Hospital Deploys Cisco UCS to Support Medical Applications

Children's Hospital Colorado increased data center virtualization using Cisco Unified Data Center solutions and Microsoft Hyper-V.

Executive Summary

- **Customer Name:** Children's Hospital Colorado
- **Industry:** Healthcare
- **Location:** Aurora, Colorado
- **Number of Employees:** 5500

Challenge
- Scaling data center to meet internal and external customer needs
- Providing memory density to support compute-intensive applications
- Streamlining data center management

Solution
- Established flexible data center built around Cisco Unified Data Center solutions
- Virtualized servers using Microsoft Hyper-V for improved performance of critical applications

Results
- Achieved 1000 percent faster data migration speeds with Microsoft Hyper-V and Cisco UCS
- Improved scalability with ability to provision 50 servers in one day
- Reduced cooling costs and electrical costs

Business Challenge

Founded in 1908, Children's Hospital Colorado has become a leader in healthcare for children and is consistently ranked by peers and industry groups as one of the top pediatric hospitals in the United States. Thousands of doctors, staff, and specialists provide comprehensive pediatric care at its main campus in Aurora, Colorado and at its network of 15 remote locations around the state. In addition to expert medical care, Children's Hospital Colorado is committed to continuing education opportunities for professionals, leading research in childhood disease, and advocacy for children's health issues.

To help keep its place in the forefront of pediatric medical technology and services, Children's Hospital Colorado developed a virtualized data center to run approximately 350 clinical and business applications, many of which are highly specialized and used for critical research. The data center also hosts EpicCare Electronic Medical Record (EMR) software, which streamlines data management and enables the hospital to provide services for thousands of users at clinics. Given the critical role that these applications play in delivering outstanding patient services, the hospital's IT staff actively looks for ways to continually improve application performance and efficiency for medical personnel.

"We identified areas of our data center infrastructure, including manageability, scalability, and density, where we felt improvements could make a significant difference for staff and our IT administration," says Rick McIntosh, manager of systems infrastructure at Children's Hospital Colorado. "The biggest issue was finding a solution that could meet all of our performance requirements." In addition to creating a private cloud for internal

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applications, Children's Hospital Colorado needed added reliability and scalability for its role as a service provider to clinics and other groups. Strong support for virtualization and both Microsoft and Linux operations systems were also a must.

After considering several options, Children's Hospital Colorado chose Cisco® Unified Data Center solutions with Cisco Unified Computing System™ (UCS®) servers and Cisco Unified Fabric. To virtualize the new data center, the hospital adopted Microsoft Hyper-V Server 2012. Because a large number of the medical applications run on Microsoft operating systems with SQL databases, Microsoft could offer advanced virtualization capabilities, as well as improve performance and license management.

Network Solution

As a Cisco networking customer, Children's Hospital Colorado was already familiar with the quality, reliability, and excellent service from Cisco, which encouraged the IT team to look more closely at and eventually deploy Cisco UCS Servers. "We initially looked at Cisco UCS Servers because of our successes using Cisco networking solutions," says McIntosh. "Diving deeper, we were extremely impressed by the Cisco architecture. Cisco UCS achieves memory density and processing power beyond what other manufacturers have been able to achieve."

Children's Hospital Colorado built its data center around a total of 50 Cisco UCS B230 M2 Series Blade Servers and Cisco UCS B200 M3 Series Blade Servers. Cisco UCS B230 Servers make up the bulk of the compute system, while the Cisco UCS B200 Servers balance performance with versatility for a broader range of applications. With high RAM density, both models are well suited for virtualization.

Cisco UCS also features a streamlined infrastructure that significantly reduces cabling and management. Rather than connecting each server individually, servers are connected to power and networks at the chassis level for a more flexible architecture that eliminates the need for expensive fabric. Cisco UCS 6248 Fabric Interconnects link Cisco UCS Servers to the network with unified ports supporting both Ethernet and Fibre Channel connections. The Cisco fabric interconnects at the hospital connect to Cisco Nexus® 7000 Series Switches at the core and Cisco switching solutions positioned at the access layer to complete the network.

One of the biggest advantages of Cisco UCS is the centralized management through Cisco UCS Manager. Cisco UCS Manager provides visibility into the entire network, physical and virtual, from a single pane of glass. Templates help automate provisioning for increased agility and scalability. If a hardware failure occurs, IT staff simply needs to drop the new blade into place and apply a service profile template to have an identical server back online in minutes.

Children's Hospital Colorado brings even greater scale to Cisco UCS Manager with Cisco Prime™ Central software. While Cisco UCS Manager provides powerful, centralized server management, Cisco Prime Central goes a step further to provide global definitions and unified management across multiple domains. The two systems work together to provide Children's Hospital Colorado with a foundation for superb disaster recovery and high availability.

CISCO

Although Children's Hospital Colorado had past experiences virtualizing environments using other solutions, the IT staff discovered that switching to Microsoft Hyper-V Server 2012 achieved tremendous performance for many critical applications, including Microsoft SQL Server, Microsoft Exchange, Citrix, and other Microsoft Windows-based applications, due in part to the smooth access to a rich, Microsoft Windows operating environment. The ability to create secure, isolated virtual networks and flexible virtual machines improved usability of the specialized medical applications and set the foundation for virtual desktop infrastructure (VDI). Using Microsoft Hyper-V Server 2012 and VMware, Children's Hospital Colorado has virtualized over 80 percent of its data center environment.

Business Results

Virtualizing with Microsoft Hyper-V enables Children's Hospital Colorado to delivery incredible boosts to service speed. "The RAM density of Cisco UCS, with the performance of Microsoft Hyper-V and speed of the Cisco fabric, delivers extraordinary performance," says McIntosh. "We achieved data migration speeds up to 10 times faster compared to our previous data center environment." McIntosh also noted that Cisco UCS enables IT to support approximately 60 guests per host, which is twice the amount that could previously be supported.

The flexible new data center gives IT staff the agility necessary to respond to customer needs quickly. The gains were particularly evident during the hospital's planned upgrade of its EpicCare environment. The upgrade involved building out over 15 new servers. Even though the previous environment was also virtualized, it would have required additional servers far beyond what Cisco architectures required, to handle the computing requirements. Additionally, it could take two weeks to configure and provision the servers. Using service profiles in Cisco UCS Manager and powerful Cisco UCS blade servers, IT staff can easily provision 15 servers in a day.

The added flexibility also solved last-minute infrastructure issues to deliver top performance out of the new EpicCare environment. After planning the upgrade for nearly a year, Children's Hospital Colorado was only six weeks from going live when the IT team was notified that the application demonstrated much higher performance on Intel E5 processors than Intel E7 processors. Unfortunately, IT staff had already planned the environment around leveraging Cisco UCS Servers with Intel E7 processors.

Typically, IT staff could not have accommodated last-minute changes to the infrastructure. Instead, the team would likely have scaled the environment to make up for the lost performance, raising the cost of the project. Children's Hospital Colorado simply ordered new Cisco UCS B200 Servers with Intel E5 processors. "We were running on a very short timeline, but with just a few adjustments to the template, we integrated the new Cisco UCS servers into our infrastructure and had them running within 24 hours," says McIntosh. "These last-minute changes would have been impossible if Cisco wasn't such a committed technology partner."

Cisco Unified Data Center solutions also reduce costs by consolidating the infrastructure. Children's Hospital Colorado reduced its physical footprint to one-sixth the original size. The more compact, energy-efficient environment reduced cooling and electrical costs by approximately 40%. "The Cisco environment is so easy to manage that we were able move more than 50% of the staff to other high-value roles," says McIntosh. "Staff is now contributing to other vital areas of the business, such as disaster recovery planning and other activities."

Next Steps

In addition to adding more blades and capacity to the data center, Children's Hospital Colorado is upgrading its disaster recovery site using Cisco Unified Data Center solutions and has established plans to move the data center to a new facility in the future. Overlay Transport Virtualization (OTV) on the Nexus 7000 Series is expected to significantly improve disaster recovery abilities by helping to deploy virtual computing resources and clusters across data centers.

Children's Hospital Colorado is also working through a pilot virtual desktop initiative. By implementing virtual desktops across it main campus and remote locations, the hospital can significantly simplify IT management by centralizing software and reducing the need to maintain and update individual computers. "We're planning to go into production with virtual desktops by the end of year one with 500 seats," says McIntosh. "The current plan is to scale by 2000 seats for each of the next two years, but given the easy scalability of Cisco UCS, I wouldn't be surprised if we grew much faster."

For More Information

To find out more about Cisco Unified Data Center, visit: www.cisco.com/go/unifieddatacenter. To find out more about Cisco Unified Computing System, visit: www.cisco.com/go/ucs.