At a Glance

Customer
Tahoe Forest Health System

Industry
Health care

Solution
Network Convergence with Emulex Universal Converged Network Adapters (UCNAs)

Products

· Emulex OneConnect OCe10102-F CNA and OneConnect OCe10102-I CNA
· Cisco Nexus 5000 Series switch
· VMware vSphere 4

Key Benefits

· High performance with 10Gb Ethernet (10GbE), iSCSI, TOE and Fibre Channel over Ethernet (FCoE) offloads
· Space savings by reducing cable clutter by nearly 75%
· Cost savings by reducing management resources up to 50% and reducing the number of modules, adapters, switches and cables
· Future-ready with 10GbE for increased bandwidth, Fibre Channel over Ethernet (FCoE) or Hardware iSCSI when ready

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Emulex OneConnect UCNA Platform Simplifies Data Center Management, Cuts Costs and Creates a Future-proof Plan for Hospital's 10GbE Bandwidth Requirements

The Customer

Tahoe Forest Health System (TFHS) provides a wide range of health care support services and manages two hospitals in the rural, recreational areas of northern California and Nevada: Tahoe Forest Hospital in Truckee, California, and Incline Village Community Hospital in Incline Village, Nevada. Tahoe Forest Hospital and Incline Village Community Hospital are Critical Access Hospitals (CAH) offering primary and specialty health care services in five counties and two states. The vision of Tahoe Forest Health System is to be "The best mountain community health system in the nation."

In order to serve a seasonal influx of patients and the resulting heavy patient record load, TFHS's data center moved to a highly virtualized server environment two years ago. Its virtualized environment has nine VMware ESX hosts and 11 physical machines that replaced 60 physical servers.

The Challenge

With so much riding on the busy hospital's IT infrastructure, TFHS has a state-of-the-art data center and an IT staff well-equipped and poised to implement emerging technology required to ensure the hospital systems are reliable, redundant and responsive.

"As a Critical Access Hospital with a vast array of services, we attempt to use leading edge technologies from established vendors to ensure we provide the best care for our patients," explained Spin Shaffer, IT infrastructure manager at Tahoe Forest Health System. "Our decision to virtualize and implement VoIP is another example based on our goals to provide the best quality patient care possible, and this is what led us to network convergence."

Once the decision to implement Voice over IP (VoIP) networks was made, Shaffer said they needed to upgrade their back-end infrastructure. "The availability of a hospital's phone system not only impacts customer service, but oftentimes involves patient safety. Our VoIP system was going to reside on our ESX hosts, so we needed to ensure the hosts were solid and delivered the performance we required."

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The original 1GbE virtualization network environment required a dozen or more cables per physical machine for multiple redundancies over copper, as well as network connections. This environment was highly complex and expensive and cooling was a major challenge. Looking to the future, Shaffer wanted to prepare for more growth, streamline the operation and minimize management resources: "We were preparing to move to a new data center so we used this as the momentum to create a much simpler, cost-efficient and easier to maintain environment. Our intentions were to be proactive versus reactive, and plan ahead for the next seven years."

Shaffer said his data center faced a number of challenges:

• Ensure the highest reliable and redundant infrastructure

• Increase bandwidth and future-proof the technology for 10GbE expansion

• Minimize cable complexity and increase management efficiency

The Solution

To support high-performance applications such as VoIP and streaming, TFHS upgraded from a Brocade Fibre Channel switch to a Cisco Nexus 5000 switch capable of integrating Fibre Channel and Ethernet traffic over the same connection. To further embrace FCoE capabilities, introduce 10GbE technology and meet current and future demands by consolidating and sharing resources across multiple applications, the company replaced QLogic Host Bus Adapters (HBAs) with Emulex OneConnect UCNAs.

"Once we looked at the Nexus 5000s, it became obvious that we could integrate the Emulex CNAs into our network, take advantage of FCoE and 10GbE, simplify management and increase the bandwidth, reliability and capability we needed for future growth," Shaffer explained.

TFHS now uses 1GbE to the wiring closets and 10GbE for the core virtualization network and to support an upcoming Citrix XenDesktop environment. The Cisco Nexus 5000 switch and Emulex CNAs manage data between the 10GbE core and 1GbE closet connections.

Emulex OneConnect CNAs support TFHS's FCoE and iSCSI Storage Area Networks (SANs) and allow TFHS to dispense with hot and expensive copper cables. Now each physical host just has two cables that each transport Fibre Channel and Ethernet without impacting performance. The second cable is purely redundant for high availability.

One of the main decisions to deploy the Emulex CNA was based on the performance enhancements it enabled with VMware's ESX 4.0 for I/O-intensive and bandwidth-intensive applications. "When it comes to I/O per second (IOPs), the OneConnect card beats the QLogic and Intel cards hands down," Shaffer stated.

TFHS researched other cards, but realized that other vendors only offered one protocol type per card. Emulex CNAs combine FCoE, Ethernet and iSCSI support on a single platform. This translated to big savings for TFHS on operational costs by using far fewer connections and energy. It was also much simpler for them to change configurations as needed.

Shaffer said the selection of Emulex was an obvious choice from the beginning: "We eagerly waited for the release of OneConnect because it was the only card that could give us the choice of Fibre Channel, FCoE, Ethernet or iSCSI. From a management perspective, the flexibility to have one vendor, one card and multiple protocols is invaluable."

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> IT Infrastructure Manager,
> Tahoe Forest Health System

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The Results

Shaffer, who forecasts that TFHS's data center will be expanding by at least two hosts per year in the near future, is ready to grow with the Emulex and Cisco 10GbE-enabled converged networking environment. "The combination of the Nexus 5000 and the OneConnect CNAs has made it much easier to set up and manage new servers," he said. "It helps us hedge future issues, preserve our investment, ensure longevity and be positioned for bandwidth growth. The technology has essentially allowed us to refine and keep our capital expenditures down as a whole."

TFHS was impressed with Emulex's technical support department as well, with engineers who ensured that the new OneConnect CNAs were deployed with high levels of operational continuity. "I've worked in this industry for nearly 25 years, and have never had this level of technical support and customer service from any other vendor," Shaffer exclaimed. "Emulex support extended beyond its products to the overall health of our networking environment. They have continued to exceed our expectations."

Shaffer concluded by stating that although Tahoe Forest Health System takes pride in running best-in-class applications and deploying leading-edge technology, "Our doctors, nurses and patients don't really care what's making it all tick in the data center. They just want it to work. And with the help of Emulex, it just works."

Benefits of Network Convergence to Tahoe Forest Health System:

High Performance	The ability to support 10GbE, iSCSI, TOE and FCoE offloads resulted in higher levels of performance and bandwidth.
Energy and Space-efficient	A reduction in cables by 75% (from 140 to 20), reclaiming floor space in the new data center.
OpEx Savings	A savings of up to 50% in operational expense (OpEx) by reducing time spent on managing and configuring ports, cables and multiple HBA and network interface cards (NICs).
CapEx Savings	A savings in capital expense (CapEx) with fewer modules, adapters, switches and cables.
Future-proof Technology	The flexibility to expand to 10GbE as needed, as bandwidth requirements grow.

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