Improving Shaw University Network Infrastructure

A Report Submitted to

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By

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Improving Shaw University Network Infrastructure

This the final report on Shaw University’s project to improve and enhance its network infrastructure through implementation of a wireless LAN for students and faculty. This project was funded by AN-MSI.

Project Description

During the last five years Shaw University had invested money and resources to provide its faculty, students and staff with access to computers, the Internet, and electronic services and resources from their offices, libraries, computer laboratories, and residential halls (student dorm rooms). This access was made available through a Gigabit fiber optic backbone with 100 Megabit connections to the desktop. As the wireless-ready devices such as PDAs and laptops became more affordable, the University decided to enhance its instructional computing resources by implementing a wireless LAN solution to address increasing demands for utilization of such devices by faculty and students.

Project Goals and Objectives

There are three goals associated with project. The following highlights the goals and outcomes:

Goal #1:

To enhance instructional technologies services and resources

Outcomes:

Implementation of a secured wireless LAN has enabled faculty and students at Shaw University to have mobile access to instructional technology resources of the University. Students and faculty are no longer restricted to use these instructional technology resources either form their offices or the computer computers laboratories. Faculty could choose to have a class in a large lecture hall equipped with a wireless access point. Another faculty could role a wireless-ready cart with thirty wireless-ready laptops to his or her classroom and have an interactive class in which students have access to the Internet and electronic libraries.
Goal #2:

To set up a wireless network for students

Outcomes:

This project has enabled Shaw University to enhance its instructional network. Now students could bring their own or University-provided laptops to various locations and utilize the instructional technology resources. The current wireless LAN covers following locations:

Teacher Education Building
- First floor (classrooms and lecture hall)
- Second floor (classrooms and the library)

The Main Library
- First floor
- Second floor

Leonard Building
- First floor (library)
- Third floor (lecture hall)

Goal #3

To provide students and faculty with up-to-date technologies for teaching, learning and research

Outcomes:

The creation of CISCO wireless LAN enhanced the collaboration level between faculty and students. The wireless LAN enabled faculty and students to have interactive teaching and learning capabilities outside the traditional settings.

Architectural Design

After researching the various access points, the University decided to select CISCO AIRONT 1200 series wireless access points. These devices are upgradeable to 802.11g standards. We initially worked with CISCO local office located in RTP. CISCO engineers visited the campus and surveyed the locations. During this visit we discussed in details the correct set up and configuration of these devices and associated security risks. As the result of these discussions CISCO recommended that in order to reduce the security risk Shaw University need to install CISCO ACS 3.5 secured servers on its network. This server would
not allow any connection to the wireless LAN without appropriate user authentication. In addition to CISCO ACS the University decided to create a separate VLAN on its network dedicated to wireless LAN. The creation of additional VLAN added another layer of the security to the network.

During summer 2003, the University received an evaluation copy of ACS along with a CISCO 1200 access point. This device was installed in the library and was connect to the University’s fiber optic backbone.

**Implementation Strategies**

After the installation of the initial access point in the library faculty and students were informed of the existence of this device. Faculty members were encouraged to visit the library and test the wireless device. Faculty reactions to this new technology were very positive and they indicate that they need more such devices in other locations.

This new phenomenon on campus created lots of interests and excitements among faculty and students. During monthly meetings of the Instructional Technology Committee, faculty indicated that in order for students to benefit from the wireless LAN additional access points and wireless-ready laptops were needed. The committee members identified the following locations for installation of additional access points.

- Both two floors of the main library
- Library and the lecture hall located in the Teacher Education building
- Library and lecture hall located in Leonard building
- Creation of a mobile wireless-ready cart with thirty laptops

To address faculty and students wireless instructional needs, the University provided the library with twenty wireless-ready IBM notebooks. In addition to these notebooks the University also purchased forty Toshiba wireless-ready laptops for the Teacher Education program. These systems are now available to faculty and students.

**Lessons Learned**

The implementation of the wireless LAN required:

- Selection of right technologies to address both ease of use and security requirements.
- Starting with a small wireless LAN with 1-to5 access points.
- Selection of location for mounting the access points to provide adequate coverage.
• Configuration of access points to minimize security risks by turning off access point’s SSID and changing the default names.
• Programming the access point to deny access beyond the normal operational hours.
• Programming the access point to drop any connection below 5Mbps, this will prevent access outside the predetermined wireless LAN range.
• Making sure that WEP is running on the access points.
• Monitoring the network regularly and changing security setting as needed.

Conclusion

The addition of CISCO wireless LAN to existing wired network has resulted in:

• Network mobility.
• Greater access to instructional technology resources for faculty and students.
• Enhancement of available instructional technology resources and services.
• Integration of emerging technologies into classroom instructions.
• Infusion of wireless devices such as PDAs and laptops into daily teaching, learning and research activities.
• Reduction of cost associated with expansion of wired networks.