University Connects People and Things in New Ways

Customer Case Study



EXECUTIVE SUMMARY

Customer Name: University of New South Wales Australia
Industry: Higher Education
Location: Australia
Potential users: 55,000 Students, Faculty, and Staff

Challenge

- Provide free Wi-Fi across campus and in student accommodations
- Minimize cost of future upgrades
- Improve facilities planning

Solution

- Cisco wireless access points with support for new 802.11ac standard
- Compact, low-cost Cisco wireless access points for student accommodations
- Cisco Connected Mobile Experiences (CMX) to collect and analyze location information

Results

- Delivered great user experience for 55,000 people using 168,000 devices
- Prepared to introduce "flipped" learning
- Improved facilities planning by capturing information about students' paths across campus

University of New South Wales deployed 4000 wireless access points for Wi-Fi, location information, and facilities management.

Challenges

Visit the University of New South Wales (UNSW) Australia campus and you'll see students watching video lectures before class on their mobile devices. Socializing with classmates using mobile social applications. Enjoying video calls with family on the other side of the world while sitting outdoors.

UNSW is one of Australia's leading research and teaching universities. It enrolls more than 50,000 students, from more than 120 countries. The campus Wi-Fi network, UniWide, is a source of pride. "Today's students grew up in a connected world, and demand for Wi-Fi is massive," says Greg Sawyer, infrastructure manager for UNSW. "We consider our network an asset for attracting students, and for teaching and research."

By 2012, UniWide covered most of the 94-acre campus, using 1800 Cisco wireless access points. "Mobile device use was doubling every year or two, so we needed more access points," says Sawyer. Students who own smartphones, tablets, and laptops with the latest wireless standard expect faster performance. That meant the wireless network had to support the new 802.11ac standard.

UNSW also wanted to provide free Wi-Fi in new student accommodations, which house 2500 students. Most universities charge a fee for Wi-Fi in residence halls to offset costs. But UNSW has been offering free Wi-Fi since 2007 and considers it an advantage in attracting students. So the access points had to be low-cost.

The university's plans for Wi-Fi went beyond web and email. One idea was using the network to gather information for planning. Knowing how students walked across campus would help the facilities department decide where to add new cafes and convenience stores, for example.

Another idea was making processes more efficient by allowing different campus systems to talk to each other. When a video surveillance camera sensed a large crowd, for example, it could tell the lighting system to turn on lights. "Harnessing the power of the 'Internet of Things' requires a reliable and scalable network," says Sam Costello, manager of facilities systems strategy and delivery for UNSW.

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"Instead of replacing thousands of wireless access points when 802.11ac Wave 2 is ratified, we can just plug in a new module, at one-third the cost. We'll save approximately AU$3 million compared to refreshing all access points."

Greg Sawyer
Manager of Infrastructure Services
University of New South Wales

Solution

UNSW found its answer in Cisco wireless solutions.

Upgradeable Access Points Save Capital Costs

From anywhere on campus, users can connect to the network through one of 4000 wireless access points. Approximately 1200 of these are Cisco® Aironet 3602 Wireless Access Points. They support the current generation of wireless devices. When 802.11ac Wave 2 devices become available in 2015, the IT team will simply add a module to support the new standard. "We liked that Cisco is looking ahead," Sawyer says. "Instead of replacing more than one thousand wireless access points when 802.11ac Wave 2 is ratified, we can just plug in a new module, at one-third the cost. We'll save approximately AU$3 million compared to refreshing all access points." In addition to adding new access points, the university is replacing its 1800 existing access points with Cisco Aironet 3702 Wireless Access Points. These, too, support the new 802.11ac standard.

Compact Access Points Are Affordable for Student Accommodations

The new residence halls have Cisco Aironet 702 Wireless Access Points, one for every two rooms. "The Cisco Aironet 702 is affordable for residence halls because of its small form factor," Sawyer says. "Students love having Wi-Fi in the residence halls. And it's the same network we have on campus, so they can keep their connection as they leave the building."

Location-Based Analytics Simplifies Facilities Planning

UNSW recently completed a proof of concept using the Cisco wireless network to collect information for facilities planning. Now Discovery Technology, a Cisco partner, is deploying the Cisco location solution in eight campus buildings. "UNSW is one of the first universities in the world to collect location information over Wi-Fi," says Brendan Williams, managing director of Discovery Technology.

The solution senses the location of mobile devices on campus and plots them on a map throughout the day. Location information is anonymous: it does not include the person's identity. Facilities planners can look at the map to see the paths that students take across across campus, and where they congregate. The underlying technology is Cisco Mobility Services Engine with the Connected Mobile Experiences (CMX) license. Ideas for using this information include locating eateries where the students are. Arranging classrooms to minimize walking time. Selecting locations for video surveillance cameras. Planning where large classes meet. "Cisco CMX can help us accurately predict when attendance drops in large lecture halls so that we can move the class to a smaller space," says Costello.

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Greg Sawyer
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University of New South Wales

Results

Excellent Wireless Experience
In late 2013, 168,000 unique devices connected to the wireless network, an average of three to five devices for every student and university employee. The number of concurrent users peaked at 28,000. "Half of the entire university population was on the network at the same time, and performance was excellent," Sawyer says.

New Ways to Learn and Work
UNSW is starting to use the wireless network for "flipped learning." "High-performance, high-density Wi-Fi is giving us the opportunity to look at teaching in a new way," Sawyer says. "Students watch video lectures before class, from anywhere. Class time is used for small group activities to reinforce the lecture material."

University employees use the network for administration and research. It's common to see everyone in a large conference room looking up information on laptops and tablets. Communications consultants no longer need to bring folders of floor plans to job sites because they can view the plans on an iPad. And researchers can record data on an iPad instead of having to go to an office and plug in.

"We anticipate 50 to 100 percent more devices on campus every year," Sawyer says. "Whatever next year's 'killer app' is, our network will be ready for it."

Harnessing the Internet of Things
Now UNSW is putting the network to use to make facilities management more efficient. For example, today, common areas are cleaned and trash bins emptied based on a schedule, not on need. Unnecessary trips waste staff time and fuel. Video surveillance cameras can show custodians when common areas need cleaning. Sensors on trash bins can indicate fill level. Contractors who remove chemical waste from labs can see when waste needs pickup.

"All of the things that connect to our network can give us a clear picture of the who, what, how, and when of campus usage," says Costello. "That helps us create an engaging, fulfilling, and positive campus experience."

Technical Implementation

Wired Network: Each building has a Cisco Catalyst® 4500 Switch that connects to centralized Cisco Catalyst 2960-X Stackable Switches. "The 10-Gbps uplinks in the Catalyst 2960-X give us the bandwidth we need for the explosion of mobile devices on campus," Sawyer says. "These switches are reliable: they just work and work and work. And using one vendor for all of our switches simplifies support."

High-Density Deployment: The IT team uses Cisco Prime™ Infrastructure to visualize Wi-Fi coverage on a map, looking for any coverage gaps that need to be filled. All students in a 400-seat lecture hall can connect, thanks to 20 access points. Each floor of the library has up to 60 access points, enough for 1200 people to connect at the same time, with a great experience.

Security: "Wireless is one of our most secure networks," Sawyer says. Students are given free antivirus software, and are encouraged to download the latest mobile operating systems, which have better protections. The IT team can see which users are connected and with which device. And Cisco CleanAir® technology, built-into the access points, detects interference and routes traffic around it.

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Product List

Switches and Routers

- Cisco Catalyst Switches 4500 and 2960-X

Wireless

- Cisco Aironet Wireless Access Points 3702 and 3602
- 802.11ac Radio Module for Cisco Aironet 3600 Series
- Cisco Aironet Wireless Access Points 700 in Residence Halls
- Cisco Mobility Services Engine with Connected Mobile Experiences (CMX) License
- Cisco Prime Infrastructure

Partner Products

- Discovery Technology: Connected Customer eXperience (CCX) Smartphone Application for Wi-Fi Advanced Analytics

For More Information

- Learn more about Cisco Wireless Solutions: http://www.cisco.com/go/wireless.
- Learn more about Cisco Wireless Solutions for Higher Education: www.cisco.com/web/strategy/education/mobility_for_higher_education.html.
- Learn more about Cisco Connected Mobile Experiences: www.cisco.com/go/cmx.
- Learn more about the Cisco Catalyst Switch 2960-X: www.cisco.com/c/en/us/products/switches/catalyst-2960-x-series-switches/index.html.

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C36-731798-00 07/14