School District Transforms Classroom Learning with Wireless Technology

British Columbia's School District 23 uses network solutions to bring innovative applications into the classroom.

EXECUTIVE SUMMARY

School District 23, Central Okanagan

- Industry: Education
- Location: Kelowna, British Columbia, Canada
- Number of Users: 4000

Business Challenge

- Deliver innovative learning applications to transform the classroom experience
- Provide new technology tools with optimal reliability and performance
- Support a mobile learning environment
- Secure thousands of mobile laptops

Solution

Deployed Cisco routing, switching, wireless, and security solutions to support a state-of-the-art digital learning environment.

Business Results

- New digital resources help students work more collaboratively and successfully
- Students have the flexibility to access learning tools and the Internet from anywhere in the classroom
- Small IT team can manage the entire environment centrally and efficiently
- District can distribute mobile laptops to students without fear of malware infection

Challenge

A poetry class begins with a lesson on haiku. But instead of just writing words on paper, students add images, videos, and music to make their poems come alive. Next it is onto geometry, where instead of using a pencil and compass, students manipulate shapes visually on a computer screen, stretching triangles and watching how the angles change. In social studies, students create multimedia presentations complete with videos of life in foreign countries downloaded from the Internet. Then it is time for English, where before even beginning their compositions, students use mind-mapping software to visually trace out the contours of their argument and see how each point builds to a smooth conclusion.

Upon seeing a curriculum like this, most parents would say, "Wow, how can I sign my child up?" If your child attends school in the Central Okanagan regional district of British Columbia, you don't have to. It is just another day in School District 23.

School District 23 encompasses 44 schools in and around the city of Kelowna, serving 20,000 students. The district had a reputation for outstanding quality, but its leaders were always striving to do more.

"If you look into a public school classroom virtually anywhere in North America, you'll find that not much has changed for the last 50 years," says Jon Rever, director of Technology and Education Services for School District 23. "We wanted to introduce technology tools into the education program that would really affect teaching and learning. Our intention was to change the way teachers teach and the way kids learn."

The district launched the "Together iLearn" program to equip all 7th- through 12th-grade students with their own laptop computers and put in place a state-of-the-art digital learning curriculum to help them make the most of the laptops. District leaders also selected a variety of innovative learning applications, including Microsoft Office applications, digital encyclopedias, Web resources, and a broad range of state-of-the-art, specialized applications for science, math, and English.

All of these tools held the potential to transform the learning experience for students. To unlock that potential, however, the district needed a powerful technology infrastructure to deliver them. They needed a high-performance network foundation and a secure, manageable wireless network that would reliably connect all schools and classrooms. They also needed effective solutions to secure the environment, and tools to manage the infrastructure efficiently and cost-effectively.

"When you look at budget trends in public education, we know there is not going to be a lot of extra dollars to add more technicians," says Rever. "As our technology demands increase, we need solutions that can be optimally controlled from central locations so that we don't need more staff to support them."

"When we take a technology into the learning environment, it has to be rock-solid in terms of uptime…. We need always-on, utility-grade performance. With Cisco, we can depend on that."

--Jon Rever, Director of Technology and Education Services, School District 23

Solution

After exploring several options, School District 23 leaders chose Cisco to support the entire wireless infrastructure, as well as Cisco® solutions for the routing, switching, management, and security foundation of the iLearn program.

"Manageability and stability were two of the biggest factors in our decision," says Dave Norrish, technical coordinator for School District 23's learning technology department. "When we first began this project, we were using a different wireless technology, and the vendor changed their direction within six months of our deploying it. We needed a solution that we could depend on long-term. We felt that Cisco set the standard for wireless networks today."

Cisco's reputation for reliability was also an important consideration.

"When we take a technology into the learning environment, it has to be rock-solid in terms of uptime," says Rever. "The minute it stops working, teachers will literally put it on the shelf and stop using it. We need always-on, utility-grade performance. With Cisco, we can depend on that."

To build the network foundation for the iLearn program, School District 23 deployed a combination of Cisco Catalyst® 3560 series and Cisco Catalyst 2960 series switches at the district headquarters and the schools, as well as a variety of robust Cisco routers. The Catalyst switches provide exceptional bandwidth and performance for even the most demanding learning applications, as well as features such as advanced quality-of-service (QoS) to support future applications such as IP-based voice and video services. To provide reliable wireless network access to all participating classrooms, the district deployed more than 400 Cisco Aironet® 1130 Series and 1230 Series access points across 15 sites. These access points integrate with the Cisco routers and switches, and the solution's management tools allow the IT team to control the entire wired and wireless environment from the district headquarters.

Given the nature of the program and its users, security was a chief concern for the iLearn technology infrastructure. With thousands of children able to surf the Web from anywhere, the threat of student laptops getting infected with viruses and malware—and ultimately infecting the rest of the network—was a serious risk. School District 23 deployed Cisco Security Agent on every laptop.

Cisco Security Agent is a host-based intrusion prevention system (IPS) solution that goes beyond traditional antivirus software by monitoring actual operating system behavior for suspicious behavior—not just blocking known attack signatures. The district also uses Cisco Security Agent to control user behavior on student PCs, preventing them from installing certain types of software or launching applications that could harm the computer or the network. Using an advanced IPS solution like Cisco Security Agent rather than a basic antivirus system also streamlines maintenance of the solution.

“If we had to rely on a traditional antivirus product, we would have to make sure the antivirus software on every single student PC was updated on a regular basis,” says Norrish. “That just wouldn’t work well in our environment. Cisco Security Agent provides strong security without the need for constant updates.”

To protect the district headquarters network and data center, School District 23 also uses a Cisco Adaptive Security Appliance (ASA) as the network firewall. A Cisco Network Admission Control (NAC) Appliance also protects the data center by helping ensure that any endpoint attempting to connect to the network (such as a computer from a visiting vendor) has complied with basic security policies, such as having up-to-date operating systems. Because all of these technologies are Cisco solutions, they all communicate and interoperate to act as a single, adaptive defense system.

“The Cisco solutions all work hand-in-hand to give us a complete security solution,” says Rever. “They provide us with excellent compatibility and a more secure environment.”

Results

The Cisco technology infrastructure—and the innovative iLearn applications that it supports—now serve 4000 students and have profoundly changed the classroom experience. Students have access to resources, collaboration tools, and modes of learning that would be inconceivable in a traditional classroom. Having a robust Cisco network and digital tools at their disposal, students can more easily collaborate and communicate, and take a more active role in reviewing and commenting on each other’s work. Standardized reading and math scores for iLearn students are improving, and initial assessments indicate that iLearn students progress in these areas at about twice the rate of students in traditional classrooms. With the technology to access a world of information on their own, School District 23 students also are becoming more self-directed in their approach to schoolwork.

“Traditionally in the classroom, teachers bring the information and knowledge to students,” says Lisa McCullough, principal of Mount Boucherie Secondary School. “With the iLearn program, students are also able to access that information on their own. It has brought a far greater depth of understanding and knowledge into the classroom and into the hands of students, which makes them more engaged in the learning process.”

Despite the scope of the applications and infrastructure that School District 23 has deployed, the centralized manageability of the Cisco Catalyst switches, Cisco routers, and Cisco wireless solutions allow a small IT team to support the entire environment.

“We have added a lot of infrastructure and a lot of functionality,” says Rever. “The Cisco solution has allowed us to maintain this very large environment without increasing our staffing levels.”

While equipping 4000 children with wireless Internet access carries significant security risks, the Cisco security solutions are also providing strong protection.

“The kids often try to circumvent the security protection to do things they want to do online,” says Norrish. “Cisco Security Agent allows us to control a big portion of that, while protecting us from worms and Trojans. With all the laptops we have out in the wild, we haven’t had a single problem with viruses getting into our network.”

“As students move in and out of the LANs at their schools, we know those systems attaching to our network are clean,” adds Rever. “If a laptop does get infected, Cisco Security Agent reports back to our management console, and we can take care of the problem centrally.”

Ultimately, School District 23 leaders believe that the unique combination of innovative learning applications and the state-of-the-art Cisco network will help prepare students to succeed in college and in their lives and careers after school.

“As kids move through our system and have access to this technology to support their learning, when they graduate they’re going to be that much more skilled,” says Rever. “They’ll already be accustomed to using a variety of tools that they’ll need in their jobs. And they’ll have ample experience being creative, being problem-solvers, collaborating, communicating—doing all of the things that future employers will be looking for. I believe that will have a major impact on our community.”

Next Steps

In the coming months, the School District 23 IT team plans to continue building on the Cisco network and security solutions to further enhance the performance, manageability, and security of the environment. The team is working through each school and upgrading sites with older switching platforms to high-performance Cisco Catalyst switches. School District 23 is also expanding the Cisco NAC Appliance solution to incorporate all of the schools. The solution will support secure guest network access and lay the security foundation for the future, when many children will bring their own laptops to school. School District 23 is also in the process of constructing a new, state-of-the-art middle school that will rely heavily on Cisco technology.

“In addition to wireless connectivity in the classroom, we will be installing our first true voice-over-IP system there, as well as exploring things like network-based public-address systems,” says Rever. “All of it will be Cisco-based. We’re striving to emulate the Cisco concept of the human network, and we think it will be very beneficial for our students.”

PRODUCT LIST

Routing and Switching

- Cisco Catalyst 3560 Series Switch
- Cisco Catalyst 2960 Series Switch
- Cisco 3825 Series Router
- Cisco 2800 Series Router
- Cisco 2600 Series Router
- Cisco 1600 Series Router

Security and VPN

- Cisco Security Agent
- Cisco ASA 5520 Series
- Cisco NAC Appliance
- Cisco Secure Access Control Server

Wireless

- Cisco Aironet 1230 Series Access Points
- Cisco Aironet 1130 Series Access Points
- CiscoWorks Wireless LAN Solution Engine (WLSE)

For More Information

Visit the following Cisco web sites for more information about:

- **Cisco solutions for schools and classrooms:** http://www.cisco.com/go/education.
- **Cisco Catalyst Switches:** http://www.cisco.com/go/catalyst
- **Cisco security solutions:** http://www.cisco.com/go/security
- **Cisco wireless solutions:** http://www.cisco.com/go/wireless

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 C36-468786-00 04/08