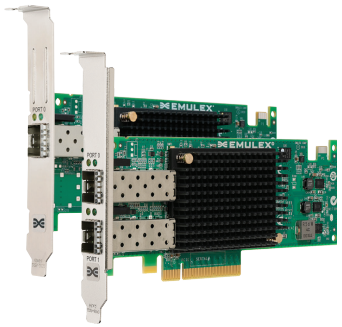

OneConnect® OCe11100

Family of 10Gb 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 (1GbE) 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 10GbE Platform

The Emulex OneConnect® OCe11101 network interface card (NIC) and OCe11102 Universal Converged Network Adapter (UCNA) are third-generation, high-performance 10Gb Ethernet (10GbE) adapters that provides server connectivity for network and/or storage traffic. The payoff is a rapid return on investment (ROI) based on:

- Lower capital expenditure (CAPEX)—Single 10GbE adapter can replace storage adapters and multiple 1GbE NICs[1]
- Lower operational expenditure (OPEX)—One management console for network and storage
- Higher virtualization ratios—Protocol offloads save CPU cycles and optimize memory usage

Emulex OneConnect technology provides optimized performance for TCP/IP, TOE, Fibre Channel over Ethernet (FCoE) and iSCSI protocols. Accelerators/offload engines for all supported protocols allow OneConnect adapters to deliver maximum performance, regardless of the mix of network traffic.[1]

OneConnect® OneCommand®

Key Features

One platform for every network connection

- Full TCP, iSCSI and FCoE offloads[1]
- Same firmware, drivers and management as OneConnect blade and LOM solutions.

Superior performance

- Hardware accelerators for all protocols[1]
- 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 network adapters, UCNAs and HBAs

Key Benefits

Lower OPEX and CAPEX

- One network infrastructure reduces CAPEX
- One management console reduces OPEX
- Leverages existing IT investments

Optimize 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[1]
- VM-specific performance, QoS and management

Secure management

- Role-based administration integrated with Light Directory Access Protocol (LDAP) and Active Directory (AD) services

Enterprise-ready

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

OneConnect® OCe11100

Family of 10GbE Network and Storage Adapters

One Connection for Network and Storage

OneConnect product family

- OCe11102-N: 10GbE Network Adapter
- OCe11102-I: 10GbE iSCSI Adapter
- OCe11102-F: 10GbE FCoE Converged Network Adapter or iSCSI Adapter
- OCe11101-N: 10GbE Network Adapter

Virtualized I/O

New multi-core servers are enabling much higher virtualization ratios. OneConnect 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 OCe11102 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 (FCoE)

OneConnect OCe11102 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 OCe11102 UCNA 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 OCe11102 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 adapters support for SR-IOV, VMs 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

The Universal Multi-Channel (UMC) capability of OneConnect adapters 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

OCe11102 storage adapters support Fibre Channel, iSCSI and Preboot eXecution Environment (PXE) boot options for both x86 and Universal Extensible Firmware Interface (UEFI) platforms.

Powerful Management Software for Maximum Data Center Efficiency

The Emulex OneCommand® Manager enterprise class management application features a multiprotocol, cross-platform architecture that provides centralized management of all adapters provided by Emulex. This enables IT administrators to manage network connectivity with one tool for maximum efficiency. OneCommand Manager also features:

- OneCommand® Manager plug-in for VMware vCenter Server—enables comprehensive control of Fibre Channel HBAs and network (FCoE, iSCSI and TCP/IP NIC) connectivity solutions provided by Emulex from VMware's vCenter Server management console. Emulex OneCommand Manager plug-in for VMware vCenter Server supports both the new VMware vSphere 5.1 Web Client and the VMware vCenter Server desktop client with an identical feature set regardless of the client.

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 Peformance 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[1]

OneConnect OCe11102 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® OCe11100

Family of 10GbE Network and Storage Adapters

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

- 10GbE Link speed
- PCIe Express 2.0 (x8, 5GT/s), MSI-X support (OCe11102)
- PCIe Express 2.0 (x4, 5GT/s), MSI-X support (OCe11101)
- 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)
- 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),1 teaming support and IEEE 802.3ad

FCoE Features[1]

- 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[1]

- 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[2]
  - 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

- Class 1 Laser Product per DHHS 21CFR (J) and EN60825-1
- UL recognized to UL 60950-1 2nd edition
- CUR recognized to CSA22.2, No. 60950-1-07
- Bauart-certified to EN60950-1 2nd edition
- FCC Rules, Part 15, Class A
- ICES-003, Class A
- EMC Directive 2004/108/EEC (CE Mark)
  - EN55022:2010, Class A
  - EN55024:2010
- Australian EMC Framework (C-Tick Mark)
  - AS/NZS CISPR22, Class A
- VCCI (Japan), Class A
- KCC (Korea), Class A
- BSMI (Taiwan), Class A
- EU RoHS Compliant (Directive 2002/95/EC)
- China RoHS Compliant

Ordering Information

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
Optical	OCe11101-NM	N/A	N/A
Copper Direct Attach	OCe11101-NX	N/A	N/A

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

[1] *OCe11100 network adapters TCP/IP traffic. OCe11102 adapters can support TCP/IP, iSCSI and FCoE traffic.*
[2] *Does not apply to OCe11101 adapter.*

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13-1206 · 6/13