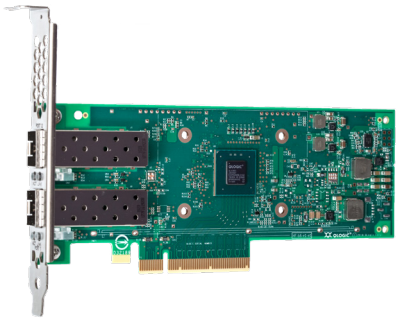
HPE® CN1300R

8th Generation 10/25GbE Converged Network Adapter with iSCSI, FCoE, and Universal RDMA



- Powerful 10GbE adapter with 25GbE compatibility
- Universal RDMA—Delivers choice and flexibility with concurrent support for RoCE, RoCEv2, and iWARP technologies
- FastLinQ SmartAN for simplified connectivity with switches without user intervention
- Secure firmware update process with private/public key encryption technology prevents hackers from altering adapter
- Increase VM density and accelerate multitenant networks with full offload for tunneling protocols
- Accelerate the most demanding telco NFV workloads with Marvell Data Plane Development Kit (DPDK) high-speed packet processing engine

The HPE CN1300R 10/25Gb Ethernet (GbE) CNA with Universal Remote Direct Memory Access (RDMA) leverages Marvell® FastLinQ® eighth-generation technology to deliver true 25GbE performance. Integrated, advanced networking eliminates I/O bottlenecks and conserves CPU cycles. Optimized for use across enterprises, managed service providers (MSPs), and large public and scalable public cloud deployments, the HPE CN1300R enables organizations to achieve new levels of performance in physical, virtual, and cloud environments.

The 10/25GbE specification enables network bandwidth to be cost-effectively scaled in support of next-generation server and storage solutions residing in cloud and Web-scale data center environments. 25GbE results in a single-lane connection similar to existing 10GbE technology—but it delivers 2.5 times greater bandwidth. Compared to 40GbE solutions, 25GbE technology provides superior switch port density by requiring just a single lane (versus four lanes with 40GbE), along with lower costs and power requirements. Marvell is a leading innovator driving 25GbE technologies across enterprise and cloud market segments.

The HPE CN1300R CNA delivers advanced Ethernet solutions , including support for NVMe over RoCE, that are designed to meet requirements from leading enterprise and cloud providers. Marvell FastLinQ features that collectively deliver the most advanced 10/25GbE adapter include:

- Network virtualization—offloads for single-root I/O virtualization (SR-IOV), Virtual Extensible LAN (VXLAN), Generic Network Virtualization Encapsulation (GENEVE), Generic Routing Encapsulation (GRE), and Network Virtualization using Generic Routing Encapsulation (NVGRE)
- Universal RDMA technologies—RDMA over Converged Ethernet (RoCE), RoCEv2, iSCSI Extensions for RDMA (iSER), and Internet wide area RDMA protocol (iWARP)
- FastLinQ SmartAN™ technology delivers seamless connectivity between 10GbE and 25GbE environments
- Support for Non-volatile memory express (NVMe™) over Fabric (NVMe/oF) connectivity to next-generation storage arrays

Reduce Capital Expenditure and Operating Expense

Marvell FastLinQ 10/25GbE technology in the HPE CN1300R delivers better price-per-gigabit versus 10GbE. The adapter is backward compatible with existing 10GbE installations, while allowing an upgrade to 25GbE infrastructure. This technology enables cloud providers and large-scale data center operators to reduce operating expense while continuing to scale their network of server and storage nodes to meet increasing demands of the future. Marvell FastLinQ 25GbE technology is cost-efficient and power-efficient because it uses a single lane, as opposed to quad-lane 40GbE. The

HPE CN1300R 10/25GbE CNA is compatible with 25Gbps lanes used in 100GbE, paving the way to a seamless upgrade path to connect to 100GbE switches that have 4×25GbE capability.

Accelerate Any Network with Universal RDMA Offload

The HPE CN1300R 10/25GbE CNA supports RoCE and iWARP acceleration to deliver low latency, low CPU utilization, and high performance on Windows® Server Message Block (SMB) Direct 3.0 and 3.02, Windows Storage Spaces Direct (S2D), and iSER. The HPE CN1300R CNA has the unique capability to deliver Universal RDMA that enables RoCE, RoCEv2, and iWARP. Marvell FastLinQ Universal RDMA and emerging low latency I/O bus mechanisms such as network file system over RDMA (NFSoRDMA) and NVMe-oF allow customers to accelerate access to data. Marvell's cutting-edge offloading technology increases cluster efficiency and scalability to many thousands of nodes.

High Density Server Virtualization

The latest hypervisors and multicore systems use several technologies to increase the scale of virtualization. The HPE CN1300R CNA supports:

- VMware® NetQueue
- Windows® Hyper-V® Virtual Machine Queue (VMQ)
- Linux® Multiqueue
- Windows, Linux, and VMware® switch-independent NPAR
- Windows Hyper-V, Linux Kernel-based Virtual Machine (KVM), and VMware ESXi™ SR-IOV

These features provide ultimate flexibility, quality of service (QoS), and optimized host and VM performance while providing full 10/25Gbps bandwidth per port. Public and private cloud virtualized server farms can now achieve 2.5 times the VM density for the best price and VM ratio.

Wire-Speed Network Virtualization

Enterprise-class data centers can be scaled using overlay networks to carry VM traffic over a logical tunnel using NVGRE, VXLAN, GRE, and GENEVE. Although overlay networks can resolve vLAN limitations, native stateless offloading engines are bypassed, which places a higher load on the system's CPU. The HPE CN1300R 10/25GbE CNA efficiently handles this load with advanced NVGRE, VXLAN, GRE, and GENEVE stateless offload engines that access the overlay protocol headers. This access enables traditional stateless offloads of encapsulated traffic with native-level performance in the network. Additionally, the HPE CN1300R CNA supports VMware NSX® and Open vSwitch™ (OVS).

Ease Migration from 10GbE to 25GbE

The HPE CN1300R 10/25GbE CNA supports Marvell FastLinQ SmartAN technology, which provides seamless connectivity between 10GbE and 25GbE environments. At 25GbE, considerations need to be made for FEC and bandwidth settings, which are dependent on the type of cabling used and the switch port settings. With SmartAN, the adapter automatically negotiates the best settings for the connection without any user intervention.

Hyper-Scale Orchestration with OpenStack

The HPE CN1300R 10/25GbE CNA supports the OpenStack® open source infrastructure for constructing and supervising public, private, and hybrid cloud computing platforms. It provides for both networking and storage services (block, file, and object) for iSER. These platforms allow providers to rapidly and horizontally scale VMs over their entire, diverse, and widely spread network architecture to meet the real-time needs of their customers. Marvell's integrated, multiprotocol management utility, QConvergeConsole® (QCC), provides breakthrough features that allow customers to visualize the Open-Stack-orchestrated data center using auto-discovery technology.

Accelerate Telco Network Function Virtualization (NFV) Workloads

In addition to OpenStack, the HPE CN1300R 10/25GbE CNA supports NFV that allows decoupling of network functions and services from dedicated hardware (such as routers, firewalls, and load balancers) into hosted VMs. NFV enables network administrators to flexibly create network functions and services as they need them, reducing capital expenditure and operating expenses, and enhancing business and network services agility. Marvell FastLinQ 25GbE technology is integrated into the DPDK and can deliver up to 38 million packets per second to host the most demanding NFV workloads.

The HPE CN1300R 10/25GbE CNA supports the NSX-T/N-VDS Enhanced data path/ Network Stack (ENS) polling mode driver (QeDeNTV_ens) for NFV workloads on VMware ESXi 6.7.

Trusted, Secure, Reliable, and Interoperable

The HPE CN1300R 10/25GbE CNA adheres to standards that ensure interoperability with a wide range of network solutions. Marvell adapters are secure by design. Through public and private key encryption technology, the adapter enforces a process for secure firmware updates that prevent hackers from altering the code running on the adapter.

Host Bus Interface Specifications

Bus Interface

- PCI Express® (PCIe®) Gen 3 x8, Gen 2 x8 (electrical)

Host Interrupts

- MSI-X

I/O Virtualization

- SR-IOV (up to 192 virtual functions)

Compliance

- *PCI Express Base Specification,* rev. 3.1
- *PCI Express Card Electromechanical Specification,* rev. 3.0
- *PCI Bus Power Management Interface specification,* rev. 1.2

Ethernet Specifications

Throughput

- 25Gbps line rate per-port in 25GbE mode
- 10Gbps line rate per-port in 10GbE mode

Ethernet Frame

- Standard MTU sizes and jumbo frames up to 9,600 bytes

Stateless Offload

- IP, TCP, and user datagram protocol (UDP) checksum offloads
- TCP segmentation offload (TSO)
- Large send offload (LSO)
- Giant send offload (GSO)
- Large receive offload (LRO) (Linux)
- Receive segment coalescing (RSC) (Windows)
- Receive side scaling (RSS)
- Transmit side scaling (TSS)
- Interrupt coalescing
- VMware NetQueue, Microsoft® Hyper-V VMQ (up to 208 dynamic queues), and Linux Multiqueue
- Universal RDMA
- DPDK/VMware N-VDS Enhanced Data Path

Tunneling Offloads

- VXLAN
- GRE
- NVGRE
- GENEVE

Ethernet Specifications

Compliance

- IEEE Specifications:
  - *802.1AS/1588-2008 PTPv2*
  - *802.1q (VLAN)*
  - *802.1Qaz (DCBX and ETS)*
  - *802.1Qbb (Priority-based Flow Control)*
  - *802.3-2015 (10Gb and 25Gb) Ethernet flow control*
  - *802.3-2015 Clause 52 (10Gb Ethernet Optical)*
  - *802.1ax (Link Aggregation)*
  - *802.3by-2016 (25G Ethernet)*
  - *1588-2002 PTPv1 (Precision Time Protocol)*
- *SFF8431 Annex E (10Gb Direct Attach Copper)*
- RFCs:
  - *IPv4 (RFC 791)*
  - *IPv6 (RFC 2460)*

Board Firmware Features

- Secure Firmware Update process
- Smart Auto Negotiation (FastLinQ SmartAN)
- Forward error correction (FEC) support:
  - Reed-Solomon FEC (RS-FEC)
  - Fire Code FEC (FC-FEC)

RDMA Specifications

Universal RDMA

- RoCE
- RoCEv2
- iWARP
- Storage over RDMA: iSER, SMB Direct, S2D, and NVMe-oF
- NFSoRDMA

FCoE Specifications

Performance

- 3.6 million FCoE IOPS

iSCSI Specifications

Performance

- 2.9 million iSCSI IOPS

Tools and Utilities

Management Tools and Device Utilities

- QLogic® Control Suite™ integrated network adapter management utility (CLI) for Linux and Windows
- QCC Plug-ins for vSphere (GUI) and ESXCLI plug-in for VMware
- QCC PowerKit (Windows PowerShell® cmdlets) for Linux, VMware, and Windows
- Pre-boot unified extensible firmware interface (UEFI) Device Configuration pages in system BIOS
- Native OS management tools for networking

Boot Support

- Unified extensible firmware interface (UEFI)
- Pre-execution environment (PXE) 2.0
- FCoE Boot from SAN
- iSCSI remote boot

APIs

- SNIA HBA API v2
- SMI-S

Operating System Support

For specific product compatibility information, see the HPE Single Point of Connectivity Knowledge (SPOCK) for HPE Storage Products at www.hpe.com/storage/spock

Physical Specifications

Ports

- Dual 10/25Gbps Ethernet: SFP28 cages

Form Factor

- Low-profile PCIe card (6.60in. × 2.71in.)

Environment and Equipment Specifications

Temperature

- Operating: 0°C to 55°C (32°F to 131°F)
- Storage: –40°C to 65°C (–40°F to 149°F)

Airflow

- 100LFM at 55°C with two 85C-rated optical SR transceivers

Note:
All advertised features are enabled in the hardware. Actual feature availability is dependent on software driver releases. See the release notes.

Picture may not be representative of the final shipping product.

Environment and Equipment Specifications

Humidity

- Operating: 10% to 80%
- Storage: 5% to 90

Compliance

- RoHS compliant

Connectivity

Rate	Cable and Maximum Distance (m)		
	DAC	SR FOC	AOC
10G	7	400 OM4 300 OM3	30
25G	5	100 OM4 70 OM3	30

DAC = Direct attach cable
SR FOC = SR fiber optic cable
AOC = Active optical cable

Agency Approvals—Safety

US and Canada

- UL 60950-1
- CSA C22.2

Europe

- TUV EN60950-1
- TUV IEC 60950-1
- IEC62368 2nd and 3rd Edition
- CB Certified

Agency Approvals—EMI and EMC (Class A)

US and Canada

- FCC Rules,CFR Title 47, Part 15, Subpart Class A
- Industry Canada, ICES-003: Class A

Europe

- EN55032
- EN55024
- EN61000-3-2
- EN61000-3-3

Japan

- VCCI: Class A

New Zealand and Australia

- AS/NZS: Class A

Korea

- KC-RRA Class A

Taiwan

- BSMI CNS 13438

Product Support Information

For specific product compatibility information, refer to the HPE Single Point of Connectivity Knowledge (SPOCK) for HPE Storage Products at www.hpe.com/storage/spock

Server Support Information

HPE ProLiant Gen10 Servers

- Select HPE ProLiant Gen10 DL, ML, and Apollo servers
- For details regarding supported server options, see HPE Server QuickSpecs at www.hpe.com/info/qs

Ordering Information

HPE CN1300R 10/25GbE SFP28 CNA (HPE part number Q0F09A)

Resources

For more information, visit us on the web at: www.marvell.com/hpe
For questions or enquiries, e-mail hpesolutions@marvell.com

MARVELL

To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.