Overview

HPE HDR InfiniBand Adapters

HPE HDR InfiniBand and Ethernet 200Gb adapters are based on Mellanox ConnectX®-6 VPI and Socket Direct® technologies. They support all InfiniBand and Ethernet data rates for HPE ProLiant XL and DL Servers. The single ported cards can function as a single port HDR InfiniBand card, or a single port 200Gb Ethernet card; the dual ported cards can function, within a 200Gb maximum aggregated bandwidth per card, as a dual ported HDR InfiniBand card, a dual ported 200Gb Ethernet card, or a mixed function card. They are designed for customers who need low latency and high bandwidth InfiniBand interconnect in their high-performance computing (HPC) systems.

HPE HDR100 InfiniBand and Ethernet 100Gb adapters are based on Mellanox ConnectX®-6 VPI technology. They support dual-function InfiniBand and Ethernet for HPE ProLiant XL and DL Servers. The single ported card can function as a single port HDR100 InfiniBand card, or a single port 100Gb Ethernet card; the dual ported card can function as a dual ported HDR100 InfiniBand card, a dual ported 100Gb Ethernet card, or a mixed function card. It is designed for customers who need low latency and high bandwidth interconnect up to 100Gb in their high-performance computing (HPC) systems. HDR100 adapters coupled with HDR 40 port switches via HDR splitter cables provide simplified fabrics, requiring less equipment while achieving the same performances as the previous InfiniBand generation.

The Mellanox ConnectX®-6 VPI adapters combined with HDR InfiniBand Switches deliver low latency and up to 200Gbps injection bandwidth, ideal for performance driven server and storage clustering applications in HPC and enterprise data centers.

HPE HDR InfiniBand 200Gb 1-port QSFP56 and HPE HDR100 InfiniBand 100Gb 1 or 2 port QSFP56 Adapters are supported on HPE ProLiant Gen10 Plus servers and HPE ProLiant Gen10 servers but a different part number is to be ordered based on server generation. They are industry standard adapters with no HPE customization when used with HPE ProLiant Gen10 Plus servers. They are HPE versions developed on HPE specifications when used with HPE ProLiant Gen10 servers. Differences from the industry standard versions are primarily related to the management features implemented in the firmware.
HPE HDR InfiniBand 200Gb 2-port QSFP56 and HPE HDR InfiniBand 200Gb 1 or 2 port QSFP56 OCP3 Adapters are supported on HPE ProLiant Gen10 Plus servers only.



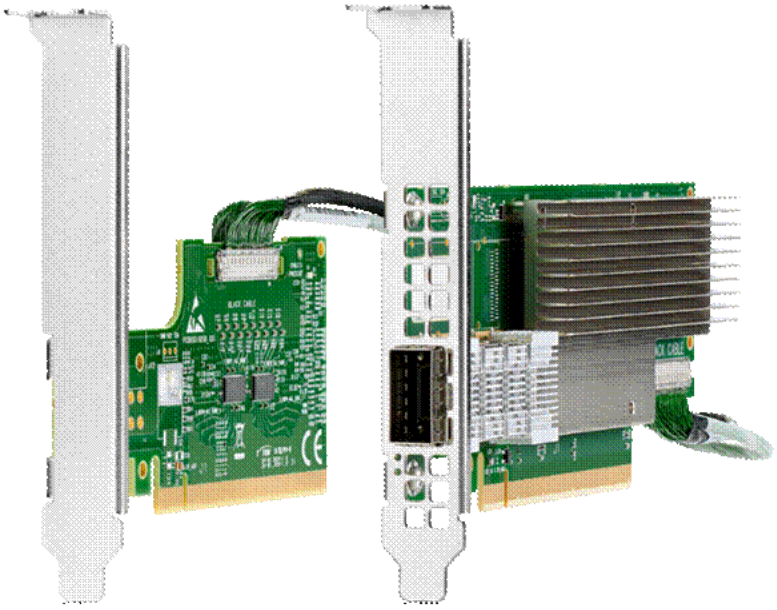
P/N P31323-B21, P31323-H21 (for Gen10 Plus only)



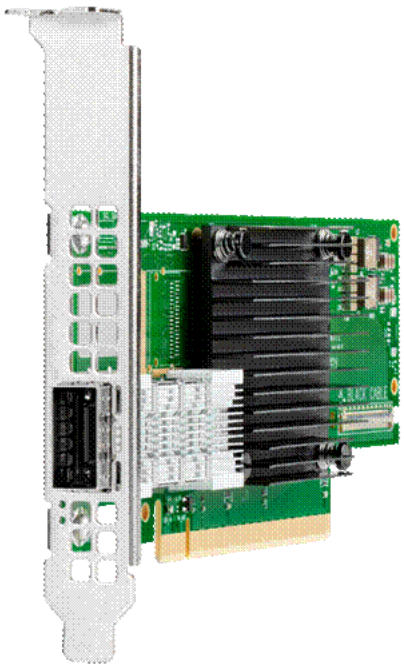
P/N P31348-B21, P31348-H21 (for Gen10 Plus only)



P/N P31324-B21, P31324-H21 (for Gen10 Plus only)



P/N P06154-H21, P06154-H21, P23664-B21, P23664-H21 (HDR 1-port ConnectX®-6) + P06154-H22/23 with Gen10



P/N P06250-H21, P06250-H21, P23665-B21, P23665-H21 (HDR100 1-port ConnectX®-6)



P/N P06251-H21, P06251-H21, P23666-B21, P23666-H21 (HDR100 2-port ConnectX®-6)

Models

HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 MCX653105A-HDAT Adapter	P23664-B21
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 MCX653105A-HDAT Adapter	P23664-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 MCX653106A-HDAT Adapter	P31324-B21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 MCX653106A-HDAT Adapter	P31324-H21
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 OCP3 MCX653435A-HDAI Adapter	P31323-B21

HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 OCP3 MCX653435A-HDAI Adapter	P31323-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 OCP3 MCX653436A-HDAI Adapter	P31348-B21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 OCP3 MCX653436A-HDAI Adapter	P31348-H21

Notes: The adapters above are industry standard adapters with no HPE customization. No auxiliary card required.

HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe3 x16 MCX653105A-HDAT Adapter	P06154-H21
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe3 x16 MCX653105A-HDAT Adapter	P06154-H21
HPE InfiniBand HDR PCIe3 Auxiliary Card with 150mm Cable Kit	P06154-H22
HPE InfiniBand HDR PCIe3 Auxiliary Card with 150mm Cable Kit	P06154-H22
HPE InfiniBand HDR PCIe3 Auxiliary Card with 350mm Cable Kit	P06154-H23
HPE InfiniBand HDR PCIe3 Auxiliary Card with 350mm Cable Kit	P06154-H23

Notes: For the adapters above, one auxiliary card must be ordered with every HDR adapter. Short or Long version is server model dependent.

HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe4 x16 MCX653105A-ECAT Adapter	P23665-B21
HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe4 x16 MCX653105A-ECAT Adapter	P23665-H21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe4 x16 MCX653106A-ECAT Adapter	P23666-B21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe4 x16 MCX653106A-ECAT Adapter	P23666-H21

Notes: The adapters above are industry standard adapters with no HPE customization. The dual-ported adapter can deliver two times 100Gb.

HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe3 x16 MCX653105A-ECAT Adapter	P06250-H21
HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe3 x16 MCX653105A-ECAT Adapter	P06250-H21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe3 x16 MCX653106A-ECAT Adapter	P06251-H21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe3 x16 MCX653106A-ECAT Adapter	P06251-H21

Notes: The dual-ported adapters above can deliver the aggregated bandwidth that the x16 PCIe Gen3 slot can sustain, not two times 100Gb.

Kit Contents

- Low profile PCIe adapter with tall bracket and short bracket in the box.
- Quick install card
- Product warranty statement

Standard Features

Servers supported

HPE IB HDR 200Gb 1p QSFP56 Adapter for HPE ProLiant Gen10 servers

HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL170r Gen10 for HPE Apollo 2000 Gen10
- HPE ProLiant XL190r Gen10 for HPE Apollo 2000 Gen10
- HPE ProLiant XL270d Gen10 8 SXM2 GPU Module for HPE Apollo 6500 System

Notes: This adapter is not supported on the HPE ProLiant XL270d Gen10 8 PCIe GPU Module

- HPE Apollo 4200 Gen10

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL360 Gen10
- HPE ProLiant DL380 Gen10
- HPE ProLiant DL560 Gen10
- HPE ProLiant DL580 Gen10
- HPE ProLiant DL385 Gen10

Notes: This adapter will occupy two x16 PCIe Gen3 slots. One slot must be attached to processor 1 and one to processor 2.

HPE IB HDR 200Gb 1p QSFP56 Adapter for HPE ProLiant Gen10 Plus servers

HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL225n Gen10 Plus
- HPE ProLiant XL220n Gen10 Plus
- HPE ProLiant XL290n Gen10 Plus
- HPE ProLiant XL645d Gen10 Plus
- HPE ProLiant XL675d Gen10 Plus
- HPE Apollo 4200 Gen10 Plus

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL385 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL325 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL365 Gen10 Plus
- HPE ProLiant DL345 Gen10 Plus
- HPE ProLiant DL360 Gen10 Plus
- HPE ProLiant DL380 Gen10 Plus

HPE IB HDR 200Gb 2p QSFP56 Adapter for HPE ProLiant Gen10 Plus servers

HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL225n Gen10 Plus
- HPE ProLiant XL220n Gen10 Plus
- HPE ProLiant XL290n Gen10 Plus
- HPE ProLiant XL645d Gen10 Plus
- HPE ProLiant XL675d Gen10 Plus
- HPE Apollo 4200 Gen10 Plus

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL385 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL325 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL365 Gen10 Plus
- HPE ProLiant DL345 Gen10 Plus
- HPE ProLiant DL360 Gen10 Plus
- HPE ProLiant DL380 Gen10 Plus

HPE IB HDR 200Gb 1p or 2p QSFP56 OCP3 Adapter for HPE ProLiant Gen10 Plus servers

Notes: To get the total bandwidth of 200Gb/s, an OCP Upgrade Cable Kit is required on some servers to expand the OCP slot to 16 PCIe lanes. Please refer to server QuickSpecs.

HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL225n Gen10 Plus
- HPE ProLiant XL645d Gen10 Plus
- HPE Apollo 4200 Gen10 Plus

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL385 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL325 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL365 Gen10 Plus
- HPE ProLiant DL345 Gen10 Plus
- HPE ProLiant DL360 Gen10 Plus
- HPE ProLiant DL380 Gen10 Plus

HPE IB HDR100 100Gb 1p or 2p QSFP56 Adapters for HPE ProLiant Gen10 servers
HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL170r Gen10 for HPE Apollo 2000 Gen10
- HPE ProLiant XL190r Gen10 for HPE Apollo 2000 Gen10
- HPE ProLiant XL270d Gen10 for HPE Apollo 6500 System
- HPE ProLiant XL230k Gen10 for HPE Apollo 6000 Gen10 (HDR100 1p only)
- HPE Apollo 4200 Gen10
- HPE Apollo 4510 Gen10

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL360 Gen10
- HPE ProLiant DL380 Gen10
- HPE ProLiant DL560 Gen10
- HPE ProLiant DL580 Gen10
- HPE ProLiant DL385 Gen10
- HPE ProLiant DL325 Gen10

HPE IB HDR100 100Gb 1p or 2p QSFP56 Adapters for HPE ProLiant Gen10 Plus servers
HPE ProLiant XL Servers (use -H21 part numbers):

- HPE ProLiant XL225n Gen10 Plus
- HPE ProLiant XL220n Gen10 Plus
- HPE ProLiant XL290n Gen10 Plus
- HPE ProLiant XL645d Gen10 Plus
- HPE ProLiant XL675d Gen10 Plus
- HPE Apollo 4200 Gen10 Plus

HPE ProLiant DL Servers (use -B21 part numbers):

- HPE ProLiant DL385 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL325 Gen10 Plus and Gen10 Plus v2
- HPE ProLiant DL365 Gen10 Plus
- HPE ProLiant DL345 Gen10 Plus
- HPE ProLiant DL360 Gen10 Plus
- HPE ProLiant DL380 Gen10 Plus

Product Features

HPE 1p/2p QSFP56 adapters

- Security features - digitally signed firmware components, secure firmware loading, secure firmware update, UEFI secure boot
- Low profile PCIe Gen3/Gen4 x16 or OCP 3.0
- HPE Standard warranty, support, service
- PXE boot over InfiniBand
- Improved thermal control with HPE ProLiant XL and DL servers
- Supports UEFI and legacy boot options (HPE UEFI driver with adapters for Gen10 servers , Mellanox UEFI driver with adapters for Gen10 Plus servers)
- InfiniBand feature highlights
    - Hardware-based reliable transport

  - Collective operations offload
  - Hardware-based reliable multicast
  - Extended Reliable Connected transport (XRC)
  - Dynamically Connected transport (DCT)
  - Enhanced Atomic operations
  - Advanced memory mapping support, allowing user mode registration and remapping of memory (UMR)
  - On demand paging (ODP) - registration free RDMA memory access

- Ethernet feature highlights
  - 200/100/50/40/25G/10G Ethernet
  - RoCE (RDMA over Converged Ethernet)
  - Data Center Bridging (DCB)
  - Stateless offloads for overlay networks and tunneling protocols
  - SR-IOV: up to 256 Virtual Functions
    - SR-IOV: up to 16 Physical Functions per port
    - DPDK
    - HPE iLO Shared Network Port with OCP 3.0 adapters

HDR InfiniBand or 200G Ethernet Throughput

The HPE HDR100 adapters deliver up to 100Gbps HDR100 InfiniBand per port while the HPE HDR adapters deliver up to 200Gbps HDR InfiniBand, providing the network performance needed to improve response times and alleviate bottlenecks that impact performance of customers' applications. They are ideal for high performance computing clusters and datacenter servers that require low latency and high bandwidth networking. These adapters also support Ethernet and can deliver up to 200G Ethernet throughput. The HPE HDR100 2p adapters can deliver 100G Ethernet total on Gen10 servers and 200G total (2x 100G) on Gen10 Plus servers. The HPE HDR 2p adapters can deliver 200G Ethernet total (load balancing or 1x 200G) on Gen10 Plus servers.

Notes:

- The HPE IB HDR/EN 200Gb 1p QSFP56 adapter for Gen10 Servers (P06154-H21/-B21 + P06154-H22/H23/B22/B23) presents itself as two logical devices, each attached to a different processor. If the RHEL inbox OFED driver is used, the application will have to feed the two devices to leverage the full performance of the adapter. If the Mellanox OFED is used instead, the application will see only one device and full performance is obtained transparently.

- For the adapters described in this document, QSFP ports when used as Ethernet do not support splitter cables (Only one MAC address available per port).

InfiniBand Standards

The HPE 1p/2p QSFP56 adapters provide support for the following InfiniBand standard
Compliant to IBTA 1.3 standard

Congestion Control

Hardware-based congestion control

Offloads

Collective operation offloads
The HPE 1p/2p QSFP56 adapters support the following offloads:

- Tag Matching and Rendezvous Offloads
- Adaptive Routing on Reliable Transport
- Burst Buffer Offloads for Background Checkpointing
- NVMe over Fabric (NVMf) Offloads

Transport

- Hardware-based reliable transport
- Extended Reliable Connected transport (XRC)
- Dynamically Connected transport (DCT)

Atomic Operation

Enhanced Atomic operations

IEEE Standards

The HPE 1p/2p 940QSFP56 adapters provide support for the following IEEE Standards:

- IEEE 802.3bj, 802.3bm 100 Gigabit Ethernet
- IEEE 802.3ba 40 Gigabit Ethernet
- IEEE 802.3ad, 802.1AX Link Aggregation
- IEEE 802.1Q, 802.1P VLAN tags and priority
- IEEE 802.1Qau (QCN) - Congestion Notification
- IEEE 802.1Qaz (ETS)
- IEEE 802.1Qbb (PFC)
- IEEE 802.1Qbg
- IEEE 1588v2

Jumbo Frames

The HPE 1p/2p QSFP56 adapters support jumbo frames (also known as extended frames), permitting up to a 9.6K byte (KB) transmission unit (MTU).

CPU Offload

The HPE 1p/2p QSFP56 adapters support the following offload features

- RDMA over Converged Ethernet (RoCE)
- TCP/UDP/IP stateless offload
- LSO, LRO, checksum offload
- RSS (can be done on encapsulated packet),TSS, HDS, VLAN
- Insertion/stripping, Receive flow steering
- Hardware offload of encapsulation and de-capsulation of NVGRE and
- VXLAN overlay networks

Single-Root I/O Virtualization

The HPE 1p/2p QSFP56 adapters support SR-IOV:

- SR-IOV: up to 256 Virtual Functions
- SR-IOV: up to 16 Physical Functions per port
- Configurable via UEFI.

IPv4 and IPv6

The HPE 1p/2p QSFP56 adapters support IPv4 and IPv6.

Time synchronization implementations (PTP)
Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.
The HPE 1p/2p QSFP56 adapters support Precision Time Protocol IEEE 1588v2

Network Adapter Teaming
The HPE 1p/2p QSFP56 adapters support NIC teaming on Linux and on Windows with tools from the Operating Systems.

Server Integration
The HPE 1p/2p QSFP56 adapters are validated, tested, and qualified server options for the supported HPE ProLiant and HPE Apollo servers.
This approach provides a more robust and reliable networking solution than offerings from other venders and provides users with a single point of contact for both their servers and their network adapters.

Configuration Utilities
The HPE 1p/2p QSFP56 adapters for Gen10 servers are configurable through HPE UEFI.
The HPE 1p/2p QSFP56 adapters for Gen10 Plus servers are configurable through Mellanox UEFI.

LED Indicators
The colored LED on each port of the HPE 1p/2p QSFP56 adapters indicate link status and link activity.

HPE Sea of Sensors 3D
The HPE 1p/2p QSFP56 adapters support the HPE's Sea of Sensors technology for improved thermal control and energy efficiency.

Service and Support

HPE Services
No matter where you are in your digital 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

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.
HPE Managed Services | HPE

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

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

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

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.

Notes: To review the list of Lifecycle Services available for your product go to:

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

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

Other Related Services from HPE Services:

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

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 quick-specs, 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
www.hpe.com/services

Configuration Information

InfiniBand Direct Attach Cable (Passive Copper cables - 200G QSFP56 to 200G QSFP56)

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

InfiniBand Split Direct Attach Cable ("Y" Passive Copper cables - 200G QSFP56 to 2x100G QSFP56)

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

Notes: Direct Attach Cable must be purchased separately for copper environments.

InfiniBand Active Optic Splitter Cables ("Y" AOC Cables- 200G QSFP56 to 2x100G QSFP56)

HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 3m AO Splitter Cable	P26659-B21
HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 5m AO Splitter Cable	P26659-B22
HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 10m AO Splitter Cable	P26659-B23
HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 15m AO Splitter Cable	P26659-B24
HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 20m AO Splitter Cable	P26659-B25
HPE InfiniBand HDR 200Gb to HDR100/Ethernet 2x100Gb QSFP56 to 2xQSFP56 30m AO Splitter Cable	P26659-B26

Notes:

- New generation of Active Optical Splitter cables for connections to HDR100 adapters.

- Active Optical Cable must be purchased separately for fiber-optic environments.

InfiniBand Active Optic Cables (AOCs - 200G QSFP56 to 200G QSFP56)

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

Notes:

- HDR Active Optical Cables are not supported with the HDR100 adapters for HPE ProLiant Gen10 servers (P06250-H21/-B21 and P06251-H21/-B21). For optical connection with these adapters, EDR Active Optical Cables can be used. Ethernet cables and transceivers must also be of a Power Class compatible with these adapters, i.e. Power Class 4 or below (3.5W max).

- The other HDR and HDR100 adapters are functionally supported with HDR Active Optical Cables. However, thermal limitations may occur depending on the server model and its environmental conditions. Please

refer to the respective platform QuickSpecs to understand limitations. Same applies to Ethernet Active Optical Cables and transceivers.

- Active Optical Cable must be purchased separately for fiber-optic environments.

Additional Supported Cables

For qualified Ethernet cables and transceivers, please refer to the release notes of the Adapters: visit **the support website** and search by adapter part number and operating system. Look for the most recent release and select the Release Notes tab when on the page.
Notes: For the adapters described in this document, QSFP ports when used as Ethernet do not support splitter cables (Only one MAC address available per port).

Technical Specifications

General Specifications (HPE HDR 200G 1p/2p QSFP56)	
Network Processor	Mellanox ConnectX-6
Data Rate	200Gbps
Bus Type	2x PCIe Gen3 x16 (ProLiant Gen10 servers) or PCIe Gen4 x16 (ProLiant Gen10 Plus servers)
Form Factor	Low profile adapter compliant with the PCIe Gen3 and PCIe Gen4 standard

Power and Environmental Specifications	
Operating Temperature	32° to 131° F (0° to 55° C)
Humidity	5% to 95% non-condensing
Power	1p Adapter with Passive cables: 19.3W (typical), 24W (max); Active Optical cables: 29.5W (max) 2p Adapter with Passive cables: 23.6W (typical), 28.2W (max); Active Optical cables: 39.3W (max)

General Specifications (HPE HDR 200G 1p/2p QSFP56 OCP3)	
Network Processor	Mellanox ConnectX-6
Data Rate	200Gbps
Bus Type	PCIe Gen4 x16 (ProLiant Gen10 Plus servers)
Form Factor	OCP3 adapter compliant with OCP Spec 3.0 SFF

Power and Environmental Specifications	
Operating Temperature	32° to 131° F (0° to 55° C)
Humidity	5% to 95% non-condensing
Power	1p Adapter with Passive cables: 18.5W (typical), 23.3W (max); Active Optical cables: 28.5W (max) 2p Adapter with Passive cables: 21.4W (typical), 26.7W (max); Active Optical cables: 37W (max)

General Specifications (HPE HDR100 100G 1p/2p QSFP56)	
Network Processor	Mellanox ConnectX-6
Data Rate	100Gbps per port (limited to 100Gbps+ total on ProLiant Gen10 servers)
Bus Type	PCIe Gen3 x16 (ProLiant Gen10 servers) or PCIe Gen4 x16 (ProLiant Gen10 Plus servers)
Form Factor	Low profile adapter compliant with the PCIe Gen3 and PCIe Gen4 standard

Power and Environmental Specifications	
Operating Temperature	32° to 131° F (0° to 55° C)

Humidity	5% to 95% non-condensing
Power	1p Adapter with Passive cables: 15.6W (typical), 20.3W (max); Active Optical cables: 23.3W (max) 2p Adapter with Passive cables: 17.7W (typical), 22.4W (max); Active Optical cables: 28.5W (max)

EMC (Emissions)

- FCC Part 15 (CFR 47) ,Class A
- ICES-003 ,Class A
- EN55022 ,Class A
- CISPR22 ,Class A
- AS/NZS CISPR 22, Class A (RCM mark)
- VCCI Class A
- EN55024
- KC (Korea)

RoHS Compliance

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Safety

- UL 60950-1
- CAN/CSA-C22.2 No. 60950-1
- EN 60950-1
- IEC 60950-1

Environmental

- EU: IEC 60068-2-64: Random Vibration
- EU: IEC 60068-2-29: Shocks, Type I / II
- EU: IEC 60068-2-32: Fall Test

Operating System Support

HPE 1p/2p QSFP56 adapters are supported on MLNX_OFED 5.1 on the following Linux operating systems:

- RHEL: 7.7, 7.8, 8.1, 8.2
- CentOS: 7.7, 7.8, 8.1, 8.2
- SLES 12 SP4, SLES 12 SP5, SLES 15 SP1, SLES 15 SP2

HPE 1p/2p QSFP56 adapters are supported on WinOF-2 version 2.50 on the following Windows operating systems:

- Windows Server 2019
- Windows Server 2016

HPE 1p/2p QSFP56 adapters configured as Ethernet only mode are also supported in the following virtualized environments:

- ESXi 7.0 U2

Please refer to the firmware/software download page of the device for the latest update.

Environment-friendly Products and Approach End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) 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.

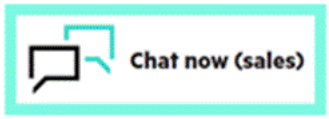
These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

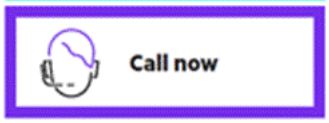
Summary of Changes

Date	Version History	Action	Description of Change
06-Nov-2023	Version 11	Changed	Overview section was updated. HPE Services Rebranding
10-Jul-2023	Version 10	Changed	Configuration Information section was updated
15-Nov-2021	Version 9	Changed	Service and Support section was updated.
04-Oct-2021	Version 8	Changed	P28169-B2x cables removed. Add note about Ethernet splitter cables not supported. Typo correction, changing -H21 for -B21 on some line items. Overview, Configuration Information and Related Options sections were updated.
06-Jul-2021	Version 7	Changed	Note for P28169-B2x cables updated. Configuration Information section was updated
07-Jun-2021	Version 6	Changed	Standard Features, Configuration Information and related options sections were updated. Add new generation of AOC and AOC Splitter. New Gen10 Plus platform compatibility added: XL220n, XL290n, DL360, DL380 ,XL675d, XL645d, Apollo 4200
06-Apr-2021	Version 5	Changed	Minimum version for VMware. InfiniBand with Windows Server corrected.Technical Specification section was updated.
07-Dec-2020	Version 4	Changed	Overview, Standard Features and Configuration Information sections were updated. OCP adapters support on DL325 and DL385 Gen10 Plus. HDR 2-port adapter support on DL325 and DL385 Gen10 Plus.
05-Oct-2020	Version 3	Changed	HDR 2P, HDR 1P OCP, HDR 2P OCP added Standard Features and Technical Specifications sections were updated.
02-Dec-2019	Version 2	Changed	Overview, Standard Features and Technical Specifications sections were updated. HDR/HDR100 industry standard cards for Gen10 Plus servers added.
05-Aug-2019	Version 1	New	New QuickSpecs

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