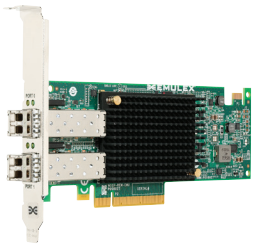
# OCec14000
# 10GbE Cloud Adapter



## Overview

As the fourth generation of the Emulex OneConnect® product line, the OCec14000 Cloud Adapter is the first Emulex adapter capable of supporting OpenWorks client, delivering multiple benefits for the enterprise cloud, including:

- Increasing data center IT agility and scalability through deployment of a secure multi-tenant cloud
- Driving scalability and flexibility in converged infrastructures
- Optimizing server hardware utilization by scaling high density virtualization

The OCec14000 family of 10Gb Ethernet (10GbE) Cloud Adapters is designed for the high bandwidth and scalability demands of tier 1 enterprise applications with storage protocol (FCoE and iSCSI) offloads and more scalable virtualization with cloud optimization using overlay network offload technology.

### Support for Emulex OpenWorks™

The Emulex OpenWorks Connector provides a highly scalable infrastructure that enables bare metal adapter configuration management and rapid provisioning/deployment capabilities for scale-out environments such as cloud-based infrastructures. The Emulex OpenWorks Connector utilizes a RESTful API, allowing third party provisioning tools to utilize the new OpenWorks Connector Boot Manager to manage the Emulex OneConnect OCec14000 Cloud Adapters. Egenera, a provider of cloud and data center infrastructure management software, is the first partner to utilize this API, and when combined with Egenera's PAN Manager 8.0, allows rapidly configuration and provisioning of machine images to bare metal rack servers for physical and virtual environments.

### Emulex Virtual Network Exceleration (VNeX™) overlay network offloads for multi-tenant cloud networking

Scaling existing technologies for private or public multi-tenant infrastructures requires networking solutions that can enable virtual machine (VM)-VM communication and virtual workload migration across Layer 2 and Layer 3 boundaries without impacting connectivity or performance. At the same time, these solutions need to ensure isolation and security for thousands or millions of tenant networks. However, with existing technology, the available 4094 VLAN IDs are insufficient to isolate/secure each tenant in a data center (private cloud) or hybrid cloud environment. Virtual Extensible Local Area Network (VXLAN) used by VMware, and Network Virtualization using Generic Routing Encapsulation (NVGRE) used by Microsoft, are next-generation overlay networking solutions that address these requirements. Overlay network solutions are a MAC-in-IP data packet encapsulation scheme enabling the creation of virtualized Layer 2 subnets that can span physical L3 IP networks. Traffic from each VM is mapped to a specific virtual network; the packets are then routed transparently over the existing physical infrastructure.

## Key benefits

- Maximizes server hardware return on investment (ROI) with high virtual machine density
- Simplifies deployment of secure, scalable multi-tenant cloud infrastructures
- Minimizes total cost of ownership (TCO) through deployment of heterogeneous workloads on Converged Infrastructure
- Accelerates applications and storage performance
- Provides the bandwidth needed for slot constrained server platforms
- Reduces complexity through the deployment of a common network platform
- Reduces management and infrastructure costs

## Key features

- Superior network convergence—storage and network traffic over a common 10GbE infrastructure
- Powerful hardware offloads for:
  - Virtual Network Fabrics (NVGRE & VXLAN)
  - Storage protocols: iSCSI and FCoE
  - Stateless TCP
- Greater bandwidth with PCIe 3.0
- VMware vSphere NetQueue support
- Microsoft Windows Server VMQ and Dynamic VMQ support

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Emulex VNeX offload technology powered by a multi-core adapter ASIC engine accelerates the performance of network virtualization by offloading the header encapsulation process, while simultaneously preserving legacy stateless TCP offloads, providing full native network performance in an overlay network environment.

### Flexible workload storage connectivity with Fibre Channel over Ethernet (FCoE) and iSCSI offloads

The OCec14000 Cloud Adapters support FCoE offload using the same enterprise-class Emulex drivers that work with Emulex LightPulse® Fibre Channel Host Bus Adapters (HBAs). The OCec14000 Adapters also support iSCSI offload, providing performance that is superior to iSCSI solutions based on software initiators and standard Network Interface Cards (NICs). Finally, the OCec14000 adapters also have the ability to support NIC and iSCSI or FCoE offloads on the same port.

### Lower TCO

- Consolidates multiple 1GbE adapters, associated cables and switch ports
- Higher VM workload bandwidth allocation to drive higher VM density on host servers
- Lower per-Gb bandwidth cost compared to deploying multiple 1GbE adapters

### Optimized I/O utilization

- Granular bandwidth provisioning minimizes wasted idle bandwidth and waste of dedicated 1GbE adapters
- Enables Service Level Agreement (SLA)-based provisioning and deployment

### Simplified deployment

- Works with any 10GbE switch

### Simplified management – Emulex OneCommand® Manager application

The OneCommand Manager application provides centralized management of Emulex OneConnect Adapters and LightPulse HBAs throughout the data center from a single management console. The OneCommand Manager application provides a graphical user interface (GUI) and a scriptable command line user interface (CLI). OneCommand Manager for VMware is fully integrated with VMware vCenter to simplify management for virtual server deployments.

### Fourth generation platform delivers enterprise-class reliability and performance

Leveraging generations of advanced, field-proven controller and adapter technology, OCec14000 Cloud Adapters meet the robust interoperability and reliability requirements of enterprise and scale-out data centers.

### Controller

- Emulex Engine™ (XE)100 series (Skyhawk™)

### Ethernet standards

- Dual IEEE 802.3-2008 10GBASE Ethernet ports (10GBASE-SR/10GBASE-CR)
- IEEE 802.1Q virtual LANs (VLAN)
- IEEE 802.3x Flow control with Pause frames
- IEEE 802.1Qbg Edge Virtual Bridging
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS); Data Center Bridging Capability Exchange (DCBX)
- IEEE 802.1Qbb Priority Flow Control (PFC)
- IEEE 802.3ad Link Aggregation/LACP
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)

### Ethernet Network Interface (Layer 2 NIC) and TCP/IP

- NDIS 5.2, 6.0, 6.2, 6.3-compliant Ethernet functionality
- IPv4/IPv6 TCP, UDP checksum offload
- IPv4/IPv6 Receive Side Scaling (RSS)
- IPv4/IPv6 Large Receive Offload (LRO)
- IPv4/IPv6 Large Send Offload (LSO)
- Dynamic VMQ (Windows Server 2012 Hyper-V) and NetQueue (VMware vSphere)
- Programmable MAC and VLAN addresses
- 128 MAC/VLAN addresses per port
- Support for hash-based Multicast MAC address filters
- Support for hash-based Broadcast frame filters per port
- VLAN offloads (insertion and extraction)
- Jumbo frame support up to 9200 Bytes

### I/O virtualization

- Stateless L2, L3, and L4 offloads for frame-in-frame encapsulation (VXLAN, NVGRE)
- PCI-SIG Address Translation Service (ATS) v1.0
- Support for up to 512 hardware queues

### Fibre Channel over Ethernet (FCoE) offload

- Hardware offload for FCoE protocol
- ANSI T11 FC-BB-5 Compliant
- Programmable World Wide Name (WWN)
- Support for FIP and FCoE Ether Types
- Concurrent Logins (RPI): up to 8K per adapter (FCoE adapter-only mode)
- Open Exchanges (XRI): up to 4K per adapter (FCoE adapter-only mode)
- Supports up to 255 NPIV interfaces per port
- T10 PI support for end-to-end data integrity (for target mode drivers)

### Internet Small Computer System Interface (iSCSI) offload

- Hardware offload for iSCSI protocol
- Header and data digest support
- Up to 4K outstanding commands (iSCSI adapter-only mode)
- Up to 512 offloaded iSCSI connections (iSCSI adapter-only mode)
- Support for multipath I/O
- Operating system-agnostic INT13-based iSCSI boot and iSCSI crash dump support
- RFC 4171 Internet Storage Name Service (iSNS)
- Support for both IPv4 and IPv6 connections
- T10 PI support for end-to-end data integrity (for target mode drivers)

### Converged Enhanced Ethernet (CEE) and Datacenter Bridging (DCB)

- IEEE 802.1Qbb Priority Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.1Qaz Data Center Bridging Exchange (DCBX)
- Absolute per-priority rate control option/ configuration

### PCI Express (PCIe) interface

- PCIe 3.0 x8 (8, 5.0, and 2.5 GT/s per lane) compliant interface:
  - Up to 64 Gb/s full duplex bandwidth
  - Configurable width and speed to optimize power versus bandwidth
- Support for up to 8 PCIe physical functions (PFs)
- Support for x1, x2, x4, and x8 links widths
- Message Signal Interrupts (MSI-X)
- Advanced Error Reporting (AER)
- Support for D0 and D3 (hot and cold) power management modes
- Completion Timeout (CTO)
- Function Level Reset (FLR)

### Comprehensive OS support

- Windows Server
- Red Hat Enterprise Linux
- SUSE® Linux Enterprise Server
- Oracle Linux
- VMware vSphere
- CentOS

### Management, boot support

- vCenter management plugin support
- Role-based management, integrated with Active Directory and LDAP
- Flexible personality definition for networking and storage protocols
- Multi-channel configuration and bandwidth control
- UEFI and x86 remote boot support including PXE v2.1, UEFI 2.3.1, iSCSI and FCoE
- Offline and online firmware updates
- Integrated Thermal Sensor works with management utilities

### Hardware environments

- Supported on HP and Fujitsu x86, x64 servers only

Please refer to the product page on www.emulex.com and www.egenera.com

### Ordering information

**Adapters**

- OCec14102-UX
  - Dual-channel, 10GBASE-CR (direct attach copper) SFP+, CNA Adapter

**Software (required)**

- ELX-DMC-Boot
- ELX-DMC-Boot (1 year maintenance & support)

**Optional accessories**

- OC10-SR-OPT-1
  - 10GBASE-SR (short reach optical) SFP+ Optical Kit, 1 pc
- OC10-SR-OPT-2
  - 10GBASE-SR (short reach optical) SFP+ Optical Kit, 2 pcs

**Note** – The customer must order the adapter, software, and 1 year support.

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