

Public University Future-Proofs Wireless Network Investment

Western Michigan University deploys next-generation 802.11n wireless in new buildings.

EXECUTIVE SUMMARY

WESTERN MICHIGAN UNIVERSITY

- Higher Education
- Kalamazoo, Michigan
- 29,447 students and employees

CHALLENGE

- Transforming learning centers into flexible, collaborative environments
- Supporting collaborative learning and social networking applications, including video over wireless
- Maintaining a reputation as a technology innovator and leader

SOLUTION

- Cisco next-generation 802.11n wireless solution including the Cisco Aironet 1250 Series access points
- Cisco Catalyst 3750-E Series Switches with Enhanced Power over Ethernet
- Migration to a Cisco Unified Next Generation Wireless Network

RESULTS

- Deployed state-of-the-art network to prepare for an increase in the number of Wi-Fi connected devices and the associated growth in bandwidth intensive applications
- Reduced network deployment and management costs through centralized control provided by Cisco's Unified Wireless Architecture
- Offered students, faculty, and administrators the latest in wireless communications and future-proofed wireless investment in new buildings

Challenge

Michigan's fourth largest university is a true pioneer and an early adopter of wireless technology. With a campus-wide wireless network spread across 1200 acres and 151 buildings among several campuses, Western Michigan University embraced wireless technology at the turn of the century and radically changed student life.

Even though the existing wireless network had over 1,500 access points and adequately covered existing wireless applications, the network needed to evolve to provide the performance required for future applications, driven by the countless concurrent academic and extracurricular activities of more than 25,000 students.

Further, two building renovations and the addition of a new building, expanding the 80-building main campus, were the two key drivers for considering next-generation 802.11n wireless. When the university's IT department started planning for this network expansion, they did not even consider access points using the established 802.11 a/b/g standards. The primary concern was helping ensure the wireless network investment was protected from obsolescence.

During the planning phase of the next-generation wireless network, George Kohrman, the university's senior director of voice, video and data networks, collaborated closely with the building's construction team to ensure that the necessary infrastructure to support an 802.11n deployment was in place. The promise of enhanced 802.11n performance empowered IT to not only plan, design, and deploy a state-of-the-art wireless network, but also gave them the opportunity to have an active role in planning the campus expansion.

When Cisco announced the first 802.11n enterprise-class access point in the market in September 2007, Kohrman knew that, from that point on, new and renovated buildings would be outfitted with the very best in wireless networking technology, which would guarantee many years of investment protection.

Solution

Deployment of the next-generation wireless network at Western Michigan University will follow a phased approach. In the first phase, the newly renovated and newly constructed buildings are being outfitted with over two hundred 802.11n access points from Cisco. The second phase will include the gradual replacement of older Cisco® access points across the main and regional campuses.

These new access points operating under the Cisco Unified Wireless network architecture will be centrally managed, and in addition to providing important security upgrades, they will also reduce costs associated with managing the network. Due to the scale of the network, the small IT team did not have the required resources to upgrade the operating systems of the older standalone access points. Even though having multiple operating systems did not pose a performance issue, it nonetheless increased the complexity of managing the network. Migration will allow existing and new access points to be combined under a single, unified management framework, greatly lowering administrative overhead and operational costs.

The selected infrastructure enabled Western Michigan IT staff to not only centrally manage the access points using Cisco's Wireless Control System (WCS) but also to simplify the deployment of the new network. The university's IT staff completed the deployment with minimal outside help, which was essentially limited to a subcontractor pulling Ethernet cabling in the new buildings.

The power over Ethernet functionality of the Cisco Catalyst® 3750-E Series switches considerably simplified deployment and wiring costs by limiting the need for power injectors or rewiring of power plugs for the new Cisco Aironet® 1250 Series access points. Cisco's unique capability to provide full power for 802.11n access points over a single cable, using Cisco's Enhanced Power over Ethernet, further improves the flexibility in managing and maintaining those access points. Kohrman's team can now turn the new access points on or off centrally from the switch, rather than having to access the power injector each time, significantly reducing network management costs.

Cisco's end-to-end solution from the switches to the access point, to the controllers and the wireless control system empowered a relatively small IT team to effectively deploy, manage, and maintain a large network. Having a single vendor for both the wired and wireless networks was critically important to the network administrators, because the university does not expect to stop making investments in its wired infrastructure, even though the next-generation wireless network will significantly improve overall performance.

Results

The university IT department has started observing an increased influx of 802.11n clients in the network and expects that in the next academic year these devices will account for 10 percent of the devices coming into the campus. As such, students, staff, and faculty will continue to use a large number of 802.11 a/b/g devices such as dual-mode phones, wireless gaming consoles, laptops, and others. Cisco's next-generation 802.11n wireless network is not only backwards compatible with those existing devices but will also benefit users of those devices through MIMO's (multiple input multiple output) effects of more reliable connectivity and more predictable coverage.

One of the first buildings being upgraded to 802.11n technology are the Communications and Language buildings. Much of the educational material taught in these buildings is in the form of video, currently distributed via traditional methods. Increased wireless performance will enable the IT department to better serve the Communications and Language departments' constituents and possibly even improve teaching methodology by broadening the distribution of educational content.

Even though performance results are yet to be determined, the university has already benefited greatly from reduced costs associated with deploying the wireless network. Powering the new 802.11n access points using Cisco Enhanced Power over Ethernet (PoE) from the switch greatly reduced wiring costs and wiring closet space required. It also simplified deployment by allowing the university to leverage their existing switching infrastructure while achieving the full performance potential of 802.11n by utilizing the Gigabit Ethernet ports found on the Cisco Catalyst 3750E Series Switches. Additionally, the auto configuration functionality, found on the Wireless Control System, will reduce future costs associated with upgrading the software version running on these access points, by reducing the amount of time that it would take the IT staff to make those software upgrades.

More importantly, however, this next-generation network will put the IT department at ease, knowing that today's investment will be guaranteed for years to come. This is important, particularly at a time when client density in classrooms and lecture halls seems to increase year after year and the demands for reliable connectivity and predictable coverage are considered a given.

For More Information

To find out more about the Cisco Next Generation Wireless Network, go to http://www.cisco.com/en/US/netsol/ns767/networking_solutions_package.html.

To find out more about Western Michigan University, go to <http://www.wmich.edu/>.



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