

OCe14102-UX-F Dual-port 10GbE Converged Network Adapter

For Fujitsu servers

High performance virtualization networking and enterprise hardened storage interoperability



OneConnect OCe14102-UX-F

Overview

As the fourth generation of the Emulex OneConnect® product line, the OCe14102-UX-F Converged Network Adapters (CNAs) provide high performance 10Gb Ethernet (10GbE) connectivity delivering multiple benefits for the enterprise cloud, including:

- Increasing data center IT agility and scalability through deployment of a secure scale-out virtualized data center network
- Driving scalability and flexibility in converged infrastructures
- Optimizing server hardware utilization by enabling high density virtualization

The OCe14000-UX-F 10GbE CNA is designed for the high bandwidth and scalability demands of tier 1 enterprise applications with storage protocol Fibre Channel over Ethernet (FCoE) and iSCSI offloads, more scalable virtualization with support for enhanced Single-Root I/O Virtualization (SR-IOV) and Network Interface Card (NIC) port partitioning, and cloud optimization using overlay networking technology.

Emulex Virtual Network Exceleration™ (VNeX) overlay network offloads for virtualized scale-out cloud

Scaling existing technologies for private or hybrid cloud infrastructures requires networking solutions that can enable virtual machine (VM)-to-VM communication and virtual workload migration across Layer 2 and Layer 3 boundaries without requiring network reconfigurations or impacting server 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 public/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.

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, delivering full line rate network performance in a virtual network environment.

Key benefits

- Maximizes server hardware ROI with high virtual machine density
- Simplifies deployment of secure, scalable private/hybrid cloud infrastructures
- Accelerates applications and storage performance
- Eliminates wasted idle bandwidth by optimizing bandwidth allocation for applications, management and virtualization services with Universal Multi-Channel™ (UMC) port partitioning
- Reduces adapter and cable costs – one adapter for simultaneous storage and data traffic on a common 10GbE fabric
- Simplifies management

Key features

- Superior network convergence – storage and network traffic over a common 10GbE infrastructure
- Virtualization:
 - SR-IOV
 - Intelligent steering of receive I/O with VMware NetQueue and Microsoft Hyper-V VMQ for full 10GbE bandwidth utilization
 - N_Port ID Virtualization for creation of multiple virtual FCoE ports on a single physical FCoE port
- Powerful hardware offloads for:
 - Virtual Network Fabrics (NVGRE and VXLAN)
 - Storage protocols: iSCSI and FCoE
 - Stateless TCP
- Greater bandwidth with PCIe 3.0

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Flexible workload storage connectivity with FCoE and iSCSI offloads

The OCe14102-UX-F adapters support FCoE offload using the same enterprise-class Emulex drivers that work with Emulex LightPulse® Fibre Channel Host Bus Adapters (HBAs). The OCe14102-UX-F adapters also support iSCSI offload, providing performance that is superior to iSCSI solutions based on software initiators and standard NICs. Finally OCe14102-UX-F adapters also have the ability to support NIC and iSCSI or FCoE offloads on the same port.

Optimized bandwidth allocation with Universal Multi-Channel port partitioning

Emulex UMC allows multiple PCI functions to be created on each adapter port. As a CNA, each port can be configured with up to three NIC functions and one storage function for a total of two storage and six NIC functions on a two-port adapter.

The key benefits of deploying Emulex UMC technology include:

Lower total cost of ownership (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

- UMC is not dependent on specialized OS support
- Works with any 10GbE switch

UMC is ideal for virtualized server environments because bandwidth allocation can be optimized to support I/O intensive applications, virtual machine migration, and management functions.

Optimized host virtualization density with SR-IOV support

SR-IOV optimizes I/O for VMs, enabling higher host server virtualization ratios to deliver maximum server ROI. SR-IOV provides a more cost-effective solution than multiple, physical adapter ports.

SR-IOV enables multiple VMs to directly access the OCe14000's I/O resources, thus allowing VM networking I/O to bypass the host and take a path directly between the VM and the adapter, eliminating redundant I/O processing in the hypervisor. This, in turn, allows higher I/O performance and lower CPU utilization as compared to the alternative of software-emulated NIC devices that are implemented in the hypervisor.

Application acceleration with RDMA over Converged Ethernet (RoCE)

The OCe14102-UX-F is RoCE ready* with initial support for the Microsoft SMB Direct protocol. RoCE accelerates storage I/O while reducing overall CPU utilization delivering improved applications performance and enabling higher server workload density.

Simplified management with Emulex OneCommand® Manager application

The Emulex OneCommand Manager application provides centralized management of Emulex OneConnect CNAs 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.

* Requires future firmware update.

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Controller

- Emulex Engine, XE100 series controllers

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 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
- Virtual Switch Port Mirroring for diagnostic purposes
- Virtual Ethernet Bridging (VEB)
- OneConnect UMC, support for 4 NIC partitions or functions per physical port
 - For CNAs 1 function can be a storage function (iSCSI or FCoE)
- NIC SR-IOV:
 - For 2x10G: up to 31 VFs per port
- QoS for controlling and monitoring bandwidth assigned to and used by virtual entities
- Configurable control of network bandwidth by physical port, queue, or protocol
- Traffic shaping and QoS across each VF and PF

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

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

Converged Enhanced Ethernet (CEE) and Data Center 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 Gen 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
- Single Root I/O Virtualization (SR-IOV)
 - For 2x10G: up to 31 VFs per port
- Message Signal Interrupts (MSI-X)
- Advanced Error Reporting (AER)
- 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
- MAC statistics gathering (SNMP, Ethernet MIB, MIB2, RMON, RMON2)
- Offline and online firmware updates
- Integrated Thermal Sensor works with management utilities

Hardware environments

- x86, x64 servers

Please refer to the product page on www.emulex.com for further details.

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Interconnect

- Copper
 - SFP+ Direct Attached Twin-Ax Copper interface
 - Standards compliant passive copper cables up to 5m and active copper cables up to 10m
- Optical*
 - Optic 10GBASE-SR short wave lasers with LC type connector supported up to 300m on laser-optimized OM3 multimode fiber (MMF) cables

Physical dimensions

- Short, low profile MD2 form factor card
- 167.64mm x 68.91mm (6.60" x 2.71")
- Standard bracket installed (low-profile bracket available)

Environmental requirements

- Operating temperature: 0° to 55°C (32° to 131°F)
- Storage temperature: -40° to 70°C (-40° to 158°F)
- Relative humidity: 5% to 95% non-condensing

Agency and product safety approvals

North America

- FCC/Industry Canada Class A
- UL/CSA Recognized
- Class 1 Laser Product per DHHS 21CFR (J)

Europe

- CE Mark
- EU RoHS compliant
- TUV Bauart Certified
- Class 1 Laser Product per EN60825-1

Australia

- C-Tick Mark

Japan

- VCCI Class A

Taiwan

- BSMI Class A

Korea

- MSIP (formerly KCC/MIC) Class A

China

- China RoHS Compliant

Ordering information

Adapters

Dual-port 10GbE SFP+, CNA Adapter

- S26361-F5250-E1
- S26361-F5250-E201
- S26361-F5250-L501
- MC-0JCE61
- MC-0JCE62
- MCX0JCE61

Optional Accessories*

S26361-F5250-E110, S26361-F5250-L110

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

* Only Fujitsu Accessories are warranted and fully supported by Technical Support



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