

### Overview

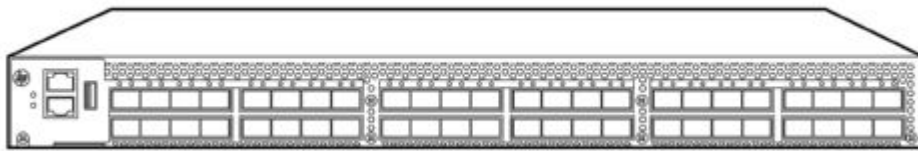
To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data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

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

The SN6000B is available in six models—

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

Power Pack+ includes additional software—Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced Performance Monitor. Power Pack+ software provides the SAN administrator with the necessary tools to monitor the health and performance of the network, while also ensuring the highest levels of security, scalability and manageability.



### What's New

- HP StoreFabric SN6000B 16Gb Port Side Air Intake Fibre Channel Switch
- HP StoreFabric SN6000B 16Gb Bundled Fibre Channel switch
- New RoHS compliant HP SAN switches

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

### Features and Benefits

#### Key Features and Benefits

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

### Models

#### **HP SN6000B 16Gb FC Switch Models**

HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch	QR481B
HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch	QK754B
HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch	QR480B
HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch	QK753B
HP StoreFabric SN6000B 16Gb 48/24 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
- Enhanced Group Management (EGM)
- HP B-series SAN Network Advisor software (optional)

#### Cabinet Support

- HP (22U, 36U and 42U) 9000 and 10000 G1 Series, (25U, 33U and 41U) HP System/e, and the 22U, 36U, and 42U HP 10000 G2 Series
- NOTE:** To order factory integration, add 0D1 after the part number on your sales order.

### Software Components, Standard, Base Models

#### Frame Filtering

An ASIC based capability that enables new applications and features. The switch has the ability to view the first 64 bytes of the Fibre Channel frame. At this time, Frame Filtering enables advanced capabilities such as Advanced Zoning and Advanced Performance Monitoring.

#### Advanced Zoning

WWN Zoning and Access Control are enforced by hardware that provides the same simple administration previously enforced only with software. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.

#### Web Tools

Web Tools is an intuitive and easy-to-use graphical interface that enables organizations to monitor and manage SAN fabrics. Tasks can be performed through a Java-capable Web browser from a standard laptop, desktop PC or workstation from any location within the enterprise.

### Product Highlights

#### EGM

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

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

#### In-flight Compression and Encryption

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

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

#### Adaptive Networking

Adaptive Networking (AN) is 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

### Product Highlights

#### 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 SN6000E 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
- Extended Fabric
- ISL Trunking

#### Fabric Vision

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

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

Fabric Vision will be included by default in all HP StoreFabric B-series Fibre Channel switches and Directors bundled with Power Pack+ (with FOS 7.2.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 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 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

<b>Extended Fabric</b>	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.
<b>ISL Trunking</b>	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.
<b>Integrated Fibre Channel Extension</b>	Integrated SAN extension over native Fibre Channel provide metro connections up to 100 km including support for 10 Gbps Fibre Channel over Dense Wavelength Division Multiplexing (DWDM) and dark fiber. This license enables support on the first eight (8) ports of the switch.
<b>SAN Network Advisor Professional</b>	<p>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<sup>2</sup></p> <ul style="list-style-type: none"><li>• Allows management of a single Fabric OS (FOS) fabric (up to a 1,000 B-Series switch ports)</li><li>• Performs group switch management beyond the scope of Web Tools</li><li>• Does not offer management for the DC SAN Backbone Director, the SN8000B Director, or FICON</li></ul> <p>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.</p> <p>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.</p>
<b>SAN Network Advisor Enterprise and Professional+</b>	<p>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.</p> <p>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 a upgrade available from SAN Network Advisor Professional Plus to SAN Network Advisor Enterprise.</p>
<b>Integrated Routing</b>	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 <sub>2</sub> 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<sup>1</sup> 1-year parts<sup>1</sup> 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<sup>2</sup> <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<sup>3</sup> highlighting recommendations for improvement. 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)**<sup>4</sup> 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**<sup>5</sup> 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>



### Service and Support

#### 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 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>

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#### 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>

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

Choose from three levels of operate and support care  
HP Proactive Care 24x7-Plus, 20 credits per year

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

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### Service and Support

**Basic Care** - Minimum recommended support      HP Foundation Care 24x7  
Additional options - 10 HP Proactive Select credits per year

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**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.

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**For more information**      [www.hp.com/services/storage](http://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<sup>2</sup>

- 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](http://www.hp.com/go/lookuptool)

### Family Information

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

Features	8/24 Bundled FC Switch	SN6000B 16Gb Bundled FC Switch
Targeted Environment	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	384 - 768 Gbit/sec full duplex
Aggregate device bandwidth	256 - 384 Gbit/sec full duplex	16Gbit/sec
OS Support	<b>NOTE</b> —Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>	
Storage system support	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>	
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

### Family Information

<b>Zoning Software</b>	Yes (Included)	Yes (Included)
<b>Hot plug, redundant power supplies</b>	No	Yes
<b>Hot plug fans</b>	No	Yes (integrated with power supply)

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

### Family Information

Features	SN8000B 8-Slot SAN Director Power Pack+	SN8000B 4-Slot SAN Director and 4-Slot SAN Director Power Pack+	DC SAN Backbone Director Power Pack+	DC04 SAN Director and DC04 SAN Director Power Pack+
<b>Targeted Environment</b>	Cloud Optimized Data Centers	Cloud Optimized Data Centers	Traditional Data Centers	Traditional Data Centers
<b>Port Bandwidth</b>	Up to 16Gbit/sec	Up to 16Gbit/sec	8Gbit/sec	8Gbit/sec
<b>Aggregate device bandwidth</b>	16.4 Tbit/sec full duplex	8.2 Tbit/sec full duplex	4.1 Tbit/sec full duplex	2 Tbit/sec full duplex
<b>OS Support</b>	<b>NOTE</b> —Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>			
<b>Storage system support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>			
<b>Ports</b>	Up to 512 SFP	Up to 256 SFP	Up to 512	Up to 256
<b>SFP</b>	B-series	B-series	B-series	B-series
<b>Advanced Trunking</b>	Included with Power Pack	Included with Power Pack or Optional Upgrade	Included with Power Pack+	Included with Power Pack+ or Optional
<b>Adaptive Networking</b>	Included	Included	Included	Included
<b>Form factor</b>	14U	9U	14U	9U
<b>Zoning Software</b>	Yes (included)	Yes (included)	Yes (Included)	Yes (Included)
<b>Hot plug, redundant power supplies</b>	Yes	Yes	Yes	Yes
<b>Hot plug fans</b>	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
<b>Targeted Environment</b>	Datacenters, Workgroups, Departments	Workgroups, Departments	Data Centers	Data Centers
<b>Port Bandwidth</b>	16Gbit/sec	8Gbit/sec	4 Gbit/sec FC Ethernet <sup>2</sup> -1 Gbit/sec	8 Gbit/sec FC Ethernet <sup>2</sup> -1 or 10 Gbit/sec
<b>Aggregate device bandwidth</b>	896 Gbit/sec full duplex	384 Gbit/sec full duplex	N/A	N/A
<b>OS Support</b>	<b>NOTE</b> —Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>			
<b>Storage system Support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>			
<b>Ports</b>	12 external /16 internal	4 or 8 external / 8 or 16 internal	18 ports <sup>2</sup> -16 FC and 2 Gigabit Ethernet	16 8Gb FC and 10 1GbE or 2 10GbE
<b>SFP</b>	B-series	B-series	HP	B-series
<b>Advanced Trunking</b>	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Optional Upgrade to chassis	Optional Upgrade to chassis
<b>Adaptive Networking</b>	Included	Included	Included	Included
<b>Form factor</b>	Embedded	Embedded	Blade in 4/256, DC SAN Back, or DC04 SAN Dir	Blade in SN8000B and DC SAN Directors
<b>Zoning Software</b>	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)

### Family Information

<b>Hot plug, redundant power supplies</b>	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in director chassis	Yes, in director chassis
<b>Hot plug fans</b>	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
<b>SN6000B 16Gb 48-port Power Pack+ FC Switch</b>	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. <b>NOTE=</b> Requires optical transceivers listed below.	QR481B
<b>SN6000B 16Gb 48/24 Power Pack+ FC Switch</b>	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. <b>NOTE=</b> Requires optical transceivers listed below.	QK754B
<b>SN6000B 16Gb 48-port FC Switch</b>	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. <b>NOTE=</b> Requires optical transceivers listed below.	QR480B
<b>SN6000B 16Gb 48/24 FC Switch</b>	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. <b>NOTE=</b> Requires optical transceivers listed below.	QK753B
<b>SN6000B 16Gb 48/24 Port Side Air Intake FC Switch</b>	HP StoreFabric SN6000B 16Gb 48/24 Port Side Air Intake Fibre Channel Switch= 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. <b>NOTE=</b> 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 <b>NOTE=</b> Requires optical transceivers listed below.	E7X99A
<b>SN6000B 16Gb Bundled Fibre Channel Switch</b>	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. <b>NOTE=</b> Twenty-four 16Gb optical transceivers (QK724A) are included in the package with this switch model.	C8R08A
<b>HP SN6000B SAN Switch 12-port Upgrade E-LTU</b>		TC356AAE (Physical License - TC356A)

### Configuration Information

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

**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 Delivery version (ending with AAE) and the second is the physical version.

### Step 2 - Options

	Model Description	Part Number																				
<b>Fibre Channel Transceivers</b>	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																				
	<b>*NOTE</b> —AJ716A is not supported with the SN6000B 16Gb FC Switch																					
	<table border="1"> <thead> <tr> <th>Distance - Maximum</th> <th>HP Standard OM2 Cable</th> <th>HP Standard OM3 Cable</th> <th>HP PremierFlex OM3+ Cable</th> <th>HP PremierFlex OM4 Cable</th> </tr> </thead> <tbody> <tr> <td>16Gb performance</td> <td>35 meters</td> <td>100 meters</td> <td>100 meters</td> <td>125 meters</td> </tr> <tr> <td>8Gb performance</td> <td>50 meters</td> <td>150 meters</td> <td>150 meters</td> <td>190 meters</td> </tr> <tr> <td>4Gb performance</td> <td>150 meters</td> <td>380 meters</td> <td>380 meters</td> <td>400 meters</td> </tr> </tbody> </table>	Distance - Maximum	HP Standard OM2 Cable	HP Standard OM3 Cable	HP PremierFlex OM3+ Cable	HP PremierFlex OM4 Cable	16Gb performance	35 meters	100 meters	100 meters	125 meters	8Gb performance	50 meters	150 meters	150 meters	190 meters	4Gb performance	150 meters	380 meters	380 meters	400 meters	
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																				
	HP B-series 10Gb SFP+ Short Range Transceiver	QK726A																				
	HP B-series 10Gb SFP+ Long Range Transceiver	QK727A																				
<b>Accessories</b>	HP B-series 2G USB Drive	AK864B																				
	HP StoreFabric SN3000B/SN6000B 16Gb SAN Switch Accessory Kit	E7Y00A																				
	<b>NOTE</b> —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																					
	<b>NOTE</b> —The Accessory Kit contains a Rack Mount Kit including rails, rail mounting hardware and plenum and HP product documentation including Read Me First, Safety Guides, User License, and Warranty.																					
<b>Optical Cables</b>	<b>HP PremierFlex OM4+ Fiber Optic Cables</b>																					
	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																				
	<b>HP OM3 LC-LC Optical Cables</b>																					
	HP LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A																				



### Configuration Information

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/>

<b>Software for SN6000B 16Gb FC Switch</b>	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 B-series Mid Range Switch Power Pack+ E-LTU	T5522AAE
	<b>NOTE:</b> The Power Pack+ Software Bundle kit includes Fabric Vision, Fabric Watch, ISL Trunking, Extended Fabric and Advanced Performance Monitor.	(Physical License - T5522A)
	<b>NOTE:</b> Adaptive Networking and Server Application Optimization features are included by default in the switch firmware (FOS 7.2.x or later, See HP SPOCK for HP supported versions of FOS 7.2.x) and do not require a separate license	
	HP 8/16Gb Mid Range Switch Fabric Vision E-LTU	TC510AAE (Physical License - TC510A)
	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 SN6000B 10Gb Integrated FC Extension E-LTU	TC358AAE (Physical License - TC358A)
	<b>NOTE:</b> Enables 10Gb FC for first eight ports	
	HP B-series Integrated Routing E-LTU	T5528AAE (Physical License - T5528A)
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-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

Configuration Information

[HP's Product Download web site.](#)

### Technical Specifications

<b>System Architecture</b>	<b>Fibre Channel ports</b>	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
	<b>Scalability</b>	Full fabric architecture– <a href="http://h18006.www1.hp.com/products/storageworks/san/documentation.html">http://h18006.www1.hp.com/products/storageworks/san/documentation.html</a>
	<b>Certified maximum</b>	Refer to SAN Design Guide for current configuration information– <a href="http://h18006.www1.hp.com/products/storageworks/san/documentation.html">http://h18006.www1.hp.com/products/storageworks/san/documentation.html</a>
	<b>Interoperability</b>	<ul style="list-style-type: none"> <li>• 4/256 SAN Director</li> <li>• 4/64 SAN Switch</li> <li>• 4/32B SAN Switch</li> <li>• 4/8 SAN Switch</li> <li>• 4/16 SAN Switch</li> <li>• 8/8 SAN Switch</li> <li>• 8/24 SAN Switch</li> <li>• 8/40 SAN Switch</li> <li>• 8/80 SAN Switch</li> <li>• Encryption SAN Switch</li> <li>• 2408 FCoE Converged Network Switch</li> <li>• 1606 Extension SAN Switch</li> <li>• DC04 SAN Director</li> <li>• DC SAN Backbone Director</li> <li>• SN8000B 8-Slot SAN Backbone Director</li> <li>• SN8000B 4-Slot SAN Director</li> <li>• SN6500B Fibre Channel Switch</li> <li>• SN3000B Fibre Channel Switch</li> <li>• Brocade 4Gb SAN Switch for HP c-Class BladeSystem</li> <li>• Brocade 8Gb SAN Switch for HP BladeSystem c-Class</li> <li>• HP 400 MP-Router</li> </ul>
	<b>Performance</b>	Auto-sensing of 4, 8, and 16 Gbps port speeds–10 Gbps and optionally programmable to fixed port speed.
	<b>ISL Trunking</b>	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.
	<b>Aggregate bandwidth</b>	1536 Gbit/sec full duplex
	<b>Fabric latency</b>	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).
	<b>Maximum frame size</b>	2112-byte payload
	<b>Classes of service</b>	Class 2, Class 3, Class F (inter-switch frames)
	<b>Port types</b>	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
	<b>Data traffic types</b>	Fabric switches supporting unicast
	<b>Media types</b>	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.
	<b>USB</b>	One USB port for system log file downloads or firmware upgrades
	<b>Fabric services</b>	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)
	<b>Extension</b>	Fibre Channel, in-flight compression (Brocade LZO) and encryption (AES-GCM-256)•integrated 10 Gbps Fibre Channel for DWDM MAN connectivity
	<b>Options</b>	SFP media, USB Device
<b>Management</b>	<b>Management software supported</b>	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
	<b>Management access</b>	10/100 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45), and one USB port
	<b>Diagnostics</b>	D <sub>e</sub> 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)
<b>Mechanicals</b>	<b>Enclosure</b>	Port side Intake and Port side Exhaust airflow models available•power from back•1U
	<b>Size</b>	Width•438 mm (17.23 in.) Height•43 mm (1.7 in.) Depth•443 mm (17.45 in.)
	<b>System Weight</b>	9.16 kg (20.20 lb) with two power supply FRUs, without transceivers
<b>Environment</b>	<b>Temperature</b>	Operating•0° to 40° C (32° to 104° F) Non-operating•-25° to 70° C (-13° to 158° F)
	<b>Humidity</b>	Operating•10 to 85 percent non-condensing
	<b>Altitude</b>	Operating•Up to 3000 meters (9,842 feet) Storage•Up to 12 kilometers (39,370 feet)
	<b>Shock</b>	Operating•20 g, 6 ms half-sine Non-operating•Half sine, 33G 11ms. 3/eg Axis
	<b>Vibration</b>	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
<b>Power</b>	<b>Power Supply</b>	Dual, hot-swappable redundant power supplies with integrated system cooling fans
	<b>AC input</b>	85 V to 264 V ~5 A to 2.5 A
	<b>Input line frequency</b>	47 Hz to 63 Hz
	<b>Power Consumption</b>	110 watts with all 48 ports populated with 16 Gbps SWL optics 72 watts for empty chassis with no optics

### Technical Specifications

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