

### Overview

Today we are witnessing continued exponential growth of mission-critical and business-critical workloads, increased server virtualization and accelerating all-flash storage technologies that have an ever-increasing requirement for more scale, 100% availability and reliability leading to infrastructure complexity and growing management costs. To meet these dynamic and growing business demands, organizations need to deploy infrastructure that can deliver greater consistency, predictability, and performance. Faced with exponential data growth, the network must evolve to enable businesses to thrive in this new era. To meet these dynamic and growing business demands, organizations need to deploy infrastructure that can deliver greater consistency, predictability, and performance. The newest and most exciting storage advancement today is flash-based storage. The unprecedented speed and rapidly increasing cost-effectiveness of flash-based products are dramatically accelerating data center transformation. Tomorrow, next-generation flash storage based on Non-Volatile Memory Express (NVMe) over Fabrics will provide even greater value through significant performance gains. As companies redefine application performance with flash storage, HPE StoreFabric can help organizations modernize their storage networks to maximize productivity and increase the efficiency of their storage networks—even as they rapidly scale their environments.

### HPE StoreFabric B-series SAN Director Switch Family

The HPE StoreFabric SAN Directors are the industry's leading Fibre Channel switching infrastructure solutions that provide the tools to optimize NVMe storage, simplify operations, and automate SAN management tasks, while serving as a modular building block to accommodate growth in large-scale enterprise infrastructures with breakthrough performance, and energy efficiency with long-term investment protection.

### HPE StoreFabric SN8600B 32Gb SAN Directors

HPE StoreFabric offers the most complete and comprehensive Gen6 (32Gb) SAN Director products. The SN8600B Gen6 (32Gb) SAN Directors combines innovative hardware, software, and integrated network sensors, ensuring the industry's highest level of operational stability, easy manageability and redefining application performance. Breakthrough 32 Gbps performance accelerates application response time, eliminating I/O bottlenecks and unleashes the full performance of flash and next generation NVMe-based storage. They consistently deliver five-9s availability in the world's most demanding data centers. And with non-disruptive, hot-pluggable components and a no-single-point-of-failure design, the SN8600B is truly the enterprise-class director for today's storage infrastructure.

The HPE SN8600B SAN Director is available in two modular form factors to increase business agility with seamless storage connectivity and flexible deployment offerings.

- Built for large enterprise networks, the SN8600B 8-slot Director is a 14U chassis and has eight vertical blade slots to provide up to 384 32 Gbps Fibre Channel device ports and 32 additional 128 Gbps Inter-Chassis Link (ICL) ports. This provides up to 20.48 Tbps of chassis bandwidth to address next-generation I/O- and bandwidth-intensive applications.
- Built for midsize networks, the SN8600B 4-slot Director has four horizontal blade slots to provide up to 192 32 Gbps Fibre Channel device ports and 16 additional 128 Gbps ICL ports. This provides up to 10.24 Tbps of aggregate chassis bandwidth and are ideal foundation for highly virtualized environments.

Each blade slot can be populated with the following optional blades -

- HPE StoreFabric 32Gb 64-port Fibre Channel Blade provides 64 ports of 32Gbps Fibre Channel or 10Gb/25Gb/40Gb Fibre Channel over Ethernet (FCoE) connectivity via 16 front QSFP ports and is NVMe-ready. The blade comes pre-bundled with 8 32Gb QSFP optics.
- HPE StoreFabric 48-port Fibre Channel port blade provides 48 32 Gbps Fibre Channel ports and is NVMe-ready. This is available in 2 options - Bundled with 48 32Gb SFP+ and Standard configuration (without SFP+).
- To support disaster recovery and data protection storage solutions over long distances, the HPE StoreFabric SAN Extension Blade provides 16-port for 32 Gbps Fibre Channel connectivity, 16-port for 1/10 Gigabit Ethernet (GbE)

## Overview

connectivity, and 2-ports for 40 GbE connectivity for Fibre Channel and IP replication traffic. This is available in 2 options - Bundled with (16) 32Gb SFP+ and Standard configuration (without SFP+).

The chassis connectivity leverages optical Inter-Chassis Links (ICLs), which provide 128 Gbps bandwidth through a QSFP link. These links can support up to 2 kilometers and connect up to 8 SN8600B Directors, enabling flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs.

ICLs enable scalable core-edge and active-active mesh chassis topologies. These high-density chassis topologies reduce inter-switch cabling by 75 percent and free up to 25 percent of ports for servers and storage. This maximizes overall port density within the smallest amount of rack space while freeing up front-facing device ports for server and storage connectivity.

The SN8600B 8-slot Director supports 32 ICL ports, providing the equivalent of 128 32 Gbps ports (4.096 Tbps), and the SN8600B 4-slot Director supports 16 ICL ports, providing the equivalent of 64 32 Gbps ports (2.048 Tbps). SN8600B ICLs are backward-compatible and can connect to SN8000B ICL ports, including connectivity with 2 km QSFPs at Gen5 speeds of 16 Gbps (4×16). Also, SN8600B ICLs allow multi-director connectivity without the Enterprise ICL license anymore.

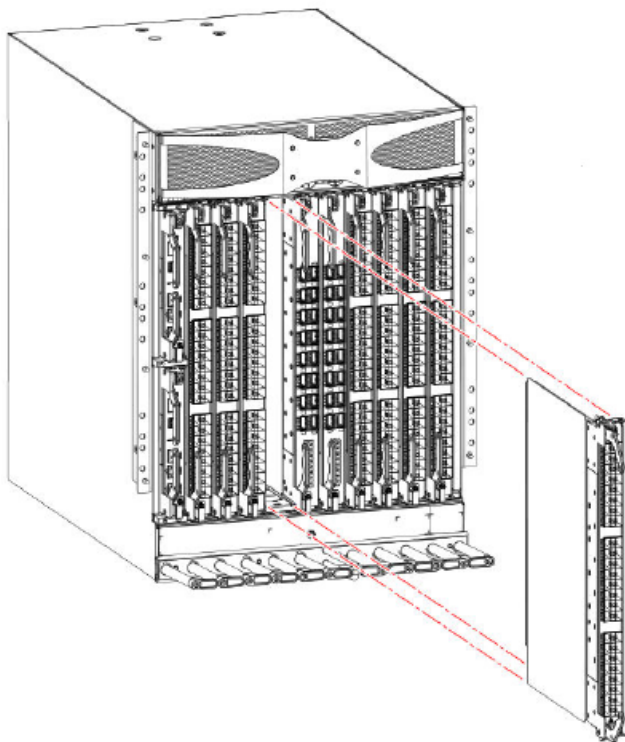
The HPE StoreFabric Power Pack+ set of tools provide a breakthrough hardware and software solution that helps simplify fabric monitoring, increase operational stability, and dramatically reduce costs by continual monitoring of the fabrics health and performance with actionable insight to remedy network problems quickly. It is pre-configured on every SN8600B 8-Slot Director and SN8600B 4-Slot Director. Power Pack+ also provides the foundation for integration into HPE storage management tools, enabling infrastructure management through a single-pane-of-glass.

The Fabric Vision technology (Included in HPE PowerPack+ Software) helps simplify monitoring, maximize network availability, and dramatically reduce costs. Beyond IO Insight and VM Insight, Fabric Vision features innovative monitoring, management, and diagnostic capabilities that enable administrators to avoid problems before they impact operations, helping their organizations meet Service Level Agreements (SLAs). The HPE StoreFabric 32Gb 64-port Fibre Channel Blade supports new Fabric Vision technology features integrated within the SN8600B Director.

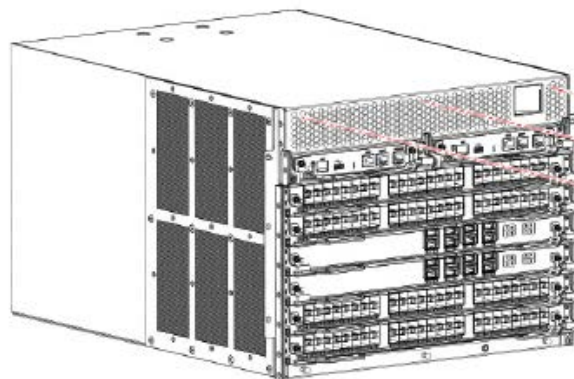
New Fabric Vision enhancements for the HPE StoreFabric 32Gb 64-port Fibre Channel Blade takes advantage of IO Insight and VM Insight (included with Fabric Vision), which provides organizations with deeper visibility throughout a storage fabric or into the performance of their environments at a VM level. This enhanced visibility enables administrators to quickly identify the source of degraded application or VM performance at the host and storage tiers, reducing time to resolution. With the HPE StoreFabric 32Gb 64-port Fibre Channel Blade, the SN8600B Director can optimize the performance of NVMe over Fibre Channel by leveraging integrated, non-intrusive, real-time monitoring and alerts. This proactive monitoring of NVMe over Fibre Channel traffic and VMs provides administrators with key insights for maintaining optimal network health and performance. IO Insight proactively monitors IO performance and behavior through integrated network sensors, providing deep insight into problems and helping to ensure service levels. This capability non-disruptively and non-intrusively gathers IO statistics from any device port, then feeds them to a monitoring policy that sets thresholds and generates alerts. VM Insight applies IO Insight visibility for each VM. Integrated VM, application-, and device-level IO latency and IOPS monitoring enables administrators to set the baseline for application performance and identify the VM or physical layer responsible for the degraded performance.

For investment protection, HPE SN8600B Directors offer three generations of backward-compatibility support for connectivity to 4, 8, and 16 Gbps Fibre Channel products. Furthermore, the SN8600B Directors supports future Fibre Channel generations as a Gen7-ready storage networking platform and allows for current Gen 6 and future generation switch blade modules to be added within the chassis.

## Overview



**HPE StoreFabric SN8600B 8-slot 32Gb SAN Director**



**HPE StoreFabric SN8600B 4-slot 32Gb SAN Director**

## HPE StoreFabric SN8000B 16Gb SAN Director

The SN8000B Directors were designed to unleash the full potential of private cloud storage and virtualization. With higher scalability and port density, 16 Gbps performance, reliability, and functionality, the SN8000B Directors are the strategic platform for transforming current SAN fabrics into cloud-optimized SANs.

HPE SN8000B SAN Directors are based on the same core technology and consist of two form factors. The SN8000B 8-Slot Director is a 14U chassis and supports 8Gb and 16Gb Fibre Channel blades for large enterprises to deliver higher scalability and port density, performance, and functionality. The SN8000B 4-Slot Director is a 9U chassis and also supports 8Gb and 16Gb Fibre Channel blades for mid-size enterprises as the core of their SANs.

The SN8000B SAN Directors provide up to 512 16Gb FC ports using the 64-port 16Gb Fibre Channel Blade. These directors also provide up to 32 QSFP based Inter Chassis Links (ICLs) which are equivalent to 128 16Gb FC ports. They support a range of Fibre Channel blade options including 32, 48 and 64 port 16Gb blades. They provide up to 10.2Tbps of total aggregate bandwidth and 1024Gbps of slot bandwidth and are the ideal foundation for private cloud storage and highly virtualized environments.

HPE SN8000B SAN Directors offer multi-protocol support through various blades with autosensing support, depending on model, for 16/10/8/4/2 Gbps Fibre Channel, FICON, FCIP and FCoE.

To help reduce downtime costs, SN8000B SAN Directors leverage the core B-series technology performing at greater than 99.999 percent uptime in the world's most demanding data centers.

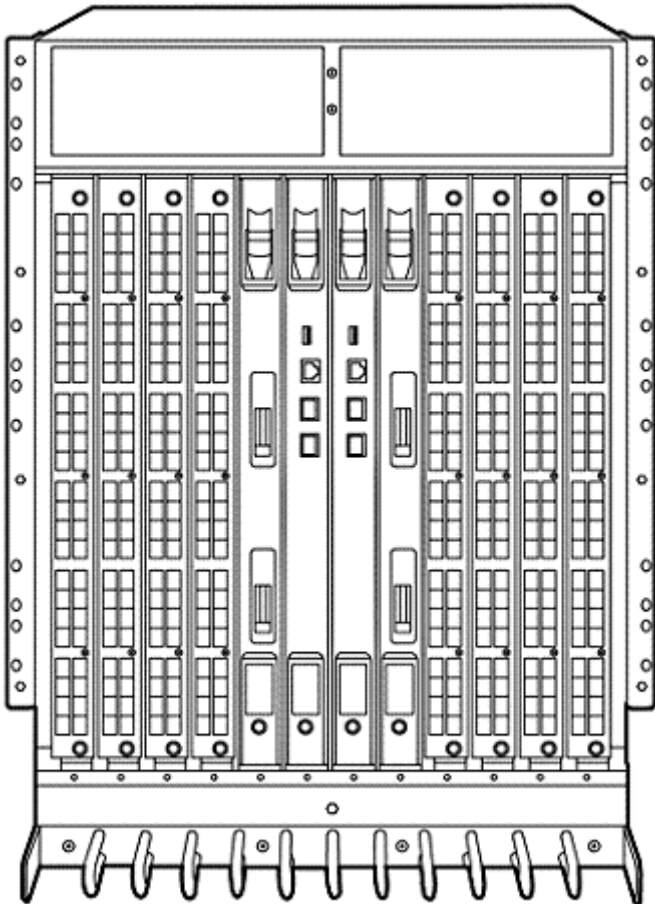
The Power Pack+ set of tools monitors the network's health and performance. It is pre-configured on every SN8000B 8-Slot Director and is available pre-configured or as an upgrade for every SN8000B 4-Slot Director. Power Pack+ also provides the foundation for integration into HPE storage management tools, enabling infrastructure management through a single-pane-of-glass.

## Overview

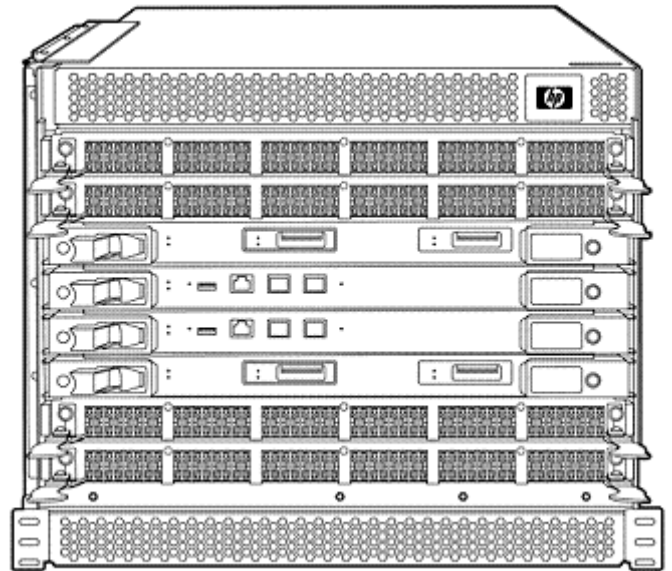
### Features exclusively available on the SN8000B SAN Directors:

The following features are available on HPE SN8000B -

- A 64-port 16Gb FC High Density Blade for the SN8000B is available offering high density port counts. It scales up to 512 16Gbps ports with a total system bandwidth of 10.2 Tbps. Compared to the 64 port 8Gb FC blade, the new 64-port 16Gb FC blade increases port density by 33%, reduces cabling by 75% and lowers TCO by providing the lowest Watts/Gb.
- There is a common ICL POD (Ports on Demand) license between SN8000B 8-Slot and 4-Slot chassis. A single ICL POD license will enable 16 QSFP ICLs or 1Tbps of bandwidth in both SN8000B 8-Slot and 4-Slot Director. A subsequent ICL POD license will enable an additional 16 QSFP ICLs or 1Tbps in SN8000B 8-Slot Director. The optional Enterprise ICL POD license allows you to connect four or more other SN8000B Director Chassis using ICLs.
- SN8000B SAN Directors allow customers to configure a port on the 16Gb 32-port and 48-port blades at 10Gb FC speed. The 10Gb port speed setting is not supported on the 16Gb 64-port blade. This is available for DWDM metro connectivity and will be enabled by a slot based 10GE license.
- SN8000B SAN Directors provide features like in-flight encryption and compression as part of base Fabric Operating System (FOS) with any 16Gb blade. The Diagnostic Port (D-Port) Optic Health Monitoring provides functional and stress testing of cables and optics. They use the capabilities of FOS, Director ASIC, and B-series 16Gb optics and are available on 16Gb port blades with 16Gb B-series optics without any additional software license.



HPE SN8000B 8-Slot SAN Director



HPE SN8000B 4-Slot Director

## Overview

### What's New

- Introducing HPE StoreFabric SN8600B 32Gb 64-port FC Blade providing 64 ports of 32Gbps Fibre Channel or 10Gb/25Gb/40Gb Fibre Channel over Ethernet (FCoE) connectivity via 16 front QSFP ports.
  - Scales the SN8600B Director to 512 ports while maximizing space utilization with 33 percent more device connectivity in a high-density blade
  - Increases agility by enabling flexible architectures with concurrent Fibre Channel, NVMe, or FCoE connectivity
  - Handles more workloads with Gen6 Fibre Channel performance and by increasing total system bandwidth up to 20 Tbps
  - Reduces complexity with 75 percent fewer cables and increases port density with Q-Flex connections
  - Drives IT innovation by optimizing NVMe performance through integrated real-time latency monitoring with IO Insight
  - With the SN8600B Brocade FC32-64 Port Blade and SN8600B Director you can optimize the performance of NVMe over Fibre Channel at a granular level by leveraging integrated, non-intrusive, real-time monitoring and alerts. This proactive monitoring of NVMe over Fibre Channel traffic and VMs too provides administrators with key insights for maintaining optimal network health and performance.
- Introducing new REST APIs directly into B-series switches and management products, which allows automation of repetitive daily tasks such as fabric inventory, provisioning, and operational state monitoring. You can quickly integrate with open source PyFOS to simplify common SAN management practices, and leverage Ansible to easily scale automation and orchestration across the infrastructure. These features are available in FOS 8.2.0a.

## Product Highlights

### HPE StoreFabric SAN Director Highlights

#### HPE SN8600B 32Gb SAN Director

Purpose-built for large Enterprise deployments to meet relentless growth, mission-critical application demands, and maximize space utilization with industries highest FC port density. SN8600B with Gen6 (32Gb) Fibre Channel, delivers unmatched 32Gb performance, reduced latency and futureproofed for slower FC speeds, NVMe storage and future Gen7 technologies. The SN8600B SAN Director family:

- Enhances operational stability, maximizes application performance, and increases business agility with enterprise-class Gen6 directors Consolidates infrastructure with 128 Gbps ICL connectivity for simpler, flatter, low-latency fabrics, and scales up to 512 ports and more using ICL ports.
- Greater workload bandwidth with total system bandwidth up to 20Tbps
- Simplifies end-to-end management of large-scale environments by automating monitoring and diagnostics
- Automatically detects degraded application or device performance through integrated network sensors
- Extends replication over distance with a highly scalable extension solution for Fibre Channel, IP, and FICON
- Simplifies configuration automation and enables integrated advanced services across the Fabric with standard REST APIs, PyFOS and Ansible support to automate repetitive tasks error free, these features are available in FOS 8.2.0a
- Seamlessly integrates next-generation NVMe over Fabrics with Gen6 Fibre Channel networks without a disruptive rip and replace, and with the the Brocade FC32-64 Port Blade and SN8600B Director you can optimize the performance of NVMe over Fibre Channel by leveraging integrated, non-intrusive, real-time monitoring and alerts.
- Mitigates risk with backward-compatibility while further protecting future investments with Gen7-ready support

#### HPE SN8000B 16Gb SAN Director

They provide a reliable, scalable, high-performance Fibre Channel switching foundation for private cloud storage and highly virtualized environments. They are designed to increase business agility while providing non-stop access to information and reducing infrastructure and administrative costs. The SN8000B director family:

- Unleashes the full potential of private cloud storage with unmatched scalability, performance, and reliability
- Enables simpler, flatter, low-latency chassis connectivity to reduce network complexity, management, and costs
- Optimizes data center connectivity over distance with integrated high-performance metro and global connectivity
- Simplifies and centralizes end-to-end Storage Area Network (SAN) management with comprehensive diagnostics, monitoring, and automation
- Maximizes performance for I/O- and bandwidth-intensive applications with more than seven times the performance of competitive offerings

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### Performance

- **SN8600B 32Gb 8-slot SAN Director**
  - Up to 512 ports (equivalent to 640 with ICLs) at 32 Gb speed
  - 20.48 Tbps aggregate chassis bandwidth

## Product Highlights

- 32 ICL ports, providing the equivalent of 128 32 Gbps ports (4.096 Tbps),
- 2.048 Tbps bandwidth per slot, providing line-rate performance for the HPE SN8600B 64-port blade
- **SN8600B 32Gb 4-Slot SAN Director**
  - Up to 256 ports (equivalent to 256 with ICLs) at 32 Gb speed
  - 10.24 Tbit/s aggregate chassis bandwidth
  - 16 ICL ports, providing the equivalent of 64 32 Gbps ports (2.048 Tbps)
  - 2.048 Tbps bandwidth per slot, providing line-rate performance for the HPE SN8600B 64-port blade
- **SN8000B 16Gb 8-Slot SAN Director**
  - 512 ports operating simultaneously at full 16Gb speed (maximum)
  - 10.2 Tbps of chassis bandwidth
  - 2 Tbps of Inter Chassis Link (ICL) bandwidth (freeing up to 128 16 Gb ports for server, storage, and fabric connections)
- **SN8000B 16Gb 4-Slot Director**
  - 256 ports operating simultaneously at full 16Gb speed (maximum)
  - 5.1 Tbps of chassis bandwidth
  - 1 Tbps of Inter Chassis Link (ICL) bandwidth (freeing up to 64 16 Gb ports for server, storage, and fabric connections)

### SAN scalability

The SN8600B 8-Slot Director scales up to 512 32 Gbps ports or a 640-port equivalent with 128 Gbps (4×32 Gbps) ICL ports (32 Gbps× 4 QSFP ports) in a single switch domain.

The SN8600B 4-Slot Director scales up to 256 32 Gbps ports or a 320-port equivalent with 128 Gbps (4×32 Gbps) ICL ports (32 Gbps × 2 QSFP ports) in a single switch domain.

The SN8000B 8-Slot Director scales up to 512 16 Gbps ports in a single switch domain.

The SN8000B 4-Slot Director scales up to 256 16 Gbps ports in a single switch domain.

Please see the following web site for SAN configuration support information:

<https://support.hpe.com/hpsc/doc/public/display?docId=c00403562>

### High-availability features

- Redundant, hot-swappable components
- Separate Control Processor (CP) and Core (CR) switching blades
- No active components on the backplane
- Redundant hot swappable power and cooling subsystems
- Enhanced data integrity on all data paths
- Fabric Shortest Path First (FSPF) rerouting around failed links
- Integration with SNMP managers
- Automatic Control Processor fail over
- Non-disruptive "hot" software code loads and activation
- Easy configuration, save and restore

### Advanced Fabric Services

- Fabric Vision (Includes IO Insight Software for SN8600B Gen 6 Director) and optimizes NVMe performance through integrated real-time latency monitoring with IO Insight
- ISL Trunking
- Hardware Enforced Zoning
- Frame Filtering
- Web Tools
- Enhanced Group Management (EGM)
- End-to-End Performance Analysis
- Extended Fabrics

## Product Highlights

- Adaptive Networking
- SAN Network Advisor
- HPE Intelligent Infrastructure Analyzer Software (IIAS)

**NOTE:** Fabric Watch is superseded by Fabric Vision in FOS 7.4. Adaptive Networking functionality and SAO functionality became part of the base FOS in version 7.2 and licenses are no longer required at or after this version.

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### 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 0D1 after the part number on your sales order.

**NOTE:** A maximum of two B-series SAN Director switches currently are supported to ship configured to order from the factory in a 42U, 10000 (10KG2) and Intelligent Series cabinet. However, 220V PDUs must be configured because 110V PDUs are not supported.

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## Software Components, Standard

### Remote Switch

The Remote Switch fabric functions with the aid of a bridging device, or network bridge. The network bridge supports Fibre Channel physical interfaces, as well as secondary non-Fibre Channel FCIP physical interfaces.

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### Frame Filtering

An ASIC based capability in the 4 Gb, 8 Gb, 16Gb and 32 Gb family of SAN switches 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.

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### Advanced Zoning

WWN Zoning and Access Control are included in the SN8600B and SN8000B SAN Directors hardware. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.

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### WebTools

WebTools is an intuitive and easy-to-use graphical interface that enables organizations to install and configure an SN8600B or SN8000B SAN Director. SAN administrators can perform the initial configuration and basic management tasks by using a Java-capable Web browser from standard laptops, desktop PCs, or workstations from any location within the enterprise.

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### SAN Director Power Pack+ Software Bundle

The SAN Director Power Pack+ Software bundle includes:

- Fabric Vision
- Extended Fabric
- ISL Trunking

**NOTE:** Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor are replaced by MAPS and Flow Vision respectively. Both are included in Fabric Vision.

**NOTE:** Optional software for the SN8000B 4-Slot (QK712A, QK712B, QK712C, QK712D) and DC04 Base SAN Director (AR478A, AR478B, AR478C).

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### 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. In addition, administrators can include IO Insight (Available on SN8600B) metrics in MAPS



## Product Highlights

policies to understand the IO profile as well as to be notified of storage IO performance degradation.

- **Configuration and Operational Monitoring Policy Automation Services Suite (COMPASS):** Simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration to seamlessly deploy a configuration across the fabric.
- **ClearLink® Diagnostics:** Ensures optical and signal integrity for Fibre Channel optics and cables, simplifying deployment and support of high-performance fabrics. ClearLink Diagnostic Port (D\_Port) is an advanced capability of Fibre Channel platforms.
- **Flow Vision:** A comprehensive tool that enables administrators to identify, monitor, and analyze specific application data flows in order to simplify troubleshooting, maximize performance, and avoid congestion 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
- **Forward Error Correction (FEC):** Enables recovery from bit errors in device connections and ISLs, enhancing transmission reliability and performance.

Fabric Vision will be included by default in all HPE StoreFabric B-series Fibre Channel switches and Directors bundled with Power Pack+ (with FOS 7.2.0a 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 7.2.0a and later)
- Application of the Power Pack+ LTU (FOS 7.2.0a and later)
- Upgrading existing Switch/Director loaded with Power Pack+ to FOS 7.2.0a or later
- Upgrading existing Switch/Director loaded with both Advanced Performance Monitor (APM) and Fabric Watch (FW) licenses to FOS 7.2.0a or later

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### Extended Fabric

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.

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### FICON Support

Optional FICON CUP license which enables host control of switches in mainframe environments. FICON Accelerator is an optional software license that increases the speed of FICON disk and tape read and writes, while maintaining the integrity of command and acknowledgement sequences.

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### ISL Trunking

For high performance enhanced ISL connectivity, this license logically groups up to eight E-ports to provide a high bandwidth trunk between two switches. Each 4 or 8-slot director needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 64 Gbps for 8 Gb, or up to 128 Gbps for 16Gb or up to 256 Gbps for 32Gb) when routing connections between switches. Connections are load-balanced across the individual links, which comprise the logical trunk group.

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### 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.

## Product Highlights

- **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.

### SAN Network Advisor Professional

HPE SAN Network Advisor Professional is a management application available at no-charge and comes with B-series SAN Switches and:

- Allows management of two Fabric OS (FOS) fabrics (up to 300 switch ports and 1000 devices)
- Performs group switch management beyond the scope of Web Tools
- Does not offer management of the SN8600B 8-slot, SN8000B 8-Slot, DC SAN Backbone Directors, or FICON.

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

SMB customers that initially start off with SAN Network Advisor Professional and have a small SAN environment may over time feel the need for an enterprise-class product (SAN Network Advisor 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. SAN Network Advisor Enterprise provides complete SN8600B and SN8000B 8-Slot Director management including enterprise-class features/environments such as FICON, Fibre Channel Routing, FCIP, adaptive networking etc. while HPE SAN Network Advisor Professional+ provides the same feature set except for support for the SN8600B 8-slot, SN8000B 8-Slot Director and FICON.

HPE SAN Network Advisor Enterprise delivers unprecedented scalability, up to 100 fabrics and 15,000 switch ports, while HPE 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.

### HPE Smart SAN for 3PAR

HPE Smart SAN, optional software for HP 3PAR, makes end-to-end SAN configuration and 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 32Gb, 16Gb and 8Gb FC switches with FOS 7.4.0a or later.

**NOTE:** A list of supported HPE FC Adapters can be found at <http://www.hpe.com/storage/spock>

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

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## Product Highlights

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### Optional Software:

#### Inter Chassis Link (ICL) License

Inter Chassis Links (ICLs) harness unused ports to connect the switching backplane of SAN Directors. The HPE StoreFabric SAN Directors offer the latest ICL technology which includes new optical ports, higher port density, and support for standard optical cables up to 100 meters or up to 2km with 2km QSFP+. ICL support enables flatter, faster, and simpler fabrics that increase consolidation while reducing network complexity and costs.

ICLs enable scalable core edge and active-active mesh chassis topologies. These high-density chassis topologies reduce inter-switch cabling by 75 percent and free up to 25% of ports for server and storage. This maximizes overall port density in the lowest amount of rack space while freeing up front-facing device ports for server and storage connectivity.

#### HPE SN8600B SAN Director

The SN8600B 8-slot Director supports 32 ICL ports, providing the equivalent of 128 32 Gbps ports (4.096 Tbps). The SN8600B 4-slot Director supports 16 ICL ports, providing the equivalent of 64 32 Gbps ports (2.048 Tbps). Gen 6 ICLs are backward-compatible and can connect to Gen 5 ICL ports, including connectivity with 2 km QSFPs at Gen 5 speeds of 16 Gbps (4×16).

HPE SN8600B chassis connectivity leverages optical Inter-Chassis Links (ICLs), which provide 128 Gbps bandwidth through a QSFP link. These links can support up to 2 kilometers and connect up to 12 SN8600B Directors.

**HPE SN8000B SAN Director** The SN8000B 8-Slot Director has a total of 32 ICL ports (16 per core switching blade) that deliver 2.048 Tbps of bandwidth. This is equivalent to 128 16 Gbps ISLs. The SN8000B 4-Slot Director has a total of 16 ICL ports (eight per core switching blade) that deliver 1.024 Tbps of bandwidth. This is equivalent to 64 16 Gbps ISLs.

Base ICL support can connect up to four SN8000B Directors.

There is a common ICL POD (Ports on Demand) license between SN8000 8-Slot and 4-Slot chassis. A single ICL POD license will enable 16 QSFP ICLs or 1Tbps of bandwidth in both SN8000 8-Slot and 4-Slot SAN Director. A subsequent ICL POD license will enable an additional 16 QSFP ICLs or 1Tbps in a SN8000B 8-Slot Director.

**NOTE:** ICL licenses are required for each SN8600B and SN8000B SAN Director. ICL QSFPs and optical cables are required for connectivity.

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#### HPE SN8000B Enterprise Inter Chassis Link Licenses

Increased core-edge and active-active mesh topologies of up to nine (9) chassis can be supported with the addition of SN8000B 8-slot or 4-slot Enterprise Inter-Chassis Link licenses (FOS v7.0.1 or greater required). The Enterprise ICL POD license allows you to connect four or more chassis to an SN8000B Director chassis using ICLs. For each SN8000B Director chassis, you can connect up to three SN8000B Director chassis via ICLs without this license. This license is required only on the SN8000B Director chassis that is connected to four or more SN8000B Director chassis. This license requirement does not depend upon the total number of SN8000B Director chassis that exist in a fabric, but only on the number of chassis connected directly to an SN8000B Director via ICLs. You must also have an ICL POD license on each SN8000B Director to activate the ICL ports. The Enterprise ICL license only allows connection of more than four chassis using ICLs; it does not enable the ICL ports on a chassis. This applies to the SN8000B Directors only.

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#### HPE B-Series SAN Director FICON CUP Active License

Optional license feature provides Control Unit Port (CUP) in-band management function designed to allow mainframe applications to perform configuration, monitoring, management and statistics collection. These applications include System Automation for OS/390 (SA/390), Dynamic Channel Management Facility (DCM) and Resource Management Facility (RMF). Hardware-enforced FICON

## Product Highlights

and FCP port zoning enhances separation with intermix operation.

**NOTE:** Supported on the HPE SN8000B SAN Directors.

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### HPE DC SAN Director Switch Multiprotocol Ext Blade FICON Accelerator Upgrade License

The FICON Accelerator software license increases the speed of FICON disk and tape read and writes, while maintaining the integrity of command and acknowledgement sequences.

**NOTE:** Supported for the MP Extension Blade (AP865A, AP865B) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C) for all B-series SAN Directors.

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### HPE B-series SAN Backbone Director Integrated Routing License

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 blade or switch. 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.

**NOTE:** Supported for all B-series SAN Directors. Separate LTU are available for each generation of product.

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### HPE MP Blade Performance Extension License

Optional software license to activate the high performance extension services. The HPE MPR Blade provides two types of SAN Services: FC-FC Subnet Routing Service for SAN island consolidation: Logically connect devices in multiple SAN fabrics to share storage resources-from any fabric regardless of distance-with the administration and fault isolation benefits of separately managed fabrics.

FCIP and FC Tunneling Service for SAN extension over distance: Either seamlessly and reliably extends HPE B-Series SANs across MAN and WAN IP networks or dark fiber and xWDM Fibre Channel networks with high performance extension services, fully integrated with HPE CA solutions for EVA and XP. FC and FCIP extension services are mutually exclusive.

**NOTE:** HPE MP Blade Performance Extension LTU/E-LTU (T4427A/T4427AAE) is an optional license for HPE Multi-Protocol Router blade (AG461B) for the DC SAN Directors.

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### 10GbE and 10Gb FC Performance Upgrade

Optional software license to activate high performance for either 10GbE or 10Gb Fibre Channel connectivity.

10GbE Performance Upgrade LTU for MP Extension Blade (**AP865A, AP865B**) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C).

Enables 10 Gigabit Ethernet ports for the MP Extension Blade (**AP865A, AP865B**) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C). Options for available Ethernet connectivity are:

- (10) 1 GbE ports and (1) 10 GbE port or
- (2) 10 GbE ports

10Gb Performance Upgrade LTU for 16Gb Fibre Channel Blades

Enables customers to configure the first 8 ports in FOS 7.0 and 7.1, any port in FOS 7.2 or later of a 16Gb Fibre Channel blade at 10Gb Fibre Channel speed. This is required for DWDM and dark fiber metro connectivity.

**NOTE:** The optional 10GbE and 10Gb Fibre Channel performance upgrade features can be applied to a mixture of 16Gb FC blades and the MP Extension Blade or Enhanced MP Extension Blade. The license is available on an individual SAN Director slot basis based on the particular blade installed. The 10GbE Performance upgrade feature is available for the MP Extension Blade (AP865A, AP865B) and Enhanced MP Extension Blade (C8R46A, C8R46B, and C8R46C) for all B-series SAN Directors. The 10Gb Performance Upgrade feature is available for 16Gb Fibre Channel Blades for the SN8000B Directors. Requires 10Gb optics (QK726A and/or QK727A).

## Product Highlights

For SN8600B 32Gb SAN Director, 10GbE is supported on the SN8600B SAN Extension Blade (Q0U85A, Q0U87A) and SN8600B 32Gb 48-port blade (Q0U84A, Q0U86A). No license is required to enable 10 Gbps support on SN8600B.

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**HPE MP Extension Blade Advanced Upgrade** Optional software license for the MP Extension Blade and Enhanced MP Extension Blade which enables two advanced extension features: FCIP Trunking and Adaptive Rate Limiting.

### **FCIP Trunking:**

FCIP Trunking feature allows multiple IP source and destination address pairs (defined as FCIP circuits) via multiple of the 1 GE and 10 GE interfaces to provide high bandwidth FCIP tunnel and failover resiliency. In addition, each FCIP circuit supports four QoS classes (Class-F, Hi, Medium and Low Priority), each as a TCP connection.

### **Adaptive Rate Limiting:**

An FCIP tunnel can be configured a minimum (guaranteed) committed rate as well as a maximum committed rate. FCIP tunnel will run at least the minimum rate. If additional bandwidth is needed, the committed rate will grow until the channel traffic demand is satisfied, maximum committed rate is reached, or the throughput capabilities of the network are reached.

**NOTE:** Supported for the MP Extension Blade (AP865A, AP865B) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C) for the SN8000B and DC SAN Directors.

## HPE Support Services and Warranty Information

<b>Warranty</b>	SN8600B 8-Slot SAN Director	(3-3-3) Hardware Warranty - Three-year NBD on-site warranty, 24x7, 4-hour remote response, installation not included.
	SN8600B 4-Slot SAN Director	(3-3-3) Hardware Warranty - Three-year NBD on-site warranty, 24x7, 4-hour remote response, installation not included.
	SN8000B 8-Slot SAN Director	(3-3-3) Hardware Warranty - Three-year NBD on-site warranty, 24x7, 4-hour remote response, installation not included.
	SN8000B 4-Slot SAN Director	(3-3-3) Hardware Warranty - Three-year NBD on-site warranty, 24x7, 4-hour remote response, installation not included.

**NOTE:** The hardware warranty covers firmware and embedded non-saleable software. Saleable software carries its own warranty, see below.

Software Warranty - Hewlett Packard Enterprise warrants only that the software media will be free of physical defects for a period of ninety (90) days from delivery.

**NOTE: EXCLUSIVE REMEDY:** The entire liability of Hewlett Packard Enterprise and its suppliers and your exclusive remedy for software that does not conform to this Limited Warranty shall be the repair or replacement of the defective media. This warranty and remedy are subject to your returning the defective media during the warranty period to Hewlett Packard Enterprise in the country in which you obtained the software.

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### Protect your business beyond warranty with HPE Support Services

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new storage solution, giving you full entitlement for the support for need for your IT and business.

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### Connect your devices:

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%<sup>1</sup> reduction in down time, near 100%<sup>2</sup> diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to Hewlett Packard Enterprise support.

1- IDC

2 - HP CSC reports 2014 - 2015

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### Optimized Care

#### HPE Proactive Care Advanced\* - 24x7 coverage, three year Support Service

This services helps achieve a higher return on your product investment with personalized support from a local assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to increase stability and reduce unplanned downtime. Leverage your system's ability to connect to Hewlett Packard Enterprise for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, this service offers critical event management to reduce mean time to resolution. This recommendation provides 24x7 coverage with four-hour response for hardware and collaborative support that offers two-hour callback for supported software issues. Collaborative software management is included with independent software vendors unless you have your software support from Hewlett Packard Enterprise where we own all cases from start through to resolution.

<http://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA5-3259ENW&cc=us&lc=en>

## HPE Support Services and Warranty Information

### Standard Care

#### **HPE Proactive Care\* with 24x7 coverage, three year Support Service**

HPE Proactive Care gives customers an enhanced call experience plus helps preventing problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice when your products are connected to Hewlett Packard Enterprise. This Service combines three years' proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. <https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

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### Basic Care

#### **HPE Foundation Care 24x7, three-year Support Service**

HPE Foundation Care 24x7 gives you access to Hewlett Packard Enterprise 24 hours a day, seven days a week for assistance on resolving issues. This service includes need based Hardware onsite response within four hours. Simplify your support experience and make Hewlett Packard Enterprise your first call to help resolve hardware or software problems.

<http://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

**NOTE:**\*HPE Proactive Care and HPE Proactive Care Advanced require that the customer connect their devices to make the most of these services and receive all the deliverables.

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### Related Services

#### **HPE SAN Deployment Service**

Hewlett Packard Enterprise delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.

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

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### For more information

#### <http://www.hpe.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 Pointnext operational 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 Support Services at <https://www.hpe.com/us/en/support.html>

## Configuration Information

Features	SN8000B 8-Slot SAN Director Power Pack+	SN8600B 8-Slot SAN Director Power Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers
Port Bandwidth	Up to 16Gbps	Up to 32 Gbps
Aggregate device bandwidth	10.2Tbps	20.48 Tbps
OS Support	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a>	
Storage system support	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>	
Ports	Up to 512 SFP	512 32 Gbps ports or a 640-port equivalent with 128 Gbps (32 Gbps×4 QSFP ports)
SFP	B-series	B-series
Advanced Trunking	Included with Power Pack	Included with Power Pack
Adaptive Networking	Included	Included
Form factor	14U	14U
Zoning Software	Yes (included)	Yes (included)
Hot plug, redundant power supplies	Yes	Yes
Hot plug fans	Yes	Yes

Features	SN8000B 4-Slot SAN Director and 4-Slot SAN Director Power Pack+	SN8600B 4-slot SAN Director Power Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers
Port Bandwidth	Up to 16Gbps	Up to 32Gbps
Aggregate device bandwidth	5.1 Tbps	10.24 Tbps
OS Support	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a>	
Storage system support	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>	
Ports	Up to 256 SFP	Up to 256 32 Gbps ports or a 320-port equivalent with 16 ICL ports.
SFP	B-series	B-Series
Advanced Trunking	Included with Power Pack or Optional Upgrade	Included with Power Pack
Adaptive Networking	Included	Included
Form factor	9U	9U
Zoning Software	Yes (included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes
Hot plug fans	Yes	Yes



## Configuration Information

Features	SN6000B 16 Gb FC Switch and SN6000B 16 Gb FC Power Pack+	SN6600B 32 Gb FC Switch and SN6600B 32 Gb FC Power Pack+	SN6600B 32 Gb Bundled (SFP+) FC Switch and SN6600B 32 Gb Power Pack+ Bundled (SFP+) FC Switch
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	16 Gbps	32 Gbps	32 Gbps
Aggregate device bandwidth	384- 768 Gbps	2 Tbps	2 Tbps
OS Support	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a>		
Storage system support	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>		
FC Ports	24 or 48 Enabled 48 Max	24 or 48 enabled 64 Max	24 or 48 Enabled 64 Max
SFP	B-series	B-series (16 Gb or 32 Gb)	B-series, 24 or 48 32 Gb SFP+ included in the box
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
Form factor	1U	1U	1U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes	Yes
Hot plug fans	Yes (integrated with power supply)	Yes (integrated with power supply)	Yes (integrated with power supply)

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base	SN3000B 16Gb FC Switch	SN3600B 32Gb FC Switch and SN3600B 32Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbps	8Gbps	16Gbps	32Gbps
Aggregate device bandwidth	64-192 Gbps	128-192 Gbps	192-384 Gbps	768 Gbps
OS Support	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</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	12 or 24 Enabled 24 Max	8 or 24 Enabled 24 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+ Upgrade	Included with Power Pack+ or Optional Upgrade

## Configuration Information

<b>Adaptive Networking</b>	Included	Included	Included	Included
<b>Form factor</b>	1U	1U	1U	1U
<b>Zoning Software</b>	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
<b>Hot plug, redundant power supplies</b>	No	No	Optional	No
<b>Hot plug fans</b>	No	No	Yes (integrated with power supply)	Yes (integrated with power supply)

Features	SN6500B 16Gb FC Switch and SN6500B 16Gb FC Power Pack+	SN4000B Power Pack+ SAN Extension Switch	1606 Extension SAN Switch
<b>Targeted Environment</b>	Workgroups, Departments	Data Centers; long distance replication, multiprotocol SAN Fabrics	Data Centers
<b>Fibre Channel Port Bandwidth</b>	16Gbps	16Gbps	8Gbps
<b>Ethernet</b>	N/A	1/10/40 Gbps Ethernet	1Gbps Ethernet
<b>Aggregate device bandwidth</b>	768-1536-Gbps		
<b>OS Support</b>	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a>		
<b>Storage system support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>		
<b>FC Ports</b>	48 or 96 Enabled 96 Max	24 FC Ports Enabled 24 Max	4 or 16 Enabled 16 Max
<b>Ethernet Ports</b>	N/A	16 Enabled	2 or 6 Enabled 6 Max
<b>SFP</b>	B-series	B-series	B-series
<b>Advanced Trunking</b>	Included with Power Pack+ or Optional Upgrade	Included	Included with Power Pack+ or Optional Upgrade
<b>Adaptive Networking</b>	Included	Included	Included
<b>Form factor</b>	2U	2U	1U
<b>Zoning Software</b>	Yes (Included)	Yes (Included)	Yes (Included)
<b>Hot plug, redundant power supplies</b>	Yes	Yes	Yes
<b>Hot plug fans</b>	Yes	Yes	Yes

## Configuration Information

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	16Gbps	8Gbps	16Gbps
Aggregate device bandwidth	448 Gbps	192 Gbps	576 Gb/s (36 ports x 16 Gb/s)
OS Support	<b>NOTE: Please Refer to SPOCK</b> <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a>		
Storage system Support	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>		
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
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

### Step 1 – Base Configuration and Power Pack

Select one:

#### Model Description

#### Part Number

HPE StoreFabric SN8600B 8-slot Power Pack+ Director Switch

Q0U63A

**NOTE:** 32Gb 512-port or 16Gb 512-port capable Fibre Channel Director, 2 control processors, 2 32 Gb core blades, 3 power supplies, 1 4Gb USB Device, rack rails, cable comb Zoning, Web tools, Fabric Vision Enhanced Group Management, Adaptive Networking, ISL Trunking, Extended Fabrics and SAN Network Advisor Enterprise Software 120 day software trial. Does not include Port blades or SFPs.

HPE StoreFabric SN8600B 4-slot Power Pack+ Director Switch

Q0U83A

**NOTE:** 32Gb 512-port or 16Gb 512-port capable Fibre Channel Director, 2 control processors, 2 32 Gb core blades, 2 power supplies, 1 4Gb USB Device, rack rails, cable comb Zoning, Web tools, Fabric Vision Enhanced Group Management, Adaptive Networking, ISL Trunking, Extended Fabrics, and SAN Network Advisor Enterprise Software 120 day software trial. Does not include Port blades or SFPs.

HPE StoreFabric SN8000B 8-slot Power Pack+ SAN Backbone Director Switch

QK710D

**NOTE:** 16Gb 512-port or 8Gb 512-port capable Fibre Channel Director, 2 control processors, 2 16Gb core blades, 2 power supplies, 1 4Gb USB Device, rack rails, cable comb Zoning, Web tools, Fabric Vision Enhanced Group Management, Adaptive Networking, Advanced Performance Monitor, Fabric Watch, ISL Trunking, Extended Fabrics, Server Application Optimization, and SAN Network Advisor Enterprise Software 120 day software trial. Does not include Port blades or SFPs.

## Configuration Information

HPE StoreFabric SN8000B 4-slot Power Pack+ SAN Director Switch	QK711D
<p><b>NOTE:</b> 16Gb 256-port or 8Gb 256-port capable Fibre Channel Director, 2 control processors, 2 16Gb core blades, 2 power supplies, 1 4Gb USB Device, rack rails, cable comb Zoning, Web tools, Fabric Vision Enhanced Group Management, Adaptive Networking, Advanced Performance Monitor, Fabric Watch, ISL Trunking, Extended Fabrics, Server Application Optimization, SAN Network Advisor Professional Software and SAN Network Advisor Enterprise Software 120 day software trial. Does not include Port blades or SFPs.</p>	
HPE StoreFabric SN8000B 4-slot SAN Director Switch	QK712D
<p><b>NOTE:</b> 16Gb 256-port or 8Gb 256-port capable Fibre Channel Director, 2 control processors, 2 16Gb core blades, 2 power supplies, 1 4Gb USB Device, rack rails, cable comb Zoning, Web tools, Enhanced Group Management, and SAN Network Advisor Professional, and SAN Network Advisor Enterprise Software 120 day software trial. Does not include Port blades or SFPs.</p>	

## Step 2 – Additional Port Configurations

Model Description	Quantity	Part Number
<p>HPE StoreFabric SN8600B 32Gb 64/32 Short Wave 8QSFP Integrated Fibre Channel Blade</p> <p><b>NOTE:</b> Only supported on SN8600B Directors (Q0U63A, Q0U83A) with FOS v8.2.0 or later. A maximum of 2 blades are supported when 4 HPE StoreFabric SN8600B 32Gb SAN Extension Blades (Q0U85A, Q0U87A) are present in the same chassis.</p> <p><b>NOTE:</b> This blade ships with 8 integrated 32Gb SW QSFP Transceivers.</p>	Add the appropriate quantity of 64-port blades to meet requirements	Q2S19A
<p>HPE StoreFabric SN8600B 32Gb 48-port Fibre Channel Blade</p> <p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A).</p>	Add the appropriate quantity of 48-port blades to meet requirements	Q0U84A
<p>HPE StoreFabric SN8600B 32Gb Short Wave 48-port SFP+ Integrated Fibre Channel Blade</p> <p><b>NOTE:</b> This blade ships with 48 integrated 32 Gb FC SW SFP+ transceivers.</p> <p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A).</p>	Add the appropriate quantity of 48-port blades to meet requirements	Q0U86A
<p>HPE StoreFabric SN8600B 32Gb SAN Extension Blade</p> <p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A). Max of 4 units per chassis.</p>	Add the appropriate quantity to meet requirements	Q0U85A
<p>HPE StoreFabric SN8600B 32Gb Short Wave 16-port SFP+ Integrated SAN Extension Blade</p> <p><b>NOTE:</b> This blade ships with 16 integrated 32 Gb FC SW SFP+ transceivers.</p>		Q0U87A

## Configuration Information

**NOTE:** Only supported in SN8600B Directors (Q0U63A, Q0U83A).

HP StoreFabric SN8000B 16Gb 32-port SFP Integrated Fibre Channel Blade

E7Y68B

**NOTE:** This blade ships with 32 integrated 16 Gb FC SW SFP transceivers.

**NOTE:** Only supported in SN8000B Directors (QK710A, QK710B, QK710C, QK710D, QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C and QK712D).

**NOTE:** A fully populated SN8000B 8-slot Director Switch with 16Gb or 8Gb 32-port blades requires two 2000W power supplies.

Add the appropriate quantity of 32-port blades to meet requirements

HP StoreFabric SN8000B 16Gb 48-port SFP Integrated Fibre Channel Blade

E7Y69B

**NOTE:** This blade ships with 48 integrated 16 Gb FC SW SFP transceivers.

**NOTE:** Only supported in SN8000B Directors (QK710A, QK710B, QK710C, QK710D, QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C and QK712D).

**NOTE:** A fully populated SN8000B 8-slot Director Switch with 16Gb or 8Gb 32-port blades requires two 2000W power supplies.

The maximum number of 48-port blades supported with two power supplies is seven (8th slot must be empty).

Add the appropriate quantity of 48-port blades to meet requirements

HPE StoreFabric SN8000B 16Gb 32-port Fibre Channel Blade  
32-port 16Gb/s Director Blade

QK713D

**NOTE:** Only supported in SN8000B Directors (QK710A, QK710B, QK710C, QK710D, QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C, and QK712D). Requires B-series optical SFP transceivers for each port as listed below.

**NOTE:** A fully populated SN8000B 8-slot Director Switch with 16Gb or 8Gb 32-port blades requires two 2000W power supplies.

Add the appropriate quantity of 32-port blades to meet requirements

HPE StoreFabric SN8000B 16Gb 48-port Fibre Channel Blade  
48-port 16Gb/s Director Blade

QK714D

**NOTE:** Only supported in SN8000B Directors (QK710A, QK710B, QK710C, QK710D, QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C, and QK712D). Requires B-series optical SFP transceivers for each port as listed below.

**NOTE:** A fully populated SN8000B 8-slot Director Switch with 16Gb or 8Gb 48-port blades requires four 2000W power supplies. The maximum number of 48-port blades supported with two power supplies is seven (8th slot must be empty).

Add the appropriate quantity of 48-port blades to meet requirements

## Configuration Information

<p>HPE StoreFabric SN8000B 16Gb 64-port Fibre Channel Blade</p> <p>64-port 16Gb/s Director Blade</p> <p><b>NOTE:</b> Supported only in SN8000B Directors (QK710A, QK710B, QK710C, QK710D, QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C, and QK712D).</p> <p><b>NOTE:</b> This blade ships with 16 integrated 4x16Gb SWL QSFP transceivers.</p>	<p>Add the appropriate quantity of 16Gb 64-port blades to meet requirements</p>	E7Y80A
<p>HP StoreFabric 8/16Gb SAN Director Enhanced Multiprotocol Extension Blade</p> <p><b>NOTE:</b> 22 enabled ports (12 8Gb Fibre Channel and 10 1 GbE) multi-protocol extension blade for SAN connectivity over FCIP. Additional 1 or 2 10GbE ports require 10GbE performance upgrade (TA751A) which will impact the number of available 1 GbE ports.</p> <p><b>NOTE:</b> Supports IP Security ( 'IPsec' ) encryption over both 10GbE ports.</p> <p><b>NOTE:</b> Supported in all B-series SAN Directors. Requires B-series optical SFP transceivers for each port as listed below.</p>	<p>Add maximum of 4</p>	C8R46C
<p>HP StoreFabric DC04 SAN Director 16 Gb Core Switch Blades</p> <p><b>NOTE:</b> 2 Core Switch Blades to upgrade the DC04 SAN Director chassis to 16Gb capability. The new core switch blades allow the DC04 Director to support 16Gb port blades, 8Gb enhanced blades, 8Gb 64 port blade and all special application blades.</p> <p><b>NOTE:</b> The process of upgrading the DC04 SAN Director using the 16Gb Core switch blade is a disruptive process.</p> <p><b>NOTE:</b> Two Core switch blades are shipped when an order is placed for the C8R82C. Both blades are required for the upgrade.</p> <p><b>NOTE:</b> Only supported in DC04 SAN Directors (AR479A, AR479B, AR479C, AR478A, AR478B, AR478C).</p>		C8R82C
<p>HP StoreFabric DC Backbone Director 16Gb Core Switch Blade</p> <p><b>NOTE:</b> 2 Core Switch Blades to upgrade the DC SAN Backbone Director chassis to 16Gb capability. The new core switch blades allow the DC SAN Backbone Director to support 16Gb port blades, 8Gb enhanced blades, 8Gb 64 port blade and all special application blades.</p> <p><b>NOTE:</b> The process of upgrading the DC SAN Backbone Director using the 16Gb Core switch blade is a disruptive process.</p> <p><b>NOTE:</b> Two Core switch blades are shipped when an order is placed for the C8R83C. Both blades are required for the upgrade.</p> <p><b>NOTE:</b> Only supported in DC SAN Backbone Director (AK857A, AK857B, AK857C, and AK857D).</p>		C8R83C

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<b>Add Software:</b>	<p>HPE StoreFabric SN8600B 128-port Integrated Routing E-LTU</p> <p>HPE StoreFabric SN8600B 8-slot Director Enterprise and Port-on-Demand Inter Chassis Link E-LTU</p>	<p>Q0T79AAE</p> <p>Q0T80AAE</p>
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## Configuration Information

**NOTE:** Each HPE SN8600B 8-slot Director requires this license for ICL connectivity (Q0T80A, 0T80AAE) and also requires (Q0U89A) 4x32Gb QSFP or (H6Z76A) 4x16Gb QSFP and cables for ICL connectivity (QK729A and/or QK731A).

HPE StoreFabric SN8600B 4-slot Director Enterprise and Port-on-Demand Inter Chassis Link E-LTU Q0T81AAE

**NOTE:** Each HPE SN8600B 4-slot Director requires this license for ICL connectivity (Q0T81A, Q0T81AAE) and also requires (Q0U91A) 4x32Gb QSFP or (Q0U90A) 4x16Gb QSFP and cables for ICL connectivity (QK729A and/or QK731A or H6Z30A).

HPE DC04 and SN8000B 4-slot SAN Director Power Pack+ E-LTU Fabric Vision, ISL Trunking, and Extended Fabric TA640AAE

**NOTE:** Optional software for only the SN8000B 4-Slot Director (QK711A, QK711B, QK711C, QK711D) and the DC04 SAN Director (AR478A, AR478B, AR478C).

**NOTE:** Starting with FOS 7.4.0a, Fabric Watch and Advanced Performance Monitor are replaced by MAPS and Flow Vision respectively. Both are included in Fabric Vision.

**NOTE:** Adaptive Networking and Server Application Optimization features are included by default in the switch firmware (FOS 7.2.0a or later) and do not require a separate license.

HPE 8/16Gb SAN Director Fabric Vision E-LTU TC513AAE

HPE SN8000B SAN Director Inter Chassis Link E-LTU TC351AAE

**NOTE:** Inter Chassis Links (ICLs) harness unused ports to connect the switching backplane of one SN8000B Director with the switching backplane of a second SN8000B Director. Each ICL connection is the equivalent of 16 fixed speed 16Gbps E\_PORTS. This additional full duplex connection provides up to an additional 2 Tbps of bandwidth and does not consume usable ports.

A maximum of four SN8000B SAN Directors may be connected using ICL connectivity

There is a common ICL POD (Ports on Demand) license between SN8000 8-Slot and 4-Slot chassis. A single ICL POD license will enable 16 QSFP ICLs or 1Tbps of bandwidth in both SN8000B 8-Slot and 4-Slot SAN Director. A subsequent ICL POD license will enable an additional 16 QSFP ICLs or 1Tbps in a SN8000B 8-Slot Director.

**NOTE:** Each SN8000B SAN Director requires a license for ICL connectivity (TC351AAE). Also requires QSFP (H6Z76A) and cables for ICL connectivity (QK729A or QK731A or H6Z30A).

HPE SN8000B 8-slot Director Enterprise Inter Chassis Link E-LTU TC389AAE

HPE SN8000B 4-slot Director Enterprise Inter Chassis Link E-LTU TC390AAE

**NOTE:** Inter Chassis Links (ICLs) harness unused ports to connect the switching backplane of one SN8000B Director with

From five to a maximum of nine

## Configuration Information

the switching backplane of a second SN8000B Director. Each ICL connection is the equivalent of 4 fixed speed 16Gbps E\_PORTS. This additional full duplex connection provides up to an additional 2 Tbps of bandwidth and does not consume usable ports.

SN8000B SAN Directors may be connected using ICL connectivity

Each 8-slot and 4-slot SN8000B chassis require its own specified license.

**NOTE:** Each SN8000B SAN Director requires a license for ICL connectivity (TC351AAE) as a prerequisite to the Enterprise Licenses (TC389AAE and TC390AAE). Also requires QSFP (H6Z76A) and cables for ICL connectivity (QK729A or QK731A or H6Z30A).

HPE DC SAN Director 16 Inter-Chassis Link E-LTU

TA641AAE

**NOTE:** Inter Chassis Links (ICLs) harness unused ports to connect the switching backplane of one DC SAN Backbone with the switching backplane of a second DC SAN Backbone Director or DC04 SAN Director. Each ICL connection is the equivalent of 16 fixed speed 8Gbps E\_PORTS. This additional full duplex connection provides an additional 1 Tbps of bandwidth and does not consume usable ports. ICL connections operate as hardware trunked ISLs.

A maximum of three DC SAN Directors may be connected using ICL connectivity

**NOTE:** Each DC SAN Director requires a license for ICL connectivity. TA641A/TA641AAE is only supported on DC SAN Backbone Director. A cable kit is required for ICL copper cable connectivity.

HPE DC SAN Director 8 Inter-Chassis Link E-LTU

TA642AAE

**NOTE:** With the 8 port ICL licenses you could connect up to 3 DC04 directors, or 3 DC SAN Backbone Directors' at half the available bandwidth, or any combination of above models totaling 3. Each ICL connection is the equivalent of 8 fixed speed 8Gbps E\_PORTS. This additional full duplex connection provides an additional 512 Gbps of bandwidth and does not consume usable ports. ICL connections operate as hardware trunked ISLs.

A maximum of three DC SAN Directors may be connected using ICL connectivity

**NOTE:** Each DC SAN Director requires a license for ICL connectivity. TA642AAE is supported on DC SAN Backbone Director or DC04 SAN Director. A cable kit is required for ICL copper cable connectivity.

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### HPE SN8000B SAN Director Inter Chassis Link Cable

HP Premier Flex MPO/MPO Multi-mode OM4 8 fiber 10m Cable

QK729A

**NOTE:** Required for TC351AAE. Also used for connectivity between QSFP ports on 2 HPE SN8000B 64-port 16Gb FC Blades.

One cable/ICL connector supports 4 ports of connectivity between 2 chassis



## Configuration Information

<p>HP Premier Flex MPO/MPO Multi-mode OM4 8 fiber 50m Cable</p> <p><b>NOTE:</b> Required for TC351A/TC351AAE. Also used for connectivity between QSFP ports on 2 HPE SN8000B 64-port 16Gb FC Blades.</p>	<p>QK731A</p> <p>One cable/ICL connector supports 4 ports of connectivity between 2 chassis</p>
<p>HP Premier Flex MPO/MPO OM4 100m (12ft) Cable</p> <p><b>NOTE:</b> Required for TC351A/TC351AAE. Also used for connectivity between QSFP ports on 2 HPE SN8000B 64-port 16Gb FC Blades.</p>	<p>H6Z30A</p> <p>One cable/ICL connector supports 4 ports of connectivity between 2 chassis</p>
<p>HPE 8/16Gb 8-Slot SAN Director Integrated Routing E-LTU</p> <p>HPE SN8000B 8-Slot and SAN Backbone Director Integrated Routing E-LTU</p> <p><b>NOTE:</b> Optional Integrated Routing License for the SN8000B 8-Slot Director (QK710A, QK710B, QK710C) and the DC SAN Backbone Director (AK857A, AK857B, AK857C).</p>	<p>T5530AAE</p>
<p>HPE DC04 and SN8000B 4-slot SAN Director Integrated Routing E-LTU</p> <p>HPE SN8000B 4-Slot and DC04 SAN Director Switch Integrated Routing E-LTU</p> <p><b>NOTE:</b> Optional Integrated Routing License for the SN8000B 4-Slot Director (QK711A, QK711B, QK711C, QK711D, QK712A, QK712B, QK712C and QK712D) and DC04 SAN Director (AR479A, AR479B, AR479C, AR478A, AR478B, AR478C).</p>	<p>TA643AAE</p>
<p>HPE Multi Protocol Extension Blade 10GbE Performance Upgrade E-LTU</p> <p>Optional software license to activate high performance for either 10GbE or 10Gb Fibre Channel connectivity.</p> <p>10GbE Performance Upgrade LTU for MP Extension and Enhanced MP Extension Blade</p> <p>Enables 10 Gigabit Ethernet ports for the MP Extension Blade and Enhanced MP Extension blade. Options for available Ethernet connectivity are:</p> <ul style="list-style-type: none"> <li>• (10) 1 GbE ports and (1) 10 GbE port or</li> <li>• (2) 10 GbE ports</li> </ul>	<p>TA751AAE</p>
<p>10Gb Performance Upgrade LTU for 16Gb Fibre Channel Blades</p> <p>Enables customers to configure the first 8 ports in FOS 7.0 and 7.1 and any port in FOS 7.2 and higher of a 16Gb Fibre Channel blade at 10Gb Fibre Channel speed. This is required for DWDM and dark fiber metro connectivity.</p>	

## Configuration Information

**NOTE:** The optional 10GbE and 10Gb Fibre Channel performance upgrade features can be applied to a mixture of 16Gb FC blades and the MP Extension Blade or Enhanced MP Extension Blade. The license is available on an individual SAN Director slot basis based on the particular blade installed. The 10GbE Performance upgrade feature is available for the MP Extension Blade (AP865A, AP865B) and the Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C) for all B-series SAN Directors. The 10Gb Performance Upgrade feature is available for 16Gb Fibre Channel Blades for the SN8000B Directors. Requires 10Gb optics (QK726A and/or QK727A).

HPE Multi-Protocol Extension Blade Advanced Upgrade E-LTU  
This optional license enables two advanced extension features: FCIP Trunking and Adaptive Rate Limiting.

TA752AAE

**NOTE:** Optional Advanced Extension license is available on all B-series SAN Directors for the MP Extension Blade (AP865A, AP865B) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C) on an individual SAN Director slot basis.

HPE Multi Protocol Extension Blade FICON CUP E-LTU  
Advanced Accelerator for FICON accelerates disk and tape read and write operations, maximizing FICON performance

TA753AAE

**NOTE:** The Optional FICON Accelerator license is available on the SN8000B, DC SAN Backbone and DC04 SAN Director for the MP Extension Blade (AP865A, AP865B) and Enhanced MP Extension Blade (C8R46A, C8R46B, C8R46C) on an individual SAN Director slot basis.

HPE Multi-Protocol Blade Performance Extension E-LTU

T4427AAE

**NOTE:** Optional software license to activate the high performance extension services for either IP or FC connectivity in the Multi Protocol Router Blade for DC backbone Directors. IP and FC extension services are mutually exclusive. It includes the Encryption Services License.

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### HPE ISL Trunking

HPE B-series SAN Director Trunking E-LTU

J4V65AAE

**NOTE:** Optional ISL Trunking License for the SN8000B 4-Slot Director and DC04 SAN Director.

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### HPE Extended Fabric

HPE B-series SAN Director Extended Fabric E-LTU

J4V64AAE

**NOTE:** Optional Extended Fabric License for the SN4000B 4-slot and DC04 SAN Director.

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### HPE FICON

HPE B-series SAN Director FICON CUP E-LTU \*

T4401AAE\*

**NOTE:** Only supported in XP Storage array environments. Please refer to The HPE mainframe connectivity stream at HPE "Single Point of Connectivity Knowledge" (SPOCK) for the latest

## Configuration Information

information.

<http://www.hpe.com/storage/spock>

<b>Management</b>	HPE SAN Network Advisor Enterprise Software E-LTU	TC352BAE
	HPE SAN Network Advisor Professional Plus Software E-LTU	TC353BAE
	HPE SAN Network Advisor Professional Plus Upgrade E-LTU	TC354BAE
	<p><b>NOTE:</b> HPE B-series software licenses are available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses are functionally equivalent to the corresponding physical licenses. The E-Delivery version (ending with AE) is the suggested option and is listed first and the physical version is second.</p> <p><b>NOTE:</b> 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.</p>	

### Step 3 – Additional Options

<b>Additional Power Supply</b>	HPE StoreFabric SN8600B Director Optional Power Supply	Q0U92A
	<p><b>NOTE:</b> Additional power supply for the HPE SN8600B 8-slot Director.</p>	
<b>Additional Power Supply</b>	HPE DC SAN Backbone Director Power Supply	AK863C
	<p><b>NOTE:</b> Add in pairs; maximum 4 supported in DC SAN Backbone chassis.</p> <p><b>NOTE:</b> Optional Power Supply for the B-series SAN Directors. The power supply is shipped with one PDU cord and one power cord.</p>	
<b>Fibre Channel Optical Transceivers</b>	HPE B-series 32Gb SFP28 Short Wave 1-pack Transceiver	P9H32A
	HPE B-Series 32Gb SFP28 Long Wave 1-pack Transceiver	P9H29A
	HPE B-series 4x32Gb 16-pack Short Wave QSFP Transceiver	Q2R30A
	<p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A). When connecting two SN8600B 8-slot Directors via ICL, requires the SN8600B 8-slot Director Inter Chassis Link License (Q0T80A, Q0T80AAE). This QSFP requires minimum version of FOS 8.1.0b.</p>	
	HPE StoreFabric SN8600B 4-slot Director 4x16Gb 8-pack Short Wave ICL QSFP Transceiver	Q0U90A
	<p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A). When connecting two SN8600B 4-slot Directors via ICL, requires the SN8600B 4-slot Director Inter Chassis Link License (Q0T81A, Q0T81AAE).</p>	
	HPE B-series 4x32Gb 8-pack Short Wave QSFP Transceiver	Q2R29A
	<p><b>NOTE:</b> Only supported in SN8600B Directors (Q0U63A, Q0U83A). When connecting two SN8600B 4-slot Directors via ICL, requires the SN8600B 4-slot Director Inter Chassis Link License (Q0T81A, Q0T81AAE). This QSFP requires minimum version of FOS 8.1.0b.</p>	
	HPE B-series 4x32Gb 1-pack Long Wave 2km QSFP Transceiver	Q2R31A
	<p><b>NOTE:</b> This QSFP requires minimum version of FOS 8.1.0b.</p>	
HPE B-series 4x32Gb 8-pack Long Wave 2km QSFP Transceiver	Q8K15A	
<p><b>NOTE:</b> This QSFP requires minimum version of FOS 8.1.0b.</p>		
HPE B-series 16Gb SFP+ Short Wave Transceiver	QK724A	
HPE B-series 16Gb LW 25km FC SFP 1-pack Transceiver	H6Z29A	
HPE StoreFabric B-Series 40GbE QSFP+ SR4 Transceiver	Q2S20A	

## Configuration Information

HPE StoreFabric B-Series 40GbE QSFP+ Bi-Directional Transceiver	Q2S21A
HPE StoreFabric B-Series 100GbE QSFP28 SR4 Transceiver	Q2S22A
HPE StoreFabric B-series 1GbE LX SFP Transceiver	E7Y74A
HPE StoreFabric B-series 40GbE Long Range QSFP+ Transceiver	E7Y75A
HPE StoreFabric B-series 40GbE Short Range QSFP+ Transceiver	E7Y76A
<b>NOTE:</b> HPE SN8600B 32Gb SAN Director supports the following HPE Complete SmartOptics 16Gb Tranceivers – 16G FC embedded DWDM Solution.	
<b>NOTE:</b> For more information regarding Smartoptics SKUs/Accessories/Cables and ordering rules please refer HPE Complete Smartoptics QuickSpecs.	
<b><a href="https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=c05205226">https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=c05205226</a></b>	
HPE 8Gb Shortwave B-series Fibre Channel 1 Pack SFP+ Transceiver	AJ716B
<b>NOTE:</b> Qualified and supported on 8Gb Fibre Channel blades; This is the ONLY 8Gb Short Wave Length SFP qualified and supported on 16Gb Fibre Channel blades (QK713A, QK713B, QK713C, QK713D, QK714A, QK714B, QK714C and QK714D).	
HPE B-series 16Gb SFP+ Long Wave 10km Transceiver	QK725A
HPE 8Gb Long Wave B-series 10km Fibre Channel 1 Pack SFP+ Transceiver	AJ717A
HPE B-series 8Gb Extended Long Wave 25km Fibre Channel SFP+ Transceiver 1 Pack	AW538A
HPE 4Gb Short Wave B-series Fibre Channel 1 Pack SFP Transceiver	AJ715A
<b>NOTE:</b> NOT supported and qualified on 32Gb and 16Gb Fibre Channel blades (QK713A, QK713B, QK713C, QK713D, QK714A, QK714B, QK714C, and QK714D).	
HP 4Gb Long Wave B-series 30km Fibre Channel SFP Transceiver 1 Pack	AN211A
<b>NOTE:</b> NOT supported and qualified on 32Gb and 16Gb Fibre Channel blades (QK713A, QK713B, QK713C, QK713D, QK714A, QK714B, QK714C, and QK714D).	
HPE B-series 10Gb SFP+ Short Range Transceiver	QK726A
HPE B-series 10Gb SFP+ Long Range Transceiver	QK727A
HP BladeSystem c-Class 10Gb XFP SR 850nm Transceiver	443756-B21
HPE B-series 4x16Gb SW SFP+ 100m 16-pack Transceiver	H6Z76A
<b>NOTE:</b> When connecting two SN8000B Directors via ICL, requires the SN8000B Inter Chassis Link License (TC351A/TC351AAE). When connecting two SN8600B 8-slot Directors via ICL, requires the SN8600B 8-slot Director Inter Chassis Link License (Q0T80A, Q0T80AAE).	
Supports distances up to 100m. Ships in a pack of 16 units.	
HPE StoreFabric B-series 4x16Gb Fibre Channel 2Km Inter-chassis Link QSFP Transceiver	K2Q88A
<b>NOTE:</b> Required for SN8000B Inter Chassis Link License (TC351A/TC351AAE). Supports distances up to 2Km. Ships in 1 unit pack.	
<b>NOTE:</b> Requires MTP to MTP 12-fiber Parallel Single Mode Cable up to 2Km in length. Contact your Hewlett Packard Enterprise sales representative or channel partner for more information on recommended cable suppliers.	

### Converged Enhanced Ethernet (CEE) Optical Transceivers

HP B-series 10GbE Short Wave SFP+ Transceiver	AP823A
HPE B-series 10GbE Long Wave SFP+ Transceiver	AP824A

### Transceiver Performance

Distance - Maximum	HPE Standard OM3 Cable	HPE PremierFlex OM3+ Cable	HPE PremierFlex OM4 Cable
32Gb performance	70 meters	70 meters	100 meters
16Gb performance:	100 meters	100 meters	125 meters
8Gb performance:	150 meters	150 meters	190 meters

## Configuration Information

4Gb performance:	380 meters	380 meters	400 meters
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<b>Copper Transceiver</b>	HPE B-series 1Gb Ethernet Copper SFP Transceiver 1 Pack <b>NOTE:</b> Supported on the HPE Multi Protocol Extension Blade and HPE Enhanced Multi Protocol Extension Blade.	AW537A
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<b>USB Device</b>	HPE B-series 4G USB Drive	N9Y63A
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### Optical cables

#### HPE PremierFlex OM4+ Fiber Optic Cables

HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A

#### HPE Premier Flex OM4 QSFP Fiber Optic Cables

HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 1m Cable	Q1H63A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 2m Cable	Q1H64A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 5m Cable	Q1H65A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 15m Cable	Q1H66A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 30m Cable	Q1H67A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 fiber 50m Cable	QK731A
HPE Premier Flex MPO/MPO OM4 100m (12ft) Cable	H6Z30A

#### HPE OM3 LC-LC Optical Cables

HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

#### High Density Cables

##### QSFP to 4xLC Breakout Cables

HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A
HPE Premier Flex MPO to 4 x Lucent Connector 30m Cable	Q1H68A
HPE Premier Flex MPO to 4 x Lucent Connector 50m Cable	Q1H69A

**NOTE:** Supported on the HPE SN8000B 64-Port 16Gb FC Blades.

**NOTE:** Due to the high number of connections required for the 64-port blade, a unique set of cables and couplers must be used to enable the High Density 64-port blade for the DC SAN Directors. There are two methods available for cabling the 64-port blade: The first method is directly from the 64-port blade to a standard LC-LC cable using an mSFP/LC Cable with an LC/LC Multi-mode Coupler as show in example A in the diagram below. The second is through the use of a patch panel as shown in

## Configuration Information

example B. A list of recommended patch panels, manufactured by CommScope and available through distributors such as Anixter, Graybar, CSC, and AccuTech, is provided below:

For Inter Switch Links (ISL) between two 8Gb 64-port blades, two mSFP/LC FC Cables along with a LC/LC Multi-mode Coupler as shown in example C can be used.

### LC-MiniSFP Cables:

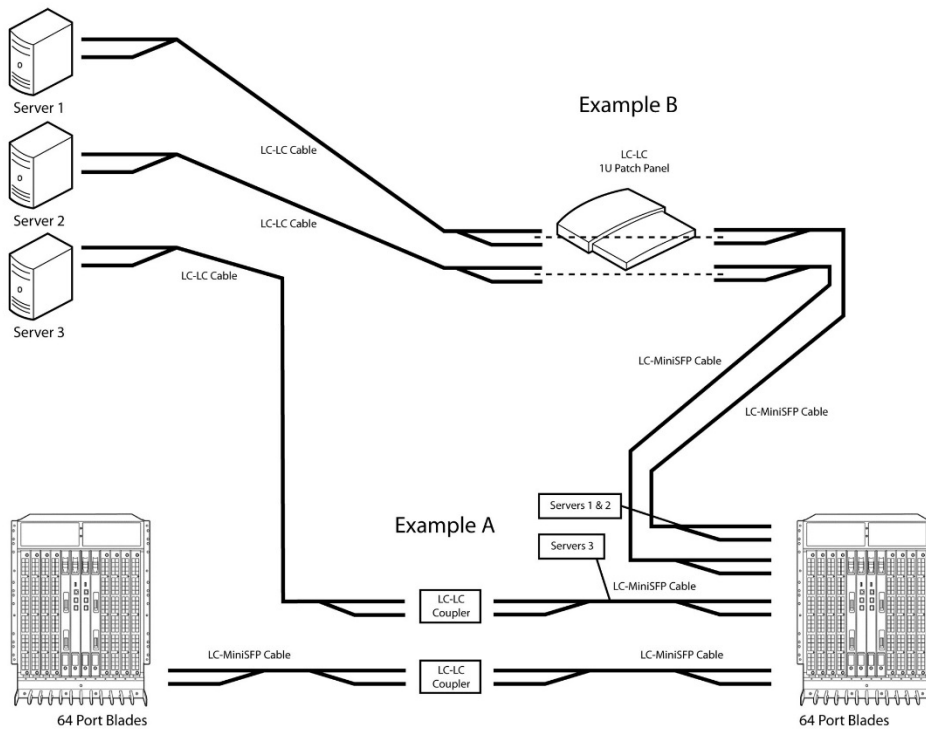
HPE B-series 1.5 Meter Multi-mode OM3 Mini SFP/LC FC Cable	BK784A
HPE B-series 2.5 Meter Multi-mode OM3 Mini SFP/LC FC Cable	BK785A
HPE B-series 5 Meter Multi-mode OM3 Mini SFP/LC FC Cable	BK786A
HPE LC/LC Multi-mode Optical Cable Coupling Connector 8 Pack	BK787A

### Optional Software

HPE Intelligent Infrastructure Analyzer Software v2 E-LTU

TC472AAE  
(Physical License - TC472A)

**NOTE:** The HPE Intelligent Infrastructure Analyzer Software (IIAS) v2 is an online monitoring and diagnostic solution intended to manage the physical layer of a Storage Area Network (SAN) consisting of HPE StoreFabric B-series and/or H-series Fibre Channel switches and directors, HPE 3PAR StoreServ Storage and HPE StoreFabric Fibre Channel HBAs.



### Recommended Patch Panels for the High Density Cables

Type	LC-LC	MPO-MPO (MTP-MTP)
CommScope part number	760139683	760136473
CommScope orderable model	3603D-1U-UP UHD w(3) 3603P-48LC-LS	3603D-1U-UP UHD w(3) 3603D-1U-72MPO
Rack unit	1U	1U
Number of ports	72	72 MPO or 432 LC ports (cables)
Lead time	4 weeks or sooner	4 weeks or sooner

## Configuration Information

**NOTE:** Up to 1024 DC SAN Backbone Director ports are supported per 42U rack using Patch Panels. The last 16 ports require couplers when using LC-LC Patch Panels.

### Trunk Cables for mSFP Connection

Type	Description	Length	Corning Part Number	Amphenol Part Number
mSFP to MTP	mSFP LC - MTP-female, 12 fiber, 12" breakout, OM3, 50/125	Need to specify length when ordering	PN varies based on length H93S5TE9-BMU-XXXM (XXX = length)	PN varies based on length 943-99867-1XXXX (XXXX = length)

## Technical Specifications

<b>Fibre Channel ports</b>	48-port 32Gb Fibre Channel port blade option for SN8600B SAN Director. 32 port, 48 port and 64 port 16Gb Fibre Channel port blade options for the SN8000B SAN Directors.
<b>Control processor</b>	Redundant (active/standby) hot swappable control processor modules
<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>Performance</b>	<p><b>SN8600B</b> Fibre Channel: 4 Gbps line speed, full duplex 8 Gbps line speed, full duplex 10 Gbps line speed, full duplex 16 Gbps line speed, full duplex 32 Gbps line speed, full duplex Autosensing of 4, 8, 16, and 32 Gbps port speeds depending on SFPs used. Speed matching between 4, 8, 16, and 32 Gbps port speeds. 10 Gbps port speeds with dedicated SFPs</p> <p>Fibre Channel over Ethernet: 10Gb line speed, full duplex 25Gb line speed, full duplex 40Gb line speed, full duplex</p> <p><b>SN8000B</b> Fibre Channel: 4.25 Gbps line speed, full duplex; 8.5 Gbps line speed, full duplex; 10.53 Gbps line speed, full duplex; 14.025 Gbps line speed, full duplex; auto-sensing of 4, 8, and 16 Gbps port speeds; 10 Gbps and optionally programmable to fixed port speed</p>
<b>ISL Trunking</b>	<p><b>SN8600B</b> - Frame-based trunking with up to eight 32 Gbps ports per ISL trunk; up to 256 Gbps per ISL trunk. Exchange-based load balancing across ISLs with DPS included in FOS</p> <p><b>SN8000B</b> - Up to eight 16 Gbps ports per ISL trunk; up to 128 Gbps per ISL trunk</p>
<b>Chassis Bandwidth</b>	<p><b>SN8600B 8-Slot SAN Director:</b> 16.384 Tbps per chassis (512 ports×32 Gbps) data rate + 4.096 Tbps ICL bandwidth (32×128 Gbps)</p> <p><b>SN8600B 4-Slot SAN Director:</b> 8.192 Tbps per chassis (256 ports×32 Gbps) data rate + 2.048 Tbps ICL bandwidth (16×128 Gbps)</p> <p><b>SN8000B 8-Slot SAN Director:</b> 10.2 Tbps per chassis (512 ports × 16 Gbps data rate + 2.048 Tbps ICL bandwidth)</p> <p><b>SN8000B 4-Slot SAN Director:</b> 5.1 Tbps per chassis (256 ports × 16 Gbps data rate + 1.024 Tbps ICL bandwidth)</p>
<b>Slot bandwidth</b>	<p><b>SN8600B</b> - 2048 Gbps (line rate)</p> <p><b>SN8000B</b> - 1024 Gbps (data rate)</p>



## Technical Specifications

<b>Local Switching bandwidth</b>	<p><b>SN8600B</b> 1536 Gbps for 32/48: 48 ports x 32Gbps (data rate) 2048 Gbps for 32/64: 64 ports x 32Gbps (data rate)</p> <p><b>SN8000B</b> 512 Gbps for 16/32: 32 ports x 16 Gbps (data rate) 768 Gbps for 16/48: 48 ports x 16 Gbps (data rate) 1,024 Gbps for 16/64: 64 ports x 16 Gbps (data rate)</p>
<b>Switch latency</b>	<p><b>SN8600B</b> HPE SN8600B 48-port blade at Gen 6 32 Gbps speeds: &lt;900 ns (including FEC); any-port-to-any-port local switching and 2.7 <math>\mu</math>s blade to blade at 32 Gbps, cut-through routing HPE SAN Extension blade (32Gb), Fibre Channel to Fibre Channel: &lt;900ns (including FEC) and 2.7 <math>\mu</math>s any-port-to-any-port at 32 Gbps, cut-through routing</p> <p><b>SN8000B</b> Locally switched port latency is 800 ns; blade-to-blade latency is 2.4 <math>\mu</math>sec; encryption/compression is less than 6 <math>\mu</math>sec per node; Forward Error Correction (FEC) adds 400 ns between E_Ports (enabled by default)</p>
<b>Maximum frame size</b>	2112-byte payload
<b>Frame buffers</b>	<p><b>SN8600B</b> - 15,000 per switching ASIC</p> <p><b>SN8000B</b> - 8192 per 16-port group on 32 and 64 port blades and up to 8192 per 24-port group on 48-port blades, dynamically allocated</p>
<b>Classes of service</b>	Class 2, Class 3, Class F (inter-switch frames)
<b>Fibre Channel Port Types</b>	<p><b>SN8600B 32Gb:</b> HPE SN8600B 32Gb 48-port FC blade: F_Port, E_Port, EX_Port, M_Port, SIM, and D_Port HPE 8600B 32Gb SAN Extension Blade: F_Port, E_Port, and EX_Port on FC, and VE_Port on GbE <b>NOTE: Self-discovery is based on switch type (U_Port) with an optional port-type control.</b></p> <p><b>SN8000B 16Gb:</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</p>
<b>Data traffic types</b>	Fabric Switches supporting unicast, multicast (255 groups), and broadcast
<b>USB</b>	<p><b>SN8600B:</b> One USB port per control processor for firmware download, support save, and configuration upload or download</p> <p><b>SN8000B:</b> 1 USB port for firmware download and for Supportsave</p>
<b>SN8000B Media types</b>	<p><b>SN8600B 32Gb:</b> HPE SN8600B 32Gb 48-port FC blade: Supports hot-pluggable Fibre Channel SFP+ at 32 Gbps SWL/LWL and SFP+ at 16 Gbps SWL/LWL/ELWL, 10 Gbps SWL/LWL SFP</p>

## Technical Specifications

HPE SN8600B 32Gb SAN Extension Blade: Supports hot-pluggable Fibre Channel SFP28 at 32 Gbps SWL/LWL; SFP+ at 16 Gbps SWL/LWL/ELWL; SFP at 10 Gbps FC SWL/LWL and Ethernet SFP+ at 1 GbE copper, 1 GbE 1000BASE-SX/LX/CWDM, SFP+ at 10 GbE SR/LR; SFP+ at 10 GbE tunable DWDM 80 km, and QSFP at 40 GbE SR4/LR4/ER4.

Core Routing (CR) blades support hot-pluggable B-series Fibre Channel QSFP at 4×32 Gbps SWL, 4×16 Gbps SWL and 4×16 Gbps 2 km QSFP for ICL connections

### SN8000B 16Gb:

16 Gbps: 16/64 FC blade requires B-series hot-pluggable QSFP connector; 4x16Gb SWL QSFP, MPO 1x12 ribbon cable connector, 16 Gbps: 16/32 and 16/48 FC blades require B-series hot-pluggable SFP+, LC connector; 16 Gbps SWL 10 Gbps: 16/32 and 16/48 require B-series hot-pluggable SFP+, LC connector; 10 Gbps SWL, LWL 8 Gbps; Enhanced MP Extension Blade require B-series hot-pluggable SFP+, LC connector; 8 Gbps SWL, LWL, ELWL ICL QSFP: B-series Core Blades require B-series hot-pluggable QSFP, MTP connector; 4×16 Gbps SWL

Fibre Channel distance subject to fiber-optic cable and port speed

## Fabric services

### SN8600B:

Adaptive Networking (Traffic Isolation, QoS); BB credit recovery; Advanced Zoning (default zoning, port/WWN zoning, peer zoning, target-driven zoning, broadcast zoning); Dynamic Path Selection (DPS); Extended Fabrics; FDMI; FICON CUP; Flow Vision; Frame Redirection; FSPF; IPoFC; ISL Trunking; Management Server; Monitoring and Alerting Policy Suite (MAPS); N\_Port Trunking; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server

### SN8000B:

Fabric Vision technology; Monitoring and Alerting Policy Suite (MAPS); Flow Vision; Advanced Performance Monitoring (APM) (including Top Talkers for E\_Ports, F\_Ports, and Fabric mode); Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Bottleneck Detection; Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB credit recovery; Fabric Watch; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; Monitoring and Alerting Policy Suite (MAPS); NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Server Application Optimization (SAO); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric)

## Extension

### SN8600B:

Supports DWDM, CWDM, and FC-SONET devices; Fibre Channel, in-flight compression (Brocade LZ0) and encryption (AES-GCM-256); BB credit recovery; FCIP, IP Extension, Adaptive Rate Limiting (ARL), data compression, Fast Write, read/write Tape Pipelining, QoS

### SN8000B:

Supports DWDM, CWDM, and FC-SONET devices; Fibre Channel, in-flight compression and encryption (AES-GCM-256) BB credit recovery; FCIP, Adaptive Rate Limiting (ARL), data compression, Fast Write, read/write Tape Pipelining, QoS

## FICON

FICON cascading; support for lossless DLS; FICON CUP; Advanced Accelerator for FICON (FICON Global Mirror and XRC emulation and read/write Tape Pipelining).

## High availability

### SN8600B SAN Director

#### Architecture

Non-blocking shared memory; passive backplane; redundant active/passive control processor; redundant active/active core switching blades; redundant WWN cards

#### Chassis Power

### HPE SN8600B 8-slot SAN Director:

## Technical Specifications

		<p>Four power supplies required for AC Low Line (100 VAC to 120 VAC)  Two power supplies required for AC High Line (200 VAC to 240 VAC).  Device ships with three PSUs or empty (3 for 2+1 redundancy). Two provide system power, but four must be installed to provide power efficiency and 2+2 redundancy.</p>
		<p><b>HPE SN8600 4-slot SAN Director:</b>  Two power supplies required for AC Low Line (100 VAC to 120 VAC).  One power supply required for AC High Line (200 VAC to 240 VAC).  The device ships with two power supplies. One provides system power, but both must be installed to provide power efficiency and 1+1 redundancy.</p>
	<b>Cooling</b>	<p><b>HPE SN8600B 8-slot SAN Director:</b>  Requires three fan tray assemblies. A failure condition is one failed fan from any fan tray.  Each assembly contains two fans for a total of six. The system requires five of six functioning fans for operation in the SN8600B 8-slot Director. One fan tray assembly can be hot-swapped and should be replaced immediately in the event of a failure.</p> <p><b>HPE SN8600 4-slot SAN Director:</b>  Requires two fan tray assemblies. A failure condition is one failed fan from any fan tray.  Each assembly contains two fans for a total of four. The system requires three of four functioning fans for operation in the SN8600 4slot Director. One fan assembly can be hot-swapped and should be replaced immediately in the event of a failure.</p>
<b>High availability</b>	<b>Airflow</b>	Non-port-side intake to port-side exhaust.
	<b>Solution availability</b>	Designed to provide 99.999 percent uptime capabilities; hot-pluggable redundant power supplies, fans, WWN cards, processors, core
	<b>SN8000B SAN Director</b>	
	<b>Control Processor</b>	Redundant (active/standby) control processor modules; automatic failover; non-disruptive software upgrades; dual-flash memory on each control processor to store two software images
	<b>Modules</b>	Hot swappable
	<b>Backplane</b>	Fully passive
	<b>Input power</b>	Dual or quad AC inputs
	<b>Chassis power</b>	Dual AC-DC power supply modules, N+2 redundant, SN8000B 8-Slot and DC SAN Backbone supports two additional power modules
	<b>Cooling</b>	DC SAN Backbone Director: Three blower assembly modules (two operational required)
		DC04 SAN Director: Two blower assembly modules (one required for operation)
<b>Management</b>	<b>SN8600B:</b>	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Advanced Web Tools, HPE SAN Network Advisor SAN Enterprise or SAN Professional Plus; Command Line Interface (CLI); SMI-S compliant; RESTful API; trial licenses for add-on capabilities.

## Technical Specifications

### SN8000B:

HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Web Tools, SAN Network Advisor SAN Enterprise (SN8000B 8-slot SAN Director) or SAN Network Advisor SAN Professional/Professional Plus (SN8000B 4-Slot SAN Director); Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities.

## Security

### SN8600B:

DH-CHAP (between switches and end devices), FCAP switch authentication, FIPS 140-2 L2-compliant, HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, user-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SFTP, SSH v2, SSL, Switch Binding, TACACS+, Trusted Switch.

### SN8000B:

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.

## Management access

### SN8600B:

10/100/1000 Ethernet (RJ-45) per control processor, in-band over Fibre Channel; serial port (RJ-45) and one USB per control processor module; DHCP/DHCPv6; call-home integration enabled through HPE SAN Network Advisor.

### SN8000B:

10/100/1000 Ethernet (RJ-45), in-band over Fibre Channel; serial ports (RJ-45) and one USB per Control Processor blade.

## Diagnostics

### SN8600B:

IO Insight for IO monitoring; ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/distance; built-in flow generator; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), flow mirroring, frame viewer, non-disruptive daemon restart, optics health monitoring, power monitoring, RAStrace logging, and Rolling Reboot Detection (RRD).

### SN8000B:

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 (16 Gbps blades-only), RAStrace logging, and Rolling Reboot Detection (RRD).

## Mechanical specifications

### SN8000B Ports per rack

Up to 1536 ports per 42U rack

Up to 1024 DC SAN Backbone Director ports per 42U rack using Patch Panels.

**NOTE:** The last 16 ports require couplers when using LC-LC Patch Panels.

### Enclosure

#### SN8600B:

**HPE SN8600B 8-slot SAN Director 12-blade slots:** 14U rack-mountable chassis; 27 in. to 31 in. and 22 in. rail kits for the four-post rack; mid-mount kit for the two-post rack

## Technical Specifications

**HPE SN8600B 4slot SAN Director 8-blade slots:** 8U rack-mountable chassis; 27 in. to 31 in. rail, 18 in. to 24 in. rail, and airflow diversion rack mount kits for the four-post rack; mid-mount kit for the two-post rack

**SN8000B:**

Rear panel-to-door airflow; SN8000B 4-Slot SAN Director ships with 1U exhaust shelf

**Width**

**SN8600B:**

Rack-mountable in a standard 19-inch EIA cabinet

**SN8000B:**

17.22 in (43.74 cm)

**Size**

**SN8000B 8-slot SAN Director**

Height: 61.23 cm (24.11 in., 14U)

Width: 43.74 cm (17.23 in.)

Depth: 61.04 cm (24.04 in.)

**SN8600B 4-slot SAN Director**

Height: 34.45 cm (13.56 in., 8U)

Width: 43.74 cm (17.23 in.)

Depth: 61.04 cm (24.04 in.)

**SN8600B 4-slot SAN Director with airflow diversion rack-mount kit**

Height: 40.00 cm (15.75 in., 9U)

Width: 43.74 cm (17.23 in.)

Depth: 61.29 cm (24.09 in.)

**SN8000B 8-slot SAN Director**

Width: 43.74 cm (17.22 in)

Height: 61.24 cm (24.11 in, 14U)

Depth (without door): 61.19 cm (24.09 in)

Depth (with door): 73.20 cm (28.82 in)

**SN8000B 4-Slot SAN Director**

Width: 43.74 cm (17.22 in)

Height: 35.00 cm (13.78 in, 8U) plus 4.37 cm exhaust shelf (1.72 in, 1U)

Depth without door: 61.19 cm (24.09 in)

Depth with door: 73.20 cm (28.82 in)

**Weight**

**SN8600B 8-slot SAN Director**

35.61 kg (78.5 lb) for chassis

145.8 kg (321.5 lb) for 384-port configuration, fully populated

**SN8600B 4-slot SAN Director**

24.5 kg (54 lb) for chassis

68.95 kg (152.0 lb) for 192-port configuration, fully populated

**SN8000B 8-Slot SAN Director**

103.50 kg (228.20 lb) fully populated

39.55 kg (82.20 lb) for chassis

68.04 kg (150.00 lb) fully populated

## Technical Specifications

<b>Environment</b>	<b>Temperature</b>	<b>SN8000B 4-Slot SAN Director</b>	25.26 kg (56.80 lb) for chassis
		<b>Operating</b>	32° to 104° F (0° to 40° C)
		<b>Non-operating</b>	-25° to 70° C (-13° to 158° F)
	<b>Humidity</b>	<b>Operating</b>	<b>SN8600B:</b> 5% to 93% RH non-condensing at 40°C (104°F) with a maximum gradient of 10% per hour
			<b>SN8000B:</b> 5% to 85% non-condensing at 104° F (40° C)
		<b>Non-operating</b>	<b>SN8600B:</b> 10% to 93% RH non-condensing at 70°C (158°F)
			<b>SN8000B:</b> 10% to 93%
	<b>Altitude</b>		Up to 3000 meters (9800 feet)
	<b>Shock</b>		20 g, 6 ms, half sine
	<b>Vibration</b>	<b>Operating</b>	<b>SN8600B:</b> 10 g, 11 ms, half sine wave
			<b>SN8000B:</b> 0.5 g p-p, 5 to 500 to 5 Hz
		<b>Non-operating</b>	<b>SN8600B:</b> 20 g, 11 ms, half sine wave
			<b>SN8000B:</b> 2.0 g, 5 to 500 Hz
	<b>Heat Dissipation</b>	<b>SN8600B 8-slot SAN Director</b>	384-port configuration: Typical: 8,836 BTU/hr; Max: 14,485 BTU/hr Power consumed: Typical: 2,589 W; Max: 4,244 W <b>NOTE: Input power is at 200 VAC with full PSU redundancy.</b>
		<b>SN8600B 4-slot SAN Director</b>	192-port configuration: Typical: 4,696 BTU/hr; Max: 8,139 BTU/hr Power consumed: Typical: 1,376 W; Max: 2,385 W <b>NOTE: Input power is at 200 VAC with full PSU redundancy.</b>
		SN8000B 8-Slot Chassis	873 W, 2982 BTU/hr
		Min: 32-port configuration (no QSFP)	
		Max: 384-port configuration (fully-loaded w/QSFPs)	2242 W, 7654 BTU/hr
		SN8000B 4-Slot Director	
		Min: 32-port configuration (no QSFP)	618 W, 2111 BTU/hr
		Max: 192-port configuration (fully-loaded w/QSFPs), 1195 W	1195 W, 4078 BTU/hr

## Technical Specifications

<b>Power</b>	<b>SN8600B</b>	<b>Supported power range</b>	<b>Input voltage</b> Standard AC input: Range: 85 VAC to 264 VAC Auto-volt Nominal: 100 VAC to 240 VAC
		<b>In-rush current</b>	<b>Power</b> 85 to 132 VAC: 1,450 W 180 to 264 VAC: 2,870 W 35 Amps maximum, peak
	<b>SN8000B</b>	<b>Frequency</b>	50 Hz to 60 Hz (Nominal: 50 Hz to 60 Hz)
		<b>Supported power range</b>	110-240 VAC, single phase
		<b>In-rush current</b>	60A maximum, peak
	<b>Power Supplies</b>	<b>Input frequency range</b>	47-63 Hz
		<b>Two power supplies included with each director</b>	Output voltages (each): 48V at 20 amps 12V at 4 amps Maximum output power: 2000 watts
	<b>Power Cables</b>	The DC SAN Directors come with:	AC inrush current: 20A maximum, peak two 220V US power cords 2 C19-C20 220V PDU jumpers.
<b>Certified maximum</b>	Please Refer to SAN Design Guide at the following URL: <a href="https://support.hpe.com/hpsc/doc/public/display?docId=c00403562">https://support.hpe.com/hpsc/doc/public/display?docId=c00403562</a>		

## Summary of Changes

Date	Version History	Action	Description of Change
07-May-2018	From Version 58 to 59	Added	Added 64-port 32Gb blade for SN8600B SAN Director.
		Changed	Overview, Product Highlights, Configuration Information, and Technical Specifications were revised.
04-Dec-2017	From Version 57 to 58	Changed	Configuration Information was revised.
23-Oct-2017	From Version 56 to 57	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
25-Sept-2017	From Version 55 to 56	Changed	Changes made throughout the QuickSpecs.
03-Apr-2017	From Version 54 to 55	Changed	Added optics and cables along with minor content edits
13-Feb-2017	From Version 53 to 54	Changed	Cosmetic Update
16-Dec-2016	From Version 52 to 53	Changed	Added a 32Gb SFP+ SKU
28-Nov-2016	From Version 51 to 52	Changed	Added content for SN8600B 32Gb SAN Director
29-Jul-2016	From Version 50 to 51	Changed	Changes made to the Configuration Information section.
07-Jun-2016	From Version 49 to 50	Changed	Changes made throughout the QuickSpecs
08-April-2016	From Version 48 to 49	Changed	Changes made to the Services Sections
16-Feb-2016	From Version 47 to 48	Changed	Content Updated on the entire document
30-Mar-2015	From Version 46 to 47	Changed	Changes made throughout the QuickSpecs.
13-Feb-2015	From Version 45 to 46	Changed	Change the version to match Product Bulletin. It was not synched up
09-Feb-2015	From version 44 to 45	Added	Added the HPE StoreFabric B-series 4x16Gb Fibre Channel 2Km Inter-chassis Link QSFP Transceiver
14-Nov-2014	From Version 43 to 44	Changed	Changes made throughout the QuickSpecs.
3-Oct-2014	From Version 42 to 43	Changed	Changes made to the Configuration Information, Service and Support and Product Highlights Sections.
21-Jul-2014	From Version 41 to 42	Changed	Changes were made in Overview, Product Highlights and Configuration Information sections.
10-Jun-2014	From Version 40 to 41	Changed	Carepack description updated on the Basic Care-Minimum recommended support  Updated some products highlights  Configuration Updates
28-Feb-2014	From Version 39 to 40	Changed	Updated the following: Configuration Information Step 1, added Fabric Vision to description for QK710B, QK711B, AK857C, AR479B, Step 2 - added note to TC513A; removed "for Core 2/64" from the description for 325887-B21 and 325886-B21;
20-Dec-2013	From Version 38 to 39	Added	HPE B-series 16b Long Wave 25km Fibre Channel SFP+ 1 Pack to Fibre Channel Switches were added.
09-Dec-2013	From Version 37 to 38	Changed	Product descriptions were revised throughout Configuration Information  HPE 8/40 SAN Switch and 8/40 SAN Switch Power Pack+ was removed from Family Information
15-Oct-2013	From Version 36 to 37	Changed	Fabric Vision was added to Product Highlights  2408 FCoE CN Switch and 2408 FCoE CN Switch Power Pack+ was removed from Family Information chart
30-Sep-2013	From Version 35 to 36	Changed	Optional Software was revised.



## Summary of Changes

01-Apr-2013	From Version 34 to 35	Changed	Changes made to update Step 2 of the Configuration Information section.
25-Mar-2013	From Version 33 to 34	Changed	Changes made throughout document in sections What's New, Product Highlights, Configuration Information and Technical Specifications.
22-Feb-2013	From Version 32 to 33	Changed	Changes were made to Product Highlights Section as well as Configuration Information section.
16-Nov-2012	From Version 29 to 32	Changed	Changes were made Configuration Information section.
14-Sep-2012	From Version 28 to 29	Changed	Changes were made in Overview, Product Highlights and Configuration Information sections.
13-Aug-2012	From Version 27 to 28	Changed	Changes made in Configuration Information.
22-Jun-2012	From Version 26 to 27	Changed	Changes made in Configuration Information.
16-May-2012	From Version 25 to 26	Changed	Updated the following: Product Highlights - removed "CUP" from the FICON Accelerator Upgrade LTU name; updated NOTE for 10GbE and 10Gb FC Performance Upgrade; Configuration Information - Step 2 Additional Port Configurations - updated NOTE for 10GbE performance upgrade and removed one NOTE and update another for HPE Extension Blade FICON Accelerator Upgrade and updated NOTE for HPE FICON; Step3 - Additional Options - updated NOTE for Fibre Channel Optical Transceivers
06-Apr-2012	From Version 24 to 25	Changed	Cabinet Support was revised.
26-Mar-2012	From Version 23 to 24	Changed	Changes made throughout the QuickSpecs.
02-Dec-2011	From Version 21 to 23	Changed	HPE Encryption FC Blade was revised in Additional Port Configurations.
14-Nov-2011	From Version 20 to 21	Changed	HPE 16GB Long Wave B-series 10km FC SFP+ 1 Pack was added and HPE LC-SC Optical Cables were removed from Step 3 in Configuration Information.
28-Oct-2011	From Version 19 to 20	Changed	Updated the following: Overview; What's New; DC SAN Director Highlights; DC SAN Director Performance; SAN Scalability (typo); Web Tools; FICON Support (typo); ISL Trunking; SAN Network Advisor; SAN Network Advisor Enterprise and Professional+; HPE DC SAN Director 8 Inter-Chassis Link LTU; HPE B-series SAN Director FICON CUP Active License; 10GbE and 10Gb FC Performance Upgrade; Family Comparison Table-Aggregate device bandwidth for the SN6000B 16Gb FC Switches; Family Comparison Table-Hot plug, redundant power supplies for the SN8000G 8-Slot SAN Director; Configuration Information - Step 3-additional options; added Note; Technical Specifications - DC SAN Director Chassis Bandwidth changed from 3Tbps to 4Tbps
26-Sep-2011	From Version 18 to 19	Changed	SN8000B Performance, DC SAN Director Highlights, Cabinet Support, Frame Filtering and ISL Trunking were revised in Product Highlights  Family Information was completely revised  Configuration Information was updated  DC SAN Director Performance was revised in Technical Specifications
22-Jul-2011	From Version 17 to 18	Changed	Note for HPE Encryption FC Blade was revised in Step 2.
20-Jun-2011	From Version 16 to 17	Changed	Changes were made throughout, including changing the title.
09-Jun-2011	From Version 15 to 16	Removed	Removed "StorageWorks" throughout the document.

## Summary of Changes

18-Mar-2011	From Version 14 to 15	Changed	Part number for HPE StorageWorks DC04 SAN Director Switch Integrated Routing LTU in Step 2.
27-Sep-2010	From Version 13 to 14	Added	PremierFlex Cable was added to Step 3.
21-Jun-2010	From Version 12 to 13	Added	<p>64-port 8Gb FC Blade provides the highest director port density on the market was added to Key Features and Benefits</p> <p>FICON CUP and FICON Accelerator were added to FICON Support</p> <p>HPE DC SAN Director Switch Multiprotocol Ext Blade FICON CUP Accelerator Upgrade LTU was added to Optional Software</p> <p>NOTE was added to HPE StorageWorks Encryption Blade Performance Upgrade</p> <p>High Density Cables, LC-MiniSFP Cables and Recommended Patch Panels for the High Density Cables were added to Optional Cables</p>
		Changed	<p>DC SAN Backbone Director was increased to 512 ports and DC04 SAN Director was increased to 256 ports</p> <p>Service and Support, HPE Care Pack, and Warranty Information was completely revised</p> <p>1 Gb/s SAN Switches was removed</p> <p>Remote Monitoring of entire data center via Instant Support Enterprise Edition (ISEE) was removed from High-availability features</p>
29-Mar-2010	From Version 11 to 12	Added	HPE Extension Blade FICON CUP Accelerator Upgrade and HPE StorageWorks B-series DCFM Professional Plug Upgrade LTU were added throughout the QuickSpecs, NOTE was added to HPE StorageWorks 10/24 Blade for DC SAN Directors, HPE StorageWorks Data Center Fabric Manager Enterprise and Fabric Manager Professional Plus were added to Management.
14-Sep-2009	From Version 10 to 11	Changed	Changes were made throughout the entire QuickSpecs, except in the Service and Support, HPE Care Pack and Warranty Information section.
20-Apr-2009	From Version 9 to 10	Changed	<p>Revised the Warranty information for the DC SAN Backbone Director in the Service and Support, HPE Care Pack and Warranty Information section</p> <p>Completely revised the chart for Recommended Services and added a chart to Related Services in the Service and Support, HPE Care Pack and Warranty Information section</p> <p>Updated the Part number for the HPE StorageWorks DC SAN Backbone Director Power Pack + in Step 1 and part numbers throughout Step 2, excluding the Encryption FC Blade and Software in the Configuration Information section</p>

## Summary of Changes

02-Mar-2009	From Version 8 to 9	Added	Encryption throughout the QuickSpecs, excluding the Family Information and Technical Specifications sections.
		Changed	Warranty section of Service and Support, HPE Care Pack and Warranty Information and corrected some spacing issues in the Technical Specifications section.
13-Feb-2009	From Version 7 to 8	Changed	Reformatted the Warranty section of the Service and Support, HPE Care Pack and Warranty Information.
26-Jan-2009	From Version 6 to 7	Changed	Changes were made throughout the entire QuickSpecs. Note the title has changed.
17-Nov-2008	From Version 5 to 6	Added	Support with M-Series M-EOS and B-Series FOS based SAN Fabrics to the Overview section  Enhanced Group Management and Data Center Fabric Manager throughout the QuickSpecs  HPE 8Gb Long Wave B-Series 10Km FC SFP +1 Pack to Optical Transceivers in Step 3 of the Configuration Information section
01-Aug-2008	From Version 4 to 5	Changed	Minor formatting changes occurred in Steps 1 and 3 of the Configuration Information section.
25-Jul-2008	From Version 3 to 4	Added	HPE B-Series SAN Backbone Director Integrated Routing LTU to Optional Software in the Product Highlights section and Step 2 of the Configuration Information section.
11-Jul-2008	From Version 2 to 3	Added	1 2Gb USB Device to Steps 1 and 3 in the Configuration Information section.
		Changed	Family Information Charts were rewritten and Optical Transceivers were updated in Step 3 of the Configuration Information section.
11-Apr-2008	From Version 1 to 2	Changed	Changes were made in the Overview and Configuration Information section.



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