Shenandoah University implements phased network refresh to accommodate growing wireless needs.

Executive Summary

Shenandoah University
- **Industry:** Higher Education
- **Location:** Winchester, VA
- **Number of Employees:** Over 4000 students; over 500 faculty and staff

CHALLENGE
- Help ensure connectivity on campus with growing demand for wireless bandwidth
- Deliver service commensurate with growing usage of real-time and multimedia services
- Address questions of capacity while also minding coverage requirements

SOLUTION
- Engage partner in research, pre- and post-implementation, and surveys to assess and address challenges
- Utilize Cisco platform to accommodate full capacity and connectivity needs across campus residences
- Address solution through phased approach to help ensure steadfast progress

RESULTS
- Achieved stability of network while accommodating growing wireless traffic
- Resolved wireless bandwidth issues to deliver consistent and effective service to students
- Recognized by Apple as "Apple Distinguished Program" and center of excellence

Challenge

Shenandoah University in Winchester, VA is a private, medium-sized institution that offers 42 baccalaureate degrees/11 undergraduate certificates, totaling 53 undergraduate programs, and boasts a student-faculty ratio of 10:1. On a campus of over 4000 students, the need for consistent and expeditious service is non-negotiable. As such, the university continues to expand its commitment to the power of innovative technology, and to enhance both the learning and teaching environments. In recent years, a series of technological advances introduced on campus, along with the increasing number of students using real-time multimedia services, forced the university to confront the growing demand for wireless bandwidth. With plans to distribute Macbooks and mobile devices to all incoming freshmen in 2012 through its "Mobile Learning Initiative," university officials quickly realized that if it were to maintain its reputation as an innovator and leader in education technology, it would need to address issues of coverage, capacity, and service.

Solution

The decision for Shenandoah University to engage a Cisco solution seemed straightforward, because the university has been deploying Cisco equipment for over 10 years. Despite maintaining a Cisco end-to-end network, the university faced so many issues with wireless connectivity, capacity, throughput, and services, that administrators and students shared the perception that Cisco technology was inadequate. In fact, discussions even took place about outsourcing all wireless issues.

With the guidance of dedicated Cisco representatives, university administration and technology personnel identified a partner to assist in assessment of their current situation, affordable pricing, all stages of implementation, and recommendations for paths of future growth. With this in mind, Shenandoah University officials agreed upon a phased approach to addressing all capacity, connectivity, and service issues faced by students and administrators.

In the summer of 2009, Shenandoah University began migrating its existing enterprise wireless infrastructure over to a Cisco wireless network, beginning with the implementation of Cisco® controller-based wireless access points, and continuing with the conversion of the entire environment expected by Fall 2011. This migration would support the University's Mobile Learning Initiative, through which all incoming freshmen were to receive MacBook laptops and iOS devices for use during their four years on campus. This initiative predicted the impending growth in wireless bandwidth demand, and wireless traffic levels jumped from 35-40 Mbps in 2009, to 135-140 Mbps in 2011.

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By the summer of 2010, university officials had already more than doubled the number of access points installed in campus residence halls, because they also completed nearly two-thirds of the migration process. At this point, officials were confident that doubling the coverage in residence halls would support wireless demand through the 2010 school year until the final phase could be completed in the summer of 2011. They were wrong. The demand for wireless connectivity grew at a higher-than-predicted rate, particularly as students began utilizing all the features available on more advanced technological devices. This demand, in turn, placed the university's ability to provide service at odds with the tremendous growth in wireless demand.

By the summer of 2011, university officials were able to install Cisco access points in all of their residence halls, add a controller to enhance redundancy for their environment, and rewire two residence halls. What was perceived initially as an Internet issue was resolved through expanding the bandwidth sufficiently to support unprecedented growth in demand for wireless access.

According to Kenneth Lambert, Shenandoah University's network administrator, "After the University's engineering staff worked out a new solution/approach with the Cisco wireless team... as our Vice President of Administration and Finance puts it, 'What was once an issue is now a thing of the past.'"

Results

The migration of Shenandoah University's existing enterprise wireless infrastructure over to a Cisco wireless network yielded immediate and lasting results. Most immediate was the noticeable drop in complaints, and the ability of university officials to address all service issues with efficiency and priority. Since July 2011, only 16 official complaints have been logged to IT representatives, and some of these issues were not even related to the university's wireless services. Now, the university also houses a mixed environment in which Apple, iOS, and Windows systems all comingle and work together without interruption.

Recently, Shenandoah University received recognition as hosting an "Apple Distinguished Program" (particularly the Pharmacogenomics and the Music Production and Recording Technology [MPRT] programs) for demonstrated success in enhancing and extending both teaching and learning through the thoughtful and innovative implementation of technology. The university's stable network and wireless infrastructure also contributed to this prestigious acknowledgment.

As the university continues to expand its Mobile Learning Initiative, more than 2500 MacBooks are on campus, with the school's wireless infrastructure supporting just about every service available on the Internet. By the end of the 2012 school year, Multicast

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Video will also be supported. Students and administrators alike identify a marked difference with the quality of connectivity now available to them. Shenandoah University is now a leading example of a truly wired campus.

For More Information

To find out more information about Cisco Wireless,
go to: http://www.cisco.com/go/wireless.

To find out more information about Cisco Routing and Switching,
go to: http://www.cisco.com/web/learning/le3/ccie/rs/index.html.

To find out more information about Cisco Voice and IP Communications,
go to: http://www.cisco.com/go/voice.

To find out more information about Cisco Security and VPN,
go to: http://www.cisco.com/go/security and http://www.cisco.com/go/vpn.

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Product List

WIRELESS
- Cisco 5508 Wireless LAN Controller
- Cisco 3502I Series Wireless Access Points