State University Advances Education with Strong Network

University of North Carolina Wilmington promotes academic excellence through wireless and collaboration technologies.

**EXECUTIVE SUMMARY**

- **Customer Name:** University of North Carolina Wilmington
- **Industry:** Education
- **Location:** Wilmington, North Carolina
- **Number of Employees:** 2,500
- **Number of Students:** 13,000

**BUSINESS CHALLENGE**

- Build secure wireless network to support thousands of devices and flexible learning environment
- Increase speed and performance of network to support growing needs
- Establish solid network foundation to support advanced academic programming, including virtual classrooms

**NETWORK SOLUTION**

- Deployed Cisco Catalyst and Nexus switches to help enable virtual networks and increase Ethernet speeds up to 10 Gigabits
- Installed over 1000 Cisco Aironet Access Points across campus to support robust wireless network
- Used Cisco TelePresence and Collaboration platform to build leading teaching/learning environment

**BUSINESS RESULTS**

- Supported more than 3800 academic programming hours and 87 courses for distance learning
- Expanded number of wireless access points more than tenfold in eight years
- Added services and capacity without needing to increase networking staff thanks to streamlined environments and centralized management

**Business Challenge**

Located in a historical port town, the University of North Carolina Wilmington (UNCW) helps thousands of students reach their educational goals every year. As part of the University of North Carolina system, UNCW values more than just pure academic achievement; the university also promotes a vision in which students embrace a commitment to the journey of learning, the love of place, and the power of ideas and innovation.

Although inspiring professors and engaging curriculum will always be key components of learning and innovation, a strong technological foundation is becoming increasingly important for modern universities. Whether accessing course materials, doing research, engaging in technical simulations, crafting papers, or simply communicating with family, today’s students expect to use technology heavily in their university careers.

As the university’s network core reached its end of life, UNCW saw an upgrade as an opportunity to better meet the current and future needs of students, faculty, and staff. This upgrade would provide the means to meet the needs for faster performance and greater density on the wired and wireless networks. At this time, the university’s strategic goals called for an increased residential campus. In just a few years, the number of students residing on campus had grown from 1000 to 4000 students, causing a large jump in capacity and security needs. Students are increasingly mobile users with multiple devices, creating strong demand for a wireless network that is as robust as a wired network. “Many students have never plugged in to wired connections,” says Leah Kraus, interim CIO at University of North Carolina Wilmington. “They expect wireless access from anywhere they use their mobile devices.”

UNCW also saw opportunities to use the upgraded networking technology to form a foundation for advanced learning environments. In particular, with the growing number of distance education classes and nontraditional students, online and virtual classrooms are a strategic investment to meet the growing needs at the university level. UNCW realized that to support its student population and better serve all students, it would need a high-performance network core backed by enhanced, integrated security and manageability.
Network Solution

UNCW updated its network with Cisco® switching and wireless solutions. At the core, the university uses a high-port-density Cisco Catalyst® 6509-E Switches virtual switching system (VSS), taking the core to the next level with network system virtualization that boosts scalability up to 132 ports per system. Cisco Catalyst 6509-E Switches are also used with the mid-port-density Cisco Catalyst 6506-E Switches in the distribution layer. Cisco Catalyst 3750-X Switches and Cisco Catalyst 4500 Switches complete the network’s access layer with industry-leading security, high availability, and low cost of ownership.

In the data center, Cisco Nexus 5596 Switches form the backbone of the environment with high flexibility that supports Ethernet, Fibre Channel, and Fibre Channel over Ethernet from unified ports. By upgrading the network, UNCW gained improved security features, a streamlined environment for easier management, and 10 Gigabit Ethernet speeds.

“Working from a strong networking foundation, we are giving students greater flexibility and learning experiences to help them achieve their academic goals and help us become a leader in education.”
— Leah Kraus, Interim CIO, University of North Carolina Wilmington

The Catalyst switches form the campus backbone that also supports wireless across the campus through over 1000 Cisco Aironet® Series Access Points. Early deployment primarily consisted of Aironet 1242 Series Access Points, which are designed specifically for challenging environments. Recently, the university has started transitioning to Aironet 3502 Access Points with Cisco CleanAir® technology for self-healing, self-optimizing networks and also to the new cost-effective Aironet 1602 Access Points.

To help networking staff manage the thousands of access points and network connections across the university, UNCW uses an array of Cisco management and security features. The Cisco ASA 5585-X Adaptive Security Appliance is a powerful security solution that meets growing needs for the most high-volume environments. Managed by the Cisco Security Manager (CSM), the ASA 5585-X supports up to 350,000 connections per second.

The Cisco Wireless Services Module 2 (WiSM2) for the Catalyst 6500 Series Switches supports up to 1000 access points with advanced wireless security. The Cisco Prime Infrastructure provides visibility, optimization, and lifecycle management for both wired and wireless networks. With centralized control, configuration management, and templates, these products greatly accelerate deployment and the introduction of new services.

Business Results

With a reliable, high-performance Cisco network backed by Cisco Catalyst switching, UNCW is using Cisco TelePresence® and WebEx® to become a leader in videoconferencing for teaching and learning. By combining audio, video, and collaborative communications in TelePresence, UNCW offers students a world-class blended learning environment where they can meet with teachers for natural interactions that approach the in-person experience. Many classes meet several times a week, and UNCW’s learning approach allows students to choose between attending the class in person or participating in the live class with video on a wired or wireless network from the location they choose. In addition, Cisco Catalyst 3750-X Switches can prioritize video traffic with Strict Priority Queuing for the highest possible quality of service, helping to achieve connections free of skipping and lag. With its collaborative platform and optimized learning experience, UNCW’s distance education with videoconferencing enrollment is growing faster than anticipated.
More importantly, students can access the system from almost any Internet connection without any complex set-up or installation. This capability greatly extends the reach and accessibility to students. Thanks to our strong investment in TelePresence, UNCW has grown its distance learning classes from 24 courses to 87 courses in less than three years. “We supported 3800 academic programming hours for distance learning in the past year, more than double the year before,” says Kraus. “Cisco TelePresence is helping us reach more students, support partnerships with other institutions, and become a leader in a high-growth area.”

**Implementing Wireless for Mobile Students**
The combination of a streamlined environment and easy management has helped UNCW scale quickly and prioritize deployment of access points across campus. The Cisco WiSM2 module on the Catalyst 6500 Series Switches supports a high number of access points and clients, a necessity for serving the growing number of devices on campus. The module even includes Cisco CleanAir technology to help identify and avoid interference for an optimized network delivering greater performance.

Using Cisco network management solutions, the networking staff can determine the number of users on any access point, view signal strength, and inspect heat maps of signal coverage. Using this information, the staff can be proactive in adjusting the position and number of access points to achieve the best coverage and signal quality before they even hear about issues. The networking staff recently used these tools to help redesign placement of access points in a new residence hall by viewing the network and determining how the building construction affected signals.

Cisco Prime Infrastructure improves scalability through use of profiles and automated configuration. Rather than manually configuring each access point individually, networking staff can apply profiles and configure multiple access points from a central management point. “Our wireless network has grown from 100 access points eight years ago to 1453 today, with another 418 already ordered,” says Kraus. “Such rapid growth would never have been possible without streamlined Cisco management.”

UNCW is also leveraging Cisco Identity Services Engine (ISE) for greater security and increased support for Bring Your Own Device (BYOD) practices. With this context-aware, identity-based platform, the university can provide different levels of access for faculty, staff, students, and guests to help ensure efficient delivery of services in the most secure way possible. Additionally, students are able to self-provision and manage personal devices, such as smartphones, tablets, and gaming systems.

**Easing Maintenance with Streamlined Management**
Despite growth of the network, including teleconferencing and greater wireless support, the streamlined Cisco network has helped enable UNCW to do more with existing networking staff. All of the switches can be controlled and managed from a central location, helping staff quickly isolate and troubleshoot performance issues. The Cisco switches also come with self-healing capabilities and failover to increase availability on the network.

The increased visibility and complete reporting also help the networking staff easily translate what they are seeing on the network for nontechnical administrative staff in an effort to clarify the need for additional infrastructure investment or new policies. For example, the networking staff saw that excessive usage by a small number of students, primarily due to pirating, affected the quality of service for others. The staff quickly built reports using data in Cisco management solutions to successfully make a case for the implementation and enforcement of usage policies from the Dean of Students.
With robust, high-speed wired and wireless networks, UNCW is leading the way through use of videoconferencing in distance education and wireless networking for a residential campus. "Working from a strong networking foundation, we are giving students greater flexibility and learning experiences to help them achieve their academic goals and help us become a leader in education," says Kraus.

For More Information
To find out more about Cisco Switching, go to: http://www.cisco.com/go/switching.