

Overview

HPE B-series SN6600B Fibre Channel Switch

Today's mission-critical storage environments require greater consistency, predictability, and performance to keep pace with growing business demands. Faced with explosive data growth, data centers need more IO capacity to accommodate the massive amounts of data, applications, and workloads. In addition to this surge in data, collective expectations for availability continue to rise. Users expect applications to be available and accessible from anywhere, at any time, on any device.

To meet these dynamic and growing business demands, organizations need to deploy and scale up applications quickly. As a result, many are moving to higher Virtual Machine (VM) densities to enable rapid deployment of new applications and deploying flash storage to help those applications scale to support thousands of users. To increase agility, reduce expenses, and realize the full benefits of these architectures, organizations need the network to deliver the performance required by today's server and storage environments. In addition, storage networks are becoming increasingly important to application performance, which means that they also must become easier to administer and manage. By treating the network as a strategic part of a highly virtualized environment, organizations can increase optimization and efficiency even as they rapidly scale their environments.

The HPE SN6600B Fibre Channel Switch meets the demands of hyper-scale virtualization, larger cloud infrastructures, and growing flash-based storage environments by delivering market-leading 32 Gb Fibre Channel technology and capabilities. It provides a high-density building block for increased scalability, designed to support growth, demanding workloads, and data center consolidation in small to large-scale enterprise infrastructures. It is built for maximum flexibility, scalability, and ease of use. Organizations can scale from 24 to 64 ports with 48 SFP+ and 4 QSFP ports, all in an efficient 1U package. It also provides a simplified deployment process and a point-and-click user interface-making it both powerful and easy to use. With the SN6600B Switch organizations gain the best of both worlds: high-performance access to industry-leading storage technology and "pay-as-you-grow" scalability to support an evolving storage environment.

The SN6600B is available in eight models: Standalone models :

- HPE SN6600B 32Gb 48/24 Fibre Channel Switch
- HPE SN6600B 32Gb 48/24 Power Pack+ Fibre Channel Switch
- HPE SN6600B 32Gb 48/48 Fibre Channel Switch
- HPE SN6600B 32Gb 48/48 Power Pack+ Fibre Channel Switch

Bundled models (with 32Gb SFP+):

- HPE SN6600B 32Gb 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch
- HPE SN6600B 32Gb 48/24 Power Pack+ 24-port 32Gb Short Wave SFP+ Integrated FC Switch
- HPE SN6600B 32Gb 48/48 48-port 32Gb Short Wave SFP+ Integrated FC Switch
- HPE SN6600B 32Gb 48/48 Power Pack+ 48-port 32Gb Short Wave SFP+ Integrated FC Switch

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

Overview



HPE B-series SN6600B Fibre Channel Switch

Models

Description

SKU

HPE SN6600B 32Gb FC Switch

HPE SN6600B 32Gb 48/24 Fibre Channel Switch	Q0U54B
HPE SN6600B 32Gb 48/24 Power Pack+ Fibre Channel Switch	Q0U55B
HPE SN6600B 32Gb 48/48 Fibre Channel Switch	Q0U56B
HPE SN6600B 32Gb 48/48 Power Pack+ Fibre Channel Switch	Q0U57B
HPE SN6600B 32Gb 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U58B
HPE SN6600B 32Gb 48/24 Power Pack+ 24-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U59B
HPE SN6600B 32Gb 48/48 48-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U60B
HPE SN6600B 32Gb 48/48 Power Pack+ 48-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U61B



Standard Features

Key Features and Benefits

- Delivers 32 Gbps performance with up to 64 ports in an energy-efficient, 1U form factor, providing maximum flexibility for diverse deployment and cooling strategies
- Features Ports on Demand (PoD) capabilities for fast, easy, and cost-effective scaling from 24 to 48 ports in 12-port increments along with a 16-port QSFP PoD for full 64 port support.
- HPE SN6600B is available in both bundled (32Gb SFP+ included) and un-bundled variants providing flexibility to customers.
- Support high-density server virtualization, cloud architectures and flash-based storage environments
- Provides proactive, non-intrusive, real-time monitoring and alerting of storage IO health and performance with IO Insight, the industry's first integrated network sensors
- Increases resiliency by automatically discovering and recovering from device or network errors
- Simplifies troubleshooting with real-time and historical visibility in a single dashboard
- Provides a flexible, simple, and easy-to-use SAN solution with industry-leading technology
- Supports highly virtualized, flash storage with multi-tenancy and non-stop operations
- Offers best-in-class port density and scalability for midrange enterprise SAN switches, along with redundant, hot-pluggable components and non-disruptive software upgrades
- In-flight encryption (FOS 8.2.0 onwards) and compression included providing efficient link utilization.
- Yields exceptional price/performance value, exceeding comparable Ethernet storage-based alternatives

SN6600B 32Gb FC Switch

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 24, 36,48 or 64-ports in a 1U enclosure
- Provides 4, 8, 10, 16 and 32 Gbps* performance
- Employs optional Inter-Switch Link (ISL) Trunking to provide a high-speed data path between switches which enables a high speed data path between 32 Gbps switches up to 256 Gbps

Notes:* 32 Gbps performance can be obtained between two 32 Gbps capable devices.

Configuration Support

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

High-availability features

- Two integrated redundant, hot swappable power supplies with integrated cooling fans
- Enhanced Fault Detection Logic
- Parity protection on all data paths and system memory

Advanced Fabric Services

- Hardware Enforced Zoning
 - Frame Filtering
 - Built-in Web browser management tools
 - In-flight Compression/ Encryption
 - Access Gateway
 - Dynamic and System Monitoring Capabilities for High Reliability
 - Virtual Fabrics
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Standard Features

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.

Notes: To order factory integration, add #0D1 after the part number on your sales order.

Software Components, Standard, Base Models

Frame Filtering

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

Advanced Zoning

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

Web Tools

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

In-flight Encryption

In-flight encryption provides security for frames while they are in flight between two switches. This allows frames to be encrypted at the egress point of an ISL between two B-series switches, and then to be decrypted at the ingress point of the ISL. This can be enabled (FOS 8.2.0 and above) for both E_Ports and EX_Ports on a per-port basis and no additional license is required.

In-flight Compression

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

Adaptive Networking

Adaptive Networking (AN) is a family of technologies which allow flexible control of traffic movement within the fabric which deliver application aware management of fabric resources. Applications may be used with multiple protocols and multiple classes of service. It includes the following features:

- **Ingress Rate Limiting:**
 - Allows the ingress bandwidth of a port to be throttled to a rate lower than negotiated with the SAN node. This could be very useful for enterprises offering stepped levels of service and enforcing SLAs.
 - **Quality of Service (QoS):**
 - Enables zones with high, medium, and low priorities within a fabric on a zone by zone basis. This can be very useful for prioritizing array replication over MANs and WANs over less critical traffic.
 - **Traffic Isolation Zones:**
 - Defines paths through a fabric for some or all nodes. Failover allows a non-preferred path to be used if the preferred fails. TIZs use failover by default but it can be disabled if traffic should stop if a preferred path fails. TIZ can be used to manually map out traffic flows within a fabric based on application, priority, and topology.
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Standard Features

Software Components, Optional

SN6600B 32Gb Switch Power Pack+ Software Bundle

The Power Pack+ Software Bundle comes with the SN6600B 32Gb 48/24 Power Pack+ Switch and SN6600B 32Gb 48/48 Power Pack+ Switch (for both standalone and 32Gb SFP+ integrated switch models). The customers can purchase it separately as an optional software bundle for the SN6600B 32Gb 48/24 FC Switch and the SN6600B 48/48 FC Switch (both standalone and 32Gb SFP+ bundles switch). It includes the following:

- Fabric Vision
- Extended Fabric
- ISL Trunking

Fabric Vision

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. It Includes

- IO Insight: Proactively and non-intrusively monitors storage device IO performance and behavior through integrated network sensors at the storage tier, providing deep insight into problems and ensuring service levels
- 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. 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 SANnav Management Portal that contains all critical SAN information for convenient review and analysis

Extended Fabric

Optional license which extends all of the scalability, reliability, and performance benefits of Fibre Channel Storage Area Networks (SANs) beyond the native 10 km distance specified by the Fibre Channel standard.

ISL Trunking

For high performance enhanced Trunking, this optional license logically groups up to eight 32 Gbps SFP+ ports per ISL trunk or up to two 128 Gbps QSFP ports per ISL trunk to provide a high bandwidth trunk between two switches. Each 32Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 256Gb) when routing connections between 32Gb switches. Connections are load-balanced across the individual links, which comprise the logical trunk group.

Integrated Routing

Integrated Routing is an optional license which provides native Fibre Channel Routing (FCR) on a per-port basis, rather than limiting routing ports to those on a dedicated routing switch or blade. Just like traditional FCR, Integrated Routing uses EX_Ports to import/export devices between fabrics, enabling selective device sharing while maintaining remote fabric isolation. Integrated Routing provides architecture flexibility to route on a port-by-port basis, enabling increased scalability and fault isolation.



Standard Features

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.
- 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.

SAN Network Advisor Enterprise and Professional+

HPE SAN Network Advisor Enterprise and Professional+ are the enterprise-class products that support FOS products. SAN Network Advisor Enterprise provides complete B-series Director Management including enterprise-class features/environments such as, Fibre Channel Routing, FCIP, adaptive networking, etc. while SAN Network Advisor Professional+ provides the same feature set except for support for the DC SAN Backbone Director, SN8000B 8-SlotDirector and FICON.

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

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>

HPE Smart SAN for 3PAR

HPE Smart SAN, optional software for HPE 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 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.

Notes:

- Supports B-series 32Gb, 16Gb and 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.



Service and Support

Warranty

(1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (standard business hours, next business day response) and 1-year labor.

Notes:

- The hardware warranty covers firmware and embedded non-saleable software. For extended hardware installation and maintenance information, click the link below: <https://ssc.hpe.com>
 - Certain restrictions and exclusions apply. Consult the Customer Support Center for details.
 - Hardware or Software product installation is not included in the warranty, but is available and highly recommended.
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Service and Support

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.

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



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.

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.

Optimized Care

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 HPE. This Service combines three years' proactive reporting and advice with our highest level of hardware support – the HPE 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>

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>

Basic Care

HPE Foundation Care 24x7, three-year Support Service –

HPE Foundation Care 24x7 gives you access to HPE 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 HPE your first call to help resolve hardware or software problems. <https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA4-8876ENW>

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

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/5981-8527ENW.pdf>



Service and Support

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.hpe.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.

Parts and Material

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.

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 www.hpe.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 personalize 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.

For more information

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 HPE and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE 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/>



Configuration Information

Step 1 - Base Configuration (Select one)

Description	SKU
HPE SN6600B 32Gb 48/48 Power Pack+ Fibre Channel Switch	Q0U57B
Notes:	
<ul style="list-style-type: none"> – 32Gb 48-port FC Switch with 48 active ports; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning and Power Pack+ software of Fabric Vision, ISL Trunking and Extended Fabric – Requires optical transceivers listed below. 	
HPE SN6600B 32Gb 48/48 Power Pack+ 48-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U61B
Notes: 32Gb 48-port FC Switch with 48 active ports bundled with 48 32Gb SFP+; accessory kit (rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, and Power Pack+ software of Fabric Vision, ISL Trunking and Extended Fabric.	
HPE SN6600B 32Gb 48/24 Power Pack+ Fibre Channel Switch	Q0U55B
Notes:	
<ul style="list-style-type: none"> – 32Gb 48-port FC Switch with 24 active ports; accessory kit (rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, and Power Pack+ software of Fabric Vision, ISL Trunking, and Extended Fabric – Requires optical transceivers listed below. 	
HPE SN6600B 32Gb 48/24 Power Pack+ 24-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U59B
Notes: 32Gb 48-port FC Switch with 24 active ports bundled with 24 32Gb SFP+; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, and Power Pack+ software of Fabric Vision, ISL Trunking and Extended Fabric	
HPE SN6600B 32Gb 48/48 Fibre Channel Switch	Q0U56B
Notes:	
<ul style="list-style-type: none"> – 32Gb 48-port FC Switch with 48 active ports; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning. – Requires optical transceivers listed below. 	
HPE SN6600B 32Gb 48/48 48-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U60B
Notes: 32Gb 48-port FC Switch with 48 active ports bundled with 48 32b SFP+; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning.	
HPE SN6600B 32Gb 48/24 Fibre Channel Switch	Q0U54B
Notes:	
<ul style="list-style-type: none"> – 32Gb 48-port FC Switch with 24 active ports; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning. – Requires optical transceivers listed below. 	
HPE SN6600B 32Gb 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U58B
Notes:	
<ul style="list-style-type: none"> – 32Gb 48-port FC Switch with 24 active ports bundled with 24 32Gb SFP+; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning. – 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 listed first and the physical version is second. 	

Configuration Information

Step 2 – Options

Description

SKU

Fibre Channel Transceivers

HPE B-series 4x32Gb 4-pack Short Wave QSFP Transceiver	Q2R28A
Notes: This QSFP requires minimum version of FOS 8.1.0a	
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 16Gb SFP+ Short Wave Transceiver	QK724A
HPE B-series 4x16Gb SW QSFP+ 100m 16-pack Transceiver	H6Z76A
HPE B-series 4x16 Short Wave QSFP Transceiver	K2Q87A
HPE B-series 16Gb LW 25km FC SFP 1-pack Transceiver	H6Z29A
HPE B-series 16Gb SFP+ Long Wave 10km Transceiver	QK725A
HPE B-series 10Gb SFP+ Short Range Transceiver	QK726A
HPE B-series 10Gb SFP+ Long Range Transceiver	QK727A

HPE SN6600B supports the following HPE Complete SmartOptics 16Gb Transceivers—16G FC embedded DWDM Solution
For more information regarding Smartoptics SKUs/Accessories/Cables and ordering rules please refer HPE Complete Smartoptics QuickSpecs. <https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=c05205226>

Accessories

HPE B-series 4G USB Drive	N9Y63A
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Optical Cables

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

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 MPO/MPO OM4 100m (12ft) Cable	H6Z30A



Configuration Information

Description

SKU

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 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 4xLC 30m Cbl	Q1H68A
HPE Premier Flex MPO to 4 x Lucent Connector 50m Cable	Q1H69A

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

Step 3 - Optional Software*

Notes:

- For Fabric OS (FOS) minimum requirements, please refer to: <https://www.hpe.com/storage/spock>
- 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 listed first and the physical version is second.

Software for SN6600B 32Gb FC Switch

HPE SN6600B 12-port Fibre Channel Upgrade E-LTU	Q0T76AAE
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Notes: (Physical License - Q0T76A)

- 12-port upgrade license for -
- SN6600B 32Gb 48/24 FC Switch (Q0U54B),
- 48/24 Power Pack+ FC Switch (Q0U55B),
- 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U58B) and 48/24 Power Pack+ 24-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U59B).

Configuration Information

Description	SKU
HPE SN6600B 16-port 4xQSFP Upgrade E-LTU	Q0T77AAE
Notes: (Physical License – Q0T77A)	
<ul style="list-style-type: none"> • 16-port upgrade license to activate QSFP ports for - • 48/24 Fibre Channel Switch (Q0U54B), • 48/24 Power Pack+ Fibre Channel Switch (Q0U55B), • 48/48 Fibre Channel Switch (Q0U56B), • 48/48 PowerPack+ Fibre Channel Switch (Q0U57B), • 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U58B), • 48/24 Power Pack+ 24-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U59B), • 48/48 48-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U60B) and • 48/48 Power Pack+ 48-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U61B) 	
HPE SN6600B PowerPack+ Upgrade E-LTU	Q0T78BAE
Notes:	
<ul style="list-style-type: none"> – (Physical License – Q0T78B) – The Power Pack+ Software Bundle kit includes Fabric Vision, ISL Trunking, and Extended Fabric. 	
HPE SANnav Management Portal Base 1yr E-LTU	R3P45AAE
Notes: (Physical License – R3P45A)	
HPE SANnav Management Portal Enterprise 1yr E-LTU	R3P46AAE
Notes: (Physical License – R3P46A)	
HPE SANnav Global View 1yr E-LTU	R3P47AAE
Notes: (Physical License – R3P47A)	
HPE SANnav Management Portal Base 3yr E-LTU	R3P48AAE
Notes: (Physical License – R3P48A)	
HPE SANnav Management Portal Enterprise 3yr E-LTU	R3P49AAE
Notes: (Physical License – R3P49A)	
HPE SANnav Global View 3yr E-LTU	R3P50AAE
Notes: (Physical License – R3P50A)	
HPE SANnav Management Portal Base 5yr E-LTU	R4P29AAE
Notes: (Physical License – R4P29A)	
HPE SANnav Management Portal Enterprise 5yr E-LTU	R4P30AAE
Notes: (Physical License – R4P30A)	
HPE SANnav Global View 5yr E-LTU	R4P31AAE
Notes:	
<ul style="list-style-type: none"> – (Physical License – R4P31A) – 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. 	

Configuration Information

Description**SKU**

HPE Smart SAN for HPE 3PAR StoreServ 7200/7400/7200c/7400c/7440c/7450/7450c E-LTU

L7D48AAE

Notes: [\(Physical License - L7D48A\)](#)

HPE Smart SAN for HPE 3PAR StoreServ 8200/8400/8440/8450 E-LTU

L7D49AAE

Notes: [\(Physical License - L7D49A\)](#)

HPE Smart SAN for HPE 3PAR StoreServ 10400/10800 E-LTU

L7D50AAE

Notes: [\(Physical License - L7D50A\)](#)

HPE Smart SAN for HPE 3PAR StoreServ 20800/20450/20850 E-LTU

L7D51AAE

Notes: [\(Physical License - L7D51A\)](#)

HPE B-series Integrated Routing E-LTU

T5528BAE

Notes: 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>



Technical Specifications

Family Information

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base
Targeted Environment	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbps	8Gbps
Aggregate device bandwidth	64 - 192 Gbps	128 - 192 Gbps
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock	
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA	
FC Ports	8 Enabled 24 Max	16 Enabled 24 Max
SFP	B-series	B-series
Advanced Trunking	Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Included	Included
Form factor	1U	1U
Zoning Software	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No
Hot plug fans	No	No

Features	SN3000B 16 Gb FC Switch	SN3600B 32 Gb FC Switch	SN6000B 16Gb FC Switch and SN6000B 16Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	16 Gbps	32 Gbps	16Gbps
Aggregate device bandwidth	384 – 768 Gb full duplex	768 Gb end-to-end full duplex	384- 768 Gb
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock		
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP7, P6000/EVA, P2000/MSA		
FC Ports	12 or 24 enabled 24 Max	8 or 24 Enabled 24 Max	24 or 48 Enabled 48 Max
SFP	B-series	B-series	B-series
Advanced Trunking	Included with Power Pack+ 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	Optional	No	Yes
Hot plug fans	Yes (integrated with power supply)	Yes (integrated with power supply)	Yes (integrated with power supply)



Technical Specifications

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

Features	1606 Extension SAN Switch	SN4000B SAN Extension Switch
Targeted Environment	Data Centers	Data Centers
Fibre Channel Port Bandwidth	8Gbps	16Gbps
Ethernet	1Gbps Ethernet	1/10/40Gbps Ethernet
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock	
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA	
FC Ports	4 or 16 Enabled 16 Max	24 Enabled 24 Max
Ethernet Ports	2 or 6 Enabled 6 Max	16 ports 1/10GbE Enabled 16 Max 2 – 40GbE ports
SFP	B-series	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included
Adaptive Networking	Included	Included
Form factor	1U	2U
Zoning Software	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes
Hot plug fans	Yes	Yes



Technical Specifications

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	16.2 Tbps
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock	
Storage system support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA	
Ports	Up to 512 SFP	384 32 Gbps ports or a 512-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	Brocade 16Gb SAN Switch for HPE c-Class BladeSystem	Brocade 8Gb SAN Switch for HPE c-Class BladeSystem	Brocade 16Gb Fibre Channel SAN Switch Module for HPE Synergy
Targeted Environment	Enterprise, Datacenters, Workgroups, Departments	Workgroups, Departments	Enterprise, Datacenters, Workgroups, Departments
Port Bandwidth	16 Gbps	8 Gbps	16 Gbps
Aggregate device bandwidth	448 Gbps	192 Gbps	576 Gbps
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock		
Storage system Support	3PAR StoreServ, StoreVirtual 4000, P9000/XP, P6000/EVA, P2000/MSA		
Ports	12 external /16 internal	4 or 8 external / 8 or 16 internal	8 SFP+ external, 4 QSFP external /12 internal
SFP	B-series	B-series	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Included	Included	Included
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



Technical Specifications

System Architecture

Fibre Channel ports	Switch mode (default): Minimum of 24 ports and maximum of 64 ports configuration. Port numbers above minimum are enabled through 12-port SFP+ increments via Ports on Demand (PoD) licenses and through one 4-port QSFP PoD, providing 16-port increments through a license; E_Ports, F_Ports, D_Ports, EX_Ports.
Scalability	Full fabric architecture with a maximum of 239 switches: https://support.hpe.com/hpsc/doc/public/display?docId=c00403562
Certified maximum	6,000 active nodes; 56 switches, 19 hops in Fabric OS® fabrics; larger fabrics certified as required Refer to SAN Design Guide for current configuration information: https://support.hpe.com/hpsc/doc/public/display?docId=c00403562
Interoperability	<ul style="list-style-type: none"> • 8/8 SAN Switch • 8/24 SAN Switch • 1606 Extension SAN Switch • SN4000B SAN Extension Switch • SN8000B 8-Slot SAN Backbone Director • SN8000B 4-Slot SAN Director • SN6500B Fibre Channel Switch • SN6000B Fibre Channel Switch • SN3000B Fibre Channel Switch • Brocade 8Gb SAN Switch for HPE BladeSystem c-Class • Brocade 16Gb SAN Switch for HPE BladeSystem c-Class • Brocade 16Gb Fibre Channel SAN Switch Module for HPE Synergy
Performance	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; 28.05 Gbps, full duplex; 112.2 Gbps, full duplex; auto-sensing of 4, 8, 16, 32 Gbps port speeds and capable of supporting 128 Gbps speeds; 10 Gbps optionally programmable to fixed port speed.
ISL Trunking	Frame-based trunking with up to eight 32 Gbps ports per ISL trunk; up to two 128 Gbps QSFP ports per ISL trunk. Exchange-based load balancing across ISLs with DPS included in Fabric OS. There is no limit to how many trunk groups can be configured in the switch.
Aggregate bandwidth	2 Tbps
Maximum Fabric latency	Latency for locally switched ports is 700 ns; compression is 1 µs per node
Maximum frame size	2112-byte payload
Frame buffers	15,360 dynamically allocated
Classes of service	Class 2, Class 3, Class F (Inter-switch frames)
Port types	D_Port (ClearLink Diagnostic Port), E_Port, EX_Port, F_Port, AE_Port; optional port-type control Access Gateway mode: F_Port and NPIV-enabled N_Port
Data traffic types	Fabric switches supporting unicast
Media types	Hot-pluggable, B-Series Branded QSFP, MPO connector, Small Form Factor Pluggable (SFP), LC connector; Short-Wave Laser (SWL), Long-Wave Laser (LWL); distance depends on fiber-optic cable and port speed. Supports QSFP (128Gbps), SFP+ (32/16/10/8 Gbps) optical transceivers.
USB	One USB port for system log file downloads or firmware upgrades



Technical Specifications

Fabric services	Monitoring and Alerting Policy Suite (MAPS); Flow Vision; Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Fabric Performance Impact (FPI) monitoring; Slow Drain Device Quarantine (SDDQ); Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning, peer zoning, target-driven zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB Credit Recovery; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; NPIV; Time Server; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric); Read Diagnostics Parameter (RDP)
Extension	Fibre Channel, in-flight encryption/compression; integrated optional 10 Gbps Fibre Channel for DWDM MAN connectivity
Options	SFP media, USB Device

Management

Management software supported	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog, Advanced Web Tools, HPE SANnav Management Software, SAN Network Advisor Enterprise or SAN Network Advisor Professional/Professional Plus; EZ Switch, Command Line Interface (CLI); SMI-S compliant; REST API; Administrative Domains; trial licenses for add-on capabilities
Security	DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, TACACS+, user-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch
Management access	10/100/1000 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45), and one USB port
Diagnostics	ClearLink optics and cable diagnostics, including electrical/optical loopback, link traffic/latency/distance; flow mirroring; built-in flow generator; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart, optics health monitoring, power monitoring, RASttrace logging, and Rolling Reboot Detection (RRD)

Mechanicals

Enclosure	Back-to-front airflow (non-port-side intake); power from back, 1U
Size	Width: 440 mm (17.32 in.) Height: 43.9 mm (1.73 in.) Depth: 355.6 mm (14 in.)
System Weight	7.73 kg (17 lb) with two power supply FRUs, without transceivers

Environment

Operating environment	Temperature : 0° to 40° C (32° to 104° F) Humidity: 10% to 85% (non-condensing)
Non-operating	Temperature: -25° to 70° C (-13° to 158° F) Humidity: 10% to 90% (non-condensing)
Operating Altitude	Up to 3,000 m (9,842 ft)
Storage altitude	Up to 12 km (39,370 ft)
Shock	Operating: Up to 20 G, 6 ms half-sine Non-operating: Half-sine, 33 G 11 ms, 3/eg axis
Vibration	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random, 5 to 500 Hz
Heat dissipation	64 ports at 716 BTU/hr



Technical Specifications

Power

Power Supply	Dual, hot-swappable redundant power supplies with integrated system cooling fans
AC input	90 V to 264 V ~3.5 A
AC Input line frequency	47 Hz to 63 Hz
AC Power Consumption	204 W with all 64 ports populated with 48×32 Gbps SFP+ SWL optics and 4× (4×32 Gbps) QSFP SWL optics 85 W for empty chassis with no optics



Summary of Changes

Date	Version History	Action	Description of Change
06-Jul-2020	Version 15	Changed	QuickSpecs layout was updated and Branding Refresh was applied.
06-Apr-2020	Version 14	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated
03-Feb-2020	Version 13	Changed	Overview, Standard Features and Service and Support sections were updated.
03-Sep-2019	Version 12	Changed	SANnav added
02-Apr-2019	Version 11	Changed	Feature and Benefits, Product Highlights, Configuration Information, Technical Specifications sections were updated.
01-Oct-2018	Version 10	Changed	Models section SKU rollover A to B and Service and Support section was updated
14-May-2018	Version 9	Changed	Added airflow in Tech Specifications and updated links.
23-Oct-2017	Version 8	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
02-Oct-2017	Version 7	Changed	Changes made to the Tech Specs Section.
25-Sep-2017	Version 6	Changed	Changes made to the entire document.
27-Mar-2017	Version 5	Changed	Added optics and cables.
27-Jan-2017	Version 4	Changed	Added a MPO/MPO OM4 100m (12ft) Cable, and changed the Warranty Section.
16-Dec-2016	Version 3	Changed	Image was changed.
28-Nov-2016	Version 2	Changed	Version number updated to match PB.
28-Nov-2016	Version 1	New	New QuickSpecs



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