QuickSpecs

Overview

HPE C-series SN6010C Fibre Channel Switch

HPE SN6010C 16Gb Fibre Channel Switch (MDS9148S)

The SN6010C 16Gb Fabric Switch (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 SN6010C switch 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 SN6010C delivers a non-blocking architecture, with all 48 16-Gbps ports operating at line rate concurrently.

The 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 SN8000C (MDS 9500) and SN8500C (MDS 9700) Series Multilayer Directors and C-series MDS 9100 and 9200 Series Multilayer Fabric Switches, providing transparent, end-to-end service delivery in core-edge deployments.

HPE C-series SN6010C FC Switch

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 SN6010C switch comes in two preconfigured models of 12 or 48 ports. The 12-port SN6010C model 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 SN6010C switch 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.

Standard Features

FlexAttach

The FlexAttach feature gives SN6010C switch 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 SN6010C switch 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 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).

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.

Standard Features

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
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.

Software Components, Optional
HPE SN6010C 12-Port Upgrade License
The flexibility of the SN6010C switch is provided by the C-series SN6010C 12-port 16Gb FC Upgrade license, which allows the addition of twelve 16-Gbps ports.

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 Fabric 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. By default, a 30-day trial license (with advanced features) is enabled on the switch. Customers must purchase the HPE SN6000C DCNM E-LTU license (server-based or switch-based license) to continue to utilize the advanced DCNM features.

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

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.

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.

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 24x7monitoring, 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 **http://www.hpe.com/services/getconnected**

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

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.

Service and Support

HPE Proactive Care
Gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice.

HPE Proactive Care is available in 3, 4 and 5 year terms with a choice of response levels: Next Business day (NBD), 24x7 with a 4 hour response, and 24x7 with 6 hour call to repair (CTR). This Service combines both reactive support when there is a problem with an enhanced call experience and start to finish case management with proactive reporting and advice.
https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf

HPE Proactive Care Advanced
Incorporates all the deliverables of HPE Proactive Care plus includes personalized support from a local, assigned Account Support Manager who will share best practice advice and personalized recommendations designed to help improve availability and performance to help increase stability and reduce unplanned downtime. Leverage your system's ability to connect to HPE for pre-failure alerts, automatic call logging and parts dispatch. For business critical incidents, Proactive Care Advanced offers critical event management to help reduce mean time to resolution. HPE Service Credits are included to redeem for technical and operational services. HPE Proactive Care Advanced is offered in 3, 4, and 5 year terms with a choice of response levels: Next Business day (NBD), 24x7 with a 4 hour response, and 24x7 with 6 hour call to repair (CTR).
https://www.hpe.com/h20195/v2/getdocument.aspx?docname=4AA5-3259ENW

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

HPE Foundation Care – (choose the response level that meets your needs)
HPE Foundation Care helps when there is a problem and is available in 3, 4, and 5 year terms with a choice of response levels: Next Business day (NBD), 24x7 with a 4 hour response, and 24x7 with 6 hour call to repair (CTR). Note that Call-To-Repair Service connects you to HPE 24 hours a day, seven days a week for assistance on resolving issues -this includes our highest level commitment to repair hardware within six hours after opening your case and respond to software questions within two hours. In addition, Simplify your support experience and make HPE your first call to help resolve hardware or software problems.
https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en

Other related services from HPE Pointnext
HPE SAN Deployment Service
Hewlett Packard Enterprise delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.
http://h20195.www2.hpe.com/V2/GetPDF.aspx/5981-8527EN.pdf

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
Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. **http://www.hpe.com/ww/learn**

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

Defective Media Retention is an option available with HPE Datacenter Care, HPE Proactive Care, Proactive Care Advanced, and HPE Foundation Care and applies only to Disk or eligible SSD/Flash Drives replaced by HPE 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 **https://support.hpe.com/hpesc/public/home**

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.
NOTE :*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

The HPE SN6010C 16Gb Fabric Switch 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. Short, Medium and 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	
HPE SN6010C 16Gb 12-port 16Gb Short Wave SFP+ Fibre Channel Switch	R0Q97A
HPE SN6010C 12-port 16Gb Fibre Channel Switch	
HPE SN6010C 12-port 16Gb Fibre Channel Switch	K2Q16A
HPE SN6010C 48-port 16Gb Fibre Channel Switch	
HPE SN6010C 48-port 16Gb Fibre Channel Switch	K2Q17A

Step 2 - Optional Software

On Demand Port Activation License

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

Management Software

HPE SN6000C Data Center Network Manager E-LTU	TC364AAE
HPE C-series 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
HPE MDS 9000 8Gb FC SFP+ Long Range Transceiver	AJ907A

Notes: Each port on the 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.

Configuration Information

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 SN8500C/SN8700C 4-slot/8-slot 16/32/64Gb FC Director	Multilayer Director	4-slot: 192 16/32/64 Gbps Fibre Channel ports, 192 FCoE ports 8-slot: 384 16/32/64 Gbps Fibre Channel ports, 384 FCoE ports	Four/Eight
HPE C-series SN6630C 32Gb Fabric Switch	Multilayer Fabric Switch	Up to 96 32 Gbps Fibre Channel ports	One fixed
HPE C-series SN6620C 32Gb Fabric Switch	Multilayer Fabric Switch	Up to 48 32 Gbps Fibre Channel ports	One fixed
HPE C-series SN6610C 32Gb Fabric Switch	Multilayer Fabric Switch	Up to 32 32 Gbps Fibre Channel ports	One fixed and one expansion slot
HPE C-series SN6010C 16Gb Fabric Switch	Multilayer Fabric Switch	Up to 48 16 Gbps Fibre Channel ports	One fixed
HPE C-series SN6500C 16Gb Multi-service Switch	Multilayer Fabric Switch	Up to 40 16 Gbps FC ports, 2 fixed 10GbE FCIP ports, 8 fixed 10GbE FCoE ports	Two 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.

Technical Specifications

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)

Technical Specifications

- 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)
- 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

Technical Specifications

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

Diagnostic and Troubleshooting
- POST diagnostics
- Online diagnostics
- Internal loopbacks
- 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)

Technical Specifications

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

Technical Specifications

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
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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