# 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 faculty, staff and administrators; approximately 10,000 students district wide

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

**SOLUTION**
- Virtual Desktop Infrastructure deployed on Cisco UCS, serving approximately 10,000 students
- Update wireless infrastructure between schools across district

**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. Steve 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 consolidated, unified data center infrastructure for hosting virtual desktops. UCSD is 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 its energies on upgrading the technical infrastructure to better support its unique student population. UCSD planned to integrate digital interactive whiteboards, rewire schools for improved wireless networking access, 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.

UCSD wanted more than the traditional, desktop-only virtualization solution. Instead, it wanted to enable multifaceted collaborative education opportunities for students. To achieve a virtualized collaborative workspace for all 13 of its K-12 schools, UCSD determined that the Cisco® Virtualization Experience Infrastructure (VXI) would be

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Director of Technology, Utica City School
District

invaluable to the transition. UCSD looked to the Cisco Unified Computing System™ (UCS™), a next-generation data center platform that enables schools to simplify, secure, and scale the hosting and management of desktop virtualization while building the foundation for full virtual education workspace deployments. UCS 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 accelerates virtual desktop deployment, and simplifies desktop management while providing 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. Notably, Cisco UCS provides the virtualized compute underpinning for Cisco VXI, working in unison with Cisco Borderless Network and Collaboration architectures to create a unified environment enabling every personally owned computer or mobile device to be a potential collaborative academic resource.

In tandem with Cisco UCS, UCSD integrated the Cisco Intrusion Prevention System (IPS) 4200 Series Sensors, which were 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 7000 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 large 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 be re-purposed to provide student access to newer environments such as Windows 7.  With education budgets lessening, this particular cost saving is critical.

### Simplified Network Management
So far, UCSD has virtualized 1000 school computers (out of 3000). With approximately 10,000 students served in the school system, simplicity is key for IT management.

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## Product List

**DATA CENTER SOLUTIONS**
· Cisco Unified Computing System (UCS) B200 M2 Blade Servers

**ROUTING AND SWITCHING**
· Cisco Nexus 7000 Series Switches

**SECURITY AND VPN**
· Cisco IPS 4200 Series Sensors

**VIDEO**
· Cisco C20 Quickset Video Conferencing Units
· Cisco TelePresence C20 Quickset Video Conferencing Units

**WIRELESS**
· Cisco LAN Controller 5508
· Cisco 1142 Wireless Access Points
· Cisco Wireless Control Software

Davis found that, as a whole, the entire wireless network is now easier to both manage and back up. From a desktop services perspective, Davis and his team are now able to support a much larger constituency of end-users using the same IT support resources as before.

### 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 educational content, including lesson plans and online classroom materials, to any mobile device connected through the district.

Elementary students have very much been included in these upgrades; currently, UCSD is conducting a pilot in one elementary school where students are given netbooks and can connect to the virtual workspace during class. To date, UCSD schools have deployed over 330 netbooks that operate on the wireless infrastructure. Davis says, "Our new virtualized collaborative workspace has been very positively received by students, faculty and administration. 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 TelePresence® 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 Cisco VXI a comprehensive solution to fit the diversity of UCSD students. By providing virtual education workspaces  UCSD has been able to deliver personalized learning software packages, such as ESL learning software, on its new virtual desktops so that its multicultural students can access it at any time. VXI 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.

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## Next Steps

In spring 2012, UCSD will be deploying the second UCS system to expand its virtualized collaborative workspace 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.

## For More Information

To learn more about Cisco VXI, go to http://www.cisco.com/go/vxi.

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.