

Emulex and Juniper Deliver High Performance iSCSI Networking Solutions

High performance switches and adapters combine to lower costs and improve productivity

At a Glance

The data center Local Area Network (LAN) is a strategic corporate asset, connecting servers, applications and storage services throughout the enterprise to support vital day-to-day business operations. However, as businesses centralize their applications and consolidate servers to simplify operations and reduce costs, demands on the data center LAN are growing. These trends not only raise the density, scalability, throughput and high availability (HA) requirements of the data center LAN, but network administrators are under pressure to deliver these capabilities while lowering costs—a daunting challenge. The evolution of storage network technology from Fibre Channel to gigabit and 10Gb Ethernet (10GbE) are helping with this transition, enabling enterprises to reduce both capital expense (CapEx) and operational expense (OpEx) while maintaining high performance and resiliency.

Products

- Emulex OneConnect™ 10Gb iSCSI Converged Network Adapter (OCe10102-1 and OCe11102-1)
- Juniper Networks EX Series Ethernet Switches (EX3200, EX4200, EX8200)

Challenge

- Reduce the impact of application centralization and server consolidation on data center LAN resources
- Migrate from Fibre channel networks to lower-cost, 10GbE while maintaining performance and reliability
- Accommodate new technologies that are contributing to data center complexity

Solution

- Juniper EX Series Ethernet Switches to simplify network design and reduce complexity
- Emulex OneConnect adapters to offload stateless TCP/IP, TCP Offload Engine (TOE) and iSCSI for optimum server utilization

Benefits

- Lowers total cost of ownership (TCO) through significant CapEx and OpEx reductions
- Improves performance, security and reliability
- Increases user productivity and enterprise agility
- Frees up IT to focus on innovative, revenue generating services

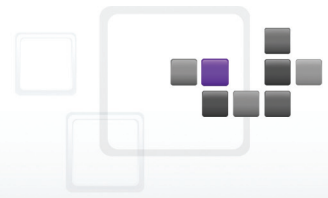
The Challenge

Data center consolidation, server centralization and worker mobility are putting tremendous strains on IT. Centralizing servers in one location require more power, space and cooling. Operational expenses can quickly outpace any savings in capital expenditures. Multiple layers of networks, servers and storage technologies add management complexity, and the growth of converted video, voice and graphical content are saturating GbE networks. In many cases, servers require multiple GbE adapters, which leads to additional switch ports, cabling and management time. High-density blade deployments add to an increasingly complex collection of connections and cables per square foot.

Server virtualization technologies address some of these problems, but at the expense of increasing demands for network bandwidth per host. In many cases, six or more GbE adapters are used to meet requirements for virtual machines (VMs), dynamic migration and management.

As storage networks begin migrating from expensive and complex Fibre Channel networks to cost-effective Ethernet, the growing use of iSCSI to support storage traffic over Ethernet adds another level of complexity and bandwidth usage. Applications and virtualized servers that require high I/O rates

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are severely limited with GbE connections, and CPU resources are quickly consumed when iSCSI software initiators are used with standard network interface cards (NICs).

As businesses increasingly rely on vast stores of data to make business decisions and meet compliance regulations, they require ever more scalable, high-performance storage solutions. While Fibre Channel still represents a large portion of the SAN market, the growing prevalence of gigabit Ethernet and the simplicity of deploying and managing an Ethernet-based Network Attached Storage (NAS) are making iSCSI an attractive, low-cost alternative.

Additionally, Ethernet-based NAS solutions take advantage of virtualization to rapidly scale and provide HA. While 4Gb/s or 8Gb/s Fibre Channel do offer a performance advantage over GbE, NICs offering TCP offload capabilities greatly enhance iSCSI performance. In addition, the emergence and adoption of lower-cost 10GbE allows iSCSI to outperform Fibre Channel and accommodate any high-speed storage needs.

Next-generation solutions such as 10GbE address requirements for more network bandwidth and better performance. As 10GbE moves from early adoption to the mainstream, new products and lower prices are making it the standard backbone for enterprise class networks.

The Juniper Networks-Emulex Solution for Converged Data Centers

Juniper Networks and Emulex are teaming up to deliver such a solution based on best-of-breed Ethernet switches and 10GbE converged network adapters. Juniper Networks EX Series Ethernet Switches and Emulex OneConnect adapters provide a simplified infrastructure that reduces the impact on server resources, high performance networking and iSCSI-based storage.

Juniper's EX Series Ethernet Switches are designed to meet the needs of today's high-performance businesses, delivering the next generation of switching technology for today's—and tomorrow's—networks. Additionally, the Emulex OneConnect UCNA is a world-class, single-chip 10GbE product that provides optimum server connectivity for converged Ethernet and storage networks.

EX Series Ethernet Switches Features and Benefits

With the EX Series switches, businesses can deploy a cost-effective family of switches that delivers the HA, unified communications, integrated security and operational excellence they need today while providing a platform for supporting the requirements of tomorrow. Juniper EX Series switches exhibit five key characteristics that, working together, deliver a true enterprise switching solution: carrier-class reliability, security risk management, network virtualization, application control, and reduced TCO.

Carrier-class reliability—Nothing succeeds like success. That's why the Juniper Networks EX Series Ethernet Switches leverage much of the same field-proven Juniper Networks technology—including high performance application-specific integrated circuits (ASICs), system architecture and Juniper Networks JUNOS® Software—that power the world's largest service provider networks. The result is a robust, time-tested and highly reliable network infrastructure solution for high-performance enterprises.

Security risk management—The Juniper Networks EX Series Ethernet Switches are fully compatible with the Juniper Networks Unified Access Control (UAC), delivering an extra layer of security by first authenticating users and performing virus checks, then enforcing precise, end-to-end security policies that determine who can access what network resources, as well as quality of service (QoS) policies to ensure delivery of business processes. Integrated anomaly-based threat detection provides additional protection by identifying and blocking distributed denial of service (DDoS) attacks.

Network virtualization—The EX4200 line of switches feature Juniper Networks Virtual Chassis technology, which enables up to 10 of the switches to be interconnected and operate as a single, logical device. With Virtual Chassis technology, users get the reliability, availability and high-port densities of traditional chassis-based systems in a cost-effective, compact form factor—the best of both worlds. The EX Series switches also support generic routing encapsulation (GRE) tunneling for sending mirrored traffic from remote locations to monitoring devices in the network operations center for centralized troubleshooting and analysis, or to build segregated overlay networks without the challenges associated with Spanning Tree.

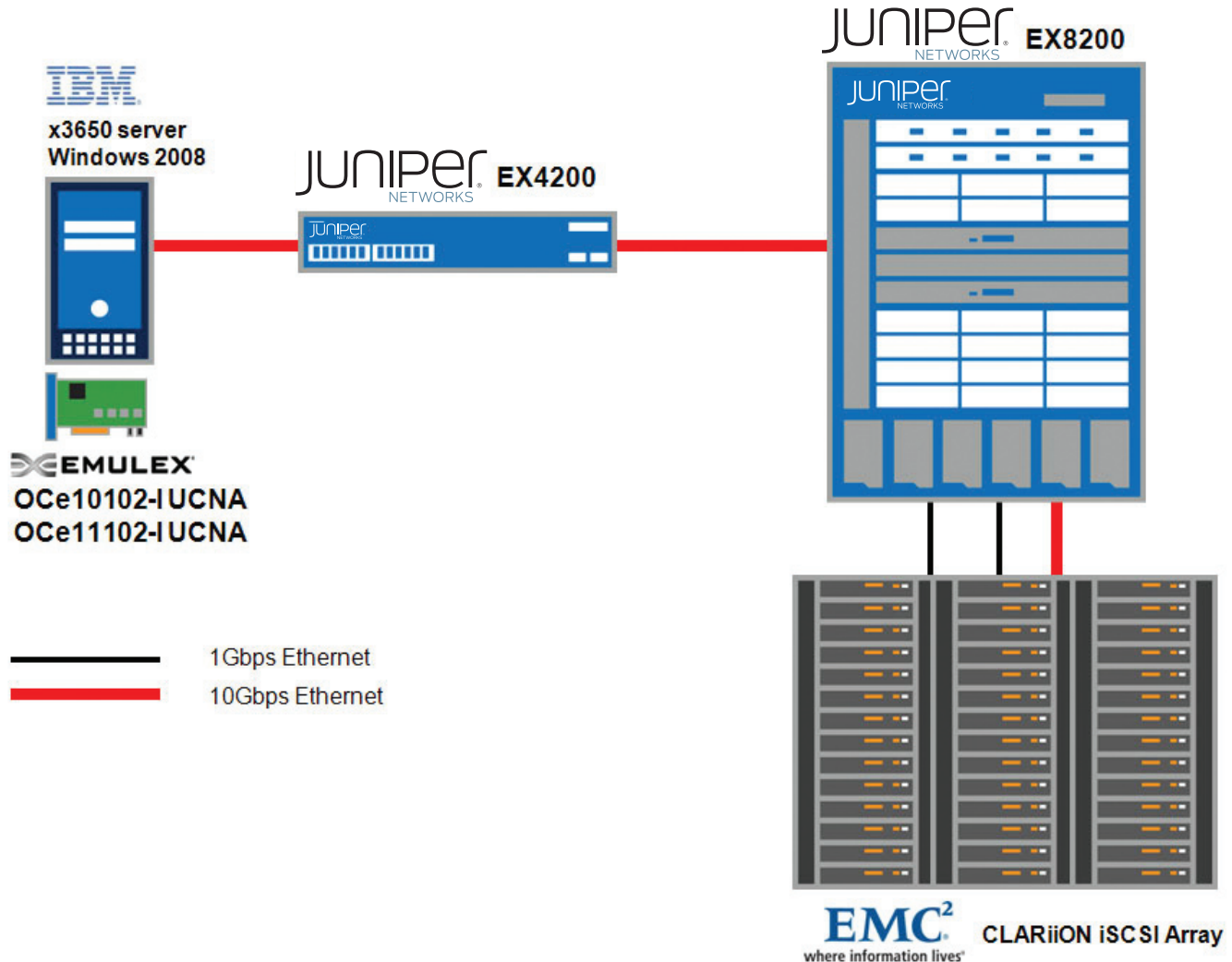
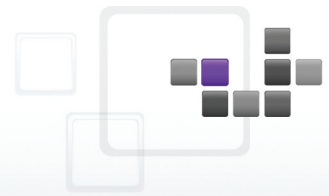
Application control—Successfully managing a network requires knowing how it's being used in order to optimize application delivery and maximize efficiency. Integrated high-performance ASICs on the chassis-based EX8200 line of Ethernet switches provide wire-speed forwarding for any and all packet sizes.

To ensure application traffic is properly prioritized, the EX Series Ethernet Switches support a robust eight QoS queues per port—more than enough to establish separate queues for control plane, voice, video and multiple levels of data traffic, with room to converge other networks such as building automation and security cameras.

Lower TCO—A highly scalable pay-as-you-grow architecture, network designs with lower power consumption, space and associated cooling requirements, a common operating system, and unified management tools across the Juniper portfolio all combine to help reduce operational and capital expenses for EX Series Ethernet Switch customers.

Working together, these EX Series switch attributes advance the economics of networking by allowing businesses to spend less money and time on their network infrastructure—and more on innovative technologies that help them gain a competitive edge.

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Emulex OneConnect Features and Benefits

As a member of the Emulex OneConnect family, the OCe10102-I and OCe11102-I provide high-performance accelerators/offload engines for TCP/IP, TOE and iSCSI with a single adapter. By leveraging a fully offloaded Ethernet/iSCSI connection, CPU resources can be saved to increase server virtualization ratios and support compute-intensive applications. The payoff is better performance with lower costs.

By combining networking and iSCSI storage traffic on a converged 10GbE infrastructure, substantial CapEx and OpEx savings can be achieved. As server virtualization and compute-intensive applications demand limited CPU resources, there is also a critical need to offload protocol processing for optimum network efficiency.

The OneConnect OCe10102-I and OCe11102-I include the following features.

TCP/IP and TOE protocol offload—The OneConnect OCe10102-I and OCe11102-I leverage the full range of TCP/IP stateless protocol offloads and adds support for TOE (or Chimney Offload), providing maximum efficiency for network processing. By offloading CPU cycles that would be used for networking, host servers are optimized for high-demand applications and cost-saving virtualization initiatives.

iSCSI offload—The OneConnect OCe10102-I and OCe11102-I support iSCSI offload which delivers performance that is superior to iSCSI software initiators and standard NIC cards. By leveraging the performance advantages of 10GbE and OneConnect offloads, iSCSI can move beyond its traditional SMB niche to enterprise-class deployments.

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More VMs per server with VEngine technology—Multiple protocol offloads enable Emulex OneConnect UCNAs to support more virtual machines per server, providing greater cost savings for server virtualization.

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.

Juniper and Emulex: Accelerating the Adoption of 10GbE in the Data Center

Data center consolidation, server centralization, virtualization and converged applications are stressing today's data center infrastructure. New technologies are exacerbating complexity associated with providing robust reliability, high-performance, and security, all in a cost-effective manner.

Juniper Networks Ethernet Switches and Emulex OneConnect adapters provide a simplified infrastructure that improves overall performance, reliability and security while reducing complexity and cost. Working together, Juniper Networks 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.

OneConnect 10Gbps 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.

About Emulex

Emulex, the leader in converged networking solutions, provides enterprise-class connectivity for servers, networks and storage devices within the data center. The Company's product portfolio of Fibre Channel host bus adapters, network interface cards, converged network adapters, controllers, embedded bridges and switches, and connectivity management software are proven, tested and trusted by the world's largest and most demanding IT environments. Emulex solutions are used and offered by the industry's leading server and storage OEMs including, Apple, Cisco, Dell, EMC, Fujitsu, Hitachi, Hitachi Data Systems, HP, Huawei, IBM, LSI, Lenovo, NEC, Oracle, NetApp, Samsung and ZTE. Emulex is headquartered in Costa Mesa, Calif., and has offices and research facilities in North America, Asia and Europe. More information about Emulex (NYSE:ELX) is available at www.emulex.com.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

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