurate problem diagnosis and faster problem resolution, as well as interactive support portals and tools. This is an integral, and cost-free, part of your HP support relationship and we are continually investing in additional cutting-edge capabilities to make it better.

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+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec	8Gbit/sec
Aggregate device bandwidth	128 - 384 Gbit/sec full duplex	256 - 384 Gbit/sec full duplex	768 - 1280 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
SFP	B-series	B-series	B-series
Advanced Trunking	Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Included	Included	Included
Form factor	1U	1U	2U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes
Hot plug fans	No	No	Yes

Features	SN3000B 16Gb FC Switch and SN3000B 16Gb FC Power Pack+	SN6000B 16Gb FC Switch and SN6000B 16Gb FC Power Pack+	SN6500B 16Gb FC Switch and SN6500B 16Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	16Gbit/sec	16Gbit/sec	16Gbit/sec
Aggregate device bandwidth	384 - 768 Gbit/sec full duplex	768 - 1536 Gbit/sec full duplex	1536-3072 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	12-24 Enabled 24 Max	24 or 48 Enabled 48 Max	48 or 96 Enabled 96 Max
SFP	B-series	B-series	B-series
Advanced Trunking	Included with Power Pack+	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Included	Included	Included
Form factor	1U	1U	2U

Family Information

Zoning Software	Yes (Included)	Yes (Included)	Yes
Hot plug, redundant power supplies	Optional	Yes	Yes
Hot plug fans	Yes	Yes (integrated with power supply)	Yes

Features	8/24 Bundled FC Switch	SN6000B 16Gb Bundled FC Switch
Targeted Environment	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	16Gbit/sec
Aggregate device bandwidth	256 - 384 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	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
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	N/A

Family Information

	6 Max	
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	

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

Family Information

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
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
SN6500B 16Gb 96/96 Power Pack+ FC Switch	<p>16Gb 96-port FC Switch with 96 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 ISL Trunking, Extended Fabric, Advanced Performance Monitoring and Fabric Watch.</p> <p>NOTE: Requires optical transceivers listed below.</p>	C8R42A
SN6500B 16Gb 96/96 FC Switch	<p>16Gb 96-port FC Switch with 96 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, SAN Network Advisor Professional</p> <p>NOTE: Requires optical transceivers listed below.</p>	C8R43A
SN6500B 16Gb 96/48 Power Pack+ FC Switch	<p>16Gb 96-port 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 and Power Pack+ software of ISL Trunking, Extended Fabric, Advanced Performance Monitoring and Fabric Watch.</p> <p>NOTE: Requires optical transceivers listed below.</p>	C8R44A
SN6500B 16Gb 96/48 FC Switch	<p>16Gb 96-port 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>	C8R45A
SN6500B 16Gb 96/48 Port Side Air Intake Fibre Channel Switch	<p>16Gb 96-port 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: Unique Port Side Intake Air flow mechanism: This model pulls air in from the port side of the switch and exhausts it out the non-port side</p> <p>NOTE: Requires optical transceivers listed below.</p>	E7X98A

Configuration Information

SN6500B SAN Switch 24-port Upgrade E-LTU

TC440AAE
(Physical License
- TC440A)

24 port upgrade license for SN6500B 16Gb 96/48 Power Pack+ FC Switch (C8R44A)
and SN6500B 16Gb 96/48 FC Switch (C8R45A)

NOTE: Some HP B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses with new part numbers listed in this document are functionally equivalent to the corresponding physical licenses with different part numbers. Some software licenses in this document are represented by two part numbers, the first of which is the E-Delivery version (ending with AAE) and the second is the physical version.

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 LW 25km FC SFP 1-pack Transceiver	H6Z29A

*NOTE: AJ716A is not supported with the SN6000B and SN6500B 16Gb FC Switches

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

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

USB	HP B-series 2G USB Drive	AK864B
	HP B-Series Switch Rack-Mount Kit	A7511A

NOTE: When any of the SN6500B Switch models is ordered, an accessory kit which contains the Rack Mount Kit is included in the package by default. A7511A is required when the original accessory kit or Rack Mount Kit is unavailable

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

Configuration Information

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

Step 3 - Optional Software*

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

Software for SN6500B 16Gb FC Switch	HP SAN Network Advisor Enterprise Software LTU	TC352A
	HP SAN Network Advisor Professional Plus Software LTU	TC353A
	HP SAN Network Advisor Professional Plus Upgrade LTU	TC354A
	HP SN6500B SAN Switch Power Pack+ E-LTU	TC441AAE
	NOTE: The Power Pack+ Software Bundle kit includes Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced Performance Monitor.	(Physical License - TC441A)
	Adaptive Networking and Server Application Optimization features are included by default in all four switch configurations and do not require a separate license.	
	HP 8/16Gb High End Switch Fabric Vision E-LTU	TC511AAE (Physical License - TC511A)
	HP B-series Mid/High End Extended Fabric E-LTU	J4V63AAE (Physical License - 313458-B21)
	HP B-series Mid/High End SAN Switch Fabric Watch E-LTU	J4V62AAE (Physical License - 313454-B21)
	HP B-series Mid/High End SAN Switch Advanced Performance Monitoring E-LTU	J4V60AAE (Physical License - 313450-B21)
	HP B-series Mid/High End SAN Switch ISL Trunking E-LTU	J4V61AAE (Physical License - 313452-B21)
	HP B-series Integrated Routing E-LTU	T5529AAE (Physical License - T5529A)
	HP Intelligent Infrastructure Analyzer Software v2 E-LTU	TC472AAE (Physical License - TC472A)

NOTE: Some HP B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-

Configuration Information

Delivery software licenses with new part numbers listed in this document are functionally equivalent to the corresponding physical licenses with different part numbers. Some software licenses in this document are represented by two part numbers, the first of which is the E-Delivery version (ending with AAE) and the second is the physical version.

NOTE: HP SAN Network Advisor software will no longer be shipped as a DVD to customers. Instead, customers will be able to access and download the software from HP's Product Download web site.

Technical Specifications

System Architecture	Fibre Channel ports	Switch mode (default): 48-, 72-, and 96-port configurations (24-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• 4/32B 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• SN3000B SAN Switch• SN6000B 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• Brocade 4Gb SAN Switch for HP c-Class BladeSystem• Brocade 8Gb SAN Switch for HP BladeSystem c-Class• HP 400 MP-Router (Interoperable with FC ports only)
	Performance	Auto-sensing of 4, 8, and 16 Gbps port speeds;
	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	3072 Gbps 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, RAStace logging, and Rolling Reboot Detection (RRD)
Mechanicals	Enclosure	Port side Intake and Port Side Exhaust airflow models available; power from back; 2U
	Size	Width: 429.25 mm (16.90 in.) Height: 86.74 mm (3.42 in.) Depth: 609.75 mm (24.01 in.)
	System Weight	16.92 kg (37.3 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 Non-operating: 10 to 90 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

Technical Specifications

	Vibration	Non-operating: Half sine, 33G 11ms. 3/eg Axis 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
	AC input	85 V to 264 V ~5 A to 2.5 A
	Input line frequency	47 Hz to 63 Hz
	Power Consumption	450 W with all 96 ports populated with 16 Gbps SWL optics 350 W for empty chassis with no optics

Summary of Changes

Date	Version History	Action	Description of Change:
10-Oct-2014	From Version 9 to 10	Changed	Update the SKU number for the HP B-series Integrated Routing E-LTU.
10-Jun-2014	From Version 8 to 9	Changed	Text formatted in Configuration Information section.
31-Mar-2014	From Version 7 to 8	Changed	Minor edits made throughout
20-Dec-2013	From Version 6 to 7	Changed	Updated the following: Configuration Information - Step 2 - Options - added HP B-series 16Gb Long Wave 25km Fibre Channel SFP+ 1 Pack, H6Z29A.
09-Dec-2013	From Version 5 to 6	Changed	Model descriptions and product descriptions were revised throughout Configuration Information HP 8/40 SAN Switch and 8/40 SAN Switch Power Pack+ was removed from Family Information
18-Nov-2013	From Version 4 to 5	Changed	Updated the following: Configuration Information - removed QK726A and QK727A from Step 2-Options, Fibre Channel Transceivers.
15-Oct-2013	From Version 3 to 4	Changed	Fabric Vision was added to Product Highlights 2408 FCoE CN Switch and 2408 FCoE CN Switch Power Pack+ was removed from Family Information chart
30-Sep-2013	From Version 2 to 3	Changed	Optional Software was revised.
12-Apr-2013	From Version 1 to 2	Changed	Added part number to the Configuration Information Section under step 1

© Copyright 2014 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.