

JUNIPER NETWORKS AND EMULEX DELIVER HIGH-PERFORMANCE LAN/SAN SOLUTIONS

Data Center Switches and Adapters Lower Costs and Improve Productivity

Challenge

- Consolidate and centralize applications without impacting performance and reliability
- Migrate legacy storage networks to 10GbE and reduce data center complexity

Solution

- Juniper Networks QFX3500 Switch and Emulex OneConnect adapters
- Converged network for storage and server connectivity

Benefits

- Resilient, high performance data center network with offload support for 10GbE, TOE, FCoE and iSCSI
- Converged LAN/SAN networks deliver a simpler and more agile data center
- Investment protection for existing server, network, and storage assets

The arrival of 10-Gigabit Ethernet (10GbE) connections is driving the unification of separate infrastructure solutions for local area networks (LANs) and storage area networks (SANs). 10GbE delivers the bandwidth and low latency needed to make Ethernet an effective technology for storage networking applications. The foundation for network convergence in the data center is now here—a single, high-performance, 10GbE infrastructure can now intelligently connect every server, network, and storage device within the data center to enable unified I/O.

Today, most storage networking installations use iSCSI or Fibre Channel over Ethernet (FCoE). With Emulex OneConnect Universal Converged Network Adapters (UCNAs) and Juniper Networks® QFX3500 Switch, data center administrators benefit from a single solution that supports both iSCSI and FCoE. For organizations that want to begin with a 10GbE networking foundation, OneConnect reduces risk with a “pay-as-you-go” option that allows the addition of FCoE or iSCSI devices via an easy-to-add software license. As a result, organizations can flexibly address unexpected requirements without replacing adapters or disrupting existing networks.

The Challenge

Today’s data intensive organizations are centralizing applications and consolidating servers to simplify operations and lower costs. The high-performance data center, using virtualized resources and high-performance storage arrays, is a crucial component of this strategy. However, even while virtualization and storage technologies effectively deliver benefits to the overall solution, they drive data center network costs and complexity in the wrong direction. The number of connections and cables per square foot of floor space has spiraled upwards, and reducing this connector/cable “density” is one of the best ways to tame the data center network.

Until recently, nearly every data center built one network for server connectivity and a completely different network for storage. Each network requires its own adapters, switches, cables, and management platforms, making a converged connectivity/storage network an obvious solution. But the performance and latency limitations of standard 1GbE have precluded adoption for storage applications. The arrival of affordable 10GbE is helping with this transition without compromising storage performance or resiliency.

Server virtualization technologies effectively conserve energy and scarce rack space by increasing the utilization of available CPU processing power. However, since each unit of server rack space now does more work, each unit of rack space also needs more network bandwidth. When the growth of video, voice, and graphical content is factored in, a single server can easily demand six or more 1GbE adapters to meet bandwidth requirements. Each adapter needs a switch port, cable, and management overhead, which means even more complexity and cost.

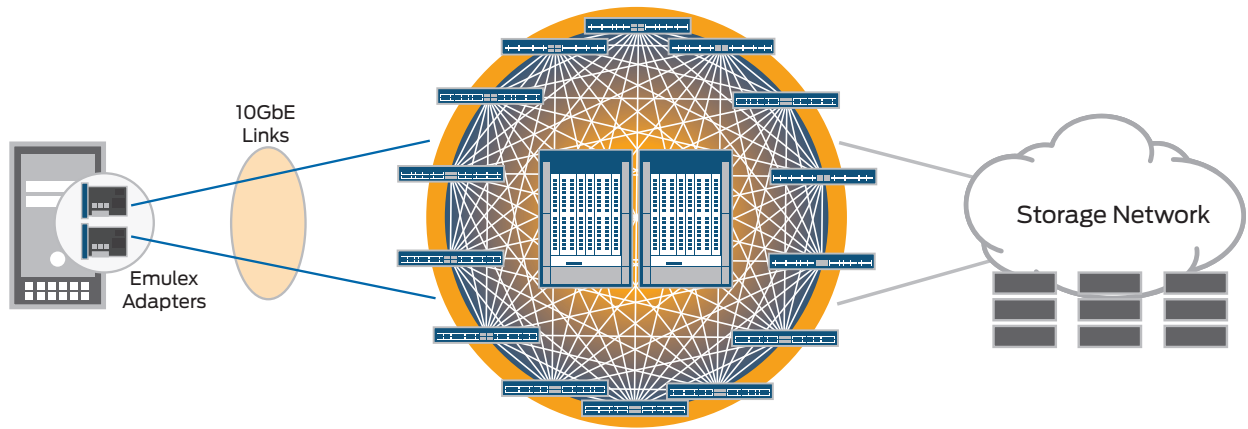


Figure 1: Emulex OneConnect UCNA with Juniper Networks QFX3500 Switch

The Juniper Networks and Emulex Converged Networking Solution

The Emulex OneConnect UCNA platform and Juniper Networks QFX3500 Switch consolidate LAN and SAN networks to deliver simpler and less expensive converged networks without sacrificing resiliency or performance. When both the LAN and the SAN share a single network, data centers need fewer server adapters, cables, and upstream switches. The Emulex OneConnect UCNA, with its CPU offload capabilities, can also reduce server count by taking over processor intensive network tasks for each server. As a result, fewer servers can support the same activity level in the data center. Emulex and Juniper maximize I/O consolidation using 10GbE that can leverage existing hardware investments for significant savings.

Features and Benefits

FEATURE	QFX3500 SWITCH	EMULEX ONECONNECT PLATFORM
Common platform—Applicable across all server tiers to enable simplification of server hardware, rapid deployment, and migration of applications	<ul style="list-style-type: none"> High-density 10GbE platform Standards-based FCoE transit switch FCoE to Fibre Channel gateway 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 1.28 Tbps of throughput 960 Mpps switching capacity Ultra low latency and low jitter All ports able to run at full wire-speed capacity with full L2 and L3 performance Operates in cut-through or store-and-forward mode 	<ul style="list-style-type: none"> Full 10 Gbps 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	<ul style="list-style-type: none"> 48 small form-factor pluggable transceiver (SFP+) ports supporting 10GbE, GbE, and 2/4/8 Gbps Fibre Channel 4 quad SFP (QSFP+) ports for a blend of 10GbE and 40 Gbps interfaces (roadmap) 	<ul style="list-style-type: none"> Automated network interface card (NIC) teaming based on link Link Aggregation Control Protocol (LACP) Assignment of NIC ports and NIC teams to multiple virtual LANs (VLANs)
Virtualization support—Complement server virtualization deployments, provide flexibility and infrastructure agility	<ul style="list-style-type: none"> Large media access control (MAC) address table IEEE 802.1Qbg for Virtual Ethernet Port Aggregator (VEPA) deployments (roadmap) 	<p>Emulex vEngine Technology that includes support for:</p> <ul style="list-style-type: none"> Virtualized queues using VMware NetQueue to optimize performance and provide full 10 Gbps bandwidth per port Multichannel capabilities that enable multiple NIC functions per port to allow quality of service (QoS) for individual virtual machines, console management, and virtual machine migration Single Root IOV (SR-IOV) to optimize performance with up to 32 virtual functions per port
Simplified management—Deployment, administration, and configuration from a centralized management console	<ul style="list-style-type: none"> Juniper Networks Junos® Space Virtual Control for end-to-end network One consistent operating environment across LAN and SAN with Juniper Networks Junos operating system Junos OS XML management protocol support 	<ul style="list-style-type: none"> One management console, many protocol services Integrated management of UCNAs and host bus adapters (HBAs) Over 7 million ports administered with Emulex management software
Energy and space efficiency—Minimal power and data center footprint	<ul style="list-style-type: none"> Less than 5 watts per 10GbE port Silver power supply unit (PSU) efficiency 	<ul style="list-style-type: none"> Industry-leading performance per watt Complements data center “green” initiatives

Solution Components

- Juniper Networks QFX3500 Switch
- Emulex OneConnect Universal Converged Network Adapter (UCNA)
- Junos Space Virtual Control

Summary—Juniper and Emulex Accelerate the Adoption of 10GbE in the Data Center

Data center consolidation, server centralization, virtualization, and converged applications are stressing today's data center infrastructure. These new technologies, while they make tremendous contributions to efficient application delivery, also have an adverse effect on network costs and complexity. The Juniper Networks QFX3500 Switch and Emulex OneConnect Universal Converged Network Adapter (UCNA) provide a simplified infrastructure that improves overall performance and reliability while reducing complexity and cost. Working together, Juniper and Emulex are enabling enterprises to improve user productivity and increase business agility through innovative data center solutions.

Next Steps

For more information, please contact Juniper Networks at www.juniper.net or Emulex at www.emulex.com.

About Emulex

Emulex is the leader in converged networking solutions for the data center. Our Connectivity Continuum architecture provides intelligent networking services that transition today's infrastructure into tomorrow's unified network ecosystem. Emulex provides a single framework that intelligently connects every server, network, and storage device within the data center. Through strategic collaboration and integrated partner solutions, Emulex provides its customers with industry leading business value, operational flexibility, and strategic advantage. Emulex is listed on the New York Stock Exchange (NYSE:ELX) and has corporate headquarters in Costa Mesa, California. News releases and other information about Emulex Corporation are available at www.emulex.com.

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

Corporate and Sales Headquarters

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100
www.juniper.net

APAC Headquarters

Juniper Networks (Hong Kong)
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

EMEA Headquarters

Juniper Networks Ireland
Airside Business Park
Swords, County Dublin, Ireland
Phone: 35.31.8903.600
EMEA Sales: 00800.4586.4737
Fax: 35.31.8903.601

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