Overview

HPE EDR InfiniBand Adapters

HPE EDR InfiniBand 100Gb 1-port 841QSFP28 Adapter is based on Mellanox ConnectX®-5 technology. It supports InfiniBand function for HPE ProLiant XL and DL Servers. It is designed for customers who need low latency and high bandwidth InfiniBand interconnector in their high performance computing (HPC) systems.

HPE EDR InfiniBand/Ethernet 100Gb 2-port 841QSFP28 Adapter is based on Mellanox ConnectX®-5 VPI technology. It supports dual-function InfiniBand and Ethernet for HPE ProLiant XL and DL Servers. It can function as a dual ported EDR 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 interconnector in their high performance computing (HPC) systems.

HPE EDR InfiniBand/Ethernet 100G 2-port 840QSFP28 Adapter is based on Mellanox ConnectX®-4 technology. It supports dual-function InfiniBand and Ethernet for HPE ProLiant XL and DL Servers. It can function as a dual ported EDR InfiniBand card, a dual ported 100Gb Ethernet card, or a mixed function card. They are designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems.

HPE EDR InfiniBand/Ethernet 100Gb 1-port 841OCP QSFP28 Adapter is based on Mellanox ConnectX®-5 VPI technology. It supports dual-function InfiniBand and Ethernet for the HPE Apollo 70 Server. It is designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems based on HPE Apollo 70 servers.

HPE Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT Adapter is based on Mellanox ConnectX®-5 EN technology. It is an Ethernet only adapter.

Combined with EDR InfiniBand Switches or 100Gb Ethernet Switches, they deliver low latency and up to 100Gbps bandwidth, ideal for performance driven server and storage clustering applications in HPC and enterprise data centers.
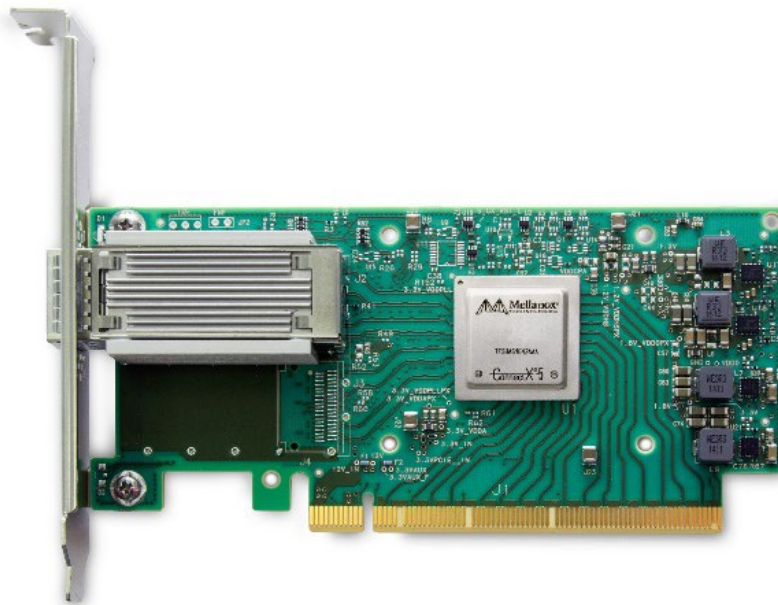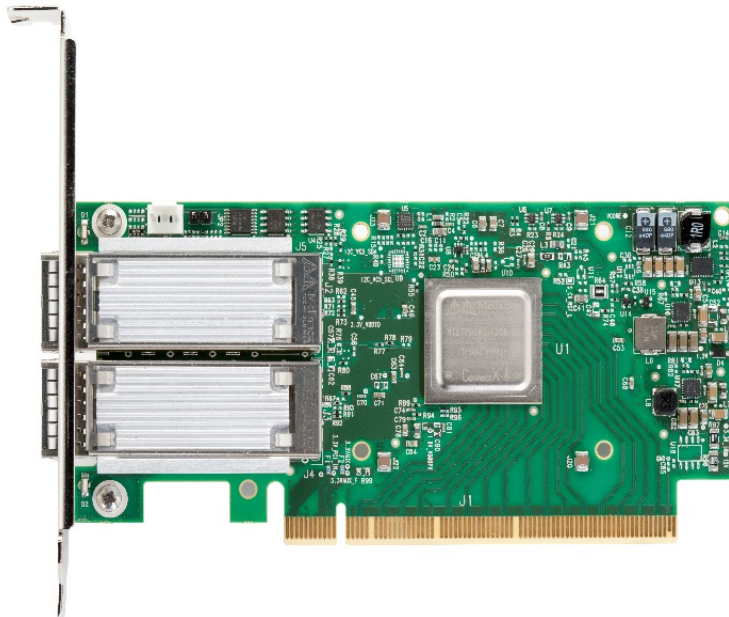

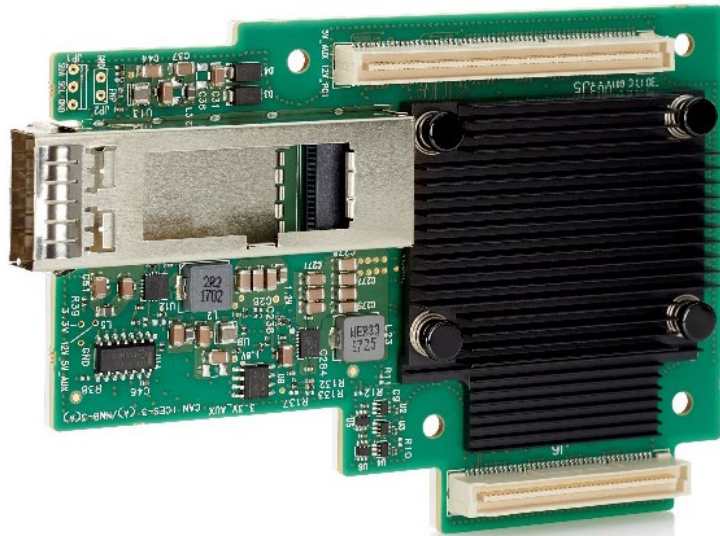**P/N 872725-B21, 872725-H21 (ConnectX®-5)**
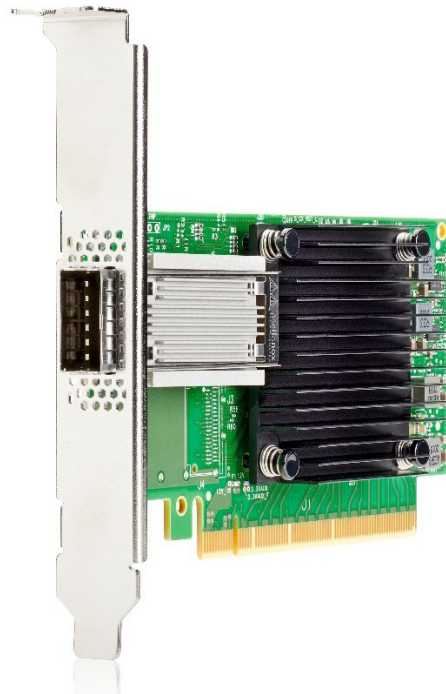
Overview
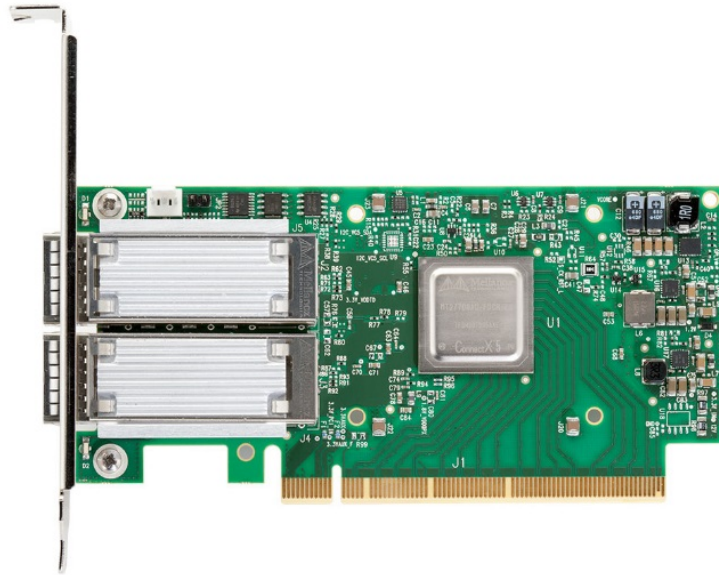
P/N 872726-B21, 872726-H21 (ConnectX®-5)

P/N 825111-B21, 825111-H21 (ConnectX®-4)

Overview

P/N P02012-B21 (ConnectX®-5)

P/N P31246-B21, P31246-H21 (ConnectX®-5 EN)

Overview

Models

HPE InfiniBand EDR 100Gb 1-port 841QSFP28 Adapter	872725-B21
HPE InfiniBand EDR 100Gb 1-port 841QSFP28 Adapter	872725-H21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter	872726-B21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter	872726-H21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter	825111-B21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter	825111-H21
HPE Ethernet 100Gb 1-port QSFP28 PCIe3 x16 MCX515A-CCAT Adapter	P31246-B21
HPE Ethernet 100Gb 1-port QSFP28 PCIe3 x16 MCX515A-CCAT Adapter	P31246-H21

Kit Contents

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

Servers supported

HPE IB EDR 100Gb 1p 841QSFP28 Adapter

HPE ProLiant XL Servers (use –H21 part numbers)

- Apollo 10 – sx40 Gen10
- Apollo 2000 – XL170r, XL190r Gen10
- Apollo 4200 Gen10
- Apollo 4500 – XL450 Gen10
- Apollo 6000 – XL230k Gen10
- Apollo 6500 – XL270d Gen10
- SGI 8600 - XA730i Gen10

HPE ProLiant DL Servers (use –B21 part numbers)

- DL325 - Gen10
- DL360 – Gen10
- DL380 - Gen10
- DL385 - Gen10
- DL560 - Gen 10
- DL580 - Gen10

HPE IB EDR/EN 100Gb 2p 841QSFP28 Adapter

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

- Apollo 2000 – XL170r, XL190r Gen10
- Apollo 4200 Gen10
- Apollo 4500 – XL450 Gen10
- Apollo 6500 – XL270d Gen10
- SGI 8600 - XA730i Gen10
- Apollo 70 – AR64z

Overview

HPE ProLiant DL Servers (use –B21 part numbers)
- DL325 - Gen10
- DL360 – Gen10
- DL380 - Gen10
- DL385 - Gen10
- DL560 - Gen 10
- DL580 - Gen10

HPE IB EDR/EN 100Gb 2p 840QSFP28 Adapter
HPE ProLiant XL Servers (use –H21 part numbers):
- HPE ProLiant XL170r and XL190r Gen10 for Apollo 2000
- HPE ProLiant XL230k Gen10 for Apollo 6000
- HPE ProLiant XL450 Gen10 for Apollo 4500
- HPE ProLiant XL270d Gen10 for Apollo 6500
- HPE Apollo 4200 Gen10
- Apollo 10 – sx40 Gen10
- SGI 8600 - XA730i Gen10

HPE ProLiant DL Servers (use –B21 part numbers)
- HPE ProLiant DL160 Gen10
- HPE ProLiant DL325 Gen10
- HPE ProLiant DL360 Gen10
- HPE ProLiant DL380 Gen10
- HPE ProLiant DL385 Gen10
- HPE ProLiant DL560 Gen10
- HPE ProLiant DL580 Gen10

HPE IB EDR/EN 100Gb 1p 841OCP QSFP28 Adapter
HPE ProLiant AR Servers (use –H21 part number)::
- Apollo 70 – AR44z; AR64z

HPE Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT PCIe3 x16 Adapter
HPE ProLiant XL Servers (use –H21 part numbers):
- Apollo 2000 – XL225n Gen10 Plus

HPE ProLiant DL Servers (use –B21 part numbers):
- HPE ProLiant DL325 Gen10 Plus
- HPE ProLiant DL385 Gen10 Plus

Standard Features

At a Glance Features

HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters
- Improved thermal control with HPE ProLiant XL and DL servers
- Supports UEFI and legacy boot options (legacy boot option doesn't apply to HPE 1p 841OCP QSFP28 adapter)
- PXE boot over InfiniBand or Ethernet
- Port personality configuration via UEFI
- Low profile PCIe Gen3 x16 (apply to HPE 1p/2p 841QSFP28 and 2p 840QSFP28 adapters)
- OCP 2.0 form factor, 2x PCIe Gen3 x8 (apply to HPE 1p 841OCP QSFP28 adapter)
- HPE Standard warranty, support, service
- InfiniBand feature highlights (apply to 1p/2p 841, 1P 841OCP and 2p 840 adapters)
  - 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 (apply to HPE 2p 841, 1p 841OCP and 2p 840 adapters)
  - 100/50/40/10G 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

HPE Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT PCIe3 x16 Adapter
- Jumbo Frame
- Stand up
- HPE Sea of Sensors 3D
- Tunnel Offload(NVGRE and VxLAN)
- Single-root input/output virtualization (SR-IOV)
- IPv6 Acceleration
- Preboot eXecution Environment (PXE)
- Checksum & Segmentation Offload
- VMware NetQueue and Microsoft Virtual Machine Queue (VMQ)
- Precision Time Protocol (PTP)
- Receive-Side Scaling (RSS)
- Receive-Side Coalescing (RSC)
- iSCSI Extensions over RDMA (iSER)
- Active Health Systems support
- Security features - digitally signed firmware components, secure firmware loading, secure firmware update, UEFI secure boot
- Authentication of digitally signed firmware through Chain of Trust on the NIC
- Additional Security features include: Device-level Firewall, Audit Logs and Sanitization

Product Features

HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters

Standard Features

EDR InfiniBand or 100G Ethernet Throughput

The HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters deliver up to 100Gbps EDR 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. The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters also support Ethernet and can deliver 100G Ethernet speed.

Notes: The HPE IB EDR/EN 100Gb 1p 841OCP QSFP28 adapter (P02012-B21) 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.

InfiniBand Standards

The HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 2p 840QSFP28 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 841QSFP28 adapters and 1p 841OCP QSFP28 support the following new 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 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 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

Standard Features

Jumbo Frames
The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters support jumbo frames (also known as extended frames), permitting up to a 9.6K byte (KB) transmission unit (MTU).

CPU Offload
The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 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 2p 841QSFP28, 1p 841OCP QSFP28 and 2p 840QSFP28 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 2p 841QSFP28 adapter, 1p 841OCP QSFP28 adapter and 2p 840QSFP28 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 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters support Precision Time Protocol IEEE 1588v2

Network Adapter Teaming
The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 2p 840QSFP28 adapters support NIC teaming on Linux and on Windows with tools from the Operating Systems.

Management support
The HPE 840QSFP28 adapter can be administered from HPE Systems Insight Manager (SIM).

Server Integration
The HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 2p 840QSFP28 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
HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 2p 840QSFP28 adapters are configurable through UEFI.

LED Indicators
The colored LED on each port of the HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 2p 840QSFP28 adapters indicate link status and link activity.

Standard Features

HPE Sea of Sensors 3D
The HPE 1p/2p 841QSFP28 adapters and HPE 2p 840QSFP28 adapters support the HPE's Sea of Sensors technology for improved thermal control and energy efficiency.

Warranty
- 2p 840QSFP28 adapters have a 1 year warranty, parts exchange.
- 1p/2p 841QSFP28 adapter and 1p 841OCP QSFP28 have a 3 year warranty, parts exchange.

Product Features
HPE Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT PCIe3 x16 Adapter

Audit Logs
Audit Logs are a forensics capability that provides traceability into authenticated firmware updates by capturing changes in standard system logs.

Authenticated Updates
Authenticated Updates brings cryptographic keys onto the NIC (for HW Authentication) to protect user and configuration data from unauthorized access and verify digitally signed firmware.

Checksum & Segmentation Offload
Normally the TCP Checksum is computed by the protocol stack. Segmentation Offload is technique for increasing outbound throughput of high-bandwidth network connections by reducing CPU overhead. The technique is also called TCP segmentation offload (TSO) when applied to TCP, or generic segmentation offload (GSO).

Device-level Firewall
Device-level Firewall blocks any unmanaged access to memory or storage. This ensures that on-device firmware and configuration data can only be accessed by authorized agents.

IPv6
IPv6 uses 128-bit addressing allowing for more devices and users on the internet. IPv4 supported 32-bit addressing.

Jumbo Frames
This adapter supports Jumbo Frames (also known as extended frames), permitting up to a 9,600 byte (KB) transmission unit (MTU) when running Ethernet I/O traffic. This is over six times the size of a standard 1500-byte Ethernet frame. With Jumbo Frames, networks can achieve higher throughput performance and greater CPU utilization. These attributes are particularly useful for database transfer and tape backup operations.

Management Support
This adapter ships with agents that can be managed from HPE Systems Insight Manager or other management application that support SNMP.

Preboot eXecution Environment (PXE)
Support for PXE enables automatic deployment of computing resources remotely from anywhere. It allows a new or existing server to boot over the network and download software, including the operating system, from a management/ deployment server at another location on the network. Additionally, PXE enables decentralized software distribution and remote troubleshooting and repairs.

Standard Features

RDMA
This adapter supports RoCE v1 and v2. RoCE v2, also sometimes called "Routable RoCE" which adds Concurrent RoCE v1 and v2 support, SR-IOV support, QoS with hierarchical TX scheduling, ECN-based congestion control for RoCE v2. RoCE is an accelerated I/O delivery mechanism that allows data to be transferred directly from the user memory of the source server to the user memory of the destination server bypassing the operating system (OS) kernel. Because the RDMA data transfer is performed by the DMA engine on the adapter's network processor, the CPU is not used for the data movement, freeing it to perform other tasks such as hosting more virtual workloads (increased VM density). RDMA also bypasses the host's TCP/IP stack, in favor of upper layer InfiniBand protocols implemented in the adapter's network processor. The bypass of the TCP/IP stack and the removal of a data copy step reduce overall latency to deliver accelerated performance for applications such as Microsoft Hyper-V Live Migration, Microsoft SQL and Microsoft SharePoint with SMB Direct.

Receive Side Scaling (RSS)
RSS resolves the single-processor bottleneck by allowing the receive side network load from a network adapter to be shared across multiple processors. RSS enables packet receive-processing to scale with the number of available processors.

Sanitization
Sanitization (Secure User Data Erase) renders User and configuration data on the NIC irretrievable so that NICs can be safely repurposed or disposed.

Secure Boot
Secure Boot safeguards the system and ensures no rogue drivers are being executed on start-up.

Server Integration
This adapter is a validated, tested, and qualified solution that is optimized for HPE ProLiant servers. Hewlett Packard Enterprise validates a wide variety of major operating systems drivers with the full suite of web-based enterprise management utilities including HPE Intelligent Provisioning and HPE Systems Insight Manager that simplify network management.
This approach provides a more robust and reliable networking solution than offerings from other vendors and provides users with a single point of contact for both their servers and their network adapters.

Single-Root I/O Virtualization
Single-Root I/O Virtualization (SR-IOV) provides a mechanism to bypass the host system hypervisor in virtual environments providing near metal performance and server efficiency. SR-IOV provides mechanism to create multiple Virtual Functions (VFs) to share single PCIe resources. The device is capable of SR-IOV, and requires Server BIOS support, controller firmware, and OS support.

Precision Time Protocol (IEEE 1588 PTP)
Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems

Tunnel Offload
Minimize the impact of overlay networking on host performance with tunnel offload support for VXLAN, NVGRE and GENEVE. By offloading packet processing to adapters, customers can use overlay networking to increase VM migration flexibility and virtualized overlay networks with minimal impact to performance. HPE Tunnel Offloading increases I/O throughput, reduces CPU utilization, and lowers power consumption. Tunnel Offload supports VMware's VXLAN, Microsoft's NVGRE solutions and Generic Network Virtualization Encapsulation (GENEVE) solutions.

Standard Features

VMware NewQueue and Microsoft Virtual Machine Queue (VMQ)

VMware NetQueue is technology that significantly improves performance of 10 Gigabit Ethernet network adapters in virtualized environments.

Windows Hyper-V VMQ (VMQ) is a feature available on servers running Windows Server 2008 R2 with VMQ-enabled Ethernet adapters. VMQ uses hardware packet filtering to deliver packet data from an external virtual machine network directly to virtual machines, which reduces the overhead of routing packets and copying them from the management operating system to the virtual machine.

IEE compliance

802.1p, 802.1Qaz, 802.1Qbb, 802.1AS, 802.3ad, 802.3by, 1588, 802.3-2012, 802.3by-2016, 802.1q

Service and Support

Warranty
Maximum: The remaining warranty of the HPE product in which it is installed (to a maximum three-year, limited warranty).
Minimum: One year limited warranty.
Notes: Additional information regarding worldwide limited warranty and technical support is available at:
http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/index.aspx#.V4e3tPkrJhE

Related Option
Please refer to link for supported cables and transceivers. - **Link**

For more information
To learn more on services for HPE Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: **http://www.hpe.com/services/proliant**

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 sage 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.

Related Options

Direct Attach Cable (Passive Copper cables)

HPE 0.5m InfiniBand EDR QSFP Copper Cable	834973-B21
HPE 1m InfiniBand EDR QSFP Copper Cable	834973-B22
HPE 1.5m InfiniBand EDR QSFP Copper Cable	834973-B23
HPE 2m InfiniBand EDR QSFP Copper Cable	834973-B24
HPE 3m InfiniBand EDR QSFP Copper Cable	834973-B25

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

Active Optic Cables (AOCs)

HPE 5m InfiniBand EDR QSFP Optical Cable	834972-B22
HPE 7m InfiniBand EDR QSFP Optical Cable	834972-B23
HPE 10m InfiniBand EDR QSFP Optical Cable	834972-B24
HPE 12m InfiniBand EDR QSFP Optical Cable	834972-B25
HPE 15m InfiniBand EDR QSFP Optical Cable	834972-B26
HPE 20m InfiniBand EDR QSFP Optical Cable	834972-B27
HPE 30m InfiniBand EDR QSFP Optical Cable	834972-B28

Notes:

- Active Optical Cable must be purchased separately for fiber-optic environments.
- Active Optical Cable are not supported with the HPE 1p 841OCP QSFP28 adapter.

Additional Supported Cables

For qualified cables for 100GbE, please refer to the release notes of the Adapters: visit **the support website** and search by part number and operating system. Look for the most recent release.

Technical Specifications

General Specifications (HPE 841QSFP28)

Network Processor	Mellanox ConnectX-5
Data Rate	100Gbps
Bus Type	PCIe Gen3 x16
Form Factor	Low profile adapter compliant with the PCIe Gen3 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: 15.5W (typical), 17.17W (max); Active Optical cables: 20.29W. 2p Adapter with Passive cables: 17.6W (typical), 19W (max); Active Optical cables: 23.9W (typical), 25.8W (max).

General Specifications (HPE 1p 841OCP QSFP28)

Network Processor	Mellanox ConnectX-5
Data Rate	100Gbps
Bus Type	2x PCIe Gen3 x8
Form Factor	OCP 2.0 type2

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: 17.2W (typical), 19.4W (max); Active Optical cables: not supported.

General Specifications (HPE 1p MCX515A-CCAT QSFP28)

Network Processor	Mellanox ConnectX-5
Data Rate	1/10/25/40/50/100Gbps
Bus Type	PCIe Gen3 x16
Form Factor	Low profile adapter compliant with the PCIe Gen3 standard

Power and Environmental Specifications

Operating Temperature	5° to 60° C (41° to 140° F)
Humidity	5% to 95% non-condensing
Power	15.1 W typical, 22.1 W maximum

General Specifications (HPE 840QSFP28)

Network Processor	Mellanox ConnectX-4
Data Rate	100Gbps
Bus Type	PCIe Gen3 x16
Form Factor	Low profile adapter compliant with the PCIe Gen3 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: 13.91W (typical), 15.70W (max); with Active Optical cables: 19.59W. 2p Adapter with Passive cables: 16.12W (typical), 18.04W (max); with Active Optical cables: 24.80W.

Technical Specifications

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
- 6 of 6

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 841QSFP28 adapters configured as IB only mode is supported on MLNX_OFED 5.1 and later version 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 2p 841QSFP28 adapter and 2p 840QSFP28 adapters configured as IB only mode, Ethernet only mode, or Port 1 IB and Port 2 Ethernet mode are supported on MLNX_OFED 5.1 and later version 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 Ethernet 100Gb 1-port QSFP28 MCX515A-CCAT PCIe3 x16 Adapter is supported on MLNX_OFED 5.1 and later version 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 841OCP QSFP28 adapter configured as IB mode or Ethernet mode are supported on MLNX_OFED 5.1 on the following Linux operating systems:
- RHEL: 8.0, 8.1 ARM
- SLES: 12 SP4 and SP5 ARM; SLES15 SP1 ARM

Technical Specifications

HPE 2p 841QSFP28, 2p 840QSFP28 and 1P QSFP28 MCX515A-CCAT adapters configured as Ethernet only mode are supported on WinOF-2 version 2.50 on the following Windows operating systems:
- Windows Server 2019
- Windows Server 2016

HPE 2p 841QSFP28, 2p 840QSFP28 and 1P QSFP28 MCX515A-CCAT adapters configured as Ethernet only mode are also supported in the following virtualized environments:
- ESXi 7.0 (driver 4.19.70.1)

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
04-May-2021	Version 10	Changed	Service and Support section was updated. Broken link fixed
05-Oct-2020	Version 9	Changed	Overview and Standard Features sections were updated MCX515-CCAT adapter added. HPE 1p 840QSFP28 adapter removed.
02-Dec-2019	Version 8	Changed	SKUs were updated in Overview section
07-Oct-2019	Version 7	Changed	Standard Features section was updated
01-Oct-2018	Version 6	Changed	Overview and Related Options were updated.
13-Aug-2018	Version 5	Changed	Standard Features and SKU descriptions were updated
04-Jun-2018	Version 4	Changed	Add HPE 1p 841OCP QSFP28 adapter
05-Feb-2018	Version 3	Changed	Updated information and add HPE 2p 841QSFP28 adapter
25-Sep-2017	Version 2	Changed	Update information and add HPE 1p 841QSFP28 adapter
31-Mar-2016	Version 1	New	New QuickSpecs

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