HPE® CN1200R 10GBASE-T CNA
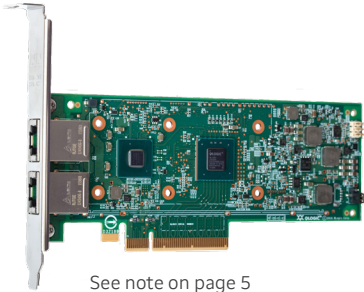
8th Generation 10Gb Converged Network Adapter with iSCSI, FCoE, and Universal RDMA

See note on page 5

The HPE CN1200R 10GBASE-T CNA with Universal Remote Direct Memory Access (RDMA) leverages the Marvell® eighth-generation Ethernet ASIC controller. It supports simultaneous LAN (TCP/IP), Universal RDMA, and SAN (Fibre Channel over Ethernet [FCoE] and iSCSI) traffic at 10Gb Ethernet (10GbE) line-rate speeds. The HPE CN1200R-T provides extremely low host CPU usage by enabling full hardware offloads.

The HPE CN1200R-T leverages Marvell's long-standing industry leadership in Ethernet by providing the highest levels of performance, efficiency, and scalability for the enterprise data center.

The acceleration of data center convergence—triggered by virtualization, software-defined networking (SDN), and multitenant cloud computing platforms—demands high-performance, converged network solutions. The HPE CN1200R-T is the solution of choice for workload-intensive computing environments, providing a reliable, high-performance 10GbE connectivity solution.

- Full line-rate 10GbE performance across both ports

- Universal RDMA—Delivers choice and flexibility with concurrent support for RoCE, RoCEv2, and iWARP technologies

- Secure firmware update process with private/public key encryption technology prevents hackers from altering the CNA

- Enables provisioning of 10GbE ports for greater deployment flexibility through switch-independent NIC partitioning

- Boosts host CPU efficiency with hardware offloads for GRE, NVGRE, GENEVE, and VXLAN tunnels

- 10GBASE-T version provides low-cost and easy-to-install RJ45 connectivity that is compatible with existing 1GbE

Features

- PCI Express® (PCIe®) Gen 3 x8 (8GT/s) support

- Full line-rate performance across both RJ45 ports

- Full hardware offload for iSCSI and FCoE

- Support for Non-volatile memory express (NVMe™) over Fabric (NVMe-oF) with RoCE or iWARP RDMA

- Broad OS and hypervisor support

- Simplifies deployment and trouble-shooting using the QLogic® Control Suite (QCS) CLI, QCC PowerKit, vCenter GUI and ESXCLI Plug-ins, and Open-Stack® integration

- Network boot support:
  - iSCSI remote boot
  - FCoE boot from SAN
  - Preboot Execution Environment (PXE) 2.0
  - Unified Extensible Firmware Interface (UEFI) support

- MSI and MSI-X support

- IPv4 and IPv6 stateless offloads

- PCI-SIG® single root input/output virtualization (SR-IOV)

- Comprehensive stateless offloads

- Auto negotiation: 1G/10G

- RX/TX multiqueue:
  - VMware® NetQueue
  - Windows® Hyper-V Virtual Machine Queue (VMQ)
  - Linux® Multiqueue

- Tunneling offloads:
  - Windows Network Virtualization using Generic Routing Encapsulation (NVGRE)
  - Linux Generic Routing Encapsulation (GRE)

Features (continued)

- Tunneling offloads (continued):
  - VMware and Linux Virtual Extensible LAN (VXLAN)
  - VMware and Linux Generic Network Virtualization Encapsulation (GENEVE)
- Receive side scaling (RSS)
- Transmit side scaling (TSS)
- Support for vLAN tagging
- Support for jumbo frames larger than 1,500 bytes (up to 9,600 bytes)

- Data center bridging (DCB)
- Network teaming, failover, and load balancing:
  - Switch Independent NIC Teaming/ Bonding
  - Switch Dependent NIC Teaming/ Bonding
  - Link aggregation control protocol (LACP) and generic trunking

Benefits

Designed for Next-gen Server Virtualization

The HPE CN1200R-T supports today's most compelling set of powerful networking virtualization features: SR-IOV, tunneling offloads (VXLAN, GENEVE, GRE, and NVGRE), and industry-leading performance, thus enhancing the underlying server virtualization features.

- SR-IOV delivers higher performance and lower CPU utilization with increased virtual machine (VM) scalability.
- Designed to meet the demands of large public cloud deployments, the HPE CN1200R-T features tunneling offloads for multitenancy with VXLAN, GENEVE, GRE, and NVGRE support.
- The HPE CN1200R-T is designed for maximum flexibility, which enables simultaneous, fully offloaded, high-performance, multiprotocol (FCoE, iSCSI, Universal RDMA, and NIC) support from each independent port of the adapter.

Extreme Application Performance

The HPE CN1200R-T features a high-speed, flexible architecture driven by independent, ultra-high performance engines. These engines meet and exceed the peak demands of the most demanding enterprise application or virtual platform.

- Availability of both RSS and TSS allows for more efficient load balancing across multiple CPU cores
- Increases server performance with full hardware offload for storage traffic
- Industry-leading FCoE performance of up to 3.6 million IOPS, suitable for high-density server virtualization and large databases
- Industry-leading iSCSI performance of up to 2.9 million IOPS, suitable for a diverse set of applications leveraging the flexibility of iSCSI

OPEX Savings with Low-power PCIe Gen 3

The HPE CN1200R-T is a PCIe Gen 3-based adapter that has one of the lowest power consumption profiles in the industry.

• Supporting the latest generation of host bus connectivity, PCIe Gen 3 enables the HPE CN1200R-T to deliver line rate dual-port performance without compromise.
• The HPE CN1200R-T is designed to provide maximum power efficiency, and still delivers a fully offloaded, high-performance I/O connectivity platform.

Accelerate Any Network With Universal RDMA Offload

The HPE CN1200R-T supports RDMA over converged Ethernet (RoCE) and Internet wide area RDMA protocol (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 Internet extensions for RDMA (iSER). The HPE CN1200R-T 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.

Simplified Management

Marvell's QConvergeConsole® (QCC) delivers a broad set of powerful Ethernet and Fibre Channel (FC) adapter management features for administrators to maximize application performance and availability. VMware vCenter GUI and ESXCLI Plug-ins and OpenStack integration are also available.

Accelerate Telco Network Function Virtualization (NFV) Workloads

In addition to OpenStack, the HPE CN1200R 10GBASE-T CNA supports NFV that allows decoupling 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 technology is integrated into the Data Plane Development Kit (DPDK) and can deliver up to 60 million packets per second to host the most demanding NFV workloads.

Leadership, Confidence, and Trust

Adapters based on Marvell technology offer you peace of mind and confidence, as proven through the company's market share leadership: #1 in Converged Network Adapters. The HPE CN1200R-T offers high reliability and availability.

Trusted, Secure, Reliable, and Interoperable

The HPE CN1200R-T adheres to standards that ensure interoperability with a wide range of network solutions. Marvell adapter technology is 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 (x8 physical connector)

Host Interrupts

• MSI-X supports independent queues

I/O Virtualization and Multitenancy

• SR-IOV (up to 192 virtual functions)
• GENEVE, GRE, and NVGRE packet task offloads
• Virtual Extensible LAN (VXLAN) packet task offloads

Compliance

• *PCI Base Specification*, rev. 3.1
• *PCI Express Card Electromechanical Specification,* rev. 3.0
• *PCI Bus Power Management Interface Specification*, rev. 1.2
• *Advanced configuration and power interface* (ACPI) v2.0

Ethernet Specifications

Throughput

• 10Gbps line rate per port
• 1G/10GBASE-T (RJ45) Auto Negotiation

Ethernet Frame

• 1,500 bytes and larger (jumbo frame)

Stateless Offload

• TCP segmentation offload (TSO)
• Large send offload (LSO)
• Large receive offload (LRO)
• Giant send offload (GSO)
• TCP and user datagram protocol (UDP) checksum offloads
• Receive segment coalescing (RSC)
• Interrupt coalescing
• RSS and TSS
• VMware NetQueue, Microsoft VMQ (up to 208 dynamic queues), and Linux Multiqueue
• Universal RDMA

Ethernet Specifications (continued)

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 Clauses 55, 40 (10GBASE-T, 1000BASE-T)*
  – *802.1ax (Link Aggregation)*
  – *802.3az EEE (Energy Efficient Ethernet)*
  – *802.3x (Flow Control)*
  – *1588-2002 PTPv1 (Precision Time Protocol)*
• RFCs:
  – *IPv4 (RFC 791)*
  – *IPv6 (RFC 2460)*

Board Firmware Features

• Secure Firmware Update process

RDMA Specifications

Universal RDMA

• RoCE
• RoCEv2
• iWARP
• Storage over RDMA: iSER, SMB Direct, S2D, 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 (QCS) Command Line Interface (CLI) for Linux and Windows
• QCC Plug-in 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

Tools and Utilities (continued)

Boot Support

• iSCSI remote boot
• FCoE boot from SAN
• PXE 2.0
• UEFI

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 10Gbps Ethernet: RJ45 connectors

Form Factor

• PCI Express short, low-profile card: 167.65mm × 68.90mm (6.60in. × 2.71in.)

Environmental and Equipment Specifications

Temperature

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

Airflow

• 150LFM at 55°C

Humidity (Relative, Non-condensing)

• Non-operational: 93% maximum at 65°C
• Operational: 7% -93% at 55°C

Cabling Distance (Maximum)

• CAT6a/7 up to 100 meters

Compliance

• RoHS compliant

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.

Agency Approvals—Safety

US and Canada

- UL 60950-1, CSA C22.2

Europe

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

Agency Approvals—EMI and EMC

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

Agency Approvals—EMI and EMC (continued)

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 CN1200R 10GBASE-T CNA (HPE part number Q0F26A)

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.