

Healthcare Organization Lowers Costs, Increases Availability

Exempla Healthcare consolidated from four data centers to two, with Data Center 3.0 solutions.

EXECUTIVE SUMMARY
Exempla Healthcare <ul style="list-style-type: none"> • Healthcare Provider • Denver, Colorado • 7000+ Employees
Business Impact <ul style="list-style-type: none"> • Reduces 5-year total cost of ownership by US\$1.58 million • Helps to ensure availability of critical healthcare information system • Increases business agility



Business Challenge

Formed in 1998, Exempla Healthcare is a not-for-profit, community-based organization that operates three hospitals and a network of clinics in the Denver, Colorado metro area. Exempla uses approximately 160 business and clinical applications, which were previously housed in four major data centers. The organization needed a new data center design, because growing use of digital medical imaging and network-connected biomedical devices had increased storage, compute, and network capacity requirements.

Exempla's IT department decided to consolidate to one major data center and build a new offsite data center in leased space. The data center solutions had to be cost-effective and highly available, and support disaster recovery.

Solution and Results

After performing a 5-year cost-benefit analysis of various data center switch platforms, Exempla chose the Cisco[®] Nexus 7010 Switch. "Not only did the Cisco Nexus platform cost less, it will also help us build a next-generation data center with a unified fabric and virtualization support," says Noel Hover, network engineer, Exempla Healthcare.

In the new data center, blade servers connect over Gigabit Ethernet to Cisco Catalyst[®] 6500 Switches equipped with Cisco ACE Application Control Engine modules, Cisco Shared Port Adapters, Cisco Wireless Services Modules, and Cisco Firewall Service Modules used to protect internal traffic, such as medical images. The Cisco Catalyst 6500 Switches connect over 10 Gigabit Ethernet to redundant Cisco Nexus 7010 Switches. A Cisco Adaptive Security Appliance provides firewall services for Internet traffic. As the data center grows, Exempla plans to add Cisco Nexus 5000 Switches at the end of each server row, using Fibre Channel over Ethernet (FCoE) to transition to a unified fabric.

The new data center began operating in May 2009, and now hosts Exempla's major clinical information systems. The main business benefits include:

- **Branch consolidation:** The Cisco Nexus 7010 Switch and Cisco ACE solution provide the performance Exempla needed to move servers from clinics and hospitals to the data center. Server consolidation reduced equipment and administration costs.
- **Lower total cost of ownership:** The 5-year total cost of ownership (TCO) of the Cisco solution is nearly 27 percent less than the architecture used in Exempla's other hospital campuses. Projected savings amount to

more than \$1.58 million. When calculating the TCO, Exempla considered capital expenditures for initial hardware and cabling, installation and support costs, and operational costs such as heating and cooling.

- **High availability:** Redundant Cisco ACE Application Control Engine modules in the Cisco Catalyst switches provide load balancing for the servers used to host the clinical information systems. “The clinical information system is critical in healthcare environments,” says Dave Feurt, network analyst. “The Cisco ACE modules provide the high availability we need because they can load-balance servers in different data centers, and also fail over to each other to provide site-to-site redundancy.” The in-service software upgrade (ISSU) feature of Cisco Nexus switches also improves availability. “Instead of working through a 4-week change management process like we used to do, we can upgrade software in the middle of the day, with no disruption,” says Ken Matlock, network analyst, Exempla Healthcare.
- **Increased application performance:** Exempla configured the Cisco ACE modules in active-active mode, which provides better response times for the clinical information system. Users have commented on the faster application performance, according to Feurt.
- **Support for virtualization:** The Cisco Nexus switch platform provides the 10 Gigabit Ethernet bandwidth needed to support application virtualization. Approximately 85 percent of Exempla’s data center applications are virtualized, and 12 to 20 virtual machines operate on each server. The IT department plans to begin using the Cisco Nexus 1000V and 4000 Switches on blade servers. “A common point of management will enable our network and server teams to collaborate more closely,” says Hover.

Exempla is considering using the Cisco Nexus 7010 Virtual Device Context (VDC) feature to separate traffic by departments. The organization is also investigating using VMware vMotion to move virtual machines between data centers over the network for disaster recovery.

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— Dave Feurt, Network Analyst, Exempla Healthcare

For more information about the Cisco Nexus Switch Family, visit: <http://www.cisco.com/go/nexus>.

For more information about Cisco ACE Application Control Engine, visit: <http://www.cisco.com/go/ace>.



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