Overview

HPE Storage Fibre Channel Switch C-series SN6010C

HPE Storage Fibre Channel Switch C-series SN6010C 16Gb (MDS 9148S)

The HPE Storage Fibre Channel Switch C-series SN6010C 16Gb (MDS 9148S) is a high-performance, flexible, cost-effective platform providing high-density, line-rate16-Gbps ports for storage networking deployments in small, medium-sized, and large enterprise environments. The HPE Storage Fibre Channel Switch C-series SN6010C offers outstanding value by providing high-availability, flexibility, and ease of use at a cost-effective price in a compact one-rack-unit (1RU) form factor. With the ability to expand from 12 to 48 ports in 12-port increments, the SN6010C offers the densities required to scale from an entry-level departmental switch to top-of-rack switch to edge connectivity in enterprise SANs. The HPE Storage Fibre Channel Switch C-series SN6010C delivers a non-blocking architecture, with all 48 16-Gbps ports operating at line rate concurrently.

The HPE Storage Fibre Channel Switch C-series SN6010C supports the C-series Device Manager quick configuration wizard, which allows it to be deployed quickly and easily in networks of any size. Powered by C-series MDS 9000 NX-OS Software, it includes storage networking features and functions and is compatible with C-series SN8500C/SN8700C (MDS 9700) Series Multilayer Directors, C-series MDS 9100 series Multilayer Fabric Switches, MDS 9200 series Multi-service Switches, and MDS 9300 series Multilayer Fabric Switches providing transparent, end-to-end service delivery in core-edge deployments.

HPE Storage Fibre Channel Switch C-series SN6010C

Standard Features

Key Features and Benefits

- **High Performance with exceptional flexibility at a low cost**
  - Up to 768 Gbps of aggregate bandwidth in a 1 rack unit (RU)
  - Up to 48 autosensing Fibre channel ports capable of speeds of 4/8/16 Gbps
  - Pay as you grow flexibility with on-demand port activation licenses
- **Intelligent storage networking services at a cost-effective price**
  - N-Port ID Virtualization (NPIV) technology to provide independent management for each virtual machine
  - N-Port Virtualization (NPV) and fabric-port (F-port) channeling features to enable scaling of SANs without reaching Fibre Channel domain ID limits
- **High Availability Platform**
  - Designed for environments in which downtime is unacceptable
  - Non-disruptive software upgrades, dual hot swappable power supplies, and hot swappable fans
  - VSANs for fault isolation and PortChannels for Inter-Switch Link (ISL) resiliency
- **Simplified Management**
  - Supports SAN plug and play capability
  - Built in storage network management
  - Reduced total cost of ownership

Industry leading 16-Gb Performance Capability

The switch offers full non-blocking 16-Gbps Fibre Channel performance on 48 line-rate ports and an aggregate bandwidth of 768 Gbps in each direction in a 1 Rack unit form factor.

Scalability

The HPE Storage Fibre Channel Switch C-series SN6010C comes in three preconfigured models of 12 or 48 ports. The 12-port SN6010C models may be upgraded onsite to enable additional ports in 12-port increments by adding the SN6010C 12-port FC Upgrade License for total scalability of 48 ports.

Cost Effective Intelligent Storage networking

The HPE Storage Fibre Channel Switch C-series SN6010C comes standard in a compact, extremely cost-effective design that simplifies deployment and administration of small and medium-scale storage-area networks (SANs) and as an edge switch in a larger enterprise. Please note that some services listed require the optional MDS 9100 Enterprise Package License.

N-Port ID Virtualization NPIV)

N-Port ID Virtualization (NPIV), a standard Fibre Channel protocol feature, individual virtual machines assume a full identity on the SAN so that Fibre Channel services such as zoning, Quality of Service (QoS), performance monitoring, and security can be provided to each virtual machine.

VSANs

VSAN, an industry standard for fabric virtualization capabilities, enables more efficient storage network use by creating hardware-based isolated environments within a single physical SAN fabric or switch. Up to 32 VSANs are supported per switch. Each VSAN can be zoned as a typical SAN and maintains its own fabric services and management domains for added scalability and resilience. VSANs allow the cost of SAN infrastructure to be shared among more users, while helping ensure segregation of traffic and retaining independent control of configuration on a VSAN-by-VSAN basis.

PortChannels
PortChannels allow users to aggregate up to 16 physical ISLs into a single logical bundle, providing optimized bandwidth use across all links. The bundle can consist of any port from the switch, helping ensure that the bundle remains active even in the event of a port failure.

FlexAttach
The FlexAttach feature gives HPE Storage Fibre Channel Switch C-series SN6010C customers the flexibility to add, move, or replace servers easily without the need to reconfigure SAN switches or storage arrays. It provides this flexibility by virtualizing the SAN identity of a server, which enables a server to retain its SAN identity even if the server is moved or replaced.

Quality of Service (QoS)
The Quality of Service (QoS) feature allows traffic to be classified into four distinct levels for service differentiation. QoS can be applied to help ensure that Fibre Channel data traffic for latency-sensitive applications receives higher priority over throughput-intensive applications such as data warehousing.

F-port trunking and channeling
The F-port trunking feature enables multiple VSANs to be transported on the uplink from a HPE Storage Fibre Channel Switch C-series SN6010C operating in NPV mode to the core switch. This feature will allow the consolidation of uplinks ports necessary for extending VSAN connectivity to the NP device.
The F-port channeling feature enables up to 16 physical uplinks between a SN6010C switch operating in NPV mode and the core switch to be bundled into a PortChannel.
Advanced traffic management features, such as fabricwide quality of service (QoS) and Inter-VSAN Routing (IVR), among others, are included with the optional HPE MDS 9100 Enterprise Package License.

IVR (MDS 9000 NX-OS Software Release 6.2.9)
VSANs and Inter-VSAN routing (IVR) enable deployment of large-scale multisite and heterogeneous SAN topologies. Integrated VSANs in port-level hardware allow any port in a system or in a fabric to be partitioned into any VSAN. Integrated IVR provides line-rate routing between any of the ports in a system or in a fabric without the need for external routing appliances.

High Availability
The SN6010C switch is designed for environments in which downtime is unacceptable. It offers:

- Non-disruptive software upgrades
- Process monitoring and stateful process restart
- Per-VSAN fabric services
- Redundant, hot-swappable power supply and redundant, hot-swappable power supply and fan trays
- Hot-swappable C-series SFP and SFP+ optics
- PortChannels for Inter-Switch Link (ISL) resiliency
- F-port Channeling for resiliency on uplinks from a SN6010C switch operating in NPV mode
- Online diagnostics

Simplified Storage Management
The HPE Storage Fibre Channel Switch C-series SN6010C comes standard with three principal modes of management: the C-series MDS 9000 Family CLI, the Quick Configuration Wizard, and the Cisco Data Center Network Manager (DCNM).

Standard Features

Command Line Interface (CLI)

The C-series MDS 9000 Family CLI is easy to learn and delivers broad management capabilities. The C-series MDS 9000 Family CLI is an extremely efficient and direct interface designed to provide optimal capabilities to administrators in enterprise environments.

Quick Configuration Wizard

The Quick Configuration Wizard helps eliminate management complexity and creates a readily available SAN environment for small- and midsized-business (SMB) applications. The wizard allows server access to storage to be set up quickly and easily in a single step using an intuitive GUI.

Interoperability

Offers compatibility with a broad range of Hewlett Packard Enterprise servers and operating systems, as well as disk and tape storage devices; see current compatibility matrix.

Diagnostics

- Embedded diagnostics
- Network analysis

Software Components, Included

NX-OS

HPE Storage Fibre Channel Switch C-series SN6010C includes the Cisco MDS 9000 NX-OS Software operating system version 6.2(9) or higher, Cisco Data Center Network Manager (Essentials Edition), and a set of configuration, maintenance and diagnostics tools. It also includes VSAN support, PortChannels, extended fabrics, and hardware-enforced zoning.

Cisco Data Center Network Manager

Cisco Data Center Network Manager (Essentials Edition) is a responsive, easy-to-use Java application that simplifies management across multiple switches and fabrics. Cisco Data Center Network Manager enables administrators to perform vital tasks such as topology discovery, fabric configuration and verification, LUN security, monitoring, and fault resolution. All functions are available through a secure interface, which enables remote management from any location. Cisco Data Center Network Manager may be used independently or in conjunction with third-party management applications. Cisco provides an extensive API for integration with third-party and user developed management tools. Additional advanced features are available with HPE's DCNM SN6000C license mentioned below.

Notes: Starting NX-OS 9.2(1), DCNM is renamed as Nexus Dashboard Fabric Controller (NDFC). Read more at,

https://www.cisco.com/c/en/us/products/collateral/cloud-systems-management/prime-data-center-network-manager/san-innovation-ndfc-so.html

Cisco Smart Licensing and Subscription Licenses

Starting from Cisco NX-OS 9.2(2), Smart Licensing Using Policy is available for HPE C-Series switches. This enables the customer to purchase subscription-based licenses for a period of time.

For more information, refer to Cisco MDS Licensing Guide, Smart Licensing Using Policy:

https://www.cisco.com/c/en/us/td/docs/dcn/mds9000/sw/9x/configuration/licensing/cisco-mds-9000-nx-os-licensing-guide-9x/smart-licensing-using-policy.html?dtid=osscdc000283

Software Components, Optional

HPE SN6010C 12-Port Upgrade License

The flexibility of the HPE Storage Fibre Channel Switch C-series SN6010C is provided by the C-series SN6010C 12-port 16Gb FC Upgrade license, which allows the addition of twelve 16-Gbps ports. This upgrade license is appropriate for the switches that have 12 active ports by default (K2Q16A and R0Q97A).

Standard Features

Notes: This port upgrade license, D4U60AAE, is EOL and inventory is limited. Recommend maximizing quantities purchased to activate additional switch ports while you can.

HPE SN6000C Data Center Network Manager E-LTU

The "Standard" Cisco Data Center Network Manager (Essentials Edition) software that is included at no charge with the SN6610C Switch provides basic switch configuration and troubleshooting capabilities. HPE's C-series Data Center Network Manager (DCNM) License (for the SN6000C Fibre Channel Switches) extends Cisco Data Center Network Manager by advanced features such as historical performance data collection for network traffic hot-spot analysis, centralized management services and advanced application integration.

Notes: Starting NX-OS 9.2(1), DCNM is renamed as Nexus Dashboard Fabric Controller (NDFC). Read more at,

https://www.cisco.com/c/en/us/products/collateral/cloud-systems-management/prime-data-center-network-manager/san-innovation-ndfc-so.html

HPE SN6000C Enterprise Package License

HPE's C-series MDS switches have a set of advanced traffic engineering and advanced security features that are recommended for all Enterprise SANs. These features are bundled together in a management application called the HPE MDS 9100 Enterprise Package. Please refer to Cisco's MDS Enterprise Package Data Sheet for more information:

https://www.cisco.com/c/en/us/products/collateral/storage-networking/mds-9000-software-licensing/product_data_sheet09186a00801ca6ac.html

HPE C-series Advantage License (Subscription License: 1/3/5 yrs)

The HPE C-series Advantage License is a combination of Cisco Data Center Network Manager and Enterprise Package licenses. It comes with 1, 3, or 5 year terms and provisioned through Cisco Smart Licensing.

Notes: NX-OS 9.2(2) is the minimum required version for C-series Advantage Licenses.

Service and Support

Warranty

(1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (8x5, next business day response) and 1-year labor.

Notes: The hardware warranty covers firmware and embedded non-saleable software. Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

HPE Services

No matter where you are in your transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

https://www.hpe.com/services

Consulting services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

https://www.hpe.com/services/consulting

SAN Fabric Integration and Migration service

HPE Data Storage Services - SAN Fabric Integration and Migration simplifies the introduction of and migration to new HPE C-series SAN fabric devices. It helps maximize the value of your investment in your new HPE C-series SAN fabric devices by leveraging HPE Services expertise and best practices.

https://www.hpe.com/psnow/doc/a50011015enw

HPE Managed Services

HPE runs your IT operations, providing 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.

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Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

https://www.hpe.com/services/operational

Recommended Services

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service 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 Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service 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

Service and Support

HPE Complete Care Service
HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service 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/completecare

Other related services from HPE Services

HPE Lifecycle Services
HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

https://www.hpe.com/services/lifecycle

- For a list of the most frequently purchased services using service credits, see the **HPE Service Credits Menu**

HPE SAN Deployment Service
Hewlett Packard Enterprise delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.
Learn more: **https://www.hpe.com/psnow/doc/5981-8527enw?jumpid=in_lit-psnow-red**

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

Learn more: **https://h20195.www2.hpe.com/v2/Getdocument.aspx?docname=5981-9356enw**

HPE Education Services
Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.

https://www.hpe.com/services/training

Service and Support

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

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials

HPE 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.

How to purchase services
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 services at **https://ssc.hpe.com/portal/site/ssc/**

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience.
Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.

https://support.hpe.com/hpesc/public/home/signin

Consume IT on your terms
HPE GreenLake edge-to-cloud platform 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 edge-to-cloud platform 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

To learn more about HPE 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**
For more information: **http://www.hpe.com/services**

Configuration Information

The HPE Storage Fibre Channel Switch C-series SN6010C 16Gb comes preconfigured with 12 or 48 autosensing Fibre Channel ports capable of 16, 8 and 4 Gbps in a compact 1RU form factor chassis. An On-Demand Port Activation license is available for "pay as you grow" expansion in 12-port increments for up to 48 Fibre Channel ports. The port slots are empty and optical transceivers are required to utilize the ports. Shortand Long Range optical transceiver options (SFPs) are available and must be ordered separately.

Step 1 - Base Configuration (Select one)

Description	SKU
HPE SN6010C 16Gb 12-port 16Gb Short Wave SFP+ Fibre Channel Switch	R0Q97A*
HPE SN6010C 12-port 16Gb Fibre Channel Switch	K2Q16A*
HPE SN6010C 48-port 16Gb Fibre Channel Switch	K2Q17A

Notes:

- *These switches have 12 ports activated out of 48 total ports. We suggest activating all desired ports now using the Port Upgrade (POD) license below.
- This 16Gb POD License is End-of-Life (EOL) and inventory is limited; therefore, we recommend customers purchase maximum quantities of the POD license when purchasing either of the HPE SN6010C 16Gb FC Switches above.

Step 2 - Optional Software

On Demand Port Activation License

HPE SN6010C 12-port 16Gb Fibre Channel Upgrade E-LTU	D4U60AAE

Notes: This 16Gb POD License is End-of-Life (EOL). Inventory is limited therefore we recommend customers purchase maximum quantities of the POD license when purchasing either of HPE SN6010C 16Gb FC Switches above.

Management Software

HPE SN6000C Advantage 1-year E-LTU	R9N32AAE
HPE SN6000C Advantage 3-year E-LTU	R9N36AAE
HPE SN6000C Advantage 5-year E-LTU	R9N40AAE

Notes: Advantage license is a combination of Nexus Dashboard Fabric Controller (Data center Network Manager) and Enterprise Package

HPE SN6000C DCNM Switch E-LTU	R4F89AAE
HPE SN6000C Enterprise Package E-LTU	A7515AAE

Step 3 - Options

Select each required option with quantities specified:

16Gb FC Transceivers

HPE C-series 16 Gb Fibre Channel SW SFP+ Transceiver	C8S72A
HPE C-series 16 Gb Fibre Channel LW SFP+ Transceiver	C8S73A

8 Gb FC Transceivers

HPE MDS 9000 8Gb FC SFP+ Short Range Transceiver	AJ906A

Notes: Each port on the HPE Storage Fibre Channel Switch C-series SN6010C may be configured to accept Short or Long Wave SFP optical transceivers. When ordering additional transceivers for the SN6010C, remember that all the active ports must be populated with above SFP optical transceivers only. (No substitutes allowed) Using other transceivers may void product warranty. The bundled switch (R0Q97A) comes with 12 16Gb SFPs populated by default.

HPE OM3 LC-LC Optical Cables

Description	SKU
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

HPE PremierFlex OM4+ Fiber Optic Cables

HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 Fiber 50m Cable	QK731A
HPE Premier Flex 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

Technical Specifications

Family Information

	Switch Type	Maximum ports	Number of slots per chassis
HPE C-series SN8700C 4-slot/8-slot/16-slot 16/32/64Gb FC Director	Multilayer Director	4-slot: 192 16/32/64 Gbps Fibre Channel ports 8-slot: 384 16/32/64 Gbps Fibre Channel ports 16-slot: 768 16/32/64 Gbps Fibre Channel ports	Four/Eight/Sixteen
HPE Storage Switch C-series SN6730C	Multilayer Fabric Switch	Ninety-six 64 Gbps Fibre Channel ports	One fixed
HPE C-series SN6710C 64Gb Fabric Switch	Multilayer Fabric Switch	Twenty-four 64 Gbps Fibre Channel ports	One fixed
HPE C-series SN6720C 64Gb Fabric Switch	Multilayer Fabric Switch	Forty-eight 64 Gbps Fibre Channel ports	One fixed
HPE C-series SN6640C 32Gb Multi-service Switch	Multilayer Fibre Channel Switch	Up to 12 32-Gbps Fibre Channel ports, four 1/10-, two 25-, and one 40- Ethernet IP storage services ports	One fixed
HPE C-series SN6630C 32Gb Fibre Channel Switch	Multilayer Fibre Channel Switch	Up to 96 32 Gbps Fibre Channel ports	One fixed
HPE C-series SN6620C 32Gb Fibre Channel Switch	Multilayer Fibre Channel Switch	Up to 48 32 Gbps Fibre Channel ports	One fixed
HPE C-series SN6610C 32Gb Fibre Channel Switch	Multilayer Fibre Channel Switch	Up to 32 32 Gbps Fibre Channel ports	One fixed and one expansion slot
HPE C-series SN6010C 16Gb Fibre Channel Switch	Multilayer Fibre Channel Switch	Up to 48 16 Gbps Fibre Channel ports	One fixed

Notes: For additional switch support information, refer to the C-series FC Switch Connectivity Stream on the Single Point of Connectivity Knowledge (SPOCK) website at: **https://h20272.www2.hpe.com/spock/**. You must sign up for a Hewlett Packard Enterprise Passport to enable access. Once logged in, click Switches under Other Hardware in the last navigation panel of the window to access the Fibre Channel Switch Streams. Click on the C-Series FC Switch Connectivity Stream to open the document.

Minimum software requirements

MDS 9000 NX-OS Software Release 6.2(9)

Performance and port configuration

- Port speed: 16 and 8 Gbps autosensing with 16 Gbps of dedicated bandwidth per port
- Buffer credits: Up to 256 for a group of 4 ports, with a default of 64 buffer credits per port and a maximum of 253 buffer credits for a single port in the group
- Ports per chassis: Up to 48 16-Gbps ports
- Base configuration with 12 ports; additional configuration for 48 ports available.
- Upgrade ports in 12-port increments from any configuration with the port activation license
- PortChannel: Up to 16 ports in a PortChannel

Security

- VSANs
- Zoning
  - Hardware-enforced zoning
  - Logical-unit-number (LUN) zoning and read-only zones
- FC-SP for host-to-switch and switch-to-switch authentication
- Port security
- Management access
  - SSHv2
  - SNMPv3
  - IP ACLs

Compatibility

Fibre Channel protocols

- FC-PH, Revision 4.3 (ANSI INCITS 230-1994)
- FC-PH, Amendment 1 (ANSI INCITS 230-1994/AM1 1996)
- FC-PH, Amendment 2 (ANSI INCITS 230-1994/AM2-1999)
- FC-PH-2, Revision 7.4 (ANSI INCITS 297-1997)
- FC-PH-3, Revision 9.4 (ANSI INCITS 303-1998)
- FC-PI, Revision 13 (ANSI INCITS 352-2002)
- FC-PI-2, Revision 10 (ANSI INCITS 404-2006)
- FC-PI-3, Revision 4 (ANSI INCITS 460-2011)
- FC-PI-4, Revision 8 (ANSI INCITS 450-2008)
- FC-PI-5, Revision 6 (ANSI INCITS 479-2011)
- FC-FS, Revision 1.9 (ANSI INCITS 373-2003)
- FC-FS-2, Revision 1.01 (ANSI INCITS 424-2007)
- FC-FS-1, Amendment 1 (ANSI INCITS 424-2007/AM1-2007)
- FC-FS-3, Revision 1.11 (ANSI INCITS 470-2011)
- FC-LS, Revision 1.62 (ANSI INCITS 433-2007)
- FC-LS-2, Revision 2.21 (ANSI INCITS 477-2011)
- FC-AL, Revision 4.5 (ANSI/INCITS 272-1996)#
- FC-AL-2, Revision 7.0 (ANSI/INCITS 332-1999)#
- FC-AL-2, Amendment 1 (ANSI/INCITS 332-1999/AM1-2003)#
- FC-AL-2, Amendment 2 (ANSI/INCITS 332-1999/AM2-2006)#
- FC-SW-2, Revision 5.3 (ANSI INCITS 355-2001)
- FC-SW-3, Revision 6.6 (ANSI INCITS 384-2004)
- FC-SW-4, Revision 7.5 (ANSI INCITS 418-2006)
- FC-SW-5, Revision 8.5 (ANSI INCITS 461-2010)FC-GS-3, Revision 7.01 (ANSI INCITS 348-2001)
- FC-GS-4, Revision 7.91 (ANSI INCITS 387-2004)
- FC-BB-6, Revision 2.00 (ANSI INCITS 509-2014)
- FC-BB-2, Revision 6.0 (ANSI INCITS 372-2003)
- FC-BB-3, Revision 6.8 (ANSI INCITS 414-2006)
- FC-BB-4, Revision 2.7 (ANSI INCITS 419-2008)
- FC-BB-5, Revision 2.0 (ANSI INCITS 462-2010)
- FCP, Revision 12 (ANSI INCITS 269-1996)
- FCP-2, Revision 8 (ANSI INCITS 350-2003)
- FCP-3, Revision 4 (ANSI INCITS 416-2006)

Technical Specifications

- FCP-4, (BSR INCITS PN-1828-D-200x)
- FC-SB-2, Revision 2.1 (ANSI INCITS 349-2001)
- FC-SB-3, Revision 1.6 (ANSI INCITS 374-2003)
- FC-SB-3, Amendment 1 (ANSI INCITS 374-2003/AM1-2007)
- FC-SB-4, Revision 3.0 (ANSI INCITS 466-2011)
- FC-SB-5, Revision 2.00 (ANSI INCITS 485-2014)
- FC-VI, Revision 1.84 (ANSI INCITS 357-2002)
- FC-FLA, Revision 2.7 (INCITS TR-20-1998)
- FC-PLDA, Revision 2.1 (INCITS TR-19-1998)
- FC-Tape, Revision 1.17 (INCITS TR-24-1999)
- FC-MI, Revision 1.92 (INCITS TR-30-2002)
- FC-MI-2, Revision 2.6 (INCITS TR-39-2005)
- FC-MI-3, Revision 1.03 (INCITS TR-48-2012)
- FC-SP, Revision 1.8 (ANSI INCITS 426-2007)
- FC-SP-2, Revision 2.71 (ANSI INCITS 496-2012)
- FC-DA, Revision 3.1 (INCITS TR-36-2004)
- FC-DA-2, Revision 1.06 (INCITS TR-49-2012)
- FC-MSQS, Revision 3.2 (INCITS TR-46-2011)
- FAIS Revision 1.03 (ANSI INCITS 432-2007)
- FAIS-2, Revision 2.23 (ANSI INCITS 449-2008)
- FC-IFR, Revision 1.06 (ANSI INCITS 475-2011)
- Extensive IETF-standards-based TCP/IP, SNMPv3, and Remote Monitoring (RMON) MIBs
- Fibre Channel classes of service: Class 2, Class 3, and Class F
- Fibre Channel standard port types: E, F, and FL
- Fibre Channel enhanced port types: SD, ST and TE
- # Supported only at 8G FC speed

Advanced Services

Please note that some services require the optional Enterprise Package license to be activated.

- NPIV
- VSAN
- PortChannels
- NPV mode
- FlexAttach
- F-port trunking and channeling
- Flow-based and zone-based QoS
- IVR (in Cisco MDS 9000 NX-OS Software Release 6.2.9 or later)
- SPAN

Fabric Services

- Name server
- Registered state change notification (RSCN)
- Login services
- Broadcast
- In-order delivery

Diagnostic and Troubleshooting

- POST diagnostics
- Online diagnostics
- Internal loopbacks

Technical Specifications

- Fibre Channel traceroute
- Fibre Channel ping
- Fibre Channel debug
- Cisco Fabric Analyzer
- Syslog
- Port-level statistics

Management

- Access methods
  - Out-of-band 10/100/1000 Ethernet port
  - EIA/TIA-232 serial console port
  - In-band Fibre Channel over IP (FCIP)
- Access protocols
  - CLI
  - SNMP
  - SMI-S
- Security
  - RBAC using RADIUS or TACACS+ authentication, authorization, and accounting (AAA) functions
  - VSAN-based roles
  - SSHv2
  - SNMPv3

Management Applications

- Zero-touch deployment with DHCP (in Cisco MDS 9000 NX-OS Software Release 6.2.9 or later)
- C-series MDS 9000 Family CLI
- Quick Configuration Wizard
- C-series Data Center Network Manager and Device Manager
- C-series Data Center Network Manager (optional; requires C-series Data Center Network Manager license)

Availability

- Non-disruptive software upgrades
- Process monitoring and stateful process restart
- Per-VSAN fabric services
- Redundant, hot-swappable power supply and redundant, hot-swappable power supply and fan trays
- Hot-swappable SFP and SFP+ optics
- PortChannels aggregating up to 16 ports
- F-port Channeling
- Online diagnostics

Serviceability

- Configuration file management
- Call Home
- Port beaconing
- System LEDs
- SNMP traps for alerts

Environmental

- Physical dimensions (H x W x D) of 1RU: 1.72 x 17.16 x 16.34 in. (4.37 x 43.59 x 41.50 cm)
- Weight of fully configured chassis: 19.84 lb (9 kg)
- Ambient operating temperature: 32 to 104°F (0 to 40°C)
- Ambient non-operating temperature: -40 to 158°F (-40 to 70°C)
- Humidity (RH), ambient (noncondensing) operating: 10 to 90%
- Humidity (RH), ambient (noncondensing) non-operating and storage: 10 to 95%
- Operating altitude: -197 to 6500 ft (-60 to 2000 m)

Power and Cooling

- Power supplies (300W AC) (maximum of 2 per switch)
- AC Input: 100 to 240 VAC nominal (+/-10% for full range)
- Frequency: 50 to 60 Hz nominal (+/-3 Hz for full range)
- Maximum power consumption:
  - With 4-Gbps optics (48 ports fully populated): 99W with 0.89A at 110 VAC and 0.45A at 220 VAC
  - With 8-Gbps optics (48 ports fully populated): 101W with 0.90A at 110 VAC and 0.46A at 220 VAC
  - 100W (on base model config running 16G 100% traffic load at 25C)
- 125W (on fully populated config running 16G 100% traffic load at 25C)Airflow: Rear to front (toward ports)
- Cisco recommends maintaining a minimum air space of 2.5 in. (6.4 cm) between walls and chassis air vents and a minimum horizontal separation of 6 in. (15.2 cm) between two chassis to prevent overheating

Safety

- CE Marking
- UL 60950 -1
- CAN/CSA-C22.2 No. 60950 -1
- EN 60950 -1
- IEC 60950 -1
- TS 001
- AS/NZS 3260
- IEC 60825
- EN 60825
- 21 CFR 1040

EMC

- FCC Part 15 (CFR 47) Class A
- ICES-003 Class A
- EN55022 Class A
- CISPR22 Class A
- AS/NZS 3548 Class A
- VCCI Class A
- EN55024
- EN50082-1
- EN61000-3-2
- EN61000-3-3
- EN61000-6-1

Summary of Changes

Date	Version History	Action	Description of Change
03-Sep-2024	Version 28	Changed	Service and Support section was updated.
15-Apr-2024	Version 27	Changed	Rebranding Series Name applied
26-Feb-2024	Version 26	Changed	Overview, Standard Features, Configuration Information and Technical Specifications sections were updated. Added EOL note for POD License. Maintenace.
13-Nov-2023	Version 25	Changed	HPE Services Rebranding
04-Apr-2022	Version 24	Changed	Added NDFC and Subscription licenses
04-Oct-2021	Version 23	Changed	Service and Support section was updated Obso SKU was removed
02-Aug-2021	Version 22	Changed	Service and Support section was updated.
17-Aug-2020	Version 21	Changed	Added SN8700C product family information
03-Aug-2020	Version 20	Changed	QuickSpecs layout was updated and Branding Refresh was applied.
01-Jun-2020	Version 19	Changed	Modified K2Q17A SKU description and notes
03-Feb-2020	Version 18	Changed	Added DCNM Switch based license
15-Jul-2019	Version 17	Changed	Family Information and Configuration Information sections were updated.
03-Jun-2019	Version 16	Changed	Added new bundled switch offering and updated services information
03-Dec-2018	Version 15	Changed	Product Highlights, Service and Support and Configuration Information sections were updated.
01-Oct-2018	Version 14	Changed	Overview were revised.
02-Jul-2018	Version 13	Changed	Added SN6610C Switch details.
06-Nov-2017	Version 12	Changed	Updated all software license product names and part numbers to reflect move to e-licensing, updated branding of products.
07-Aug-2017	Version 11	Changed	Updated Services and Warranty urls, updated hardware dimensions and specifications, added flow-based QOS.
11-Nov-2016	Version 10	Changed	Changes applied to the entire document.
21-Oct-2016	Version 9	Changed	Changed made to the Product Highlights section.
08-Apr-2016	Version 8	Changed	Removed references to MDS 8Gb Fabric Switch for HP BladeSystem as products are, now, obsolete and updated Spock url.
20-Nov-2015	Version 7	Changed	Removing all rebranding references.
06-Nov-2015	Version 6	Changed	Corrected the buffer credit information.
18-Sep-2015	Version 5	Changed	Removed SN6000C switches as obsolete.
10-Apr-2015	Version 4	Changes	Corrected the part numbers for the 16Gb FC SFPs.
20-Feb-2015	Version 3	Changed	Removed MDS9222i as obsolete, corrected name of DCNM license, other minor formatting updates.
12-Dec-2014	Version 2	Changed	Changed Header name to HP SN6010C 16Gb Fibre Channel Switch (MDS9148S).
01-Dec-2014	Version 1	New	New QuickSpecs

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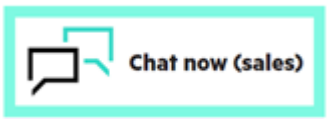

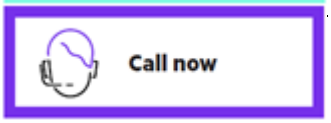

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