

Taking the Wireless Route at NSU

by Billie Jo Kaufman

Professional Perspectives—Tools and Techniques of the Trade. The Professional Development Committee encourages members to continue to explore topics after presentations at the local, regional, and national levels. We welcome your comments and article suggestions. Please contact Carol Avery Nicholson at 919/962-1199 or carol_nicholson@unc.edu.

It's a spring morning, and first-year law student Yashmin Alexis is registering for her fall classes at Nova Southeastern University. No, she's not standing in a long line at the registrar's office. Rather, she's sitting in the school cafeteria entering her course preferences over the Internet from her laptop.

Alexis isn't alone. At tables scattered across the cafeteria of the Shepard Broad Law Center, students have their faces buried in computer screens as they access a variety of applications over the law school's wireless LAN. In nearby classrooms, most students are furiously typing lecture notes. Students hanging out in the lounge balance portable computing devices on their laps, and one student climbing stairs is intently focusing on a laptop balanced in her palm.

Nova Southeastern may not match up with Harvard or Yale when it comes to history and prestige, but the law school is trying to make up for its lack of pedigree with a technology focus. Students must buy laptops outfitted with wireless adapters so they can connect to a wealth of Internet-based applications from anywhere on campus—Neil Weinberg, *Network World*, 5/17/99

This access is made possible via Proxim RangeLAN 2 wireless adapters and Proxim RangeLAN 2 radio frequency transceivers mounted in the ceiling tiles linked by 10M bit/sec Ethernet to Cabletron hubs. Hubs connect over Fast Ethernet to FDDI ring.

So, why wireless?

A mandatory laptop program was implemented in Fall '97. The administration and faculty agreed laptop implementation was not designed to carry a piece of technology from the parking lot to the classroom. Technology should not just be a mobile word processor. Implementation equaled classroom integration.

This was the first obstacle. NSU Law was designed and constructed in the summer of 1992. Each classroom has only one

dataport connection and in many cases the location is ill-designed for teaching.

Cost studies were conducted and the numbers were staggering. These costs were particularly high because the building was "new." Labor costs for the project were high because the project window was tight. (NSU operates a summer conditional program, full summer school, and is often host to NTIA workshops, leaving virtually no down time for construction-related activities.) NSU has a full summer session and six of the 10 classrooms are concrete-tiered so power and data retrofitting involved extensive redesign.

Brain-storming sessions were held to resolve this issue. We had to have data to the classrooms to accomplish the overall goals. From time to time, wireless technology would float to the top but was always met with a resounding, "It's not there yet," from law center computer personnel and even louder from University Office of Information Technology. The "wireless isn't there yet" theory had some validity. "Wireless local area networks have been available for more than a decade, but high prices, poor reliability, limited bandwidth and lack of standards have limited their deployment," notes *Library Systems Newsletter* (8/99:59).

NSU Law connected with AMP Corporation/Proxim and the rest is history. AMP met with computer services and administration to demonstrate its product. It was a live classroom demonstration. In addition, AMP agreed to do a demonstration project in the office of *International & Comparative Law Journal*. Each was successful!

Cost studies and site surveys were completed.

The hardware and installation costs came in at about \$80,000. Installation could be scheduled for a long weekend. Student costs the first year were \$535. This year those costs were reduced to \$299.

Wireless LANs provide an extension to or an alternative for a wired LAN.

Wireless LANs use radio frequency (RF) technology to send/receive data over the air. Wireless LANs provide:

- mobility;
- installation speed/simplicity;
- flexibility;
- reduced cost of ownership; and,
- reliability.

There are a number of different kinds of wireless technology:

- narrowband;
- spread spectrum;
- frequency hopping spread spectrum;
- direct sequence spread spectrum; and,
- infrared technology.

Each kind has its advantages and limitations. Each kind has its specific vendors.

How do wireless LANs work?

"A transmitter/receiver (transceiver) device, called an access point, connects to the wired network from a fixed location using standard cabling. The access point receives, buffers, and transmits data between the wireless LAN and the wired network infrastructure." (www.proxim.com)

Each access point can support a group of 15–20 users and can operate within a range of 100–300 feet high. (NSUs are mounted in the ceilings.)

Each user has a wireless PC card and software that provides the interface between the client network and the airwaves via the antenna. Access points located throughout the NSU building allow for the students to "roam."

What should you consider if you're thinking about a wireless LAN?

1. Why would you do wireless vs. wired? Do you have some of our problems? Are you in an older building where design problems are difficult for wired networks? Are there time and money problems?

A Desktop Learning Opportunity

2. Can you get the range and coverage you need? Get a site plan. Arrange for a demonstration project.
3. Can you get the “throughput” you want? Bandwidth has been limited to 2.0 Mbps but is now as high as 10.0 Mbps. There is a new standard, designated IEEE 801.11HS. 3 Com is already using the new standard to manufacture AirConnect. (*Library Systems Newsletter* 8/99:59)
4. What’s the integrity and reliability of a wireless LAN? Military systems have used RF technology for over 50 years. There’s little interference. The connections are far more robust than cellular connections.
5. Will it work with what we have? Wireless LANs work with Ethernet or Token Ring. Wireless LAN nodes work with set drivers. Once the drivers are installed, the operating system functions like any other network device.
6. Will we need special training to administer wireless technology? Only the

access points require cabling. Network managers are freed from pulling cables. Moves and changes are easy.

7. Are OIT and Administration traumatized over security issues? Remember, wireless technology started in the military. Provisions are built in and are usually more secure than wired LANs. There are complex encryption provisions as well. At NSU, each individual network user logs-on with a password to insure security to the network.
8. This is too good to be true: What’s the cost? Access points will range from \$1000 to \$2000. PC cards range from \$300 to \$1000. Cost to install and maintain is generally much lower than wired networks.
9. Are there any health hazards I should consider? Wireless LANs have less output than a cellular phone. Radio waves fade rapidly. Wireless LANs meet stringent government and industry regulation. Remember, the health industry itself is one of the biggest users of wireless technology.

A recent survey of higher education networking staff conducted by Proxim revealed some interesting data: “knowledge about wireless LANs is low—only 30% of the respondents were familiar with the benefits of wireless LANS.” (www.proxim.com)

Library Systems Newsletter (8/99:60) states: “completely wireless LANs will not be common, but wired building backbones with wireless from hubs to desktops will be.”

Why is that?

At NSU Law, the flexibility, integrity, and ease at which we provide network access anywhere in the building is exciting. That ability to provide a data port wherever the students decides to gain access is phenomenal.

We invite you to visit NSU Law to see wireless access in person. Or visit www.proxim.com.

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