Ohio Information Technology Center Implements Dual Data Centers

Hamilton/Clermont Cooperative Association uses Unified Computing System to create redundant system for school districts.

EXECUTIVE SUMMARY

HAMILTON/CLERMONT COOPERATIVE ASSOCIATION (HCCA)

- K-12 Education
- Cincinnati, Ohio, USA
- 38 public school districts and 70 non-public buildings, with approximately 160,000 students, faculty, and administrators
- Cisco Partner: DPSciences Corporation

EDUCATION CHALLENGE

- Address increases in IT services offered, district revenue, and number of networked computers
- Expand services with multiple network cables based on environment type
- Create scalable system infrastructure

SOLUTION

- Deploy Cisco Unified Computing System to unite computing, network, storage access, and virtualization into cohesive platform
- Implement modular switching system to deliver 10 Gigabit Ethernet and unified fabric in data center

BUSINESS RESULTS

- Higher availability of applications and services
- Immediate performance improvement of applications in terms of process and memory
- No single point of failure; redundant system

Education Challenge

The Hamilton/Clermont Cooperative Association (HCCA) is one of 23 regional Information Technology Centers (ITC) established by the state of Ohio. A member of the Ohio Educational Computer Network, HCCA provides data, Internet, and telecom services for public and nonpublic schools in the Greater Cincinnati Metropolitan Area as well as business systems. These services include the collection and distribution of data for financial, student, and media services. HCCA also provides technical and networking services to affiliate schools and is currently owned by 38 public schools and 70 private schools.

While the site director manages the day-to-day affairs of HCCA, a board of directors (composed of member school's superintendents) approves the long-term path for the site. HCCA solely focuses on unique services to K-12 districts, as opposed to working within other industries such as banking or other commercial businesses. "Our focus is to help schools run their business through applications. It is the core of what we do," says Al Porter, executive director, HCCA.

Like most ITCs, HCCA fosters a "co-op" environment by providing and running systems for districts and schools, thus allowing schools to abstain from purchasing or managing their own applications, servers, and other technology. This arrangement allows for a continuity of services and removes the management of access and facilities from the districts.

When HCCA was initially established in 1990, the core services that it provided focused on financial support, but that quickly extended into student information centers in the 1990s with the birth of the Internet. By 2000, HCCA was putting service packages together to transfer districts to a fiber backbone. In 2004, HCCA began to offer individual district services, such as voice over IP (VoIP) phones, data processing, and Internet access.

"Essentially, HCCA is *the* information office for schools," says Frank Williams, chief technology officer, HCCA. "We accommodate the growing financial, information and daily needs of students

and faculty members over a variety of core IT applications, such as email hosting, office automation, electronic archiving of files, work flows, vendor invoices, and more.

“HCCA is out front in the state in providing services to schools that are both valuable and cost effective,” says Porter. “We are astutely aware that our short-term actions affect our long-term goals.”

“By 2010, we had several projects under way at the same time that created a perfect convergence,” says Williams. “We were forced to look at the bigger infrastructure picture as opposed to incremental upgrades. Along with my staff, it was determined there was a need to open dual data centers that connected to 10 Gigabit links. This scaling of the operation set the stage for the single most significant upgrade in HCCA’s history, a complete replacement of the data center infrastructure.”

Over the years, HCCA has seen tremendous growth in the type of services offered, district revenue earned, and number network computers needed. As an IT organization, it is imperative that this type of growth is managed to help ensure operational efficiency. Additionally, HCCA had difficulty sustaining and expanding several of its servers with multiple network cables based on the specific environment type, making troubleshooting extremely complex. Although these were not unique challenges, HCCA saw an opportunity to find a solution that positions it for growth.

Solution

HCCA engaged DPSciences (DPS) to assess their current network, computing resources and current state of virtualization to prepare for the data center and network upgrade. Instead of taking incremental steps to add additional servers and storage capacity, DPS and Cisco recommended HCCA fully virtualize their network and computing resources. Based on this recommendation, HCCA replaced all legacy Hewlett Packard servers with a Cisco Unified Computing System ™ (UCS) and fully replicated the design of the Cisco Nexus® 7000 Series Switches, with 61xx fabric interconnect units, to accomplish the startup of their new data centers.

“HCCA was quick to see the value and impact the Nexus and UCS server architectures would have on their goal to consolidate hundreds of servers into just a handful across two data centers. At the time, they were one of the first ITCs to execute this vision,” says Stephen Vandegriff, executive vice president, DPSciences. “They took the next step in data center consolidation and are benefiting from the resulting cost savings and performance enhancements.”

Cisco® UCS is a next-generation data center platform that unites computing, network, storage access, and virtualization into a cohesive platform. The UCS solution integrates a low-latency, lossless, 10 Gigabit Fibre Channel over Ethernet unified network fabric with enterprise-class, Intel-based, x86-architecture, and ties it all together with a single pane of glass management system. This approach decouples scale from complexity and is designed to reduce the total cost of ownership and increase business agility.

Williams and his team architected their server virtualization infrastructure around the Cisco’s virtualization-optimized Fibre Channel over Ethernet (FCoE) mezzanine card, the UCS M81KR Virtual Interface Card (VIC). Unique to the Cisco UCS solution, the Cisco VIC enabled HCCA to collapse their virtual networking and physical networking onto a single infrastructure thereby improving operational expenses by reducing network management points.

Additionally, Cisco Nexus 7000 Series Switches, a modular switching system designed to deliver 10 Gigabit Ethernet and unified fabric in the data center, were also deployed.

"Cisco has the depth and breadth of products and services that will allow us to grow the data centers for years to come," says Williams. "Additionally, the simplification of our support contracts was very appealing from a maintenance, support, and technical management point of view."

Business Results

Since deployment, HCCA's districts and schools have a higher availability of several applications and services. Involved districts saw an immediate performance improvement of applications in terms of process and memory on UCS. "Imagine a teacher having to calculate the grade point average for thousands of students," says Williams. "What used to take 10 minutes to do, now takes 10 seconds. In terms of process, we have seen a vast improvement."

> "We can now provide a business continuity environment with exponentially improved processing power and speed."
> **—Frank Williams, Chief Technology Officer, Hamilton/Clermont Cooperative Association**

The dual computing system allowed HCCA to create different tiers of services offered to the area districts based on the budget and business needs of each individual district. The servers are able to virtually move from one data center to another depending on workload throughout any given day. Since deployment, HCCA's districts have not complained about network downtime or slowness, problems are fixed easily, and mobility has increased. "With the Cisco VIC, deployment of applications that require multiple Ethernet and Fibre Channel interfaces are no longer constrained by the available physical adapters," explains Williams. "This unique feature to the UCS solution is ideal for workloads that require multiple, separate interfaces to isolate different types of traffic."

The continuity of operations also improved with the state-of-the-art dual data center computing system. With no single point of failure, everything performed on the system is redundant. For example, if one site goes down, another can still function at 100 percent capacity.

"Before automation, student information systems could be down for a day and it wasn't a big deal," says Williams. "Now, with phones, attendance, bell schedules and other critical applications located on the server, a failed system can put a school into crisis mode. During a power outage, I could have all data re-positioned at an off-site location, and users wouldn't lose data or even know there was an issue. Dual computing allows us to not only provide more applications and services, but protect critical data as well. We now can provide a business continuity environment with exponentially improved processing power and speed."

Surrounding districts are now looking to HCCA to provide and run systems that they usually would have handled themselves in an effort to help ensure site back-up recovery.

PRODUCT LIST

Routing and Switching
- Cisco Nexus 7000

Data Center
- Cisco Unified Computing System
- Cisco UCS M81KR Virtual Interface Card

Security
- Cisco ASA 5540 Series Adaptive Security Appliances

HCCA is also saving districts money. "We had a hard dollar savings that paid for the infrastructure upgrade in three years alone," says Williams. "With an ease of management and maintenance comes additional cost savings. This is truly a self-funding IT initiative."

“The Cisco UCS deployment and ‘rip and replacement’ of our entire data center system represents the single most significant upgrade in the history of HCCA. It is also the smoothest and easiest transition we have ever made,” says Porter.

Next Steps

HCCA is looking into implementing the Cisco Virtual Desktop Infrastructure within the data center. As the foundation, VMware supports the creation of virtualized servers, each potentially using multiple physical central processing units (CPUs) and multiple gigabytes of memory. The number of CPUs and memory can be easily modified as applications grow, and HCCA technicians can relocate virtualized servers between physical servers to accommodate an application’s changing demands for computing resources. “With a central console that has management components embedded, we would no longer have to install different software into each computer,” says Williams. “We are excited to be a part of the constant evolution of this technology, and to provide greater services to our districts.”

Due to the innovation and advanced application of HCCA’s data center project, the company was nominated at the VMworld 2010 U.S. Conference in San Francisco, California for “Best Implementation” in the country.

For More Information

To find out more about the Cisco Unified Computing System, go to: www.cisco.com/go/unifiedcomputing.

Cisco Partner Information

For more than 50 years, DPSciences (DPS) has earned a reputation for managing critical business environments. Today, DPS designs and supports flexible technology solutions around collaboration, data center virtualization, security, mobility, and cloud-based services. DPS serves thousands of clients across the United States with primary markets in Chicago, Cincinnati, Cleveland, Columbus, Detroit, Indianapolis, Kansas City, Louisville, Milwaukee, Nashville, Phoenix, and Pittsburg.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA 02/11