



> INNOVATIVE UNIVERSITY POWERS UP LEARNING WITH WIRELESS CAMPUS

NORTEL



Case Study

University of Jaén

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> **Manuel Aranda Fontecha,**
Chief of Communications
and Telematic Services,
University of Jaén



Customer: University of Jaén

Country: Spain

Industry: Education

Challenge: To provide students, lecturers, research and administrative staff with secure, 24-hour communications and data retrieval from the University network, within two campuses.

Solution: A highly flexible and secure Wireless Mesh Network. Incorporating the University’s existing Nortel Ethernet Routing solution, the network includes Nortel Wireless Access Point 7215s and 7220s for indoor and outdoor wireless mesh coverage. The Nortel Wireless Gateway 7250 offers highly secure IPSec tunnelling. All of this is managed by the Nortel Enterprise Network Management System.

Benefits:

- **Flexible communications for all** – users can access the network anywhere on campus, with any device, 24/7
- **High availability** – the network automatically reconfigures itself and reroutes data
- **Easy network expansion** – access points are self-finding and auto-configuring
- **Maximum security** – robust data encryption and IPSec tunnelling ensure end-to-end protection



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The scenario

When you have a reputation for being innovative, you need to work hard to maintain it.

This was the challenge faced by the University of Jaén. An institution that opened in 1993, the University is renowned for its innovation and cutting-edge research facilities.

But to keep innovating, you need to keep communicating. Sharing information quickly and easily is a prime concern to the University, and everyone – including students, researchers, lecturers and administrative staff – must be able to access the information they need, when they need it.

So in 2005, the University decided to make communications even more flexible. Manuel Aranda Fontecha, Chief of Communications and Telematic Services, explains: “The University already operated a robust Nortel data backbone, which enabled secure data communications across the inside of the main campus. But whilst this served its purpose well, staff and students needed to be more connected for the sake of their work. This meant providing access to University data, the intranet and the Internet – whether they were in the central Jaén campus or the campus in the city of Linares.”

Manuel and his team had considered deploying fixed networks. But each campus is sizeable and must cater for a growing number of staff, students and visitors, who all need the flexibility to move around as they wish. This made wireless communications an imperative.

Traditional WLAN technology, however, would still involve laying a lot of cabling across the two campuses. And for a growing university, extending this coverage could be prohibitively costly and resource-intensive. “What we needed was a more sophisticated way to gain the greatest long-term availability, security and flexibility, both inside the campuses and out,” explains Manuel. “That meant choosing a leading-edge solution from a provider that shared our reputation for innovation.”

The solution

After conducting an investigation into several different options, Manuel and his team chose to implement a Wireless Mesh Network from Nortel. Given its innovative nature, this was co-financed by the European Regional Development Fund (ERDF) which encourages regional development initiatives in Europe. “Having worked with Nortel for many years, we trusted the team’s recommendations. There was no doubt that Nortel’s innovative Wireless Mesh Network was the most flexible, cost-effective and manageable solution available to us.”

Wireless Mesh Networks are ideal for coverage of large open areas, both indoors and outdoors, including areas in which Ethernet cabling doesn’t exist and is prohibitive to install. This is because the network employs wireless links for backhaul, enabling the WLAN to be installed with minimal additional cabling, and empowering communications in areas where coverage was previously limited.

The highly flexible configuration at the University of Jaén comprises 115 Nortel Wireless Access Point 7215s for indoor coverage and 10 Nortel Wireless Access Point 7220s for outdoor coverage. Importantly, the access points are self-finding and auto-configuring, meaning that new points can be added without halting the flow of communication. Moreover, traffic within and between each cluster of access points – known as Community Area Networks – employs multi-hop routing to find the most appropriate route to its destination. This means the network is almost entirely formed and maintained without the need for manual intervention.

To break out securely onto the Wide Area Network, the wireless access points backhaul data to a Nortel Wireless Gateway 7250. Encryption and IPSec tunnelling functionality ensures highly secure transmission of all communications to and from the WAN, whilst the configuration allows traffic to move seamlessly between switches or gateways if there is a network incident.

Ease of management is, of course, essential to a solution of this scale. The Nortel Enterprise Network Management System provides the University of Jaén with one centralised management system to identify and resolve issues across all devices and access ports on the network, before they affect performance.

The results

Following an extensive period of testing, the network was officially launched in April 2006. Since that date, users across both campuses are able to communicate with much greater flexibility.

Users can now log on to the network from any location, securely accessing services such as the Internet, intranet, email, University library and other databases and publications – even through their own devices: “In the past, users have been restricted to devices that were owned by the University, in order to ensure access was secure,” explains Manuel. “With Nortel’s Wireless Mesh Network, however, users can authenticate themselves securely using whichever device they choose, from laptops to PDAs.” This is thanks to Wi-Fi Protected Access (WPA), an industry-standard data encryption method that uses TKIP (Temporal Key Integrity Protocol) to ensure every data packet has its own unique encryption key or the Advanced Encryption Standard (AES).

But that’s not all. Thanks to the 802.1X compliance of the Nortel’s Wireless Mesh Network solution, the University of Jaén can now become part of eduroam. This project enables students, lecturers and researchers from universities across Europe, Australia, China, Japan and Taiwan to visit other member institutions, logging on to that institution’s WLAN using the credentials from their home institution: “Thanks to the Wireless Mesh Network, visitors can start work as soon as they arrive,” says Manuel. “This is crucial for students who need to continue their studies, and also researchers who need to uphold the standards for which the University is well known.”

Importantly, the network’s ability to reconfigure and restart itself in the event of a failure ensures the highest availability, without the need for staff intervention. And its centralised management system enables the university to detect and tackle network issues before they become a problem.

As far as the future is concerned, expansion of the network is already under way: “We’ve had no complaints about coverage at all. But we’ve decided to boost signal as much as possible. That’s why we recently installed thirty more Wireless Access Point 7215s at strategic locations across the campuses,” continues Manuel. “Because of the way the access points interact, this process is very easy and very quick.” In addition to this, Manuel and his team are already making plans for the use of wireless voice over IP – and even facilities such as virtual teaching.

Manuel believes the project has transformed the way people at the University conduct their studies, research and daily work: “One of the most important aims of this project was to ensure everyone at the University felt connected, but free to work in the way they wanted. There’s no doubt we’ve achieved that. Thanks to the cutting-edge technology we’ve received from Nortel, the University of Jaén can maintain its reputation as a highly innovative institution.”

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