

### Overview

#### HPE B-series SN4000B SAN Extension Switch

Today's IT organizations are under pressure to keep pace with the growing avalanche of data traffic between data centers and the changes driven by virtualized application workloads. Faced with this challenge, coupled with rising Service Level Agreement (SLA) requirements and recovery expectations, enterprise data centers need their disaster recovery plans to enable fast, continuous, and easy access to mission-critical data from anywhere in the world. Ultimately, storage administrators want to replicate large amounts of data quickly, reliably, and simply while minimizing operational and capital expenses. To address this challenge, the HPE SN4000B Extension Switch with Brocade Fabric Vision technology delivers unprecedented performance, continuous availability, and simplified management to handle the unrelenting growth of data traffic between data centers. The HPE SN4000B is a purpose-built data center extension solution that maximizes performance and scalability for large, complex environments, allowing IT organizations to future-proof their storage extension infrastructure by adding more throughput capacity as their needs grow. The HPE SN4000B Data Center Extension Switch is a robust platform for large scale, multi-site data center environments implementing disk and tape data protection solutions. HPE B-series SN4000B SAN Extension Switch Data Center Extension Switch is ideal for:

- Data protection for open systems and mainframe
- Multi-site synchronous and asynchronous storage replication
- Centralized tape backup, recovery, and archiving

The HPE SN4000B configuration is a bundle including a comprehensive set of advanced services: Fabric Vision, Extension Trunking, Adaptive Rate Limiting, ISL Trunking, IPsec, Compression, Open Systems Tape Pipelining (OSTP), Fast Write, Adaptive Networking and Extended Fabric. Optional value-add licenses for Integrated Routing, FICON CUP, and Advanced FICON® Accelerator are available to address challenging extension and storage networking requirements in open system and mainframe environments. The SN4000B SAN Extension Switch is fully compatible with the entire B-Series family of FC switching platforms, delivering advanced 16 Gbit/sec fabric services end-to-end over distance and providing investment protection for hardware as well as the ability to leverage expertise and training across the data center staff.



HPE SN4000B SAN Extension Switch

#### What's New

- Updated SKUs (Suffix changed from A to B)

## Standard Features

### Key Features

#### Maximize the Value of SANs

- FCIP Extension of Fibre Channel SANs provides connectivity over longer distances that would otherwise be technologically not possible, impractical, and too expensive with native Fibre Channel or when dark fiber resources are unavailable.
- Achieve bandwidth savings and higher bandwidth utilization via data compression by compressing FC frames before they are encapsulated into FCIP packets.
- Extensive diagnostics, system-monitoring capabilities, and performance monitoring (including extensive and granular TCP statistics graphing in Webtools).

#### Superior Performance

- TCP acceleration helps to overcome latency between source and target locations by adjusting the TCP window size and performing selective acknowledgements.
- Advanced Quality of Service (QoS) techniques can be used to prioritize traffic and guarantee that necessary bandwidth requirements are met.
- Key protocol features are enabled in the FCIP implementation to optimize performance of SAN extension over IP networks, including Storage-Optimized TCP.

#### Outstanding Scalability and operational flexibility

- FCIP Trunking feature allows multiple IP source and destination address pairs (defined as FCIP circuits) to provide high bandwidth FCIP tunnel and failover resiliency.
- Adaptive Rate Limiting feature meets minimum bandwidth guarantee for each tunnel while allowing full utilization of the available network bandwidth without adverse impact to throughput performance during high traffic loads.
- Optional FC Routing delivers fabric isolation in conjunction with FCIP, enabling separate fabrics to share devices without merging across the IP network.

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### SN4000B SAN Extension Switch

- 24 Fibre Channel ports with link speeds of 4, 8, and 16 Gbps, compatible with short wavelength (SWL), long wavelength (LWL) and extended long wavelength (ELWL) SFP+ transceivers
- Sixteen 1 GbE/10 GbE ports, compatible with copper, ultra-short reach (USR), short reach (SR) and long reach (LR) SFP/SFP+ transceivers
- Two 40 GbE ports, compatible with short reach (SR) and long reach (LR) QSFP transceivers
- Rack-mountable 2U chassis
- One RJ-45 Ethernet management port with 10/100/1000 Mbps auto negotiating capability
- One USB port that provides storage for firmware updates, switch support data, and storage for configuration uploads and downloads

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### Configuration Support

The HPE SN4000B SAN Extension Switch is fully compatible with the B-series FC switches and directors. For complete interoperability information please check:

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

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### Simplified Management

Brocade Fabric Vision technology provides a breakthrough hardware and software solution that helps simplify monitoring, maximize network availability, and dramatically reduce costs. Featuring innovative monitoring, management, and diagnostic capabilities, Fabric Vision technology enables administrators to avoid problems before they impact operations, helping their organizations meet SLAs.

The HPE SN4000B Extension Switch supports the following Fabric Vision technology features for storage extension management:

- Monitoring and Alerting Policy Suite (MAPS): Provides a pre-built, policy-based threshold monitoring and alerting tool that proactively monitors storage extension network health based on a comprehensive set of metrics at tunnel, circuit, and QoS layers. Administrators can configure multiple fabrics at one time using pre-defined or customized rules and policies for specific ports or switch elements.



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## Standard Features

- Fabric Performance Impact (FPI) Monitoring: Uses pre-defined thresholds and alerts in conjunction with MAPS to automatically detect and alert administrators to severe levels of latency and identifies slow drain devices that might impact the network. This feature uses advanced monitoring capabilities and intuitive MAPS dashboard reporting to indicate various latency severity levels, pinpointing exactly which devices are causing or impacted by a bottlenecked port.
  - Dashboards: Provides integrated dashboards that display an overall SAN health view, along with details on out-of-range conditions, to help administrators easily identify trends and quickly pinpoint issues occurring on a switch or in a fabric.
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### Hardware Based Compression

Hardware-based compression delivers the ability to maximize throughput over lower bandwidth links in the wide area network, optimizing the cost efficiencies of FCIP. The SN4000B Extension Provides multiple modes to optimize compression ratios for various throughput requirements.

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### IPSec

The HPE SN4000B SAN Extension Switch IPSec function is capable of supporting both Ipv4 and Ipv6, mix of secure and non-secure tunnels on the same GE port, jumbo frames, and VLAN tagged connections.

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### Scalability

Refer to the guidelines described in the Heterogeneous Open SAN Design Reference Guide available at:

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

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### Cabinet Support

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

**Notes:** To order factory integration, add OD1 after the part number on your sales order.

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## Software Components, Standard

### Fabric Vision

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

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

### Extended Fabric

Optional license which comes bundled with the SN4000B and 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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### ISL Trunking

For high performance enhanced Trunking this optional license, which comes bundled with the SN4000B, logically aggregates E-ports to provide a high bandwidth trunk between two switches. Each 16Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 128Gb) when routing connections between 16G switches.

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## HPE SANnav Management Software

HPE SANnav Management Software is the next-generation SAN management application suite for HPE B-series SAN environments. It consists of SANnav Management Portal Software and SANnav Global View Software:

- SANnav Management Portal is a next-generation SAN management application with a simple browser-based user interface (UI) streamlining common workflows, such as configuration, zoning, deployment, troubleshooting, and reporting.



## Standard Features

- SANnav Global View helps administrators visualize the health, performance and inventory of multiple SANnav Management Portal instances at data centers across the globe or a single multi-tenant data center using a simple, intelligent dashboard.

SANnav Management Portal and SANnav Global View not only transform SAN telemetry data into useful insights, such as health and performance scores, but also enable administrators to quickly associate real-time data with historical metrics and logs for in-depth analysis. This can help with spotting trends, establishing baselines, and identifying any behavioral changes over time.

HPE SANnav Management Software is available as a term-license for 1-year, 3-years and 5-years period as both – physical and electronic License-to-Use (LTU). It supports 8Gb, 16Gb and 32Gb FC Switches and Directors.

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## SAN Network Advisor Enterprise and Professional+

HPE SAN Network Advisor Enterprise and Professional+ are the enterprise-class products that support FOS products. SAN Network Advisor Enterprise provides complete 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 SN8000B 8-Slot Director, DC SAN Backbone 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.

**Notes:** HPE SAN Network Advisor 14.4.5 supports only the Enterprise edition. Any migrations to 14.4.5 utilizing a Professional+ license will provide Enterprise level equivalent functionality while on 14.4.5. The Professional and Trial editions as well as the head-less SMI agent only editions are not supported in 14.4.5 for new installations or migration from previous HPE SAN Network Advisor versions.

See the HPE Single Point of Connectivity Knowledge (SPOCK) B-series stream for HPE SAN Network Advisor version support.

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

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## WebTools

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

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## Software Components, Optional

### Integrated Routing

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

### HPE SN4000B 10Gb WAN Rate Upgrade and HPE SN4000B 40Gb WAN Rate Upgrade Licenses

HPE SN4000B 10Gb WAN Rate and HPE SN4000B 40Gb WAN Rate are optional licenses which enable additional WAN throughput. The 10Gb WAN Rate Upgrade license will increase the maximum available aggregate bandwidth for all tunnels to 10Gbps while the 40Gb WAN Rate Upgrade license will increase the maximum available aggregate bandwidth for all tunnels to 40Gbps.



## Standard Features

### FICON

Optional software allows FICON Switching to provide Fibre Channel and FICON intermix, FICON Control Unit Port (CUP), and FICON cascading for more than one B-Series SAN Director in XP Storage Array environments. The 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 and FCP port zoning enhances separation with intermix operation.

### 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 only supported with B-series Switches, HPE 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:

<https://www.hpe.com/us/en/product-catalog/storage/storage-software/pip.hpe-smart-san-for-3par.8295863.html>

#### Notes:

- Supports B-series Brocade 16/8Gb FC switches with FOS 7.4.0a or later.
  - A list of supported HPE FC Adapters can be found at <http://www.hpe.com/storage/spock>
  - Supports 3PAR StoreServ storage with 3.2.2 or later with only 16Gb target ports on HPE 3PAR StoreServ storage.
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## Service and Support

### Warranty

(1-1-1) Hardware Warranty - One-year on-site warranty, 8x5, next business day response, installation not included.

**Notes:** 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.

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### 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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### For bundled Software Support

Your HPE storage product includes comprehensive support and software updates to enhance the performance and availability of your software. The service provides access to HPE technical resources for assistance in resolving software operations issues, and, also provides access to software updates and reference manuals in electronic form.

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### Achieve maximum return from your IT investment

Get the expertise you need at every step of your IT journey with **HPE Pointnext services and support**. We help you lower your risks and costs using proven best practices, automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally. With **Advisory Services**, we focus on your business outcomes and goals, partnering with you to design your transformation and build a roadmap tuned to your unique challenges. Our **Professional** and **Operational Services** can be leveraged to speed up time-to-production, boost performance and accelerate your business. HPE Pointnext specializes in flawless and on-time implementation, on-budget execution, and creative configurations that get the most out of software and hardware alike.

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### Consume IT on your terms

#### **HPE GreenLake Flex Capacity**

Combines the simplicity, agility, and economics of public cloud with the security and performance benefits of on-premises IT. You determine your own "Right Mix" of Hybrid IT and workload placement without having to use.

With its agile pay-per-use service, HPE GreenLake Flex Capacity can help your IT organization:

- Avoid IT expenses stemming from overprovisioning
  - Improve time to market by maintaining a safe buffer of capacity, ready for use when you need it
  - Keep capacity ahead of demand with regular monitoring—and a simple change order to replenish
  - Pay for only the capacity used, not the capacity deployed
  - Reduce IT risk with tailored support
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### Connect your devices

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Reduce down time, increase diagnostic accuracy and have 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 HPE support.

Learn more about getting connected at [www.hpe.com/services/getconnected](http://www.hpe.com/services/getconnected)

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## Service and Support

### Free up resources with Operational Services from HPE Pointnext

Choose from the recommended services for customers purchasing from Hewlett Packard Enterprise or an authorized reseller are quoted using Hewlett Packard Enterprise order configuration tools.

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#### **HPE Datacenter Care**

Helps customers to address the pressing needs of IT today and smoothly transform to a more agile cloud-like IT operations model. We help run and monitor your IT by offloading the day to day routine tasks, helping customers be more predictive and proactive, and saving time with one place to call with for all of their IT. Datacenter Care is available as both tailored statement of work and as a packaged service for 3, 4, and 5 year terms.

Partner with an assigned account team backed by local and global experts, access HPE enhanced call experience with priority access, use specialized support for complex, technologies, choose hardware and software support for your devices, implement proactive monitoring to stay ahead of issues, and access HPE IT best practices and IP. HPE Datacenter Care advantage options are available to add to your agreement to give you specialized expertise for performance, security, back up analysis, and much more.

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#### **Optimized Care**

##### **HPE Proactive Care\* with 6 hour call-to-repair commitment, three year Support Service**

HPE Proactive Care gives customers an enhanced call experience plus helps preventing problems and maintains IT stability by utilizing tailored, 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 highest level of hardware support - The Hewlett Packard Enterprise 24x7, six hour hardware call-to-repair. Hewlett Packard Enterprise is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable storage systems.

<https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

**Notes:** \*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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#### **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>

**Notes:** \*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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#### **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.

<https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA4-8876ENW>



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## Service and Support

### 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.hp.com/V2/GetPDF.aspx/5981-8527ENW.pdf>

#### HPE Basic Installation Service

Provides for the basic hardware installation of HPE branded storage devices to assist you in bringing your new hardware into operation in a timely and professional manner.

<https://h20195.www2.hp.com/v2/Getdocument.aspx?docname=5981-9356enw>

#### HPE Service Credits

Offers flexible services and technical skills to meet your IT demands as your business evolves. With a menu of services, you can access additional resources and specialist skills to help you maintain peak performance of your IT. HPE Service Credits help you proactively respond to your dynamic IT and business needs.

#### HPE Education Services

Provides comprehensive training designed to expand the skills of your IT staff and keep them up to speed with the latest technologies.

Consult your Hewlett Packard Enterprise Sales Representative or Authorized Channel Partner of choice for any additional questions and support options.

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### Parts and Materials

Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

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### HPE Support Center

The HPE Support Center is a personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more <http://www.hp.com/support/hpesc>

The HPE Support Center Mobile App\* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Support Service or HPE contractual support agreement.

**Notes:**\*HPE Support Center Mobile App is subject to local availability.

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## Service and Support

### For more information

<http://www.hpe.com/services>

<https://www.hpe.com/us/en/services/operational.html>

To learn more on HPE Storage Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"

<https://www.hpe.com/us/en/contact-hpe.html>

HPE Support 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 HPE order configuration tools.
  - Customers purchasing from a commercial reseller can find HPE Support Services at <https://ssc.hpe.com/portal/site/ssc/>
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## Configuration Information

### Step 1 – Base Configuration + Power Pack (Select one)

Description	SKU
<b>HPE SN4000B Power Pack+ SAN Extension Switch</b>	
HPE SN4000B Power Pack+ SAN Extension Switch	E7Y73C
42 ports (24 16Gb Fibre Channel , 16 1/10 GbE and 2 40 Gigabit Ethernet) Extension switch for Fibre Channel over Internet Protocol (FCIP) traffic forwarding over IP wide area networks (WAN). Includes Power Pack.	

#### Notes:

- Fibre Channel ports require optical transceivers listed below. Ethernet ports require optical or copper transceivers listed below.
- Some HPE B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses with new part numbers listed in this document are functionally equivalent to the corresponding physical licenses with different part numbers. Some software licenses in this document are represented by two part numbers, the first of which is the E-Delivery version (ending with AE) and the second is the physical version.

### Step 2 – Options

#### 16 Gb Transceivers

HPE B-series 16Gb SFP+ Short Wave Transceiver	QK724A
HPE B-series 16Gb SFP+ Long Wave 10km Transceiver	QK725A
HPE B-series 16Gb LW 25km FC SFP 1-pack Transceiver	H6Z29A

#### 8 Gb Transceivers

HPE B-series 8Gb Shortwave Fibre Channel 1 Pack SFP+ Transceiver	AJ716B
HPE B-series 8Gb Long Wave 10km Fibre Channel 1 Pack SFP+ Transceiver	AJ717A

#### 1 GbE Transceivers

HPE B-series 1GbE LX SFP Transceiver	E7Y74A
HPE B-series 1Gb Ethernet Copper SFP 1 Pack Transceiver	AW537A

#### 10 GbE Transceivers

HPE B-series 10GbE Short Wave SFP+ Transceiver	AP823A
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#### 40 GbE Transceivers

HPE B-series 40GbE Long Range QSFP+ Transceiver	E7Y75A
HPE B-series 40GbE Short Range QSFP+ Transceiver	E7Y76A

#### 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

##### MPO/MPO Multi-mode Cables

HPE Premier Flex MPO/MPO Multi-mode OM4 12 fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 fiber 50m Cable	QK731A
HPE Premier Flex MPO/MPO OM4 100m (12ft) Cable	H6Z30A

## Configuration Information

Description	SKU
<b>OM3 LC-LC type cables</b>	
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

### Step 3 - Optional Software\*

**Notes:** \* For Fabric OS (FOS) minimum requirements, please refer to: <http://www.hpe.com/storage/spock>

#### Optional Software

##### Software for SN6500B 16Gb FC Switch

HPE SANnav Management Portal Base 1yr E-LTU	R3P45AAE
<b>Notes:</b> (Physical License – R3P45A)	
HPE SANnav Management Portal Enterprise 1yr E-LTU	R3P46AAE
<b>Notes:</b> (Physical License – R3P46A)	
HPE SANnav Global View 1yr E-LTU	R3P47AAE
<b>Notes:</b> (Physical License – R3P47A)	
HPE SANnav Management Portal Base 3yr E-LTU	R3P48AAE
<b>Notes:</b> (Physical License – R3P48A)	
HPE SANnav Management Portal Enterprise 3yr E-LTU	R3P49AAE
<b>Notes:</b> (Physical License – R3P49A)	
HPE SANnav Global View 3yr E-LTU	R3P50AAE
<b>Notes:</b> (Physical License – R3P50A)	
HPE SANnav Management Portal Base 5yr E-LTU	R4P29AAE
<b>Notes:</b> (Physical License – R4P29A)	
HPE SANnav Management Portal Enterprise 5yr E-LTU	R4P30AAE
<b>Notes:</b> (Physical License – R4P30A)	
HPE SANnav Global View 5yr E-LTU	R4P31AAE
<b>Notes:</b> (Physical License – R4P31A)	

#### Notes:

- The Base edition of HPE SANnav Management Portal does not support management of director class switches.
- HPE SANnav Management Software License-to-Use (LTU/E-LTU) includes maintenance and support for the duration of the license. At the end of the license period, customer will need to purchase a new license to continue using the software. Software renewal via HPE PointNext is not allowed/supported.
- A 90-day, full-featured trial license for SANnav Management Portal and SANnav Global View is available.

HPE SN4000B FICON Accelerator E-LTU	D4U29BAE
HPE B-series Integrated Routing E-LTU	T5528BAE
<b>Notes:</b> (Physical License – T5528B)	
HPE 8/40 and 1606 Extension SAN Switch FICON CUP E-LTU	TA748BAE
<b>Notes:</b> The FICON CUP and the FICON CUP accelerator support is contingent upon IBM certification. Please refer to The HPE B-Series FICON connectivity stream at HPE "Single Point of Connectivity Knowledge" (SPOCK) for the latest information.	

## Configuration Information

### Description

HPE SN4000B 10Gb WAN Rate Upgrade E-LTU

**SKU**  
D4U27BAE

**Notes:** (Physical License – D4U27B)

HPE SN4000B 40Gb WAN Rate Upgrade E-LTU

D4U28BAE

**Notes:** (Physical License – D4U28B)

### Notes:

- Some HPE B-series software licenses are now available through the Electronic Delivery (E-Delivery) mechanism. The E-Delivery software licenses with new part numbers listed in this document are functionally equivalent to the corresponding physical licenses with different part numbers. Some software licenses in this document are represented by two part numbers, the first of which is the E-Delivery version (ending with AE) and the second is the physical version.
- Universal Temporary Licenses (UTLs) are available for trial usage or to test select features before purchasing permanent licenses. These UTLs enable optional features on B-series Directors and Switches on a temporary basis for one-time usage. Additional information can be found at the following URL using your HPE Passport credentials:

**<https://h20392.www2.hpe.com/portal/swdepot/displayProductInfo.do?productNumber=BROCADETRIAL>**

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## Technical Specifications

### Family Information

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+
<b>Targeted Environment</b>	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
<b>Fibre Channel Port Bandwidth</b>	8Gbps	8Gbps	16Gbps	32Gbps
<b>Aggregate device bandwidth</b>	64-192 Gbps	128-192 Gbps	192-384 Gbps	768 Gbps
<b>OS Support</b>	<b>Notes: Please Refer to SPOCK <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a></b>			
<b>Storage system support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>			
<b>FC Ports</b>	8 Enabled 24 Max	16 Enabled 24 Max	12 or 24 Enabled 24 Max	8 or 24 Enabled 24 Max
<b>SFP</b>	B-series	B-series	B-series	B-series
<b>Advanced Trunking</b>	Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ Upgrade	Included with Power Pack+ or Optional Upgrade
<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)

## Technical Specifications

<b>Features</b>	<b>SN600B 16 Gb FC Switch and SN600B 16 Gb FC Power Pack+</b>	<b>SN660B 32 Gb FC Switch and SN660B 32 Gb FC Power Pack+</b>	<b>SN660B 32 Gb Bundled (SFP+) FC Switch and SN660B 32 Gb Power Pack+ Bundled (SFP+) FC Switch</b>
<b>Targeted Environment</b>	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
<b>Fibre Channel Port Bandwidth</b>	16 Gbps	32 Gbps	32 Gbps
<b>Aggregate device bandwidth</b>	384- 768 Gbps	2 Tbps	2 Tbps
<b>OS Support</b>	<b>Notes: Please Refer to SPOCK <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a></b>		
<b>Storage system support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>		
<b>FC Ports</b>	24 or 48 Enabled 48 Max	24 or 48 enabled 64 Max	24 or 48 Enabled 64 Max
<b>SFP</b>	B-series	B-series (16 Gb or 32 Gb)	B-series, 24 or 48 32 Gb SFP+ included in the box
<b>Advanced Trunking</b>	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
<b>Adaptive Networking</b>	Included	Included	Included
<b>Form factor</b>	1U	1U	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 (integrated with power supply)	Yes (integrated with power supply)	Yes (integrated with power supply)



## Technical Specifications

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>Notes: Please Refer to SPOCK <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a></b>		
<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



## Technical Specifications

Features	SN800B 8-Slot SAN Director Power Pack+	SN8600B 8-Slot SAN Director Power Pack+
<b>Targeted Environment</b>	Cloud Optimized Data Centers	Cloud Optimized Data Centers
<b>Port Bandwidth</b>	Up to 16Gbps	Up to 32 Gbps
<b>Aggregate device bandwidth</b>	10.2Tbps	20.48 Tbps
<b>OS Support</b>	<b>Notes: Please Refer to SPOCK <a href="https://www.hpe.com/storage/spock">https://www.hpe.com/storage/spock</a></b>	
<b>Storage system support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>	
<b>Ports</b>	Up to 512 SFP	512 32 Gbps ports or a 640-port equivalent with 128 Gbps (32 Gbps×4 QSFP ports)
<b>SFP</b>	B-series	B-series
<b>Advanced Trunking</b>	Included with Power Pack	Included with Power Pack
<b>Adaptive Networking</b>	Included	Included
<b>Form factor</b>	14U	14U
<b>Zoning Software</b>	Yes (included)	Yes (included)
<b>Hot plug, redundant power supplies</b>	Yes	Yes
<b>Hot plug fans</b>	Yes	Yes



## Technical Specifications

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



## Technical Specifications

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
<b>Targeted Environment</b>	Enterprise, Datacenters, Workgroups, Departments	Workgroups, Departments	Enterprise, Datacenters, Workgroups, Departments
<b>Port Bandwidth</b>	16 Gbit/sec	8 Gbit/sec	16 Gbit/sec
<b>Aggregate device bandwidth</b>	448 Gbit/sec	192 Gbit/sec	576 Gb/s (36 ports x 16 Gb/s)
<b>OS Support</b>	<b>Notes: Please Refer to SAN Design Guide</b> <a href="https://h20566.www2.hpe.com/hpsc/doc/public/display?docId=c00403562">https://h20566.www2.hpe.com/hpsc/doc/public/display?docId=c00403562</a> or <a href="https://h20566.www2.hpe.com/hpsc/doc/public/display?docId=c00403562">https://h20566.www2.hpe.com/hpsc/doc/public/display?docId=c00403562</a>		
<b>Storage system Support</b>	<b>3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA</b>		
<b>Ports</b>	12 external /16 internal	4 or 8 external / 8 or 16 internal	8 SFP+ external, 4 QSFP external /12 internal
<b>SFP</b>	B-series	B-series	B-series
<b>Advanced Trunking</b>	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
<b>Adaptive Networking</b>	Included	Included	Included
<b>Form factor</b>	Embedded	Embedded	Embedded
<b>Zoning Software</b>	Yes (Included)	Yes (Included)	Yes (Included)
<b>Hot plug, redundant power supplies</b>	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in Synergy Frame
<b>Hot plug fans</b>	Yes, in BladeSystem Enclosure	Yes, in BladeSystem Enclosure	Yes, in Synergy Frame



## Technical Specifications

### System Architecture

<b>Ports</b>	42 ports: 24 Fibre Channel (E, F, M, FL, EX) , sixteen 1/10 and two 40 Gigabit Ethernet (VE) ports
<b>B-series switch interoperability</b>	<ul style="list-style-type: none"> <li>• 8/8 SAN Switch</li> <li>• 8/24 SAN Switch</li> <li>• 1606 SAN Extension Switch</li> <li>• SN4000B SAN Extension Switch</li> <li>• Brocade 8Gb SAN Switch for HPE BladeSystem c-Class</li> <li>• Brocade 16Gb SAN Switch for HPE BladeSystem c-Class</li> <li>• Brocade 16Gb Fibre Channel SAN Switch Module for HPE Synergy</li> <li>• SN8000B Director Switches</li> <li>• SN6000B Fibre Channel Switch</li> <li>• SN6500B Fibre Channel Switch</li> <li>• SN3000B Fibre Channel Switch</li> </ul>
<b>Performance</b>	Auto-sensing of 4, 8, and 16 Gbps port speeds. FCIP Performance: 1/10/40Gbps line speed
<b>ISL Trunking</b>	Up to eight 16 Gbps ports per Brocade Trunk; up to 128 Gbps per trunk.
<b>Fibre Channel aggregate bandwidth</b>	384 Gbps Full Duplex
<b>FCIP aggregate bandwidth</b>	40 Gbps: 2 ports at 20 Gbps (data rate)
<b>Fabric latency</b>	700 ns with no contention, cut-through routing at 16 Gbps
<b>Maximum frame size</b>	2112-byte payload
<b>Maximum MTU size</b>	Ethernet Jumbo Frames at 9,000-bytes
<b>Classes of service</b>	Class 2, Class 3, Class F (inter-switch frames)
<b>Port types</b>	F_Port, E_Port, EX_Port, (FCR E_Port), D_Port (Diagnostic), M_Port (Mirror), and self-discovery based on switch type (U_Port). VE_Port (FCIP and virtual E_Port)
<b>Data traffic types</b>	Fabric switches supporting unicast, multicast (255 groups), and broadcast
<b>USB</b>	One USB port for system log file downloads or firmware upgrades
<b>Media types</b>	<p><b>Fibre Channel: Brocade hot-pluggable Small Form Factor (SFP) and SFP+, short wavelength (SWL), long wavelength (LWL), and extended long wavelength (ELWL) transceivers (available wavelength options vary for 8 Gbps and 16 Gbps SFPs)</b></p> <p><b>Ethernet:</b> Brocade hot-pluggable Small Form Factor (SFP) and SFP+, short reach wavelength (SRWL), long reach wavelength (LRWL), extended long wavelength (ELWL), and copper SFP/SFP+ transceivers (available reach options vary from 1 GbE, 10 GbE, and 40 GbE)</p>
<b>Fabric services</b>	<p><b>Simple Name Server (SNS);</b> Registered State Change Notification (RSCN), NTP, RADIUS, RCS (Reliable Commit Service), Dynamic Path Selection (DPS), Exchange-based routing, device-based routing, port-based routing, lossless), Brocade Advanced Zoning, Web Tools, Adaptive Networking with QoS, Extended Fabric, ISL Trunking, Fabric Vision technology, and Advanced Extension.</p> <p><b>Optional Fabric Services include:</b> Integrated Routing, (FCR), FICON CUP, FICON Management Server (FMS), and Advanced Accelerator for FICON.</p>

## Technical Specifications

<b>Licensing options</b>	<p><b>HPE SN4000B 10Gb WAN Rate Upgrade license</b></p> <ul style="list-style-type: none"> <li>This upgrade license will increase the maximum available aggregate bandwidth for all tunnels to 10Gbps.</li> </ul> <p><b>HPE SN4000B 40Gb WAN Rate Upgrade license</b></p> <ul style="list-style-type: none"> <li>This upgrade license will increase the maximum available aggregate bandwidth for all tunnels to 40Gbps. This license can only be installed when the 10Gb WAN Rate Upgrade license is already installed. If removing a WAN Rate Upgrade license, users will need to adjust the aggregate bandwidth capacity for all tunnels to lower limits before removing one or both upgrade license(s). If both the 10 Gb WAN Rate Upgrade and 40Gb WAN Rate Upgrade licenses are installed on a switch, users cannot remove the 10Gb WAN Rate Upgrade license before removing the 40Gb WAN Upgrade license.</li> </ul> <p><b>Notes:</b> The base configuration without either upgrade license will support a maximum aggregate bandwidth for all tunnels at 5Gbps. The 10Gb WAN Rate Upgrade and 40Gb WAN Rate Upgrade licenses apply to all FCIP ports on the switch. Without these licenses the switch will only allow 5Gb of FCIP traffic and the 40GbE ports will be disabled. By Adding the 10Gb WAN Upgrade license the throughput limitation is increased to 10Gbps. If the 40Gb WAN Upgrade license is added the 40GbE ports are enabled and all FCIP throughput restrictions are removed.</p> <p><b>HPE B-series Integrated Routing license:</b> Integrated Routing is an optional license which provides native Fibre Channel Routing (FCR) on a per port basis.</p> <p><b>HPE SAN Switches FICON CUP license:</b> Control Unit Port (CUP) enables host control of switches in mainframe environments</p> <p><b>HPE SN4000B FICON Accelerator license:</b></p> <ul style="list-style-type: none"> <li>Accelerates IBM zGM (XRC), FICON tape read/writes, and z/OS host connection to Teradata systems</li> </ul>	
<b>Management</b>	<b>Supported management software</b>	SSH v2, HTTP/HTTPS, SNMP v1/v3, Telnet; SNMP (FE MIB, FC Management MIB); Web Tools; Network Advisor SAN Enterprise or Network Advisor Professional/ Professional Plus (optional); HPE SANnav Management Software; Command Line Interface (CLI); SMI-S RADIUS, LDAP
	<b>Security</b>	AES-GCM-256 encryption on ISLs, AES-GCM-256 IPsec encryption on virtual ISLs (VE_Port), DH-CHAP (between switches and end devices), FCAP switch authentication; FIPS 140-2 L2-compliant, HTTPS, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, TACACS+, User-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch
	<b>Management access</b>	10/100/1000 Ethernet (RJ-45), in-band over Fibre Channel ports; serial port (RJ-45) and one USB port
	<b>Diagnostics</b>	POST and embedded online/offline diagnostics, including FCping, Pathinfo (FCtraceroute), etc.
<b>Mechanical</b>	<b>Enclosure</b>	Back-to-front airflow; 2U, 19-inch EIA-compliant, power from back
	<b>Size</b>	Width: 44 cm (17.3 in.) Height: 8.6 cm (3.2 in.) Depth: 60.9 cm (24.01 in.)
	<b>System weight</b>	19 kg (42.0 lb) with two power supplies, without SFP/SFP+

## Technical Specifications

<b>Environmental</b>	<b>Temperature</b>	Operating: 0°C to 40°C (32°F to 104°F) Non-operating: -25°C to 70°C (-13°F to 158°F)
	<b>Humidity</b>	Operating: 10% to 85% (non-condensing) Non-operating: 10% to 90% (non-condensing)
	<b>Altitude</b>	Operating: Up to 3000 m (9842 ft) Storage: Up to 12 km (39,370 ft)
	<b>Shock</b>	Operating: 20 g, 6 ms, half-sine Non-operating: 33 g, 11 ms, half-sine, 3/eg Axis
	<b>Vibration</b>	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random 5 to 500 Hz
	<b>Heat dissipation</b>	Maximum 22 ports: 590 BTU/hr
	<b>Airflow</b>	Maximum 60 CFM; nominal 44 CFM
<b>Power</b>	<b>Power supply</b>	Dual hot-swappable redundant power supplies
	<b>Power inlet</b>	C14; requires C13 plug
	<b>Input voltage</b>	85 to 264 VAC nominal
	<b>Input line frequency</b>	47 to 63 Hz
	<b>Inrush current</b>	Maximum of 60 amps for period of 10 to 150 ms
	<b>Power</b>	Short-range optics: Nominal 388 watts/1,324 BTU/hr; maximum 454 watts/1,550 BTU/hr Long-range optics: Nominal 426 watts/1,454 BTU/hr; maximum 492 watts/1,679 BTU/hr



## Summary of Changes

Date	Version History	Action	Description of Change
05-Oct-2020	Version 12	Changed	Updated physical software licenses
03-Aug-2020	Version 11	Changed	QuickSpecs layout was updated and Obso SKUs were removed
06-Apr-2020	Version 10	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated
03-Feb-2020	Version 9	Changed	Updated SANnav 5-year term-license
03-Sep-2019	Version 8	Changed	Updated SANnav details
05-Nov-2018	Version 7	Changed	Overview, Product Highlights, Service and Support, Standard Features and Configuration Information sections were updated SKUs descriptions were updated Obsolete SKUs were removed
23-Oct-2017	Version 6	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
07-Jun-2016	Version 5	Changed	Updated SAN network advisor SKU/E-LTU and added Smart SAN details
08-Apr-2016	Version 4	Changed	Changes made to the Services Sections
16-Feb-2016	Version 3	Changed	Changed made to the entire document
05-Jun-2015	Version 2	Changed	SKUs description updated, Obsolete SKUs removed (AK870A), Changed made throughout the entire document
30-Feb-2015	Version 1	New	New QuickSpecs



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