University Accelerates Academic Excellence With Pervasive Wireless

Coventry University expands its wireless coverage and deploys 802.11n to meet the rapidly growing academic and research needs of its students, faculty, and staff.

EXECUTIVE SUMMARY

COVENTRY UNIVERSITY

- Higher Education
- Coventry, England
- 17,000 students
- 2400 faculty, staff, and employees

CHALLENGE

- Use leading and advanced technologies to facilitate innovation, creativity, and productivity
- Improve IT infrastructure, applications, and processes to create a "smart" campus by 2010
- Support technology-savvy students bringing Wi-Fi devices on campus

SOLUTION

- Cisco® Aironet® 1250 Series access points supporting 802.11n
- Cisco Aironet standalone access points migrated to run LWAPP
- Cisco Aironet 1100 Series access points
- Cisco Catalyst® 6500 Series Wireless Services Modules (WiSM)
- Cisco Wireless Control System (WCS) with location operating on a converted CiscoWorks WLSE

RESULTS

- 200 to 300 concurrent users per day with 3000 distinct users per month
- Students are using the WLAN as a study aid, to complete registration tasks, and for social networking
- Faculty are using the WLAN to aide administration functions, research activities and collaboration

Challenge

Coventry University is a dynamic and creative university committed to providing an excellent education enriched by applied research. It facilitates innovation, creativity, and productivity among its students, faculty, research teams, administrators, and staff with leading and advanced technologies.

The university is also committed to improving its IT infrastructure, applications, and processes with the goal of creating a "smart" campus by 2010.

To meet these goals and differentiate the university to make it the top school of choice for new students, Coventry decided to deploy a robust pervasive wireless network (WLAN). This wireless network needed to support technology savvy students using a variety of Wi-Fi devices; facilitate effective and enhanced learning in and out of the classroom; and support a broad range of multidisciplinary research activities that deliver innovative business solutions and serve as a source of revenue for the university.

The chosen WLAN needed to support future implementation of dual-mode voice devices, location services, mobile context-based learning, high-bandwidth learning solutions, and social applications such as video-on-demand and multimedia.

The university was also under increased pressure to decommission their wired computer lab classrooms and release them for other purposes. "Most of our students had laptops, so we were seeing a decrease in attendance at the wired computer labs," says John Latham, Pro Vice Chancellor. "Also, our faculty needed to use the rooms for other classes. It made sense for us to close the wired computer labs and use a WLAN to support students needing to access on-line course work, information, or applications."

In 2005, Coventry installed a small wireless LAN pilot of 53 Cisco® Aironet® standalone (autonomous) access points in 29 buildings for all student and staff facing departments. By early 2007, the number of students and faculty accessing this pilot WLAN had grown significantly. Results from the student and faculty survey at that time showed that the need for wireless on campus was accelerating. Student public centers, staff areas, and classrooms were the locations where wireless accessibility was most requested. This feedback confirmed to the university that they were on track with their plans to implement wireless as a new technology to support enhanced learning opportunities.

At the same time, the IT department was receiving increasing requests to provide wireless guest access for visiting faculty, students, alumni, and maintenance personnel. The IT department was also seeing an increase in incidents where students, located at the edge of the pilot wireless network, were inadvertently connecting to off-campus business or residence access points. The coverage limits of the pilot wireless LAN were starting to cause confusion among students and faculty.

Solution

In July 2007, Coventry began planning the design of their pervasive wireless network. “We were impressed with the capabilities of the Cisco Unified Wireless Network,” says Paul Brennan, Coventry network services leader. “We liked how easy it was to deploy and manage. We especially liked the fact that we could use our existing standalone access points and just add wireless LAN controllers and more access points as we needed them.”

Coventry migrated all 53 of their existing standalone access points to run lightweight access point protocol (LWAPP) using Cisco’s free software release. Next, they added three Cisco Catalyst 6500 Series Wireless Services Modules (WiSM) and Cisco Aironet 1100 Series access points operating in lightweight mode as a scheduled deployment of 60 access points per week for a total of 550 access points on campus. Twelve of the 1100 Series access points have external antennas that run outdoors to provide coverage for selected outdoor areas. For centralized management, the university converted its CiscoWorks Wireless LAN Solution Engine (WLSE) to operate as a Cisco Wireless Control System (WCS) with location.

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—Paul Brennan, Network Services Leader, Coventry University

“We think Cisco WCS is outstanding,” says Brennan. “It’s very easy to use, and it gives us clear visibility into what’s occurring on our wireless network. We use its built-in security features all of the time to detect unauthorized access points and attacks against our network. It helps us pinpoint where a rogue device is located so that we can decide if it is malicious. This has helped us adjust our access point placement to reduce connectivity problems that occurred because of neighboring business and residential access points.”

Guest users are also managed with Cisco WCS. “The guest access solution supported by Cisco WCS is very good,” says Paul Brennan. “We have several people on campus who are authorized lobby ambassadors. They receive guest access credentials from our service desk, and then they set up guest user accounts using Cisco WCS. With Cisco WCS, we can limit guests to a particular area of the campus or WLAN, and we can enforce expiration dates for access.”

For client access, Coventry supports two service set identifiers (SSIDs). One SSID is open and requires no authentication. It leads to a captive portal, which requests a username and password. The second SSID supports 802.1X authentication. It authenticates students, faculty, and staff through the university's Cisco Secure Access Control Server (ACS). Users are then redirected to their authorized area of the network.

“We found that the wireless network was actually more secure than some areas of our wired network,” says Brennan. “In some of our older buildings, anyone could plug into a port and get access to staff-only areas of the network, because there were no 802.1x or MAC authentication requirements. We've been upgrading these portions of the wired network to make them more secure. We have been quite pleased with the robust security supported by the Cisco Unified Wireless Network.”

Results

Coventry currently has 200 to 300 concurrent users per day on the wireless network, with 3000 distinct users per month. This number is projected to increase as more students arrive on campus with laptops, more course curriculum becomes web-based, and new mobility solutions are implemented. The university is anticipating that their flexible campus environment and multipurpose classrooms will facilitate increased WLAN usage and real-time classroom collaboration using video, audio, multimedia, and e-learning applications.

Feedback from students indicates that they are using the wireless LAN as a study aid to access websites and information, to complete registration tasks, and for social networking. Faculty is using the wireless LAN for administration functions, research activities, email, and communication with colleagues and students on social networking websites. Faculty are also considering incorporating video-on-demand and audiocasts into their teaching curriculum.

To date, the IT department has completed requests from faculty, staff, and students to support a variety of web-based services over the wireless network including Webmail, the university Intranet for distance learning; WebCT for online virtual learning; StaffNet, the library book searching system; scheduling portals for the Coventry Business School and Center for Academic Writing; support for registration and graduation applications; and the student academic records system. The IT department has also modified the on-campus antivirus application so that antivirus updates can be completed over the wireless network.

In mid-2008, Coventry completed an 802.11n pilot deployment with 20 Cisco Aironet 1250 Series access points. This pilot was very successful. Coventry recorded 129 Mbps+ peak throughput with 802.11n clients and enhanced throughput and reliability for 802.11a/b/g client devices.

Next Steps

Coventry will continue to add 802.11n access points throughout the campus—especially in areas with dense student usage and administration and research areas requiring high-speed access to high bandwidth applications. For new buildings, the university is considering using Cisco Aironet 802.11n access points to provide network access to classrooms and offices instead of wired ports.

Coventry is looking at using the WLAN to support real-time monitoring and tracking of assets as they move in or out of areas on campus. Assets are occasionally misplaced or misrouted, and looking for them is time-consuming for campus security and other departments. “One of the advantages of the Cisco architecture is that it's easy to add location and context-based services to support asset tracking,” says Brennan. “Projectors, plants, tools, and scientific equipment are reported lost or stolen, and then we find out later that they’ve just been misplaced. If we put Wi-Fi tags onto these assets, we can track them using the wireless network.”

The university is also exploring voice over WLAN solutions (VoWLAN) using dual-mode Wi-Fi phones. “People move around on campus and cell phone charges can add up,” says Brennan. “If we can use the wireless network and VoWLAN to phone our mobile faculty and staff it can provide significant cost savings to the university.”

For More Information

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

To find out more information about Coventry University, go to: http://www.coventry.ac.uk/

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