Emulex and Cisco Deliver High Performance Converged Networking Solution

High performance switches and adapters combine to lower costs and improve business agility, resilience and performance

At a Glance

The Emulex OneConnect™ Universal Converged Network Adapter (UCNA) platform and Cisco Nexus™ 5000 Series Switches combine to deliver a high performance converged networking solution that significantly reduces capital expense (CapEx) and operational expense (OpEx). The OneConnect UCNA is a single-chip 10Gb Ethernet (10GbE) architecture that supports high performance offloads for stateless TCP/IP, TCP Offload Engine (TOE), Fibre Channel over Ethernet (FCoE) and iSCSI, delivering optimum performance for networking and data center virtualization. The Cisco Nexus 5000 Series integrates with the Emulex UCNA, using cut-through technology that enables consistent low-latency networking solutions. With Cisco and Emulex, the transition to a single, unified network fabric is transparent and consistent with existing practices and management software.

Products

- Emulex OneConnect UCNA Platform (OCe10000 and OCe11000)
- Cisco Nexus 5000 Series Switches

Solution Benefits

- Consolidate the data center to a 10GbE infrastructure with offload support for 10GbE, 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

The Evolution of Converged Networks

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, dynamic migration and management. Servers requiring multiple 1GbE adapters lead to additional switch ports, cabling and management overhead. With the growth of video, voice and graphical content, 1GbE networks are running out of bandwidth. High-density blade deployments add to the difficulty with an increasingly complex collection of connections and cables per square foot, all contributing to high CapEx and OpEx.

The emergence of 10GbE addresses an IT manager's concerns regarding the bandwidth and latency issues of 1GbE and lays the foundation for more widespread adoption of network convergence in data centers. Converged networking combines existing Local Area Networks (LANs) and Storage Area Networks (SANs) into a single high performance 10GbE framework that intelligently connects every server, network and storage device within the data center, enabling unified I/O.

The Emulex OneConnect UCNA design leverages ten generations of Emulex Fibre Channel HBA technology and supports multiple protocols, allowing data center administrators to consolidate to a single high performance, high bandwidth 10GbE infrastructure. Based on a single-chip architecture, OneConnect UCNAs provide CPU offload for FCoE and iSCSI for block storage, and stateless TCP/IP and TOE offload for networking and connect to Cisco Nexus 5000 Series Switches.

The decision to deploy iSCSI or FCoE is largely based on current deployments in your environment. Enterprise data centers with Fibre Channel SANs already in place typically choose FCoE, while smaller data centers with no Fibre Channel often choose iSCSI. With OneConnect, data center administrators can use one platform to support both iSCSI and FCoE. For organizations that want to begin with 10GbE networking, OneConnect "pay-as-you-go" options allow addition of FcoE or iSCSI support with a straight-forward software licensing procedure. There's no requirement to replace adapters or disrupt existing networks.

OneConnect™ OneCommand™

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The following OneConnect UCNAs that support 10GbE, iSCSI and FCoE are fully functional with Cisco Nexus 5000 Series Switches:

OneConnect 10Gb/s Ethernet Network Adapter (OCe10102-N and OCe11102-N)
This adapter is a high performance, dual-port Network Adapter for 10GbE networks. Protocol offload for stateless TCP/IP and TCP Chimney Offload provide maximum bandwidth with minimum use of CPU resources. This adapter includes support for FCoE and iSCSI protocol offloads, increasing overall processing performance. By using a common infrastructure for Ethernet and storage networks, data centers can reduce CapEx for adapters, switches and cables, and OpEx for power, cooling and IT administration.

OneConnect 10Gb/s FCoE Converged Network Adapter (OCe10102-F and OCe11102-F)
This adapter is a high-performance 10Gbps FCoE adapter that supports FCoE offload and consolidates traffic for networking, Fibre Channel and FCoE storage. It uses a common 10GbE infrastructure for networking and storage, reducing CapEx for adapters, switches and cables, and OpEx for power, cooling and IT administration. New multi-core server platforms, server virtualization and high-demand applications are driving the need for low-latency, high-bandwidth networks. This adapter meets these requirements with full 10GbE network performance using an 8-lane PCI Express Gen 2 architecture and support for stateless TCP Offload and TCP Chimney Offload. With "boot from LAN/SAN" capability, the Fibre Channel SAN and PXE boot support make this adapter ideal for blade servers and other diskless deployments.

OneConnect 10Gb/s iSCSI Converged Network Adapter (OCe10102-I and OCe11102-I)
This iSCSI adapter uses a common 10GbE infrastructure for networking and storage, reducing CapEx for adapters, switches and cables, and OpEx for power, cooling and IT administration. This adapter supports iSCSI offload, providing performance that is superior to iSCSI solutions based on software initiators and standard NICs. With "boot from LAN/SAN" capability, the PXE and iSCSI boot support make this adapter ideal for blade servers and other diskless deployments. By leveraging the performance advantages of 10GbE and OneConnect offloads, iSCSI can move beyond its traditional SMB niche to enterprise-class deployments.

Emulex Cisco Solution

A new I/O connectivity architecture from Emulex allows IT administrators to enjoy the benefits and cost savings of a streamlined, converged network. The Emulex OneConnect UCNA platform combines with Cisco Nexus 5000 Series Switches to deliver a robust, high performance converged networking solution that lowers CapEx and OpEx while protecting a data center's existing LAN and SAN investment.

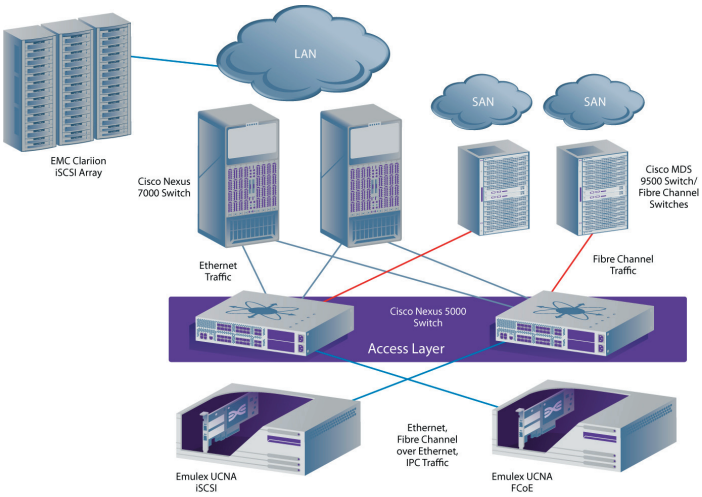

Figure 1 Emulex Cisco converged network solution.

CapEx and OpEx Savings

Cisco and Emulex adapter and switch technologies deliver scalable I/O consolidation that decreases CapEx and OpEx by reducing the number of server adapters, cables and upstream switches in enterprise and SMB data centers. Rather than the overhead of redundant adapters and switches for LAN and SAN networks, I/O consolidation supports both networks on a single link. When combined with CPU off-load capabilities, Emulex OneConnect UCNAs result in fewer servers required to support data center needs. With Emulex and Cisco, IT administrators can maximize I/O consolidation with 10GbE ports and leverage existing hardware investments to drive significant savings in CapEx and OpEx.

Summary

Emulex and Cisco together offer a robust converged networking solution, delivering high performance while reducing CapEx and OpEx. Since both the adapter and switch families connect to native Fibre Channel networks, existing investments in storage networks are protected. Further, the Emulex OneConnect UCNA is the only 10GbE adapter product with a "pay-as-you-go" option that enables data centers to add support for networked storage when and where needed, further protecting an enterprise's investment. Look to Emulex and Cisco to continue to deliver leading convergence solutions aimed at meeting the most pressing data center needs.

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Benefit	Cisco Nexus 5000 Series Switch	Emulex OneConnect Platform
Common platform—Applicable across all server tiers to enable simplification of server hardware, rapid deployment and migration of applications	· Full access layer solution including 1GE, 10GbE, iSCSI, FCoE and Fibre Channel · Complete LAN and SAN switch functionality · Supports LAN, SAN and NAS traffic · Allows consolidation of all data center I/O at the access layer on a single network technology - Ethernet	· One console for all networks · 10GbE, iSCSI, TOE and FCoE offloads · Simplifies I/O hardware choices for IT managers
High performance—Capable of supporting multiple protocol offloads offering high levels of performance and efficiency	· Non-blocking, non-oversubscribed at speeds up to 10Gbps · High port density, lossless Ethernet, wire-speed performance · Extremely low latency	· Full 10Gb bandwidth per channel available for Ethernet and FCoE or iSCSI · Hardware accelerators for all protocols · High performance with high CPU efficiency
Robust Ethernet capabilities - Full support for Ethernet standards within converged network environment	· Standards-based, high-performance Ethernet support · Virtual PortChannel (vPC) allows creation of PortChannels that span two switches	· Automated NIC teaming based on Link Aggregation Control Protocol (LACP) · Ethernet link aggregation while FCoE traffic remains unteamed · Assignment of NIC ports and NIC teams to multiple Virtual LANs (VLANs)
Virtualization support—Complement server virtualization deployments, provide flexibility and infrastructure agility	· All servers have access to high performance LAN and SAN in a standard I/O configuration	· VEngine Technology delivers more VMs per server with TOE, iSCSI and FCoE offload
Simplified management—Deployment, administration and configuration from a centralized management console	· One consistent operating environment across LAN and SAN with NX-OS	· One management console, many protocol services · Integrated management of UCNAs and HBAs · Over 7 million ports administered with Emulex management software
Energy and space efficiency—Minimal power and data center footprint	· Front-to-back cooling supporting efficient data center hot- and cold-aisle designs · High density port counts · Elimination of majority of long travel cables between access layer and next layer of switching	· Industry-leading performance per watt · Complements data center “green” initiatives

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