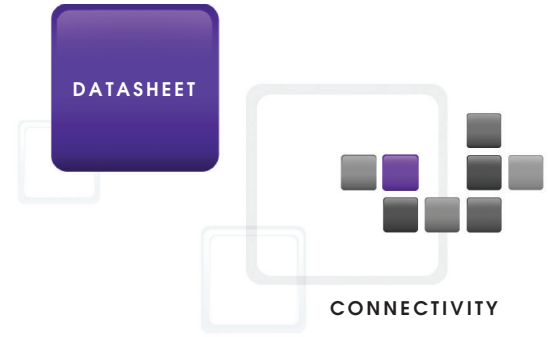


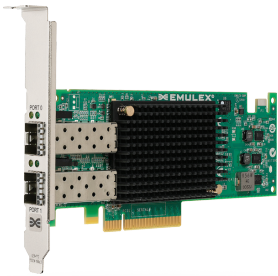


OneConnect® OCe11102

10 Gigabit Ethernet Network and Storage Adapters



**SIMPLIFIED
NETWORKING,
TRUSTED SAN
INTEROPERABILITY
AND INCREASED
BUSINESS
AGILITY**



The Problem

Data centers have traditionally used specialized networks to meet individual I/O connectivity requirements for networking and storage. With increasing deployments of blades and virtualized servers, data centers are inherently facing network sprawl, primarily driven by deployments of multiple 1Gb Ethernet links and external storage. This network sprawl has resulted in:

- Increased capital costs for adapters, switch ports and cables
- Increased operational costs for power, cooling and IT management

Emulex OneConnect Universal CNA Platform

The Emulex OneConnect OCe11102 Universal Converged Network Adapter (UCNA) is a third-generation, high-performance 10 Gigabit Ethernet (10GbE) product platform that provides server connectivity for network and storage traffic with multi-function server adapters. The payoff is a rapid return on investment (ROI) based on:

- **Lower capital expense (CapEx)**—Single 10GbE adapter can replace Host Bus Adapter (HBA) and multiple 1GbE Network Interface Cards (NICs)
- **Lower operational expense (OpEx)**—One management console for network and storage
- **Higher virtualization ratios**—Protocol offloads save CPU cycles and optimize memory usage

Emulex OneConnect UCNA technology provides optimized performance for TCP/IP, TOE, TCP Chimney, Fibre Channel over Ethernet (FCoE) and iSCSI protocols. Accelerators/offload engines for all supported protocols allow OneConnect UCNAs to deliver maximum performance, regardless of the mix of network traffic.

Key Features

One platform for every network connection

- Full TCP, iSCSI and FCoE offloads
- Same firmware, drivers and management as OneConnect blade and LOM solutions.

Superior performance

- Hardware accelerators for all protocols
- High performance with high CPU efficiency

Energy-efficient design

- Industry-leading performance per watt
- Complements data center “green” initiatives

Easy to deploy and manage with OneCommand® Manager application

- One management console, many protocol services
- Integrated management of UCNAs and HBAs

Key Benefits

Optimized for convergence

- One network infrastructure reduces CapEx
- One management console reduces OpEx
- Leverages existing IT investments

Optimized for server virtualization with vEngine™ technology

- Support for VMware NetQueue and Microsoft VMQ optimizes performance for virtualized servers
- More virtual machines (VMs) per server with full TCP, iSCSI and FCoE protocol offloads
- VM-specific performance, QoS and management

Enterprise-ready

- Hardware parity, CRC, ECC and other advanced error checking
- Backed by field proven Emulex reliability and support



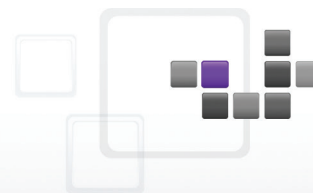
OneConnect®



OneCommand®

OneConnect OCe11102

10 Gigabit Ethernet Network and Storage Adapters



One Connection for Network and Storage

OneConnect product family

- OCe11102-N: 10Gb Network Adapter
- OCe11102-I: 10Gb iSCSI Adapter
- OCe11102-F: 10Gb FCoE Converged Network Adapter or iSCSI Adapter

Virtualized I/O

New multi-core servers are enabling much higher virtualization ratios. OneConnect OCe11102 adapters support NetQueue for VMware and Virtual Machine Queue (VMQ) for Microsoft Windows Server 2008 Hyper-V to optimize performance for virtualized servers.

Network Convergence

OneConnect UCNAs support transmission of storage and network traffic over a converged lossless network based on IEEE Data Center Bridging (DCB) standards. Network convergence delivers significant cost savings by eliminating separate infrastructures for storage and networking and supporting bandwidth allocation to optimize throughput.

Fibre Channel over Ethernet

OneConnect UCNAs support FCoE, seamlessly converging Fibre Channel and Ethernet while leveraging mature Fibre Channel management tools and processes. By consolidating traffic, FCoE simplifies network management and significantly reduces total cost of ownership (TCO).

iSCSI

OneConnect is an optimum solution for iSCSI storage deployments. Using a hardware iSCSI adapter with full protocol offload provides better performance and simplified management when compared to iSCSI software initiators and standard NICs. OneConnect iSCSI and FCoE adapters also support iSCSI over DCB to enable lossless transmissions and optimized performance.

Enterprise iSCSI

The OneConnect Enterprise iSCSI solution includes support for DCB standards for optimum performance. Priority Flow Control (PFC) is used to insure a consistent stream of data between servers and storage arrays. Quality of Service (QoS) and Enhanced Transmission Selection (ETS) support protocol priorities and allocation of bandwidth for iSCSI and IP traffic.

Single Root I/O Virtualization (SR-IOV)

With OneConnect support for SR-IOV, virtual machines can share adapter ports to optimize performance with up to 32 virtual functions per port. VM to VM communication is enabled with a Layer 2 switch that is embedded in the OneConnect adapter. OneConnect adapters are PCI-SIG compliant and will support SR-IOV as available with hypervisors.

Universal Multi-Channel

OneConnect Universal Multi-Channel (UMC) allows multiple PCI functions to be created on each adapter port. Each NIC function is presented to the operating system or hypervisor as a physical port with a separate MAC address and user-assigned bandwidth. This enables a single adapter port to provide specialized NIC functions for different uses, such as payload traffic, guest migration and console management. OneConnect Ethernet adapters present four NIC functions per port. OneConnect iSCSI and FCoE adapters present one iSCSI or FCoE function plus three NIC functions per port.

Multiple boot options

OneConnect UCNAs support Fibre Channel, iSCSI and Preboot eExecution Environment (PXE) boot options for both x86 and Universal Extensible Firmware Interface (UEFI) platforms.

Simplified Management

OneCommand Manager application

The OneCommand Manager application enables management of Emulex One Connect UCNAs and LightPulse® HBAs throughout the data center from a centralized management console. In-depth management capabilities include remote firmware and boot code upgrades, beaconing, statistics and advanced diagnostics. The OneCommand Manager application provides a graphical user interface (GUI) and a scriptable command line user interface (CLI).

Quality of service

Using the OneCommand Manager application, administrators can allocate portions of the 10GbE bandwidth to network or storage traffic. Using OneConnect support for virtual ports, storage-based QoS can be individually managed for VMs.

Highest Performance and Reliability

Enterprise-ready

Leveraging ten generations of advanced, field-proven Fibre Channel HBA technology, the Emulex OneConnect family meets the robust interoperability and reliability requirements of corporate data centers. The design leverages proven Emulex enterprise-class drivers, firmware and hardware architectures, while delivering sophisticated capabilities required to manage multiple types of data flow concurrently with optimized performance.

vEngine technology

Emulex vEngine technology allows data centers to take full advantage of virtualization capabilities of new multi-core servers. With protocol offloads for TCP, iSCSI and FCoE, critical CPU resources are dedicated to running VMs, not I/O overhead.

Greener data centers

The Emulex OneConnect UCNA platform delivers industry-leading performance and scalability per watt, reducing requirements for power and cooling. Protocol offload enables efficient use of computing resources, supports more VMs per CPU, and reduces the number of servers required to support data center demands.

Advanced error checking

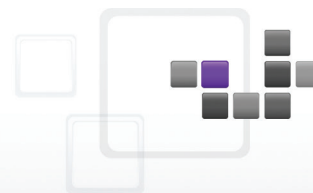
End-to-end data protection with hardware parity, CRC, ECC and other advanced error checking and correcting ensure that data is safe from corruption.

Pay-As-You-Go

All OneConnect adapters are based on a single hardware platform, which means support for storage connectivity can be managed with keys that enable the use of protocol offloads. With this flexibility, a baseline OneConnect network adapter can support FCoE or iSCSI offload without removing or replacing the board.

OneConnect OCe11102

10 Gigabit Ethernet Network and Storage Adapters



SPECIFICATIONS

Standards

- ANSI INCITS T11 FC-BB-5 2.0, FC-PI-2, FC-GS-4, FC-TAPE and FCP-3
- PCI Express base spec 2.0
- PCI Bus Power Management Interface, rev. 1.2, Advanced Error Reporting (AER)
- IEEE 802.3ae (10GBASE Ethernet Ports)
- IEEE 802.1q (Virtual LANs)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3x (Flow Control)
- IEEE 802.1p (Quality/Class of Service)
- IEEE 802.1Qaz (Enhanced Transmission Selection)
- IEEE 802.1Qaz (Data Center Bridging Capabilities Exchange)
- IEEE 802.1Qbb (Priority-based Flow Control)
- IEEE 802.1ab (Link Layer Discovery Protocol)
- PHP hot plug-hot swap

Architecture

- Dual-channel, 10Gb/s Ethernet Link speed
- PCIe Express 2.0 (x8, 5GT/s), MSI-X support
- Integrated data buffer and code space memory

Ethernet Features

- IPv4/IPv6 TCP, UDP checksum offload; Large Send Offload(LSO); Large Receive Offload; Receive Side Scaling (RSS); IPv4 TCP Chimney Offload
- VLAN insertion and extraction
- Jumbo frames up to 9000 Bytes
- Preboot eXecution Environment (PXE) 2.0 network boot and installation support
- Interrupt coalescing
- Load balancing and failover support including adapter fault tolerance (AFT), adaptive load balancing (ALB), teaming support and IEEE 802.3ad

Fibre Channel over Ethernet (FCoE) Features

- Full FCoE protocol offload
- Common driver for UCNAs and HBAs
- 64 N_Port ID Virtualization (NPIV) interfaces (total for adapter)
- Support for FIP and FCoE Ether Types
- Fabric Provided MAC Addressing (FPMA) support
- 1024 concurrent port logins (RPIs) per port
- 1024 active exchanges (XRIs) per port
- Remote Boot from SAN

iSCSI Features

- Full iSCSI protocol offload
- Target discovery methods
- Authentication modes
- Int 13 Remote Boot

I/O Virtualization and QoS

- PCI-SIG SR-IOV compliant
- 128 Virtual Functions (VFs)
- Up to 32 VFs per Physical Function (PF)
- On-chip VM to VM switching
- Quality of Service (QoS) across each VF and PF

Comprehensive OS Support

- Windows Server
- VMware ESX
- Red Hat Enterprise Linux Server
- Novell SUSE® Linux Enterprise Server
- CentOS
- Ubuntu (OCe11102-N)
- Oracle Solaris
- FreeBSD (OCe11102-N)

Hardware Environments

- x86, x64 servers
- Itanium™ IA64 servers

Interconnect

- Optical
 - Optics: 10GBASE-SR short wave lasers with LC type connector
- Copper Direct Attach
 - SFP+ Direct Attached Twin-Ax Copper interface
 - Standards compliant passive copper cables up to 5m and active copper cables up to 10m
- Copper Twisted Pair
 - Connectors: IEC 60603-7 8 Position 8 Contact (8P8C), commonly known as RJ45
 - Cables: Cat 6 up to 55m, Cat 6a up to 100m

Physical Dimensions

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

Power and Environmental Requirements

- Volts: +3.3, +12
- 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 Approvals

North America:

- FCC Class A
- UL/CSA Recognized

Europe:

- CE Mark
- EU RoHS compliant
- TUV Bauart Certified

Japan:

- VCCI Class A

Taiwan:

- BSMI Class A

Korea:

- MSIP (formally KCC/MIC) Class A

China:

- China RoHS Compliant

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

Interconnect	NIC	NIC + iSCSI	NIC + iSCSI + FCoE
Optical	OCe11102-NM	OCe11102-IM	OCe11102-FM
Copper Direct Attach	OCe11102-NX	OCe11102-IX	OCe11102-FX
Copper Twisted Pair	OCe11102-NT	OCe11102-IT	N/A

Note: Some of these products may not be available in the U.S.
Please contact your supplier for more information.

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Emulex Connects™ Servers, Storage and People

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