



# Emulex and VMware Deliver High Performance Virtualization in Converged Network

## Strong partnership results in leading edge virtualization solutions

### At a Glance

IT departments are implementing VMware® server virtualization to increase operating efficiencies and improve resource utilization. Many are turning to the Emulex OneConnect™ Universal Converged Network Adapter (UCNA) for network connectivity. The Emulex OneConnect platform is a 10Gb Ethernet (10GbE) architecture that supports high performance offloads for TCP/IP, TCP Offload Engine (TOE), iSCSI and Fibre Channel over Ethernet (FCoE), delivering improved performance for networking and data center virtualization.

### Products

- Emulex OneConnect Universal Converged Network Adapter Platform (OCe10000 and OCe11000)
- Emulex OneCommand™ Manager (formerly HBAnyware®)
- VMware vSphere™

### Solution Benefits

- Consolidate the data center to a 10GbE infrastructure with offload support for TCP/IP, TOE, FCoE and iSCSI
- Protect investments in existing server, network, storage and facilities assets
- Decrease CapEx and OpEx by simplifying the data center infrastructure
- Increase business agility with easier, faster and pervasive data center virtualization
- Enhance business resilience and performance by offloading CPU resources for greater operational efficiency

Data centers have typically deployed dedicated infrastructures for networking and storage, with each network requiring a separate set of adapters, switches and cables. To reduce costs, blade servers and server virtualization technologies are implemented which result in increasing demands for network bandwidth per host. In many cases, six or more 1GbE adapters are used to meet requirements for virtual machines (VMs), dynamic migration and management. With the growth of video, voice and graphical content, 1GbE networks are running out of bandwidth.

Virtualized servers usually require high I/O rates and are severely limited with 1GbE connections. This leads to multiple 1GbE Network Interface Card (NIC) adapters plus additional switch ports, cabling and management time. Added to this is the growing use of iSCSI to support storage traffic over Ethernet, resulting in another level of complexity and bandwidth usage. All of this contributes to high capital expense (CapEx) and operational expense (OpEx).

These costs can be reduced by deploying a converged network with a single set of resources that can be dynamically provisioned for networking and storage in response to changing business requirements. Converged networks are highly beneficial with server virtualization. The Emulex OneConnect UCNA platform and VMware vSphere product set combine to deliver an unmatched data center solution by delivering the following:

- 1. Common platform**—Applicable across all server tiers to enable simplification of server hardware, rapid deployment and migration of applications
- 2. High performance**—Capable of supporting multiple protocol offloads offering high levels of performance and efficiency
- 3. Virtualization support**—Complement server virtualization deployments, provide flexibility and infrastructure agility
- 4. Simplified management**—Deployment, administration and configuration from a centralized management console
- 5. Energy and space efficiency**—Minimal power and data center footprint



# Emulex and VMware Deliver High Performance Virtualization in Converged Network

VMware vSphere is the market-leading virtualization solution available today, enabling customers to achieve new heights of availability and optimization of resource pools with multiple ESX servers running in a single VMware cluster. VMware enables non-disruptive migration of VMs across ESX servers, as well as moving VMs between storage targets.

## Why Emulex for VMware

Data centers with VMware virtualization solutions have long relied on high performance network connectivity from Emulex. With Emulex OneConnect UCNAs and the OneCommand Manager application, these data centers now can implement a high performance converged networking solution.

## Emulex OneConnect iSCSI Adapters

VMware vSphere 4.1 adds support for iSCSI adapters that provide optimum efficiency with hardware offload for the iSCSI protocol and TOE. The Emulex OneConnect iSCSI adapter has 120% better CPU efficiency when compared to a NIC and software initiator.

## Streamline management

The Emulex OneCommand Manager application provides comprehensive reporting, optimizing and troubleshooting, enabling management of Emulex LightPulse Fibre Channel Host Bus Adapters (HBAs) and OneConnect UCNAs for servers throughout the network from a single console. The in-box Emulex Common Interface Model (CIM) provider also provides first-time online management of adapters for ESXi servers. This results in higher availability as there is no need to bring down the adapter for configuration and management.

## VMware vCenter™ Server plug-in

The OneCommand Manager plug-in for VMware vCenter Server simplifies management of Emulex adapters by enabling administrators to centrally monitor, manage, update and run diagnostics from VMware vCenter Server. The Emulex OneCommand Manager plug-in also offers asset information, such as adapter and driver firmware versions and driver configuration settings and allows IT administrators to natively update adapter firmware and driver settings.

## Improve asset utilization

Emulex fully supports N\_Port ID Virtualization (NPIV) technology, enabling each HBA or CNA port to register multiple virtual ports (vPorts) identified by a virtual worldwide port name (WWPN) within the fabric. vPorts can then be assigned to VMs, supporting security and quality of service that is specific for each VM.

## Increase data center flexibility and availability

Emulex OneCommand Manager's vPort mapping capability enables viewing of VM to vPort associations on a single management pane. With Emulex, IT administrators can improve the speed at which hardware resources can be reallocated within VMware environments, increasing data center flexibility and availability.

## CapEx and OpEx savings

Emulex OneConnect UCNAs reduce cabling, hardware, rack space and power consumption costs. When combined with CPU off-load capabilities, fewer servers are required to support data center needs. With Emulex, IT administrators can maximize I/O consolidation with 10GbE ports and leverage existing hardware investments to drive significant savings in capital and operating expenses.

## vNetwork Distributed Switch

Users can leverage VMware vNetwork Distributed Switch to dynamically adjust workloads across a team of physical adapters with robust Emulex OneConnect teaming capabilities that include assignment of NIC ports and NIC teams to multiple Virtual Local Area Networks (VLANs) and link aggregation of Ethernet traffic for ports with FCoE traffic.

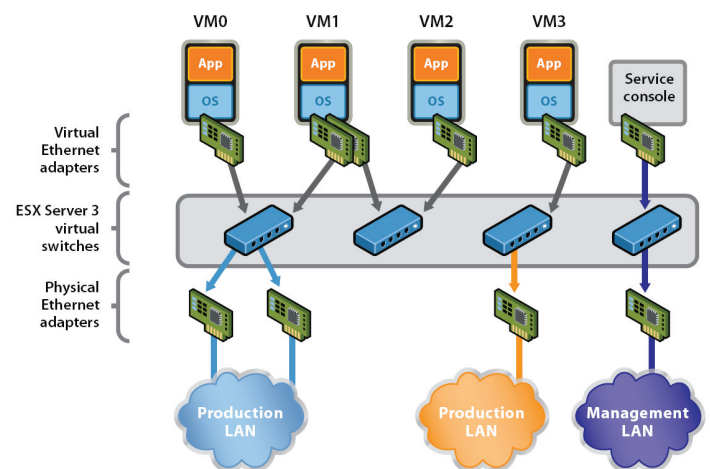


Figure 1 Network connectivity with UCNA in ESX environment.

## NetQueue support

VMware NetQueue is a multi-queue performance technology that significantly improves performance in 10GbE virtualized environments. OneConnect UCNAs support VMware NetQueue, enabling improved server consolidation, reduced hypervisor overhead and an increase in the number of VMs that can run on virtualized servers.

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### Storage connectivity

VMware Infrastructure storage architecture provides a layer of abstraction that manages the complexity of differences between physical storage subsystems. To the application and guest OS inside each VM, storage is presented simply as SCSI disks.

The virtual SCSI disks inside the VMs are provisioned from datastore elements in the data center. A datastore is like a storage appliance that serves up storage space for virtual disks, and stores VM definitions. A datastore will reside on a VMFS volume for block-based storage or a mount-point for NFS storage. The VMFS volume is typically comprised of a single LUN, but can span several LUNs. A virtual disk can be copied, moved and backed-up just like any other file. For guest OSs that support hot-adds of new disks, a new virtual disk can be added without having to shut down the VM.

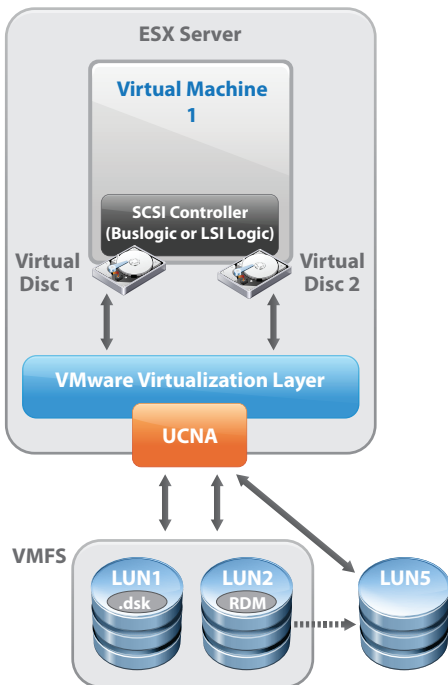


Figure 2 Storage connectivity with UCNA in ESX environment.

A Fibre Channel SAN-based datastore is the most common deployment and enables VMotion, ESX boot from SAN, raw device mapping and support for high availability clusters. VMware also supports converged network solutions by providing support for FCoE. With this capability, Emulex OneConnect UCNA can provide transparent connectivity to the existing Fibre Channel storage.

### Summary

Emulex and VMware together offer a robust converged networking solution, delivering high performance for server virtualization while reducing CapEx and OpEx. The combination of VMware Virtual Infrastructure with Emulex Fibre Channel HBAs and OneConnect UCNAs enables data centers to facilitate an adaptive next generation data center. Look to Emulex and VMware to continue to deliver leading edge solutions aimed at meeting the most pressing data center needs.

vmware®

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