Healthcare Provider Increases Business Agility

Moses Cone Health System deployed Unified Computing System as part of the transition to electronic medical records.

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EXECUTIVE SUMMARY

MOSES CONE HEALTH SYSTEM
- Healthcare
- Greensboro, North Carolina
- 7600 employees

CHALLENGE
- Adopt electronic medical records
- Minimize infrastructure costs
- Enable cost-effective growth

SOLUTION
- Deployed Cisco Unified Computing System, engaging Cisco Advanced Services for planning, design, and implementation
- Continued using existing storage area networks and Cisco MDS 9000 Multilayer Fabric Switches

RESULTS
- Saved US$90,000 to implement 17th server
- Reduced time to implement VMware ESX host from two days to one hour
- Saved 96 hours on server configuration

Challenge

Based in North Carolina, Moses Cone Health System offers a range of services, including cardiovascular care, the latest cancer treatments, rehabilitation neurology, and trauma care, in both hospital and outpatient settings. In response to the U.S. economic stimulus program, Moses Cone Health System is accelerating its transition to electronic medical records (EMR) and Physician Order Entry (POE). To support EMR, the IT team is deploying Microsoft Amalga, a real-time data warehousing application designed for clinical data. The availability and flexibility of the computing system used to host Microsoft Amalga would be critical to success, because clinical staff planned to use the application to view and update EMRs and access Moses Cone Health System's other clinical applications, such as radiology and lab systems.

The IT department had already begun adopting server virtualization, using VMware ESX software on rack-optimized servers. But the new clinical data warehousing applications would require 16 additional VMware ESX servers, and the data center lacked sufficient I/O infrastructure and cabling. In addition, provisioning this quantity of physical servers would be difficult in the few weeks available.

"We needed a cost-effective computing system that would enable us to expand our use of EMRs quickly over the next year, minimize network infrastructure build-out, and reduce time to rack and configure servers," says Michael Heil, manager of technology infrastructure, Moses Cone Health System.

Solution

The Moses Cone Health System IT department considered two approaches. One was to continue using existing rack servers, adding Cisco® Nexus 5000 Switches to implement a unified fabric that supports Fibre Channel over Ethernet (FCoE). This approach would eliminate the need for separate server connections to the data and storage networks, significantly reducing the costs of cables and switch ports. However, the approach would not reduce data center space, power, and cooling needs for servers, nor would it reduce the time and cost of provisioning new servers.

Moses Cone Health System instead decided to implement the Cisco Unified Computing System (UCS), which combines compute, networking, storage access, and virtualization in a cohesive system. "With the Cisco UCS, we can install Microsoft Windows 2008 on one blade, and then quickly move it at any time to another blade in the same or different chassis, say, if a blade fails," says Heil.

Cisco Advanced Services provided planning and design services to identify and address business and technical considerations before implementation. Over the three weeks of implementation, the Advanced Services team provided knowledge transfer and gave the IT staff hands-on experience with Cisco UCS Manager.

The Cisco UCS integrates into the Health System's existing data center environment, including its Ethernet network, fibre channel environment, and EMC Clariion SAN array. Initially, the IT department configured the Cisco UCS with 2 chassis containing a total of 16 server blades. Later the team added another chassis containing 8 blades, bringing the total to 24. Each chassis attaches to a pair of Cisco 6100 Fabric Interconnects over four FCoE connections. The fabric interconnects, in turn, connect to the core network over 10 Gigabit Ethernet, and to the storage networks over 4-Gbps fibre channel by way of Cisco MDS 9100 Series Multilayer Switches.

> "We installed eight servers on Cisco UCS within 30 minutes of taking it out of the box."
>
> **—Michael Heil, Manager of Technology Infrastructure, Moses Cone Health System**

Results

Low-Cost Growth

The Moses Cone Health System IT team calculated that for 16 servers, the Cisco UCS platform costs approximately the same as a traditional server architecture. For 17 or more servers, the Cisco UCS will cost US$90,000 less. "All subsequent server blades connect to the LAN and SAN through the Cisco UCS 6100 Fabric Interconnects instead of requiring additional switch ports, LAN interface cards and cables, and SAN interface cards and cables," Heil says. Savings in copper and fiber cabling alone amounted to $17,000.

Moses Cone Health System plans to migrate most of its applications from standalone servers to VMware on the Cisco UCS by 2012.

Increased Flexibility

Although the Cisco UCS is optimized for virtualization, it can also support physical servers in the same chassis as VMware. Moses Cone Health System took advantage of this flexibility when it received the unexpected news that the database servers for a new document management application had to be installed on physical servers. By hosting Microsoft Windows Server on the Cisco UCS, the Health System can take advantage of hardware abstraction to provide mobility for the physical server. "This simplifies our business continuity and disaster recovery plans," says Heil.

As another example of the flexibility of the Cisco UCS, the IT team initially configured server blades with 96 GB of memory and then later realized that 48 GB would be sufficient. To remove memory, the usual process is to power down the server, remove the chips, and then reboot, a process that can take 15 minutes per blade, which is difficult to schedule in a 24-hour healthcare environment. The Cisco UCS shortened the process: a Health System engineer removed the memory from unused blades and then moved the service profiles to these blades. "Using service profiles in this way reduced downtime from 10 or 15 minutes to 4 minutes, and avoided the risk of a 1-hour outage if a memory chip was not seated correctly," says Heil. "Service profiles also gave us confidence that the application would operate correctly as soon as it was moved."

Rapid Deployment

When Moses Cone Health System received its third chassis, Heil timed the process. "It took less than 17 minutes for two of us to unbox, rack, power, and cable up the FCoE connections," he says. "Just four cables connect the chassis fabric extenders to the Cisco UCS 6120 Fabric Interconnect."

Implementing a new VMware ESX host on the Cisco UCS takes one hour, compared to up to two days in the previous environment. "We installed eight servers on Cisco UCS within 30 minutes of taking it out of the box," Heil says, estimating that his team saved 1 to 2 weeks for all 16 servers.

In the previous computing environment, deploying a new server required zoning host bus adapter (HBA) World Wide Port Names to the SAN fabric, which took 2 to 3 hours. Only one individual had this skill, so deployment could be delayed until he found the time. Using the Cisco UCS, the individual with the needed skills was able to create a shared pool of HBA World Wide Port Names. Assigning all 48 zones on the SAN fabric took just 1.5 hours, instead of 2 to 3 hours for each server. The IT department saved at least 96 hours, or more than two weeks for one full-time employee.

Simplified Monitoring

While testing the Cisco 6100 Fabric Interconnects, the IT staff disconnected cables and then used Cisco UCS Manager to measure how quickly the virtual machine moved to a different blade. "The Cisco UCS Manager reports events within a few seconds," Heil says. "We can quickly see issues, and Cisco UCS Manager reflects changes far more quickly than most Java applications."

Faster Recovery

If an HBA on Moses Cone Health System's rack-optimized servers failed, replacing it took one full day for two people. Now if the equivalent card on a Cisco UCS blade fails, the IT department can simply move the service profile to a spare blade, eliminating the time previously spent re-zoning.

Simplified Disaster Recovery

Moses Cone Health System is building a secondary data center for disaster recovery. The IT department plans to boot servers from the SAN and replicate application data to the secondary site, which will have its own Cisco UCS. If a nonvirtualized server at the primary site fails, the IT department will use service profiles to configure a blade in the Cisco UCS at the secondary site.

Heil concludes, "Cisco UCS has given our organization more flexibility and greater agility, giving us a solid foundation to meet changing healthcare industry demands. It's an exciting time to be in healthcare, and tools like the Cisco UCS are helping us move forward."

PRODUCT LIST
Switches
● Cisco Catalyst® 6513 Switch
Data Center
● Cisco Unified Computing System
● Cisco MDS Multilayer Switches 9134, 9124, and 9020

For More Information

To find out more about the Cisco Unified Computing System, visit: http://www.cisco.com/go/ucs.

To find out more about Cisco Data Center 3.0 solutions, visit: http://www.cisco.com/go/datacenter.

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