

Overview

HPE B-series SN6600B Fibre Channel Switch

Today's mission-critical storage environments require greater consistency, predictability, and performance to keep pace with business demands. Faced with explosive data growth, IT environments need more IO capacity than ever before to accommodate massive amounts of data, business critical applications, data intensive workloads, and deliver on the promise of uninterrupted availability and accessibility from anywhere, at any time, on any device.

To meet these dynamic and growing business demands, organizations need the ability to deploy and scale up applications quickly. As a result, many organizations are moving to higher Virtual Machine (VM) densities to enable rapid deployment of new applications and investing in flash storage to help those applications scale to support thousands of users. Organizations are realizing the full benefits of flash and transitioning their high-performance, latency-sensitive workloads to flash-based storage with NVMe. 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 and are looked at as a strategic footprint within highly-virtualized environments since they can deliver efficiency and optimization as they scale.

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 capabilities. The HPE SN6600B is NVMe-ready, allowing organizations to seamlessly integrate fibre channel networks with the next generation of flash storage, without a disruptive rip and replace. 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 nine 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 16Gb or 32Gb SFP+):

- HPE SN6600B 32Gb 48/24 24-port 16Gb Short Wave SFP+ Integrated FC Switch
- 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

Q0U58C & R6V47A have a mini-USB console/serial port instead of an RJ-45

Models

Description

SKU

HPE SN6600B 32Gb FC Switch

HPE SN6600B 32Gb 48/24 Fibre Channel Switch	Q0U54B
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 16Gb Short Wave SFP+ Fibre Channel Switch	R6V47A
HPE SN6600B 32Gb 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch	Q0U58B
HPE SN6600B 32Gb 48-port/24-port 24-port 32Gb Short Wave SFP+ Integrated Fibre Channel Switch	Q0U58C
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

Notes: The references to SFP+ in the description is intended to identify switches bundled with optics. The 32Gb optics are also referred to as SFP28 optics, referencing the industry standard for 32Gb optics.



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. PoD upgrades are available in 12-port upgrade kits, including both the license and 12 optics under one part number or the PoD licenses and optics can be purchased separately.
- HPE SN6600B is available in both bundled (16Gb or 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



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, or HTML5 (FOS 9.x and later), 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.

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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HPE Pointnext - Service and Support

Get the most from your HPE Products. Get the expertise you need at every step of your IT journey with **HPE Pointnext Services**. We help you lower your risks and overall costs using automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally. HPE Pointnext **Advisory Services** 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 brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake accelerates digital transformation in a distributed, edge-to-cloud world.

- Get Faster time to market.
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

Managed services to run your IT operations

HPE GreenLake Management Services provides services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

Free up resources with Operational Services from HPE Pointnext Services

HPE delivers services for IT by using proven best practices as well as automation and methodologies that have been tested and refined by HPE experts and artificial intelligence through thousands of deployments globally. Choose from the recommended services for customers purchasing from Hewlett Packard Enterprise or an authorized reseller. Services are quoted using Hewlett Packard Enterprise order configuration tools.



Service and Support

Recommended Services

HPE Pointnext Tech Care.

HPE Pointnext Tech Care is the new operational service experience for HPE products. Tech Care goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Pointnext Tech Care has been reimagined from the ground up to support a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Pointnext Tech Care is available in three response levels. Basic, which provides 9x5 business hour availability and a 2 hour response time. Essential which provides a 15 minute response time 24x7 for most enterprise level customers, and Critical which includes a 6 hour repair commitment where available and outage management response for severity 1 incidents.

<https://www.hpe.com/services/techcare>

HPE Pointnext Complete Care

HPE Pointnext Complete Care is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimizing your entire IT environment and achieving agreed upon IT outcomes and business goals through a personalized and customer-centric experience. All delivered by an assigned team of HPE Pointnext Services experts. HPE Pointnext Complete Care provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

<https://www.hpe.com/services/complecare>

Other related services from HPE Pointnext 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>

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.



Service and Support

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 QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

Defective Media Retention

An option available with HPE Pointnext Complete Care and HPE Pointnext Tech Care and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a brand-new digital and data driven customer experience.

Sign into the customer engagement platform, featuring modern self-serve case creation and management capabilities with inline knowledge recommendations. You will find powerful troubleshooting support through a new intelligent virtual agent with seamless transition when needed to a live support agent. <https://support.hpe.com/hpesc/public/home/signin>

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.hpe.com/support/hpesc>

Hewlett Packard Enterprise 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

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 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:

- 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.
- Does not require use of Secure optics however Secure optics can be used.

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

- Does not require use of Secure optics however Secure optics can be used.

HPE SN6600B 32Gb 48/48 Fibre Channel Switch

Q0U56B

Notes:

- 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.
- Does not require use of Secure optics however Secure optics can be used.

HPE SN6600B 32Gb 48/24 Fibre Channel Switch

Q0U54B

Notes:

- 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.
- Does not require use of Secure optics however Secure optics can be used.

HPE SN6600B 32Gb 48/24 16Gb Short Wave SFP+ Fibre Channel Switch

R6V47A

Notes:

- 32Gb 48-port FC Switch with 24 active ports bundled with 24 16Gb SFP+; accessory kit (Rackmount kit, enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, mini USB serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning.
- The console/serial port on this version has a mini-USB instead of the RJ45 connector. The switch comes with a mini-USB to RJ45 serial cable and a RJ45 to RS-232 adapter to connect to the host.
- 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.
- **Requires the use of Secure optics**

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

Q0U58B

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, mini USB serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning.



Configuration Information

- The console/serial port on this version has a mini-USB instead of the RJ45 connector. The switch comes with a mini-USB to RJ45 serial cable and a RJ45 to RS-232 adapter to connect to the host.
- 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.
- Does not require use of Secure optics however Secure optics can be used.

SKU

Description

HPE SN6600B 32Gb 48-port/24-port 24-port 32Gb Short Wave SFP+ Integrated Fibre Channel Switch

Q0U58C

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, mini USB serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning.
- The console/serial port on this version has a mini-USB instead of the RJ45 connector. The switch comes with a mini-USB to RJ45 serial cable and a RJ45 to RS-232 adapter to connect to the host.
- 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.
- **Requires the use of Secure optics**

HPE SN6600B 32Gb 48/48 48p SFP+ Integrated Fibre Channel Switch

Q0U60B

- 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, mini USB serial cable, base software of Advanced Fabric OS, Advanced Web Tools and Advanced Zoning.
- The console/serial port on this version has a mini-USB instead of the RJ45 connector. The switch comes with a mini-USB to RJ45 serial cable and a RJ45 to RS-232 adapter to connect to the host.
- 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.
- Does not require use of Secure optics however Secure optics can be used.



Configuration Information

Step 2 – Options

With the release of FOS 9.0 the SN6600B will have mixed optic support dependent on the model as outlined below:

- Support Secure optics ONLY:
 - Models: Q0U58C & R6V47A
- Support Secure and Standard optics:
 - Models: Q0U54A/B, Q0U55A/B, Q0U56A/B, Q0U56A/B, Q0U57A/B, Q0U58A/B, Q0U59A/B & Q0U60A/B

Fibre Channel Transceivers – Standard

HPE B-series 4x16 Short Wave QSFP Transceiver	K2Q87A
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 4x32Gb 8-pack Short Wave QSFP Transceiver	Q2R29A
Notes: This QSFP requires minimum version of FOS 8.1.0a	
HPE B-series 4x32Gb 16-pack Short Wave QSFP Transceiver	Q2R30A
Notes: This QSFP requires minimum version of FOS 8.1.0a	
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 4x32Gb 1-pack Long Wave 2km QSFP Transceiver	Q2R31A
Notes: This QSFP requires minimum version of FOS 8.1.0a	
HPE B-series 16Gb SFP+ Short Wave Transceiver	QK724A
HPE B-series 4x16Gb SW QSFP+ 100m 16-pack Transceiver	H6Z76A



Configuration Information

Description

SKU

Fibre Channel Transceivers – Secure

HPE B-series 16Gb SFP+ Short Wave 1-pack Secure Transceiver	R6B10A
HPE B-series 16Gb SFP+ Short Wave 8-pack Secure Transceiver	R6W28A
HPE B-series 16Gb SFP+ Long Wave 10km 1-pack Secure Transceiver	R6B11A
HPE B-series 32Gb SFP28 Short Wave 1-pack Secure Transceiver	R6B12A
HPE B-series 32Gb SFP28 Short Wave 8-pack Secure Transceiver	R6W26A
HPE B-series 32Gb SFP Extended Long Wave 25km 1-pack Secure Transceiver	R7M17A
HPE B-series 32Gb SFP28 Long Wave 10km 1-pack Secure Transceiver	R6B13A
HPE B-series 10Gb SFP+ Short Wave 1-pack Secure Transceiver	R6B14A
HPE B-series 10Gb SFP+ Long Wave 10km 1-pack Secure Transceiver	R6B15A
HPE B-series 4x50Gb QSFP56 Short Wave Inter Chassis Link 1-pack Secure Transceiver	R6B19A
HPE B-series 4x32Gb QSFP28 Short Wave 100m 1-pack Secure Transceiver	R6B20A
HPE B-series 16Gb SFP+ Extended Long Wave 25km 1-pack Secure Transceiver	R6B21A

Fibre Channel Transceivers – Other

HPE SN6600B supports HPE Complete SmartOptics 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> and **Brocade Fabric OS Open Systems**

Compatibility Matrix

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 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



Configuration Information

Description

	SKU
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 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

Port on Demand (PoD) Kits

With the release of FOS 9.0, the SN6600B will have mixed PoD upgrade support dependent on the model as outlined below

- Models: Q0U58C & R6V47A
 - Support PoD Kits ONLY (Port upgrade license for 12 ports and 12 optics)
- Models: Q0U54A/B, Q0U55A/B, Q0U56A/B, Q0U56A/B, Q0U57A/B, Q0U58A/B, Q0U59A/B & Q0U60A/B :
 - Support PoD Upgrades listed in Software Options as well as the PoD Kits

HPE SN6600B 16Gb 12-port Short Wave SFP+ Fibre Channel Upgrade License with Transceiver Kit	R6V48A
HPE SN6600B 32Gb 12-port Short Wave SFP28 Fibre Channel Upgrade License with Transceiver Kit	R6V49A

Notes: The above PoD Kits are available as a physical upgrade package only, these are not available as an e-license because they include the optics. PoD Kits include Secure optics.

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 16-port 4xQSFP Upgrade E-LTU	Q0T77AAE
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Notes: (Physical License – Q0T77A)

- 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 16Gb Short Wave SFP+ Integrated FC Switch (R6V47A)

Configuration Information

- 48/24 24-port 32Gb Short Wave SFP+ Integrated FC Switch (Q0U58B/C),
- 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

Description

HPE SN6600B PowerPack+ Upgrade E-LTU

SKU
Q0T78BAE

Notes:

- (Physical License – Q0T78B)
- The Power Pack+ Software Bundle kit includes Fabric Vision, ISL Trunking, and Extended Fabric.

HPE B-series Integrated Routing E-LTU

T5528BAE

Notes: Physical License - T5528B

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:

- (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.



Technical Specifications

Family Information

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	Primera, Nimble, 3PAR StoreServ, StoreVirtual ,P9500/XP7,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 Switch and SN6600B 32Gb Power Pack+ Switch	SN6700B 64Gb FC Switch
Targeted Environment	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	32 Gbps	64Gb
Aggregate device bandwidth	2 Tbps	3.5 Tbps
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock	
Storage system support	Primera, Nimble, 3PAR StoreServ, StoreVirtual , P9500/XP, MSA	
FC Ports	24 or 48 enabled 64 Max	24 Enabled 56 Max
SFP	B-series Optics (16Gb or 32Gb)	B-series Secure 24 32Gb SFP28 or 64Gb SFP56 included
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included in Power Pack+ on all switches
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)



Technical Specifications

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	Primera, Nimble, 3PAR StoreServ, StoreVirtual , P95000/XP, 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+	SN8700B 8-Slot SAN Director Power Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers	Cloud Optimized Data Centers
Port Bandwidth	Up to 16Gbps	Up to 32 Gbps	Up to 64Gbps
Aggregate device bandwidth	10.2Tbps	16.2 Tbps	31 Tbps
OS Support	Notes: Please Refer to SPOCK https://www.hpe.com/storage/spock		
Storage system support	Primera, Nimble, 3PAR StoreServ, StoreVirtual P9500/XP, MSA		
Ports	Up to 512 SFP	384 32 Gbps ports or a 512-port equivalent with 128 Gbps (32 Gbps×4 QSFP ports)	512 ports - 384 device ports with a 64Gbps data rate plus 32 4x50Gbps ICLs or 640 ports - 512 device ports with a 32Gbps data rate plus 32 4x50Gbps ICLs
SFP	B-series	B-series	B-series Secure
Advanced Trunking	Included with Power Pack	Included with Power Pack	Included with Power Pack
Adaptive Networking	Included	Included	Yes (included)
Form factor	14U	14U	14U
Zoning Software	Yes (included)	Yes (included)	Yes (included)
Hot plug, redundant power supplies	Yes	Yes	Yes
Hot plug fans	Yes	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
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	Primera, Nimble, 3PAR StoreServ, StoreVirtual P9500/XP, 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 • Brocade 32Gb Fibre Channel SAN Switch Module for HPE Synergy • SN3600B Fibre Channel Switch • SN6600B Fibre Channle Switch • SN6650B Fibre Channel Switch • SN8600B 8-Slot SAN Director • SN8600B 4-Slot SAN Director • SN8700B 8-Slot SAN Director • SN8700B 4-Slot SAN Director • SN6700B Fibre Channel Switch
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 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	HTTPS/HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog, Advanced Web Tools, HPE SANnav Management Software, SAN Network Advisor Enterprise ; HPE Network Orchestrator, 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, Secure boot, TLS v1.2/v1.3
Management access	10/100/1000 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45 or min-USB), and one USB port The console/serial port may be an RJ-45 or a mini-USB depending on model. The correct cables and adapters are provided to connect to either an RJ-45 or RS-232.
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, RAStrace 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



Technical Specifications

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

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
13-Dec-2021	Version 21	Changed	Configuration Information section was updated.
01-Nov-2021	Version 20	Changed	Clarified SFP28 32Gb optics references & added back QOU58/60B
04-Oct-2021	Version 19	Changed	Service and Support section was updated Obso SKU was removed
02-Aug-2021	Version 18	Changed	Service and Support and Configuration Information sections were updated.
07-June-2021	Version 17	Changed	Added 16Gb and 32Gb 8-Pack Secure Transceivers
07-Dec-2020	Version 16	Changed	Overview, Standard Features and Service and Support sections were updated.(FOS 9.0, Secure Optics, PoD Kits and New 16Gb offering)
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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