

Broadband Wireless Solution for Unitec Campus



Simulation Lab

CASE STUDY

Introduction

Unitec New Zealand is a major tertiary education provider that offers postgraduate and degree-level study, as well as vocational education and training to more than 50,000 students.

Unitec has around 55 full time IT staff members that manage a network of approximately 4,000 connected nodes, seventy five percent of which are workstations. There are also approximately 300 to 400 wireless laptops configured to connect to the Unitec wireless network. Staff and students are tied together through a variety of Metropolitan Area Network (MAN), Local Area Network (LAN) and Virtual Private Network (VPN) solutions.

Challenge

In an effort to enhance the Bachelor of Nursing program, Unitec and the Waitemata District Health Board (WDHB) opened a joint venture Practice and Simulation Centre (or Sim Lab) at the beginning of 2006.

The Waitakere Hospital is designed to give nursing students detailed clinical experience using human patient simulators in a simulated hospital setting. Designed to replicate a hospital environment, the centre includes an operating theatre, intensive care unit, simulation room, acute assessment room, conference room, computer suite, interview rooms and an audio visual control room. WDHB uses the Sim Lab for training medical, nursing and allied staff. In future, both Unitec and WDHB will practice clinical simulations together.

The Waitakere Hospital is located just over a kilometre away from the Unitec campus and was not part of the Unitec network. There was no way for the 450 nursing students to access Unitec resources from inside the Practice and Simulation centre until a robust data, voice and video connection from Proxim joined the two sites. Nursing students rely on the Unitec network to connect to a secure web-based central server and upload the clinical details they capture via their hand held PDAs.

Unitec set out the following criteria to evaluate proposed solutions to link the hospital and Unitec networks:

- Cost effective, to minimize administration and setup costs
- Long-distance connection that was stable, secure and robust
- Minimum throughput of 10 Mbps
- Future proof and scalable that was proven in the education environment

Solution

Unitec considered a number of connectivity solutions to bridge the networks between the hospital and Unitec, including ISDN (Integrated Systems Digital Networking), leased lines, broadband, laser links and finally point to point radio links. Most telephone carriers have ISDN and leased lines as part of their high speed connection portfolio. Although reliable, long term use of either of these solutions was not feasible due to the substantial setup costs and recurring maintenance fees.

A broadband connection was investigated. However, upon further review it was concluded that broadband, though cost effective, had a limited upload speed that would not be able to support the high definition data transfers between the two institutes.

Prompted by shortcomings of the traditional wired approach, Unitec began to explore a wireless alternative. To that end, Unitec looked at the feasibility of establishing a laser link to deliver the required bandwidth within budget. The distance between Waitakere Hospital and Unitec's closest connection point is one kilometre. Although fast, the laser links provided a connection that was only reliable up to a distance of 450 metres.

This made Unitec look at long range wireless products. The long term cost of deploying a

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wireless point to point solution was extremely attractive and would provide the coverage and throughput that was required.

elements and the surrounding RF environment. LAN1's experts were on hand to investigate any special concerns and provided network design recommendations.

Tsunami QuickBridge.11 5054-R Product



- Hop-in-a-box solution includes two radios with integrated antennas, outdoor-rated.
- Also includes Ethernet cables, mounting hardware, power injectors and documentation
- Pre-configured software defaults and easy to use graphical user interface eliminate guess work during installation
- Audible tones ensure antennas are properly aligned

Proxim's Tsunami QuickBridge.11 5054-R was recommended as it is a user-installable wireless point-to-point Ethernet bridging solution that enables buildings with direct line of sight to communicate at up to 54 Mbps. This is an ideal solution for campus networking and last mile access.

The QuickBridge units were configured to extend Unitec's internal and wireless VLANs to the hospital. The built-in VLAN functionality made it very easy to configure and incorporate the solution into Unitec's existing infrastructure.

Proxim Wireless's distributor in New Zealand LAN1 oversaw the installation and conducted a site survey to identify the overall placement of network

Benefits

Scalable Connection Exceeded Throughput Expectations

The distance between Waitakere hospital and Unitec's closest connection point was one kilometre. In connecting the two locations, Unitec was seeking at least 10 Mbps connectivity speeds with the lowest latency, no interference and highest uptime available. The QuickBridge link provided necessary bandwidth to support the transfer of clinical data.



Waitakere Hospital

"We were concerned with the potential risk of wireless threats but we were reassured by the fact that the QuickBridge units included ample security features to meet our requirements. The throughput, low latency and stability of the link have all exceeded my expectations and the team have had time to focus on new projects"- Glen Nummy, Network Engineer, Unitec.

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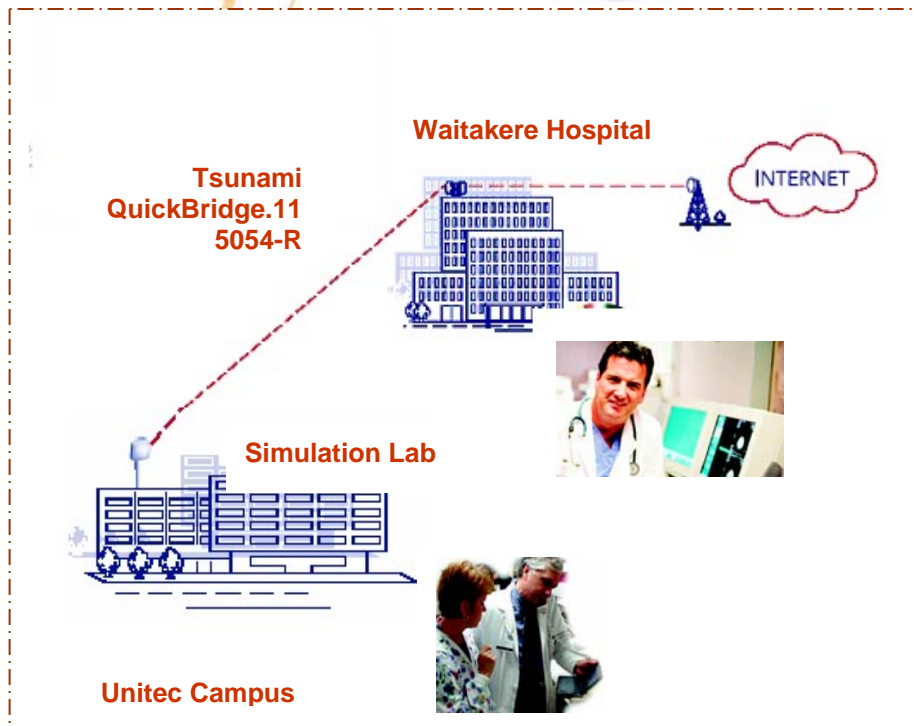
Proxim products have proved themselves by being consistent since installation and the link remained connected at the full 54 Mbps data rate in both directions, exceeding expectations. Once the connection to the hospital was up-and-running, Unitec team was considerably impressed with the throughput achieved.

Unitec tests showed that a return data trip between the two sites had a latency of only five milliseconds. Nursing students and staff were thus able to experience real time access to the Internet and Unitec resources, with access speeds comparable to that on campus.

At present, the connection supports eight simultaneous users, with an average of 2 Gigabytes (excluding broadcast traffic and wireless protocol overhead) of data passing over it every day. Transparently transferring data above Waitakere City, the QuickBridge link prepares Unitec to meet escalating IT challenges as plans are put in place to offer extended access to third nursing year students. Later in 2007, the wireless link will support up

Key Features of QuickBridge.11 5054-R

- Delivers 1.5 to 54 Mbps data rates
- Supports 5/10/20 MHz channels designed to mitigate radio interference in unlicensed frequency spectrums
- High-capacity, WiMAX QoS
- Complete "hop-in-a-box" ensures easy installation and quick return on investment



Network Deployment Diagram

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to one hundred and forty additional PDAs which will operate inside the Sim Lab. There are also plans for Unitec lecturers to run live, high-resolution simulcasts to Ohio University.

Applications of QuickBridge.11 5054-R

- Backhaul to a Central POP

Avoid expensive installation and recurring charge of a second wire line backhaul to a remote virtual POP

- Leased Line Redundancy

Eliminate recurring DS-3 leased line charges with one time installation charge of a QuickBridge.11 link

- Repeater

Extend distance or overcome path blockage by adding point to point hops

- High-bandwidth Last Mile Access

Deliver TLS (Transparent LAN Services) to corporate parks

- Inter-POP Redundancy

Avoid downtimes caused by a wire line backhaul failure

Secure and Robust

Unitec was concerned with the potential risk of wireless threats but QuickBridge units included ample security features to meet their requirements.

Security features of the QuickBridge system include the Proxim's Wireless Outdoor Routing Protocol (WORP) that eliminates unauthorized access to the network and advanced encryption that protects over-the-air transmission of sensitive medical and student data.

As a further precaution, a switch managed by Unitec and a firewall were installed at the remote hospital end of the link. By keeping the hospital and Unitec networks self contained, the risk of a cross network security leak was reduced.

Reliable and Uninterrupted

The QuickBridge system enables high bandwidth connectivity with hundred percent uptime. Furthermore, the Proxim solution is highly stable and requires minimum maintenance.

Initially there was a concern that interference from external and surrounding sources would affect the reliability of the link. The Tsunami QuickBridge does not use the crowded 2.4 GHz spectrum, instead the system utilizes the public 5 GHz spectrum which allows the use of more non-overlapping channels, the chances of radio interference in unlicensed frequency spectrums.

Cost Effective and Easily Manageable

The Tsunami QuickBridge has enabled Unitec to establish a wireless link between the two sites in a cost effective manner.

Compared to the monthly cost of a high speed fixed data circuit e.g., ISDN lines, this wireless solution easily quantified the savings.

The solution was powered by PoE (Power over Ethernet) further lowering installation costs.

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Waitakere Hospital

As soon as the link was up and running, Unitec was able to easily manage the network and configure it remotely.

Summary

Proxim's wireless solutions have given Unitec the power to vastly enhance its teaching capabilities. The ability to use applications from inside the Practice and Simulation Centre while having access to Unitec's superior resources is a huge benefit for nursing students.

The educational institute installed a pre-configured wireless LAN extension between the Waitakere hospital and its West Auckland Waitakere Campus that outperformed costly cable and laser link alternatives. Offering all the benefits of a 802.11 54 Mbps solution, the Tsunami QuickBridge.11 5054-R delivered unbeatable performance, range and throughput in an outdoor campus environment.

Proxim Wireless provided Unitec a complete solution that looks to the future. Third year nursing students were now able to access the Unitec network from within the Sim Lab via PDAs, and there are plans to use the QuickBridge system to run live simulcasts to Ohio University from the Sim Lab.

Background

Proxim Wireless Corporation, a wholly owned subsidiary of Terabeam, Inc. (NASDAQ: TRBM), is a global pioneer of end to end solutions for broadband wireless networks, with decades of experience in Wi-Fi® mesh, WiMAX, MeshMAX, Wi-Fi and Wireless backhaul. Our products are available through our extensive global channel network, backed by world-class support. Proxim is ISO-9001 certified. Information about Proxim and its products and support can be found at: www.proxim.com

Unitec, based in Auckland is split over two campuses; the central Mt Albert campus and the West Auckland Waitakere campus. Over 65,000 students from more than 80 countries study at Unitec's two campuses.



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