School District Enhances Learning with Virtual Desktops

Utica City School District deploys Unified Computing System to deliver collaborative learning for diverse population.

Executive Summary

Utica School District
- **Industry:** K-12 Education
- **Location:** Utica City, New York
- **Number of Employees:** 2000

CHALLENGE
- Streamline server management system
- Migrate school desktop computers to virtual desktop infrastructure
- Increase collaborative learning environments within constraints of small budget

SOLUTION
- Streamline 44 servers into simplified network management system
- Update wireless connection between separate schools

RESULTS
- Significantly reduced energy and desktop-replacement costs
- Converted 1000 desktops to virtual desktop infrastructure
- Enhanced opportunities for collaborative learning both between schools and beyond district

Challenge

Utica City School District (UCSD), located in New York State, spans 13 school buildings including one high school, two middle schools, and ten elementary schools, and serves approximately 10,000 students. In Utica, international refugees represent approximately 12 percent of the population, stemming from Utica's low cost of living and long-established framework for refugee social services. As such, UCSD is host to an incredibly diverse and culturally rich student population. In fact, the student body cumulatively represents a total of 42 different native languages, making many students "English as a Second Language" (ESL) and thereby requiring personalized learning plans.

The population demographic of Utica and the environs is such that 85 percent of UCSD students qualify for free or reduced school lunches. The low income rate, cultural diversity, and specific language needs of students posed a challenge to UCSD delivering collaborative learning opportunities that cut across boundaries. Steven Davis, Director of Technology at UCSD, says, "One of our goals has been to transform UCSD into a collaborative 24/7 21st century learning resource center, considering many low-income homes in the area do not have those educational resources."

UCSD envisioned streamlining its disparate, complex network of 44 servers into a virtualized desktop infrastructure, ultimately aiming for a one-to-one computer ratio for the students to increase collaborative learning opportunities. Part of the desire to bring virtualization into the schools was the increasing number of mobile devices being brought by students. UCSD recognized that 21st century learning requires addressing, if not integrating, this new technological presence. Davis says, "What concerned me was how we, as a district, could manage the incoming mobile devices and make sure they were being used for educational purposes."

Solution

In 2010, UCSD began a Capital Improvement Project, to focus their energies on upgrading the technical infrastructure to better support their unique student population. UCSD planned to integrate smartboards, rewire schools for wireless networking, and support personalized educational software over a six-year period. The first phase of this six-year "technology makeover" was to establish a strong foundation of technological infrastructure for a virtual desktop infrastructure.

To achieve desktop virtualization for all 13 of its K-12 schools, UCSD determined that the Cisco Unified Computing System™ (UCS™) was the best fit for its needs. The Cisco® UCS is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system. Within the Cisco UCS, provisioning and management of all the virtual interfaces and policies in the system are performed centrally from Cisco UCS Manager. This approach simplifies desktop

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management and also provides visibility and policy enforcement to each virtual desktop to meet regulatory compliance. For example, access controls can be set up to mitigate the risk that a rogue virtual desktop will access data from another virtual desktop on the same server.

In tandem with Cisco UCS, UCSD integrated the Cisco Intrusion Prevention System (IPS) 4200 Series Sensors, which was critical to protecting UCSD's secure network against worms, Trojans, and other malicious attacks that could negatively affect students' learning.

Finally, UCSD updated the wireless network connection in all 13 of its schools to 10 GB, using Cisco Nexus® 7000 Series Switches as the main core switching. Cisco Nexus 700 Series Switches offer an end-to-end solution in one platform for data center core, aggregation, and high-density, end-of-row and top-of-rack server connectivity, improving the ability for schools to collaborate and communicate.

Results

Cost Savings
Today, UCSD has integrated one of two purchased UCS platforms, with the second to be deployed in spring of 2012. UCSD has successfully moved from 44 disparate servers, each generating massive amounts of heat and using electricity, down to two. As a result, the energy savings have been significant. Likewise, replacing desktops used to comprise a large portion of UCSD's allotted budget. However, with the virtual desktop infrastructure, even older computer models can run on newer software, such as Windows 7. With education budgets facing perilous reduction, this particular cost saving is critical.

Simplified Network Management
So far, UCSD has virtualized 1000 school computers (out of 3000). With over 10,000 students served in the school system, simplicity is key for network management. Davis found that, as a whole, the entire wireless network is now easier to both manage and back up after integrating Cisco UCS.

Enhanced, Collaborative Learning Environment
Using the Cisco wireless managed system, UCSD students and teachers benefit from a reliable network, which can be easily leveraged for use during teaching, improving opportunities for student learning. With the new system of virtual desktops and wireless networking, teachers and administrators at UCSD can push out data, including lesson plans and online classroom materials, to any mobile device connected through the district.

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Product List

ROUTING AND SWITCHING
· Cisco Nexus 7000 Series Switches

NETWORK MANAGEMENT
· Cisco UCS B-Series Blade Servers

SECURITY AND VPN
· Cisco IPS 4200 Series Sensors

VIDEO
· Cisco C20 Quickset Video
  Conferencing Units

For More Information

To learn more about Cisco Nexus 7000
Series Switches, go to http://www.cisco.
com/go/nexus7000.

To learn more about Cisco UCS B-Series
Blade Servers, go to http://www.cisco.com/
go/ucs.

To learn more about Cisco IPS 4200 Series
Sensor, go to http://www.cisco.com/go/ips.

To learn more about Cisco C20 Quickset
Videoconferencing Units, go to http://www.
cisco.com/go/telepresence.

Elementary students have very much been included in these upgrades; currently, UCSD is conducting a pilot in one elementary school where students are given handheld netbooks and can connect to the virtual environment during class. To date, UCSD schools have deployed over 330 netbooks that operate on the wireless infrastructure. Davis says, "Our new virtual desktop infrastructure has been very positive. The students are more motivated using technology in their lessons."

UCSD has continuously expanded lesson plans and collaborative learning opportunities from its new wireless foundation. For example, UCSD has equipped each school building with a Cisco C20 Quickset video conferencing unit, which enables virtual field trips. Virtual field trips have not only enhanced educational opportunities for UCSD students, but have also reduced the costs associated with travel, which hugely benefits the high percentage of low-income families in the area.

Similarly, because of the upgraded network connection between school buildings, teachers and students at separate UCSD schools have been able to be more collaborative, sharing resources, lesson plans, and collaborating on various projects.

The improvements will affect every student from kindergarten through to 12th grade, making UCS a comprehensive solution to fit the diversity of UCSD students. The virtualized model has enabled UCSD to provide personalized learning software packages, such as ESL learning software, on its newly virtual desktops so that its multicultural students can access it at any time. UCS is enabling Davis and the greater UCSD administration to move towards their vision of being a "24/7 21st century learning resource center" which cuts across economic and cultural barriers.

Next Steps

In spring 2012, UCSD will be deploying the second UCS system to expand the desktop virtualization as well as use it as data backup. Davis says, "Integrating two UCS systems will be key for disaster recovery. UCS does a great job at having redundancy built into it. I want to be able to have an additional system in place at a different location in case we ever get a flood."

Technical Implementation

UCSD also partnered with ESI Networks, a local IT value-added reseller, to deploy the solution. Davis says, "ESI was a great business partner, supporting the school district and Cisco technology." By forming a partnership between a local, trusted business group and a national IT solutions leader, UCSD set itself up for success.