

How wireless networking improved campus Internet security, classroom capabilities

by Ray Geroski | Sep 04, 2002 7:00:00 AM

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Takeaway: Issues to consider when bringing in a WLAN

Faced with a growing enrollment that resulted in overcrowded evening course programs, Indiana University Southeast (IUS) expanded its offerings by building an off-campus graduate center. Because the new McCauley Nicolas Centre is located several miles from the IUS campus, the IT department had to determine how to connect the building to its network in a cost-effective way that offered good performance with reliable service.

They opted for a building-to-building wireless network solution that gave them the best balance of cost effectiveness and performance. Going wireless helped address a few other issues, as well as making it easier for students to take advantage of resources available through the university network. Setting up the classrooms in the building presented some problems that the IT staff was able to solve with technology and ingenuity. The IUS experience shows how wireless and other technologies can offer viable solutions to meet a variety of networking challenges.

Making the link

The location of McCauley Nicolas Centre, miles from the campus proper, looked like it might present an obstacle to integrating the annex with the university network. The time frame made the project even more daunting. In a matter of months, the building had to be up and running for the Fall 2002 semester. Linking the building to the university network was critical because user authentication, which takes place on servers located in Indianapolis (more than 100 miles away), is necessary for accessing e-mail and even applications on the local drives.

According to Larry Mand, vice chancellor of information technology, the decision to turn McCauley into a full graduate center wasn't made until earlier this year. As a result, the IT staff had to work quickly to get everything set up in time.

"It's been an ambitious project to define the space, get the architects involved, plan it, and get the contractors on site so that we can get the center opened for the fall semester."

The decision to go with a wireless connection was influenced by the time frame and the cost involved. IUS could establish a wireless Internet connection more quickly and cheaply than ground-based wire connections. The provider for the wireless Internet service is Louisville, KY-based iSkywire.

"Right now, we're just going to utilize iSkywire as a link from [the new] building to get back to campus," said John Petrysian, coordinator of network services. "But we're also looking into VOIP and transmitting voice over the same connection."

Petrysian added that wireless networking is also supported in the classrooms inside McCauley to better accommodate students with laptops. Students who have laptops with wireless capabilities will be able to log on to the university network to retrieve e-mail, conduct research, and surf the Internet.

Had IUS elected to pursue other options for linking the graduate school annex to the main campus, it would likely not have completed the project in time—and the cost would have been greater.

Technology in the classroom

One important feature of the McCauley Nicolas Centre is the computer lab it houses, which is shared by students attending computer certification classes during the day and the night students in the MBA and education programs.

The physical setup of the lab presented some challenges of its own. Because of the odd shape of the room and the presence of support beams, the typical arrangement of desks wasn't possible. To accommodate computer stations and leave aisle space, the computers had to be stationed in the center of the room.

"An island of desks runs down the center of the room with two rows of computers arranged back to back," said Russ Bush, coordinator of student computing services.

The arrangement allows the computers to be placed together while allowing space for people to move about conveniently without having to dodge obstacles. Though the organization seemed a bit awkward at first, Bush said that it offers some advantages.

"Because everyone is closer to the center of the room, it makes seeing the whiteboard and projection screens easier."

To overcome the challenge of wiring the classroom, Bush said he turned to the same kind of wiring used in the IUS wireless cafe in the library on campus.

"We got data and electric to the center of the room by going under the carpet with flat cabling," he explained.

To minimize the amount of wiring strung under the carpet, Bush said he has only two data lines running to the tables in the center of the room.

"I'm not bringing 24 flat wires under the carpet. Instead, the two data lines connect to the switches under the table and the 24 computers are connected to the switches."

Like the classrooms in the building, the lab also supports wireless networking to accommodate laptop users. In all classrooms, Bush said, power outlets have been arranged so that laptop users have access to power without having to use their batteries. But he warned that if teachers rearranged classes, some users might not have easy access to those outlets.

Another important aspect of the lab is that it accommodates groups with different purposes. During the day, students working toward certifications use the lab to learn and test networking skills. Their needs are very different from those of the students attending night courses, who just require the standard applications that IUS installs on all systems.

The solution to this problem was to install two hard drives in the machines and allow switching between them depending on the class.

“A key switch determines which drive the system boots from,” Bush said.

With the key in one position, the systems boot from the drive with the standard university image, which the business and education students use; in the other position, users can boot from a drive with which they can experiment.

“We think this will be an effective, long-term solution,” Bush said. “Because the hard drives are permanently mounted, there’s no wear and tear on the connectors; we simply switch which hard drive is active.”

The instructor can also isolate the network from the Internet to allow students to set up a test network for certification training. An A/B switch allows the instructor to access the Internet and then switch back to the local network.

The solutions Bush implemented in the lab and other classrooms make effective use of the space available while sidestepping logistical problems. And by adding wireless networking capabilities, IUS can better support users with laptops without expending resources on additional infrastructure.

Security considerations

Although wireless networking offers a cost-effective and easy means of linking sites, it also raises security concerns. IUS is aware of the security issues and has taken steps to help protect its data and prevent unauthorized access to its network.

Petrysian said that VPN tunnels secure the McCauley wireless connection on both ends, and additional measures could be implemented.

“Because we’re planning on running both voice and data across the same connections, we’re also considering the possibility of tunneling within the tunnels to further secure communications.”

Another network security measure that IUS has put in place is the use of VLANs.

“We’re isolating communications with VLAN technology to make sure that we’re not allowing people to jump on our IPs and access what they shouldn’t,” Petrysian said. “We use VLANs to narrow down what our usage is and to control it better. If need be, we can also switch the VLANs if we find that someone has in fact accessed something.”

Petrysian said that iSkywire links are secured through encryption, and the university also uses firewalls to control network access. Bush added that user authentication brings another level of security to the network.

“Users cannot even run local applications on the standard image machines without authenticating to our servers.”

Technology race

Like all universities, IUS finds itself in a race to keep up with others in offering students better

technology and technology training. Its move to wireless networking represents another step toward better accommodating student needs and providing easier access to learning resources.

The experience of IUS proves that wireless technology can be a cost-effective way to improve networking and communications.

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