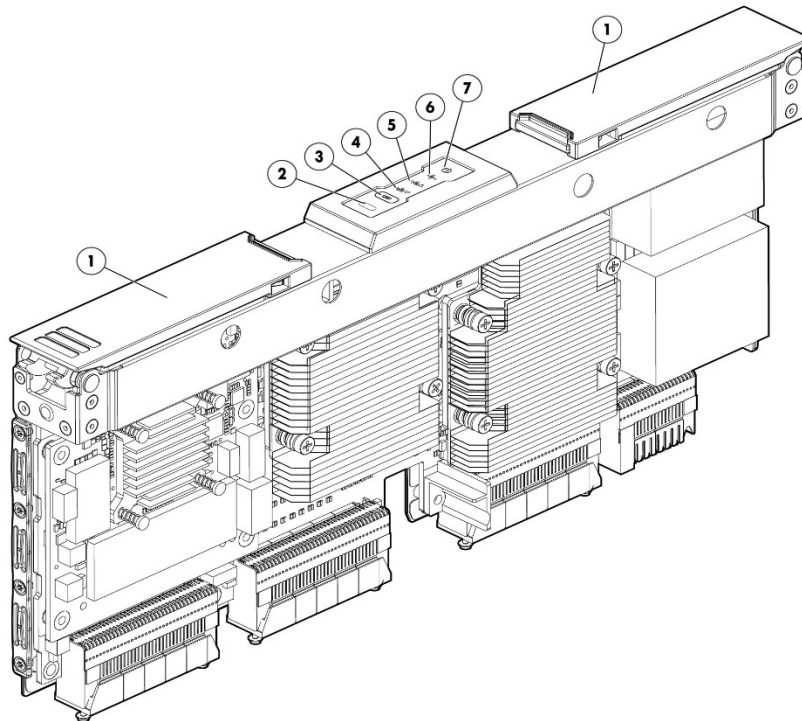


Overview

HPE Moonshot-180XGc Switch Module

The HPE Moonshot-180XGc Switch Module is designed to provide high speed, low-latency connectivity while dramatically reducing cost and complexity of deploying solutions at scale. The 180XGc Switch Module provides 1GbE and 10GbE network connections to up to 180 nodes in the HPE Moonshot 1500 System. Up to two switch modules are supported in each chassis. Failover can be enabled by stacking two switches within a single chassis or across multiple chassis.



HPE Moonshot-180XGc Switch Module

- | | |
|-------------------------------|------------------------|
| 1. Release Latch | 5. Uplink Activity LED |
| 2. Access Panel Sensor | 6. Health Status LED |
| 3. Unit ID (UID) LED / Button | 7. Power LED |
| 4. Downlink Activity LED | |
| 5. Cartridge health LED | |

Models

HPE Moonshot-180XGc Switch Module Kit

786619-B21

Standard Features

Performance

- 160Gb uplink bandwidth
 - Non-blocking architecture
 - Wire-speed switching and IPv4/IPv6 routing on all ports
 - Combine up to 8 switches into a single virtual switch
 - QSFP+ ports support 4 x 10Gb with optional breakout cable
 - Any uplink port can be used for IRF connections
 - Cut-through switching
 - Hardware-based wire-speed access control lists (ACLs)
 - Data Center Bridging (DCBX)
 - Support for VEPA (IEEE 802.1Qbg)
-

Management

- Remote configuration and management CLI
 - Standards-based SNMP management via SNMPv1, v2c and v3
 - Out of band management via iLO Chassis Manager
 - HPE IMC (Intelligent Management Center)
 - SDN with OpenFlow 1.3
 - RJ45 console port
 - sFlow
 - Manager and operator privilege levels
 - Command authorization via RADIUS
 - Complete session logging for problem resolution
 - LLDP Discovery protocol
 - IPv6 management
 - Multiple flash images
 - Multiple configuration files
 - Syslog
 - Network Time Protocol (NTP)
-

Security

- IEEE 802.1X user authentication
 - MAC-based authentication with RADIUS server
 - Access Control Lists (ACLs)
 - Secure FTP
 - STP Root Guard
 - DHCP Protection from unauthorized DHCP servers
 - IP Source Guard
 - Dynamic ARP protection to prevent eavesdropping
 - Endpoint Admission Defense (EAD)
 - RADIUS/TACACS+
 - Secure management via SSHv2 and SNMPv3
 - Unicast Reverse Path Forwarding (URPF)
 - Monitor link and Smart link
 - IPsec
 - IKE (Internet Key Exchange)
 - Disable password recovery
-

Standard Features

Level 2 Switching

- 128K MAC addresses
- 4094 VLANs
- IEEE 802.1ad QinQ VLANs
- Per VLAN Spanning Tree (PVST+)
- Private VLANs (PVLAN)
- Multicast VLAN Registration Protocol (MVRP)
- Jumbo frame support
- Port Aggregation
- Spanning Tree Protocol, MSTP, RSTP, STP Root Guard
- IP Multicast Snooping and data-driven IGMP
- Transparent Interconnect of Lots of Links (TRILL)
- Shortest Path Bridging (SPB)
- Multiple Label Switching (MPLS)
- Virtual Private LAN Service (VPLS)
- Virtual Extensible LAN (VXLAN)

Level 3 Routing

- IPv4 routing protocols - static routes, RIP, OSPF and BGP
- IPv6 routing protocols - static routes, RIPng, OSPFv3 and BGP+
- IPv6 tunneling
- IP Multicast - PIM-SSM, PIM-DM, PIM-SM, IGMP for IPv4 and IPv6
- Equal-Cost Multipath (ECMP)
- Policy-based routing
- DHCP and DHCPv6 client
- VRRP

Quality of Service (QoS)

- Advanced classifier-based QoS (with eight queues) - classifies traffic using multiple match criteria
- based on Layer 2, 3 and 4 information and applies QoS policies such as priority level and rate limit to selected traffic on a per-port or per-VLAN basis
- Traffic policing - supports Committed Access Rate (CAR) and line rate
- Powerful QoS feature - creates traffic classes based on access control lists (ACL), IEEE 802.1p precedence, IP, DSCP or Type of Service (ToS) precedence; supports filter, redirect, mirror or remark; supports the following congestion actions: strict priority (SP) queuing, weighted round robin (WRR), weighted fair queuing (WFQ), and weighted random early discard (WRED)
- Storm restraint - allows limitation of broadcast, multicast, and unknown unicast traffic rate to cut down on unwanted broadcast traffic on the network

Resiliency and High Availability

- Intelligent Resilient Framework (IRF) - Creates virtual resilient switching fabrics, up to four Moonshot-45XGc switch modules acting as a single Layer 2/3 switch; Switches do not have to be co-located and can be part of a disaster recovery system; Servers or switches can be attached using standard LACP for automatic load balancing and high availability; Simplifies network operation by eliminating Spanning Tree, ECMP and VRRP; IRF supports up to four members in a group.
 - Device Link Detection Protocol (DLDP) - Monitors Link connectivity and shuts down ports at both ends if unidirectional traffic is detected
 - Virtual Router Redundancy Protocol (VRRP)
-

Standard Features

Monitoring and Diagnostics

- OAM (802.3ah) - Detects data link layer problems in the "last mile"; monitors link status between two devices
- CFD (802.1ag) - Connectivity Fault Detection (CFD) provides L2 link OAM mechanism used for link connectivity detection and fault location
- Mirroring - Port mirroring enables traffic on a port to be simultaneously sent to a network analyzer for monitoring; Flow-based mirroring

HPE Interconnect modules

NOTE: Up to two identical pairs of Switch and Uplink modules are supported in the Moonshot 1500 System. Dual switch modules are required for network redundancy, regardless of cartridge configuration

NOTE: Check Compatibility matrix below for supported switch and uplink modules

NOTE: For information HPE ProLiant Server Cartridges and Uplink Modules, please see the following:

Cartridge:

HPE ProLiant m700p Server Cartridge

<https://psnow.ext.hpe.com/doc/PSN1009308110USEN.pdf>

HPE ProLiant m510 Server Cartridge

<https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05069171>

HPE ProLiant m710x Server Cartridge

<https://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=c05069173>

Switch:

HPE Moonshot-45Gc Switch Module

<https://www.hpe.com/us/en/servers/moonshot.html>

HPE Moonshot-45XGc Switch Module

<https://h20195.www2.hpe.com/v2/GetPDF.aspx/c04384058.pdf>

HPE Moonshot-180XGc Switch Module

<https://h20195.www2.hpe.com/v2/getdocument.aspx?docname=c04923651>

Compatibility

		Cartridge			Uplink		
Switch	Speed	m700p	m710x	m510	Moonshot-6SFP+ Uplink 704646-B21	Moonshot-16SFP+ Uplink 783263-B21	Moonshot-4QSFP+ Uplink 704652-B21
Moonshot 45Gc Switch	1Gb		X	X	X		
Moonshot 45XGc Switch	10Gb		X	X		X	X
Moonshot-180XGc Switch	1Gb	X	X	X		X	X
	10Gb		X	X		X	X

Service and Support

Service and Support

HPE Technology Services

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Services

HPE Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the selected support.

Recommended HPE Services for your HPE product (4 and 5 year Service offerings are also available)

Optimized Care

Foundation Care 24x7, three-year Service

HPE Foundation Care 24x7 connects you to Hewlett Packard Enterprise 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed. Collaborative software included in this service provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make Hewlett Packard Enterprise your first call for hardware or software questions.

<https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Standard Care

Foundation Care NBD, three-year Service

HPE Foundation Care Next Business Day (NBD) gives you support during business hours for assistance on resolving issues – features next business day hardware onsite response if needed and software with a call back within two hours. Collaborative software support is included and provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make Hewlett Packard Enterprise your first call for hardware or software Questions.

<https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Related Services

HPE Moonshot Installation & Startup Service

HPE Installation and Startup Service for the Moonshot System provides for the installation of one system and its associated ProLiant server cartridges and network switches, as well as operating system deployment and basic configuration of OS network parameters to establish network connectivity

HPE Datacenter Care service

HPE Datacenter Care helps you improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services “building blocks.” You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HPE Datacenter Care, you benefit from a personalized relationship with Hewlett Packard Enterprise via a single point of accountability for Hewlett Packard Enterprise and others’ products. For more information, visit <https://www.hpe.com/h20195/v2/getpdf.aspx/4AA4-0459ENW.pdf?ver=5.0>

HPE Self-Service Spares Service answers the question: What do you do when you need parts? We can set it up so that you get spare parts onsite through our automated self-service spares. You simply go to the part of your data center where the parts live, scan them out, scan in the broken one, and you’re done. We maintain your inventory of good spares, so that what you need is ready to go when you need it. And we provide monthly service excellence reports illustrating onsite inventory performance.

Service and Support

Connect your devices to HPE

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77% reduction in down time, near 100% diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to Hewlett Packard Enterprise support.

Defective Media Retention (DMR) and Comprehensive Defective Material Retention

If your business deals with sensitive or legally protected data, you know that it's not a simple matter to return a defective hardware component, but keeping it conflicts with the terms and conditions of many standard warranty agreements. If you don't return the component, you'll be charged for the replacement part.

HPE Foundation Care services are available with defective media retention of failed hard drives and comprehensive defective material retention of those other data-retentive components, such as memory, switches, processors and more. This may be purchased as an optional add-on to your HPE Foundation Care service purchase. This service is critical for customers who:

- Need to control and secure their classified, proprietary and confidential data.
- Are subject to current data privacy regulations.
- Want a simpler, more cost-effective solution when choosing not to return a malfunctioning disk drive or other data retentive component.

For more information on our data privacy services, see:

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

HPE Support Center

Hewlett Packard Enterprise provides several tools that make it simpler to get help from HPE:

HPE Support Center is personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more: <https://www.hpe.com/us/en/support.html>

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

HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Pointnext operational or Hewlett Packard Enterprise contractual support agreement.

NOTE: HPE Support Center Mobile App is subject to local availability.

NOTE: For more information and learn more on HPE Moonshot System, please contact your Hewlett Packard Enterprise sales representative.

Parts and Materials

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

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

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

Technical Specifications

Product Specifications Hardware

Ports

Up to one hundred eighty (180) 1 Gb Ethernet downlink ports or up to forty-five (45) 10Gb Ethernet downlink ports
Four (4) 40Gb Ethernet uplink ports OR sixteen (16) 10Gb Ethernet uplink ports
One (1) serial console interface accessible through the uplink module
One (1) internal serial interfaces to iLO Chassis Manager for use through the Virtual Serial Port (VSP)

Performance	Throughput	1.5 million pps (64-byte packets) per 1G port; 59.2 million pps per 40G port
	Switching Capacity	1040 Gbps

Memory	2 GB SDRAM, 128 MB, 22MB packet buffer per switch chip
---------------	--

Indicators / Switch	Module power, green/amber
	Module health, red/amber/green
	Module locator (UID), blue (LED & push button switch)
	Aggregated Uplink ports link/activity, green
	Aggregated Downlink ports link/activity, green

Physical Characteristics	Length	14.82 in (376 mm)
	Width	6.75 in (141 mm)
	Height	1.44 in (37 mm)
	Weight	2.298 kg (5.07 lbs)

Environmental Ranges	Temperature Range	
	Operating	50° to 95° F (10° to 35° C)
	Non-operating	-22° to 140° F (-30° to 60° C)

Relative Humidity (non-condensing)	Operating	10% to 90%
	Non-operating	5% to 95%

Altitude	Operating	10,000 ft. (3048 m)
	Non-operating	30,000 ft. (9144 m)

Power Consumption	Typical	200W
	Maximum	280W

Technical Specifications

Standards Support

General Protocols

- IEEE 802.1ag Service Layer OAM
- IEEE 802.1D MAC Bridges
- IEEE 802.1p Priority
- IEEE 802.1Q VLANs
- IEEE 802.1Qbg Virtual Edge Bridging
- IEEE 802.1s (MSTP)
- IEEE 802.1v VLAN classification by Protocol and Port
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree
- IEEE 802.1X PAE
- IEEE 802.1AX / 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3ae 10 Gigabit Ethernet
- IEEE 1588 v2 Precision Time Protocol (PTP)
- RFC 768 UDP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 TELNET
- RFC 925 Multi-LAN Address Resolution
- RFC 951 BOOTP
- RFC 1058 RIPv1
- RFC 1350 TFTP Protocol (revision 2)
- RFC 1519 CIDR
- RFC 1542 BOOTP Extensions
- RFC 2131 DHCP
- RFC 2453 RIPv2
- RFC 3768 VRRP
- RFC 4675 RADIUS VLAN & Priority
- 802.1r GARP Proprietary Attribute Registration Protocol (GPRP)

DCB

- 802.1Qaz DCBx
- 802.1Qaz ETS
- 802.1Qbb PFC
- IP Multicast
- RFC 2934 Protocol Independent Multicast MIB for IPv4
- RFC 3376 IGMPv3 (host joins only)
- RFC 3618 Multicast Source Discovery Protocol (MSDP)
- RFC 4601 PIM Sparse Mode

IPv6

- RFC 4443 ICMPv6
- RFC 4541 IGMP & MLD Snooping Switch
- RFC 4861 IPv6 Neighbor Discovery
- RFC 4862 IPv6 Stateless Address Auto-configuration

Technical Specifications

Layer 3

- Static routes
- RIP / RIPng
- OSPF / OSPFv3
- BGP / BGP+
- IPv6 tunneling
- PIM-SM
- PIM-SSM
- PIM-DM
- IGMP
- ECMP
- Policy-based routing
- DHCP and DHCPv6 client

MIBs

- IEEE 8021ag CFM-MIB
- IEEE 8021Q CFM-MIBv2
- IEEE 8021AB LLDP-MIB
- IEEE 8021AB LLDP-EXT-DOT1-MIB
- IEEE 8021AB LLDP-EXT-DOT3-MIB
- ANSI/TAA 1057 LLDP-EXT-MED-MIB
- IEEE 8023 LAG-MIB
- RFC 1213 MIB
- RFC 1493 BRIDGE-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 2233 IF-MIB
- RFC 2273 SNMP-NOTIFICATION-MIB
- RFC 2571 SNMP-FRAMEWORK-MIB
- RFC 2572 SNMP-MPD-MIB
- RFC 2573 SNMP-TARGET-MIB
- RFC 2674 P-BRIDGE-MIB
- RFC 2674 Q-BRIDGE-MIB
- RFC 3414 SNMP-USER-BASED-SM-MIB
- RFC 3415 SNMP-VIEW-BASED-ACM-MIB
- RFC 3417 SNMPv2-TM-MIB
- RFC 3418 SNMPv2-MIB
- RFC 3826 SNMP-USM-AES-MIB
- RFC 4022 TCP-MIB
- RFC 4044 FC-MGMT-MIB
- RFC 4113 UDP-MIB
- RFC 4133 ENTITY-MIB
- RFC 4273 BGP4-MIB
- RFC 4747 T11-FC-VIRTUAL-FABRIC-MIB
- RFC 4750 OSPF-MIB
- RFC 4750 OSPF-TRAP-MIB
- RFC 4936 T11-FC-ZONE-SERVER-MIB
- SFLOW-MIB (V5)

Technical Specifications

Safety and Compliance

Safety Certifications

Complies with UL 60950-1, CAN/CSA C22.2 No. 60950-1 and EN 60950-1. UL certified.

CE Marking

RoHS 6/6 compliant

Emissions Classifications (EMC)

Class A

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in or recycle information, please go to:

<https://www.hpe.com/us/en/about/environment/product-recycling.html> or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site at: <https://www.hpe.com/us/en/about/environment/product-recycling.html> These instructions may be used by recyclers and other WEEE treatment facilities as well as HEWLETT PACKARD ENTERPRISE OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
04-Mar-2019	Version 4	Changed	Standard Features, Compatibility and Service and Support sections were updated
07-Jan-2019	Version 3	Changed	Service and Support, Standard Features and Compatibility, sections were updated
18-Dec-2017	Version 2	Updated	Added new server cartridges and updated compatibility matrix
16-Feb-2016	Version 1	Created	Create the QuickSpecs for the HPE Moonshot-180XGc Switch Module



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