**Overview**

**HPE EDR InfiniBand/100GbE Adapters**

HPE EDR InfiniBand/100GbE Adapters are dual-function InfiniBand and Ethernet adapters for HPE ProLiant XL and DL Servers that are designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems.

Based on Mellanox ConnectX®-4 technology for scalability and fabric flexibility, the dual ported card can function as a dual ported EDR InfiniBand card, a dual ported 100GbE card, or a mixed function card; the single ported card can function as a single port EDR InfiniBand card, or a single port 100GbE card.

Combined with EDR InfiniBand Switches or 100GbE 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.

**Models**

- HPE IB EDR/EN 100Gb 1P 8400QSFP28 Adapter 825110-B21
- HPE IB EDR/EN 100Gb 2P 8400QSFP28 Adapter 825111-B21

**Kit Contents**

- HPE IB EDR/EN 100Gb 1P or 2P 8400QSFP28 Adapter
- Low profile PCIe bracket on the adapter; Full height PCIe bracket in the box
- Quick install card
- Product warranty statement
Compatibility

Servers supported  HPE ProLiant XL Servers:
- HPE ProLiant XL170r Gen9 for Apollo 2000
- HPE ProLiant XL190r Gen9 for Apollo 2000
- HPE ProLiant XL230a Gen9 for Apollo 6000
- HPE ProLiant XL250a Gen9 for Apollo 6000
- HPE ProLiant XL250a Gen9 for Apollo 6500

HPE ProLiant DL Servers:
- HPE ProLiant DL360 Gen9
- HPE ProLiant DL380 Gen9
- HPE ProLiant DL580 Gen9
QuickSpecs

HPE EDR InfiniBand/100GbE Adapters

Standard Features

Product Features

- EDR InfiniBand or 100G Ethernet per port
- 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
  - 100G 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

- Improved thermal control with HPE ProLiant XL and DL servers
- Supports UEFI and legacy boot options
- PXE boot over InfiniBand or Ethernet
- Port personality configuration via UEFI
- Linux and Windows server operating system support
- Low profile PCIe Gen3 x16
- HPE Standard warranty, support, services

EDR InfiniBand or 100G Ethernet Throughput

The HPE 840QSFP28 adapters deliver up to 100Gbps EDR InfiniBand or 100G Ethernet speed, providing the network performance needed to improve response times and alleviate bottlenecks that impact performance of customers’ applications. The HPE 840QSFP28 adapters are ideal for high performance computing clusters and datacenter servers that require low latency and high bandwidth networking.

InfiniBand Standards

- Compliant to IBTA 1.3 standard

Congestion Control

- Hardware-based congestion control

Offloads

- Collective operation offloads

Transport

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

Atomic Operation

- Enhanced Atomic operations

IEEE Standards

The HPE 840QSFP28 Adapters provide support for the following IEEE Standards:
## QuickSpecs

### 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 840QSFP28 adapters support jumbo frames (also known as extended frames), permitting up to a 9.6K byte (KB) transmission unit (MTU).

### CPU Offload

- 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

### MSI and MSI-X

Message Signaled Interrupt (Extended) provides performance benefits for multi-core servers by load balancing interrupts between CPUs/cores. The HPE 840QSFP28 Adapters support MSI and MSI-X.

### Single-Root I/O Virtualization

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

### IPv4 and IPv6

Supported.

### 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 840QSFP28 Adapters support Precision Time Protocol IEEE 1588v2.

### Network Adapter Teaming

Support NIC teaming on Linux and on Windows with tools from the Operating Systems.
Standard Features

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

Server Integration
The HPE 840QSFP28 adapters are validated, tested, and qualified server options for the supported HPE ProLiant XL and DL servers.

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.

Configuration Utilities
HPE 840QSFP28 adapters are configurable through UEFI.

LED Indicators
The colored LED on each port of the HPE 840QSFP28 adapters indicate link status and link activity.

HPE Sea of Sensors 3D
Support for HPE's Sea of Sensors technology for improved thermal control and energy efficiency.

Warranty
1 year warranty, parts exchange.
Service and Support

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
### Related Options

#### Direct Attach Cable (Passive Copper cables)
- HPE 0.5M IB EDR QSFP Copper cable 834973-B21
- HPE 1M IB EDR QSFP Copper cable 834973-B22
- HPE 1.5M IB EDR QSFP Copper cable 834973-B23
- HPE 2M IB EDR QSFP Copper cable 834973-B24
- HPE 3M IB EDR QSFP Copper cable 834973-B25

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

#### Active Optic Cables (AOCs)
- HPE 3M IB EDR QSFP Optical Cable 834973-B21
- HPE 5M IB EDR QSFP Optical Cable 834972-B22
- HPE 7M IB EDR QSFP Optical Cable 834972-B23
- HPE 10M IB EDR QSFP Optical Cable 834972-B24
- HPE 12M IB EDR QSFP Optical Cable 834972-B25
- HPE 15M IB EDR QSFP Optical Cable 834972-B26
- HPE 20M IB EDR QSFP Optical Cable 834972-B27
- HPE 30M IB EDR QSFP Optical Cable 834972-B28

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

#### Additional Supported Cables
- For qualified cables for 100GbE, please refer to the release notes of the Adapters.
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<td><strong>Data Rate</strong></td>
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<td><strong>Bus Type</strong></td>
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<td><strong>Form Factor</strong></td>
<td>Low profile adapter compliant with the PCIe Gen3 standard</td>
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**Operating System Support**

HPE 840QSFP28 adapters configured as IB only mode, Ethernet only mode, or Port 1 IB and Port 2 Ethernet mode are supported on MLNX_OFED 3.2 on the following Linux operating systems:

- RHEL: 6.6, 6.7, 7.1, 7.2
- CentOS: 6.6, 6.7, 7.1, 7.2
- SLES: 11 SP3, 11 SP4; 12, 12 SP1
- OEL: 6.6, 6.7, 7.1, 7.2
- Ubuntu: 14.04, 14.10, 15.04

HPE 840QSFP28 adapters configured as Ethernet only mode are supported on WinOF2 version 1.35 on the following Windows operating systems:

- Windows Server 2012 R2 (x64 only)
- Windows Server 2012 (x64 only)

HPE 840QSFP28 adapters configured as Ethernet only mode are also supported in the following virtualized environments:
QuickSpecs

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Related Options

- ESXi 6.x (VMware 4.15.3.1008)
- ESX 5.5 (VMware 4.5.1.1008)

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

Environment-friendly 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 information, please go to: [http://www.hpe.com/go/green](http://www.hpe.com/go/green). To recycle your product, please go to: [http://www.hpe.com/go/green](http://www.hpe.com/go/green) 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: [http://www.hpe.com/go/green](http://www.hpe.com/go/green). 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

<table>
<thead>
<tr>
<th>Date</th>
<th>Version History</th>
<th>Action</th>
<th>Description of Change</th>
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<tr>
<td>31-Mar-2016</td>
<td>Version 1</td>
<td>Created</td>
<td>Initial Version of the Quick Specs of HPE EDR InfiniBand/100GbE Adapters</td>
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