

Overview

HPE SN6000B Fibre Channel Switch

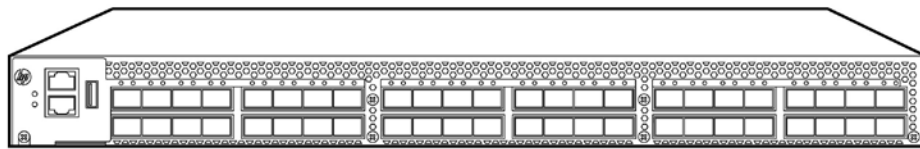
To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data 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 HPE 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 six models:

- HPE SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch
- HPE SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch
- HPE SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch
- HPE SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch
- HPE SN6000B 16Gb 48-port/24-port Active Port Side Air Intake Fibre Channel Switch
- HPE 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

- Updated HPE B-series Network Advisor SKUs to the next suffix (A to B) and added 3 Network Advisor E-LTU SKUs (Suffix AE).

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 HPE StoreFabric SN6000B 16Gb Bundled Fibre Channel switch model facilitates ease of ordering by offering the HPE SN6000B 48/24 Fibre channel switch along with twenty-four 16Gb optical transceivers in one package. The HPE StoreFabric SN6000B 16Gb Bundled Fibre Channel switch model is offered at a lower price than the sum of the list prices of the HPE SN6000B 48/24 Fibre Channel switch and the 16Gb optical transceivers

Models

HPE 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 Port Side Air Intake Fibre Channel Switch	E7X99A
	HP StoreFabric SN6000B 16Gb 48/24 Bundled Fibre Channel Switch	C8R08A

Product Highlights

SN6000B 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 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 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
- In-flight Compression and Encryption
- Access Gateway
- Dynamic and System Monitoring Capabilities for High Reliability
- Virtual Fabrics
- HPE B-series SAN Network Advisor software (optional)

Cabinet Support

HPE (22U, 36U, and 42U) 10000 G2 Series, the Intelligent Series racks, and HPE (14U, 22U, 36U, 42U, and 47U) 11000 G2 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.

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.

Product Highlights

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 a 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.

Solution Requirements:

- SAO requires B-series HBA installed in the server
-

Software Components, Optional

SN6000B 16Gb Switch Power Pack+ Software Bundle

The Power Pack+ Software Bundle comes with the (SN6000B16Gb 48/48 Power Pack+ Switch and SN6000B 16Gb 48/24 Power Pack+ Switch) or as an optional software (bundle for the SN6000B 16Gb 48/48 FC Switch, the SN6000B 48/24 FC Switch and the SN6000B Bundled Fibre Channel switch). It includes the following:

- Fabric Vision
- Fabric Watch
- Advanced Performance Monitor

Product Highlights

- Extended Fabric
- Ports-on-demand

NOTE: Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor will be obsolete. Fabric Watch settings can be converted to MAPS prior to upgrading and Advanced Performance Monitor is replaced by Flow Vision. Both MAPS and Flow Vision require a Fabric Vision 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 (MAPS): 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 HPE SAN Network Advisor that contains all critical SAN information for convenient review and analysis

Fabric Vision will be included by default in all HPE 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 HPE 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*

NOTE: *See HPE SPOCK for Hewlett Packard Enterprise 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 performance measurement. Each switch in the SAN needs its own Fabric Watch license.

NOTE: Fabric Watch has been obsoleted in FOS 7.4.0 and later. Users can migrate their Fabric Watch settings to the Fabric Vision licensed Monitoring and Performance Suite (MAPS) prior to upgrading.

Advanced Performance Monitor

This optional enabling technology helps administrators monitor and watch specific fabric metrics -- from a SID (Source ID) to a DID (Destination ID) -- so they can fine-tune and scale the fabric more efficiently. Plus, Advanced Performance Monitoring includes the ability for early warning detection of hot spots within the fabric, a powerful tool for maintaining overall balanced performance.

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

Product Highlights

NOTE: Advanced Performance Monitoring has been obsoleted in FOS 7.4.0 and later. Users can utilize the Fabric Vision licensed Flow Vision features for performance monitoring.

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

HPE 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 up to two SAN Fabric OS (FOS) fabrics (up to 300 B-Series switch ports and 1000 devices)
- Performs group switch management beyond the scope of Web Tools
- Does not offer management of the SN8000B 8-slot or DC SAN Backbone Directors,

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 Professional+ or 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 Professional+ or SAN Network Advisor Enterprise.

SAN Network Advisor Enterprise and Professional+

HPE 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 100 fabrics and 15,000 switch ports, while SAN Network Advisor Professional+ scales to 36 SAN Fabrics and 2560 switch ports. To accommodate growth, there is an upgrade available to SAN Network Advisor Enterprise from SAN Network Advisor Professional Plus.

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.

HPE Smart SAN for

HPE Smart SAN, optional software for HP 3PAR, makes end-to-end SAN configuration and

Product Highlights

3PAR

management simple and reduces the probability of errors through automation. It is an application embedded in SAN components (array, hosts and switches) that enables 3PAR arrays to orchestrate configuration, settings and policies across the SAN. Smart SAN is supported with B-series Switches, HPE StoreFabric Fibre Channel adapters (HBAs) and 3PAR storage. HPE Smart SAN for 3PAR through its Target Driven Peer Zoning (TDPZ) feature enables customers to automate peer zoning, resulting in the creation of fewer zones and enables configuration of zones in minutes and not in hours. Through automation, it reduces the probability of errors and potential downtime. Additional information can be found here: <http://www8.hp.com/us/en/products/storage-software/product-detail.html?oid=8295863#!tab=features>

NOTE: Supports B-series 16Gb and 8Gb FC switches with FOS 7.4.0a or later.

NOTE: A list of supported HPE FC Adapters can be found at <https://h20272.www2.hp.com/spock/>

NOTE: Supports 3PAR StoreServ storage with 3.2.2 or later with only 16Gb target ports on HPE 3PAR StoreServ storage.

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

HPE 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 HPE StoreFabric 16Gb, so you can efficiently and affordably consolidate, manage, and extract value from unstructured data.

HPE Services can help you discover needs and create a plan for simplifying the environment, reducing risk, and maximizing your storage investments

HPE Storage Efficiency Analysis - The HPE 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>

HPE Storage Impact Analysis (SIA): The HPE 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>

HPE Storage Modernization Service: The HPE Storage Modernization service is a 4-6 week service that defines the customers envisioned target storage environment based on a proven solution design methodology. Hewlett Packard Enterprise 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.

HPE 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>

HPE 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 HPE storage quickly and efficiently.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf>

HPE Storage and Data Residency Service - Strategic augmentation of your current environment with Hewlett Packard Enterprise technical 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>

HPE Proactive Select - A flexible way to purchase services to fit your environment with an extensive menu of HPE 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.

HPE 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>

HPE Proactive Care Personalized Support - An option-if you have HPE 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>

HPE Foundation Care 24x7 - HPE Foundation Care 24x7 connects you to HPE 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>

HPE 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 HPE Storage.

<http://education.hp.com/curr-storsan.htm>

Optimized Care - delivers Choose from three levels of operate and support care
best performance and HPE Proactive Care 24x7-Plus, 20 credits per year
stability through

Service and Support

deployment and proactive
management practices

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

Basic Care - Minimum
recommended support

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

**Remote
Support Automation**

HPE 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 Hewlett Packard Enterprise support relationship and we are continually investing in additional cutting-edge capabilities to make it better.

For more information

<http://www.hp.com/services/storage>

To learn more on HPE Storage Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner

HPE Care Pack Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from Hewlett Packard Enterprise or an enterprise reseller are quoted using Hewlett Packard Enterprise order configuration tools.
- Customers purchasing from a commercial reseller can find HPE Care Pack Services at **<http://www.hp.com/go/lookuptool>**

Family Information

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base	SN6000B 16Gb FC Switch and SN6000B 16Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec	16Gbit/sec
Aggregate device bandwidth	64 - 192 Gbit/sec	128 - 192 Gbit/sec	384- 768 Gbit/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	8 Enabled 24 Max	16 Enabled 24 Max	24 or 48 Enabled 48 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	1U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes
Hot plug fans	No	No	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	16Gbit/sec
Aggregate device bandwidth	128- 192Gbit/sec	384- 768 Gbit/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

Family Information

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	SN4000B SAN Extension Switch
Targeted Environment	Data Centers	Data Centers
Fibre Channel Port Bandwidth	8Gbit/sec	16Gbit/sec
Ethernet	1Gbit/sec Ethernet	1/10/40Gbit/sec Ethernet
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	24 Enabled 24 Max
Ethernet Ports	2 or 6 Enabled 6 Max	16 ports 1/10GbE Enabled 16 Max 2 – 40GbE ports
SFP	B-series	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included
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	Yes

Features	SN8000B 8-Slot SAN Director Power Pack+	SN8000B 4-Slot SAN Director and 4-Slot SAN Director Power
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Family Information

		Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers
Port Bandwidth	Up to 16Gbit/sec	Up to 16Gbit/sec
Aggregate device bandwidth	10.2Tbit/sec	5.1 Tbit/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	
Ports	Up to 512 SFP	Up to 256 SFP
SFP	B-series	B-series
Advanced Trunking	Included with Power Pack	Included with Power Pack or Optional Upgrade
Adaptive Networking	Included	Included
Form factor	14U	9U
Zoning Software	Yes (included)	Yes (included)
Hot plug, redundant power supplies	Yes	Yes
Hot plug fans	Yes	Yes

Features	Brocade 16Gb SAN Switch for HPE c-Class BladeSystem	Brocade 8Gb SAN Switch for HPE c-Class BladeSystem	Brocade 16Gb Fibre Channel SAN Switch Module for HPE Synergy
Targeted Environment	Enterprise, Datacenters, Workgroups, Departments	Workgroups, Departments	Enterprise, Datacenters, Workgroups, Departments
Port Bandwidth	16 Gbit/sec	8 Gbit/sec	16 Gbit/sec
Aggregate device bandwidth	448 Gbit/sec	192 Gbit/sec	576 Gbit/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		
Ports	12 external /16 internal	4 or 8 external / 8 or 16 internal	8 SFP+ external, 4 QSFP external /12 internal
SFP	B-series	B-series	B-series
Advanced Trunking	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

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Form factor	Embedded	Embedded	Embedded
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in Synergy Frame
Hot plug fans	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in Synergy Frame

Configuration Information

Step 1 - Base Configuration

Select one:

Model	Model Description	Part Number
SN6000B 16Gb 48-port Power Pack+ FC Switch	16Gb 48-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, 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. Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor will be obsolete. Fabric Watch settings can be converted to MAPS prior to upgrading and Advanced Performance Monitor is replaced by Flow Vision. Both MAPS and Flow Vision require a Fabric Vision license. NOTE: Requires optical transceivers listed below.	QR481B
SN6000B 16Gb 48/24 Power Pack+ FC Switch	16Gb 48-port 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. Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor will be obsolete. Fabric Watch settings can be converted to MAPS prior to upgrading and Advanced Performance Monitor is replaced by Flow Vision. Both MAPS and Flow Vision require a Fabric Vision license.. NOTE: Requires optical transceivers listed below.	QK754B
SN6000B 16Gb 48-port FC Switch	16Gb 48-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. NOTE: Requires optical transceivers listed below.	QR480B
SN6000B 16Gb 48/24 FC Switch	16Gb 48-port 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. NOTE: Requires optical transceivers listed below.	QK753B
SN6000B 16Gb 48/24 Port Side Air Intake FC Switch	HP StoreFabric SN6000B 16Gb 48/24 Port Side Air Intake Fibre Channel Switch 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 NOTE: Requires optical transceivers listed below.	E7X99A
SN6000B 16Gb Bundled Fibre Channel Switch		C8R08A

Configuration Information

16Gb 48-port 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.

NOTE: Twenty-four 16Gb optical transceivers (QK724A) are included in the package with this switch model.

HPE SN6000B SAN Switch 12-port Upgrade E-LTU

TC356AAE
(Physical License
- TC356A)

12 port upgrade license for SN6000B 16Gb 48/24 Power Pack FC Switch (QK754B), SN6000B 16Gb 48/24 FC Switch (QK753B), SN6000B 16Gb 48/24 Port Side Air Intake FC Switch (E7X99A) and the SN6000B 16Gb Bundled Fibre Channel Switch (C8R08A)

NOTE: Most HPE B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses with 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																			
	HPE 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 16Gb FC Switch																				
	<table><tr><th>Distance - Maximum</th><th>HPE Standard OM2 Cable</th><th>HPE Standard OM3 Cable</th><th>HPE PremierFlex OM3+ Cable</th><th>HPE PremierFlex OM4 Cable</th></tr><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></table>		Distance - Maximum	HPE Standard OM2 Cable	HPE Standard OM3 Cable	HPE PremierFlex OM3+ Cable	HPE 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
Distance - Maximum	HPE Standard OM2 Cable	HPE Standard OM3 Cable	HPE PremierFlex OM3+ Cable	HPE 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																	
Accessories	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																			
	HPE B-series 4G USB Drive	N9Y63A																			
	HP StoreFabric SN3000B/SN6000B 16Gb SAN Switch Accessory Kit	E7Y00A																			
NOTE: When any of the SN6000B Switch models is ordered, an accessory kit is included in the package by default. E7Y00A is required when the original accessory kit or Rack Mount Kit is unavailable																					

Configuration Information

NOTE: The Accessory Kit contains a Rack Mount Kit including rails, rail mounting hardware and plenum and HPE product documentation including Read Me First, Safety Guides, User License, and Warranty.

Optical Cables

HPE 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

HPE 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*

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

Software for SN6000B 16Gb FC Switch

HPE SAN Network Advisor Enterprise Software E-LTU	TC352BAE, (TC352B Physical License)
HPE SAN Network Advisor Professional Plus Software E-LTU	TC353BAE, (TC353B Physical License)
HPE SAN Network Advisor Professional Plus Upgrade E-LTU	TC354BAE, (TC354B Physical License)
HPE B-series Mid Range Switch Power Pack+ E-LTU	T5522AAE (Physical License - T5522A)

NOTE: The Power Pack+ Software Bundle kit includes Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced Performance Monitor.

Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor will be obsolete. Fabric Watch settings can be converted to MAPS prior to upgrading and Advanced Performance Monitor is replaced by Flow Vision. Both MAPS and Flow Vision require a Fabric Vision license.

NOTE: Adaptive Networking and Server Application Optimization features are included by default in the switch firmware (FOS 7.2.x or later, See HPE SPOCK for Hewlett Packard Enterprise supported versions of FOS 7.2.x) and do not require a separate license

Configuration Information

HPE 8/16Gb Mid Range Switch Fabric Vision E-LTU	TC510AAE (Physical License - TC510A)
HPE B-series Mid/High End Extended Fabric E-LTU	J4V63AAE (Physical License - 313458-B21)
HPE B-series Mid/High End SAN Switch Fabric Watch E-LTU	J4V62AAE (Physical License - 313454-B21)
HPE B-series Mid/High End SAN Switch Advanced Performance Monitoring E-LTU	J4V60AAE (Physical License - 313450-B21)
HPE B-series Mid/High End SAN Switch ISL Trunking E-LTU	J4V61AAE (Physical License - 313452-B21)
HPE B-series Integrated Routing E-LTU	T5528AAE (Physical License - T5528A)
HPE SAN Switches FICON CUP E-LTU	TA748AAE (Physical License - TA748A)

NOTE: The FICON CUP support is contingent upon IBM certification. Please refer to The HPE B-Series FICON connectivity stream at HPE "Single Point of Connectivity Knowledge" (SPOCK) for the latest information.

HPE Intelligent Infrastructure Analyzer Software v2 E-LTU	TC472AAE (Physical License - TC472A)
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NOTE: Most HPE B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses with 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: HPE 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 The HPE Product Download web site.

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	• 8/8 SAN Switch • 8/24 SAN Switch • 1606 Extension SAN Switch • SN4000B SAN Extension Switch • SN8000B 8-Slot SAN Backbone Director • SN8000B 4-Slot SAN Director • SN6500B Fibre Channel Switch • SN6000B Fibre Channel Switch • SN3000B Fibre Channel Switch • Brocade 8Gb SAN Switch for HPE BladeSystem c-Class • Brocade 16Gb SAN Switch for HPE BladeSystem c-Class • Brocade 16Gb Fibre Channel SAN Switch Module for HPE Synergy
	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	768Gbit/sec
	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
	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

Technical Specifications

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)

Security

AES-GCM-256 encryption on ISLs; DH-CHAP (between switches and end devices), FCAP switch authentication; FIPS 140-2 L2-compliant, HTTPS, IPsec, IP filtering, LDAP with IPv6, Port Binding, RADIUS, User-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch.

Extension

Fibre Channel, in-flight compression (Brocade LZO) 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

Port side Intake and Port side Exhaust airflow models available; 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

AC input

85 V to 264 V ~5 A to 2.5 A

Technical Specifications

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

Summary of Changes

Date	Version History	Action	Description of Change
07-June-2016	From Version 18 to 19	Changed	Changes made to the Models, overview, service and support and Family information sections.
22-Jan-2016	From Version 17 to 18	Changed	Changes were made throughout the entire QuickSpecs.
24-Sept-2015	From Version 16 to 17	Changed	Changes made to the Technical Specs Section
04-Sept-2015	From Version 15 to 16	Changed	Changes made to the Products Highlights, Family Info, Configuration Info and Technical Specs Sections.
10-Jun-2014	From Version 14 to 15	Changed	Product highlights and Configuration Information were revised.
23-May-2014	From Version 13 to 14	Changed	Text formatted in Configuration Information section.
20-Dec-2013	From Version 12 to 13	Added	HPE B-series 16b Long Wave 25km Fibre Channel SFP+ 1 Pack to Fibre Channel Switches was added.
09-Dec-2013	From Version 11 to 12	Changed	HPE StoreFabric B-series 8Gb and 16Gb Mid Range Switch Fabric Vision LTU was added to Software for SN6000B 16Gb FC Switch in Configuration Information HPE 8/40 SAN Switch and 8/40 SAN Switch Power Pack+ was removed from Family Information
15-Oct-2013	From Version 10 to 11	Changed	Fabric Vision was added to Product Highlights SN3000B and SN6500B Fibre Channel Switches were added to Interoperability 2408 FCoE CN Switch and 2408 FCoE CN Switch Power Pack+ was removed from Family Information chart
30-Sep-2013	From Version 9 to 10	Changed	Optional Software was revised.
22-Mar-2013	From Version 8 to 9	Removed	Configuration Information- Removed part numbers and descriptions.
08-Mar-2013	From Version 7 to 8	Changed	Family Information Updated Storage system support.
15-Feb-2012	From Version 6 to 7	Changed	Changes made to the Family Information Section.
21-Dec-2011	From Version 5 to 6	Changed	Change made in Configuration Information: description update in Optical Cables.
04-Dec-2011	From Version 4 to 5	Changed	Changes were made throughout the entire QuickSpecs.
13-Aug-2011	From Version 3 to 4	Changed	Changes were made in Overview, Models, Product Highlights, Configuration Information and Technical Specifications sections.
14-Nov-2011	From Version 2 to 3	Changed	HPE 16GB Long Wave B-series 10km FC SFP+ 1 Pack was added and HPE LC-SC Optical Cables were removed from Step 2 in Configuration Information.
28-Oct-2011	From Version 1 to 2	Changed	Key Features and Benefits was revised in Features and Benefits SN6000B 16Gb FC Switch, Advanced Fabric Services, Integrated Fibre Channel Extension and SAN Network Advisor Professional were updated and In-flight Compression and Encryption were added to Product Highlights Configuration Information was revised throughout

Summary of Changes

			Aggregate bandwidth and Media types were modified in System Architecture



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