Overview

HPE HDR InfiniBand Switches and Cables

Mellanox InfiniBand (IB) HDR Switches are supported to work with HPE InfiniBand Adapters to deliver high performance connectivity for HPC clusters using HPE ProLiant XL and DL Server families. The 1U switches feature 40 QSFP56 ports delivering up to 16Tbps of non-blocking bandwidth with sub-90ns port-to-port latency.

Ideally suited for Customers who deploy high-performance computing (HPC) clusters based on HPE ProLiant XL and DL Servers using InfiniBand technology.

Mellanox InfiniBand HDR Switch Series

Key features

- 40 ports, each providing HDR (200Gbps) performance
- 80 equivalent ports, each providing HDR100 (100Gbps) performance, using splitter cables
- 16Tbps non-blocking aggregate bandwidth with sub-90ns port-to-port latency
- In-network computing through the Co-Design Scalable Hierarchical Aggregation Protocol (SHArP) technology
- Quick and easy setup and management
- Multiple Virtual Lanes (VLs) per physical port
- Improved performance by removing fabric congestion
- Backward compatibility to Mellanox FDR and EDR InfiniBand technology for ease of migration

Standard Features

Features and benefits

Switch Specifications

- Mellanox HDR IB 40P switches are based on Mellanox Quantum™ Switch Silicon 40-port ASIC with SHArP support
- HDR (200Gbps) per port bidirectional
- Switching capacity 16Tbps
- Virtual lanes, configurable from one to eight VLs plus one management VL
- Configurable MTU size of up to 4 KB
- Maximum multicast table size: 16384 entries
- Support QSFP56 passible copper and active optical cables
- Compliant with IBTA 1.21 and 1.3
- Adaptive Routing
- Port Mirroring

HDR100

The Mellanox Quantum™ switch, when associated with ConnectX®-6 adapters, supports the HDR100 protocol. Two HDR100 adapters attached to an HDR splitter cable can be connected to a single port on the switch. Each adapter can then deliver 100Gbps of bandwidth. In effect, this turns the Mellanox Quantum™ switch into a 80-port 100Gbps InfiniBand switch, reducing the equipment required for a given fabric when compared to the previous generation and expanding the maximum number of node of a 100Gbps two-level 1:1 fat tree topology to 1,600.

Management

- Unmanaged switches
  - Require external subnet manager on the fabric (see more description below)
- Managed switches
  - Embedded subnet manager supporting fabrics of up to 2K nodes
  - Enables command line interface and chassis management GUI through dual 100/1000 Ethernet ports
  - RS232 port over DB9
  - Enables serial console through USB serial port
  - Supports Management over IPv4 or IPv6
  - Supports SNMP v1, v2, v3

Connectors and cabling

- QSFP56 ports
- Passive copper or active optical cables

Indicators

- Per QSFP56 port status LED for link and activity
- System statues LEDs for system, fans, power supplies
- Unit ID (beacon) LED

Power Supply

- Dual redundant (1+1) hot-plug power supplies
- Frequency: 50-60Hz, single phase AC

Cooling

- Front-to-rear (power side inlet) airflow
- 6 (N+1) Hot-swappable fan units

Warranty and support

- Switches carry a 3-year warranty, On Site, next business day response
- Cables carry a 1-year warranty, parts exchange

Service and Support

Services
Mellanox HDR InfiniBand Switches should have the same attached support level as the Server and Enclosure.

Protect your business beyond warranty with HPE Support 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. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement to the support for need for your IT and business. Protect your product, beyond warranty.

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- 1. IDC 2015
- 2 HPE CSC reports 2014 – 2015

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HPE Proactive Care with 24x7 coverage, three year Support Service
HPE Proactive Care gives customers an enhanced call experience. When your products are connected to Hewlett Packard Enterprise, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your Hewlett Packard Enterprise servers.
https://www.hpe.com/us/en/services/proactive-care-central.html

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HPE Foundation Care 24x7, three-year Support Service
HPE Foundation Care 24x7 gives you access to Hewlett Packard Enterprise 24 hours a day, seven days a week for assistance on resolving issues. This service includes need based Hardware onsite response within four hours. In addition, collaborative software support is included in this service that provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make Hewlett Packard Enterprise 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

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HPE Foundation Care NBD, three-year Support Service
HPE Foundation Care Next Business Day connects you to Hewlett Packard Enterprise during business hours for assistance on resolving issues – This service features need based next business day hardware onsite response and software call back within two hours. In addition, Collaborative software support 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 to help resolve hardware or software problems.
https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en

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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.

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

Service and Support

HPE Factory Express for Servers and storage

HPE Factory Express offers configuration, customization, integration and deployment services for Hewlett Packard Enterprise servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. Hewlett Packard Enterprise products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE Apollo, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers as well as the MSAxxxx3PAR suite, XP, rackable tape libraries and configurable network switches.

HPE Technology Services Support Credits offer flexible services and technical skills to meet your changing IT demands. With a menu of service that is tailored to suit your needs, you get additional resources and specialist skills to help you maintain peak performance of your IT. Offered as annual credits, you can plan your budgets while proactively responding to your dynamic business.

HPE Datacenter Care service

HPE Datacenter Care helps 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 **http://www.hpe.com/services/datacentercare**

HPE Flexibly Capacity, a building block of HPE Datacenter Care is a pay per use model for on premise infrastructure, giving you the technology you want, the ability to manage capacity when you need it, with no upfront payment. Flexible Capacity provides the needed room to grow your environment, but only pay for actual metered use. Technology transitions with refresh can be built in, and infrastructure and services are billed monthly, enabling you to align costs to business use.

Configuration Information

Description	SKU
Mellanox InfiniBand HDR 40-port QSFP56 Unmanaged Back to Front Airflow Switch • 40 QSFP56 ports externally managed switch • 2 (1+1) Power Supplies • 2 Power cords, 6ft, C13-C14 • 6 (N+1) Fan units - Power side inlet airflow • Sliding rail rackmount kit • Quick Start Guide	P10774-B21
Mellanox InfiniBand HDR 40-port QSFP56 Managed Back to Front Airflow Switch • 40 QSFP56 ports internally managed switch • 2 (1+1) Power Supplies • 2 Power cords, 6ft, C13-C14 • 6 (N+1) Fan units - Power side inlet airflow • Sliding rail rackmount kit • 1 Serial cable (DB9 to RJ-45) • Quick Start Guide	P06249-B21

Related Options

Mellanox Unified Fabric Manager (UFM) Software Licenses

Mellanox Unified Fabric Manager Advanced 1yr 24x7 Updates and Technical Support Flex License	BD571A
Mellanox Unified Fabric Manager Advanced 3yr 24x7 Updates and Technical Support Flex License	BD572A

HPE InfiniBand HDR cables

Passive Copper cables

HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 0.5m Direct Attach Copper Cable	P06149-B21
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 1m Direct Attach Copper Cable	P06149-B22
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 1.5m Direct Attach Copper Cable	P06149-B23
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 2m Direct Attach Copper Cable	P06149-B24

Passive Copper cables

HPE InfiniBand HDR 200Gb QSFP56 to 2xQSFP56 1m Splitter Direct Attach Copper Cable	P06248-B21
HPE InfiniBand HDR 200Gb QSFP56 to 2xQSFP56 1.5m Splitter Direct Attach Copper Cable	P06248-B22
HPE InfiniBand HDR 200Gb QSFP56 to 2xQSFP56 2m Splitter Direct Attach Copper Cable	P06248-B23

Active Optical cables

HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 3m Active Optical Cable	P06153-B21
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 5m Active Optical Cable	P06153-B22
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 10m Active Optical Cable	P06153-B23
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 15m Active Optical Cable	P06153-B24
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 20m Active Optical Cable	P06153-B25
HPE InfiniBand HDR 200Gb QSFP56 to QSFP56 30m Active Optical Cable	P06153-B26

Technical Specifications

Mellanox InfiniBand HDR 40-port QSFP56 Unmanaged Back to Front Airflow Switch		P10774-B21
I/O ports and slots	40 QSFP56 ports	
Additional ports and slots	1 System reset button	
Power supplies	2 power supplies (1+1 redundant and hot-swappable)	
Fan units	6 fan units (N+1 redundant and hot-swappable)	
Physical characteristics	**Dimensions**	1.7in (H) x 17in (W) x 23.2in (D) 4.36cm (H) x 43.32cm (W) x 59.06cm (D)
	Weight	12.49kg 27.536lb
Performance	**Latency**	Sub-90ns port-to-port
	Throughput	up to 16Tbps
	Linear forwarding data base	4x48K entries
Environment	**Operating temperature**	32°F to 104°F (0°C to 40°C)
	Non-Operating temperature	-40°C to 70°C
	Operating humidity	10% to 85%
	Operating Altitude	up to 3050m
	Acoustic	ISO 7779 ETS 300 753
Electrical characteristics	**Frequency**	50/60 Hz
	Voltage	100-127VAC, 200-240VAC
	Typical power with passive cables (ATIS)	(TBD)W
	Max power with optical cables (assuming 3.5W per port)	(TBD)W
Safety	US/Canada: cTUVus EU: EN60950-1 International: IEC60950-1 Customs Union, Russian Federation, Belarus and Kazakhstan	
Emissions	USA: FCC, Class A Canada: ICES, Class A EU: EN55022, Class A EU: EN55024, Class A EU: EN61000-3-2, Class A EU: EN61000-3-3, Class A Japan: VCCI, Class A Australia/New Zealand: AS/NZS CISPR 22, Class A Korea : KCC (KN32, KN35), Class A Taiwan : BSMI (CNS 13438), Class A	

Technical Specifications

Others	RoHS-6 compliant
Management	Externally managed – requires a subnet manager (for example, the subnet manager on an internally managed switch, or the Mellanox Unified Fabric Manager™ running the host) on the fabric to manage the InfiniBand fabric. Mellanox Unified Fabric Manager Advanced (UFM) is a powerful platform for managing scale-out computing environments. UFM enables data center operators to efficiently provision, monitor and operate the modern data center fabric. UFM runs on a server and is used to monitor and analyze Mellanox fabrics health and performance. UFM also can be used to automate provisioning and device management tasks. For example, UFM can communicate with devices, to reset or shut down ports or devices, perform firmware and software upgrades, etc. UFM's extensive API enables it to easily integrate with existing management tools for a unified cluster view. UFM also includes the ability to save historical information, to send alerts to external systems and to activate user made scripts based on system events.

Mellanox InfiniBand HDR 40-port QSFP56 Managed Back to Front Airflow Switch		P06249-B21
I/O ports and slots	40 QSFP56 ports	
Additional ports and slots	Dual 100/1000 Ethernet ports 1 RS232 port over DB9 1 USB port	
Power supplies	2 power supplies (1+1 redundant and hot-swappable)	
Fan units	4 fan units (N+1 redundant and hot-swappable)	
Physical characteristics	**Dimensions**	1.7in (H) x 17in (W) x 23.2in (D) 4.36cm (H) x 43.32cm (W) x 59.06cm (D)
	Weight	12.49kg 27.536lb
Management processor	Dual-core x86 CPU for the onboard subnet manager	
Performance	**Latency**	Sub-90ns port-to-port
	Throughput	up to 16Tbps
	Linear forwarding data base	4x48K entries
Environment	**Operating temperature**	32°F to 104°F (0°C to 40°C)
	Non-Operating temperature	-40°C to 70°C
	Operating humidity	10% to 85%
	Operating Altitude	Up to 3050m
	Acoustic	ISO 7779 ETS 300 753
Electrical characteristics	**Frequency**	50/60Hz
	Voltage	100-127VAC, 200-240VAC
	Typical power with passive cables (ATIS)	(TBD)W
	Max power with optical cables (assuming 3.5W per port)	(TBD)W

Technical Specifications

Safety	US/Canada: cTUVus EU: EN60950-1 International: IEC60950-1 Customs Union: Russian Federation, Belarus and Kazakhstan
Emissions	USA: FCC, Class A Canada: ICES, Class A EU: EN55022, Class A EU: EN55024, Class A EU: EN61000-3-2, Class A EU: EN61000-3-3, Class A Japan: VCCI, Class A Australia/New Zealand: AS/NZS CISPR 22, Class A Korea : KCC (KN32, KN35), Class A Taiwan : BSMI (CNS 13438), Class A
Others	RoHS-6 compliant
Management	Internally managed switch comes with a dual-core x86 CPU for the onboard subnet manager, enabling simple, out-of-the-box fabric bring-up for up to 2k nodes. The InfiniBand fabric can also be managed by the Mellanox Unified Fabric Manager™. The Mellanox Unified Fabric Manager Advanced (UFM) is a powerful platform for managing scale-out computing environments. UFM enables data center operators to efficiently provision, monitor and operate the modern data center fabric. UFM runs on a server and is used to monitor and analyze Mellanox fabrics health and performance. UFM also can be used to automate provisioning and device management tasks. For example, UFM can communicate with devices, to reset or shut down ports or devices, perform firmware and software upgrades, etc. UFM's extensive API enables it to easily integrate with existing management tools for a unified cluster view. UFM also includes the ability to save historical information, to send alerts to external systems and to activate user made scripts based on system events.

Standards and protocols
IBTA 1.2.1 and 1.3

Summary of Changes

Date	Version History	Action	Description of Change
05-Aug-2019	Version 1	Created	New QuickSpecs

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