

“The Loop” Nelson, New Zealand

Allied Telesis helps build an educational community
open-access fibre network







“The Loop” Nelson, New Zealand

Allied Telesis helps build an educational community open-access fibre network

Contents

Background	Page 2
The Vision	Page 2
The Challenge	Page 2
Success Criteria	Page 3
Selection Criteria	Page 3
The Allied Telesis Solution	Page 3
Future Requirements	Page 4
Implementation and Multimedia Demonstration	Page 5
Key Outcomes	Page 5

Executive Summary

This paper tells how an educational community developed one of the country’s first open-access fibre networks, and outlines the immense planning involved, the hurdles they jumped, and the advanced networking technology they used to realise their future dreams.

This open-access fibre network document explains:

- How an open-access fibre network is breathing life into rural communities
- Why open minds and network design flexibility are key ingredients to meeting future expansion needs
- What it is like for schools to discover for the first time the many benefits of accessing and sharing information from simple Internet access to centralised data storage
- That the only network limitation is lack of imagination.

From state-of-the-art technology to state-of-the-art computing, Nelson’s educational community has achieved what most office workers can only dream of – a light-speed network at their fingertips.

The backbone of this multi-site peering network comprises top-of-the-line Allied Telesis switching technology that guarantees superior quality of service for maximum availability of premium voice, video, and data services.

Case Study: Open-Access Fibre Network

“The Loop” Nelson, New Zealand

The Nelson Loop is a unique and inspirational story of a committed band of enthusiasts who pursued a dream to connect their educational community with an open-access fibre network. Despite the challenges of funding, physical distance, red tape, and uncharted territory, the ‘Loopies’ persevered and today have one of the most advanced and unique light-speed networks at their disposal - the backbone of which uses state-of-the-art Allied Telesis switching technology.

Background

In May 2005 the New Zealand government signalled a commitment to bringing fast and affordable broadband networks to provincial communities with the launch of the Digital Strategy.

With the education sector’s projected demand for downloading graphic intensive learning objects, two-way video conferencing, and high intensity classroom use, the government prioritised high speed, high bandwidth school networks.

Small and remote schools in the Nelson region had struggled to keep up with the digital age. They either had poor quality network infrastructures or none at all. That was before a desperate need and a fortunate opportunity led to the development of the highly acclaimed ‘Nelson Loop’.

In November 2005, for the first time ever in New Zealand, 13 schools, an Institute of Technology, Network Tasman, the Ministry of Education, and Torquell, the specialist networking division of Connector Systems Ltd - an Allied Telesis partner, collaborated and launched an educational community network in the Nelson region.

The driving force behind this extraordinary regional initiative is the collective belief that: “The richer the information that is available digitally, and the more extensive the networks that connect people, the greater the benefits that will accrue.”

The Vision

Wayne Mackay, CEO of Network Tasman, which owns and operates the electricity distribution network in the wider Nelson and Tasman areas, is credited with introducing the Loop to the community.

His idea back in 2000 was to implement an advanced network that would benefit schools and the local community while generating non-regulated revenues through the lease of fibre to business.

“It’s not that we’re altruistic, it’s that we believe education is a key factor for the development and success of our region,” explained Mr Mackay.

Network Tasman visited a number of power companies in the States to consider the various network options and business models, as well as the pitfalls, the opportunities, and the financial risks. They agreed on a model that would invest millions in laying 300km of dark fibre from Nelson to Richmond and Motueka, and to Blenheim in Marlborough.



Wayne Mackay, CEO
Network Tasman

Mr Mackay then approached the schools in the Nelson and Tasman areas with his idea; most were in full support and keen to help make it a reality – in particular Nayland College, Waimea College and the Nelson Marlborough Institute of Technology (NMIT).

“Actually, it was more like a fantastic opportunity met a desperate need in an almighty bang, or a lover’s embrace!” said Charles Newton, Principal of Nayland College.

“We also had needs of our own to connect up our key electrical sub stations from Nelson to Motueka with fibre and to improve our communications for our alarm monitoring and control system,” added Mr Mackay.

The Challenge

“A key challenge was securing an anchor tenant to lease half the fibre and minimise our risk,” said Mr Mackay. This was secured via TelstraClear.

Adri Noordover, Team Leader Information Technology Services at NMIT, then volunteered to solve the onerous task of reassigning all the public IP addresses for all the schools on the Loop to enable them to access the Internet. He had to work with Asia Pacific Network



Adri Noordover, Team Leader
Information Services, NMIT



Information Centre (APNIC) to get the authority to make changes to NMIT's allocation of some 4000 IP addresses.

Phil Earl, Professional Services Manager of Network Integrator Torque IP said that Charles Newton and Geoff Scrimgeour, ICT Project Manager at Nayland College, had done a magnificent job of understanding the needs and putting together a technical team to sort the issues out. He said, "Everyone involved helped tirelessly to get this project off the ground. It is a prominent project that no-one else has implemented of this type before in New Zealand."



nmit
Nelson Marlborough Institute of Technology
Te Whare Wānanga o Te Tao Mō o Te Waka a Māori

Success Criteria

The Loop needed to offer a competitive alternative to commercial models by providing significantly cheaper, faster, more responsive, and more educationally valid digital services and resources. It had to be open-access and non-proprietary, serve potentially up to 20,000 concurrent users, and be able to offer a range of applications.

With plans to widen the network to collaborate with other schools outside of the Nelson region and expand the Loop to offer services to community based initiatives, the network design had to be scalable, secure, and sufficiently technologically advanced to meet ongoing demands.

Mr Newton said, "Our extensive analysis of the ICT capabilities, commitment, and expectations of the Nelson region's schools confirmed that the available commercial offerings could not meet existing needs, let alone future aspirations. The analysis found that schools spend around \$2 million per year on telecommunications for often inferior services. Our business case, based on overseas experiences, indicated significant potential savings depending on the level of uptake of Loop services."



Charles Newton, Principal
Nayland College

Selection Criteria

With limited experience designing multi-site peering networks over fibre, the schools, NMIT and Network Tasman collaborated to put the project out to tender. The first stage of the project connected 12 schools to the fibre and tested it to demonstrate proof of concept. The Ministry of Education and Network Tasman jointly funded this stage.

Against formidable competition TorqueIP and Allied Telesis won the contract convincingly, having demonstrated their proven history and expertise of delivering advanced network solutions.

"They were in tune with where we wanted to go, their response was very thorough, and they convinced us that they were the best for the job," said Mr Newton. "The design of the network is professional, best practice and very secure."



"Allied Telesis is an amazing company," added Mr Mackay. "Their level 3 switching technology is amongst the best in the world, and with their R&D arm here in New Zealand we were keen to see them succeed as well."

The Allied Telesis Solution

The network was designed by TorqueIP, acting as Lead Engineers and Architects for the Loop. It comprises six Allied Telesis AT-AR9924 series switches at the core. These top-of-the-line multilayer switches provide superior Quality of Service (QOS) to ensure maximum availability of premium voice, video, and data services. The 10 Gigabit options with Ethernet Protected Switching Ring (EPSR) features, guarantee the performance, reliability, and stability of enterprise applications on the network. These features are also useful for managing the Loop's storage area network.

Allied Telesis Rapier layer 3 switches were deployed at all edge sites.

NMIT houses part of the core Loop infrastructure due to the advantages of its central location, a fibre link to the Wellington Exchange (called the WIX, which the Loop schools and NMIT jointly lease), and in-house technical expertise.

Case Study: Open-Access Fibre Network

“The Loop” Nelson, New Zealand

Adri Noordover explained, “NMIT is one of the six core schools that act as distribution points on the Loop and provide links to other surrounding schools. It is likely that we will connect to the Loop in 2006 to share resources and delivery of services with other colleges on the network such as video conferencing, or a shared Learning Management System.”

Future Requirements

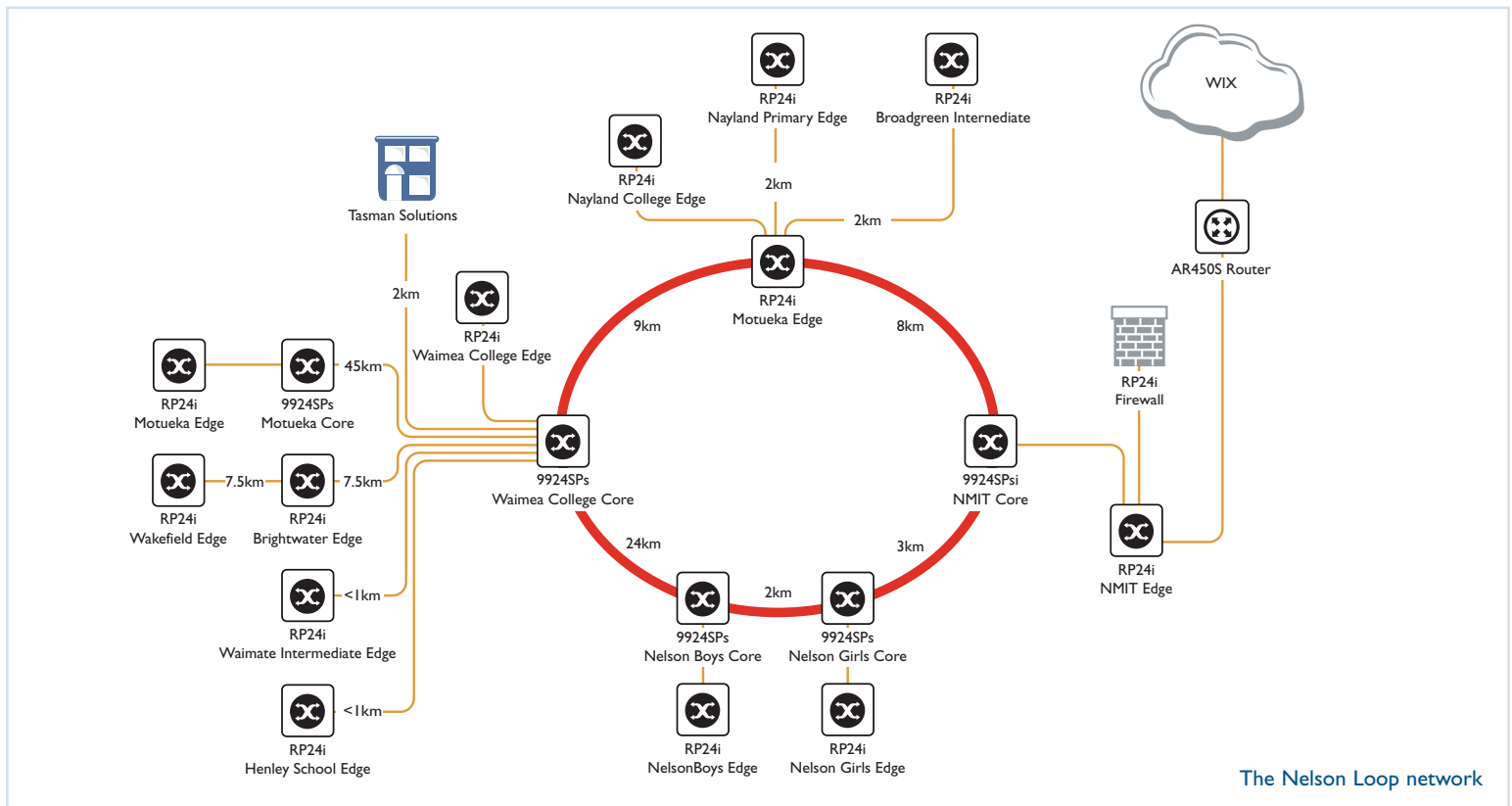
Stephen Webb, Lead Architect of TorqueIP, explained: “To ensure the network would cater for future requirements we provided the schools a range of opportunities and ideas on how they could use the network and what they could achieve. This includes:

- Fast Internet access
- VoIP
- Video conferencing
- IP radio stations
- IPTV

- Streaming video
- Off-site backup
- IP security cameras
- Content filtering (for the server farm and cache)
- Remote access for teachers and students, and much more.”

“The exercise allowed the stakeholders to realise the potential of the Loop, and enabled us to design the network accordingly. We recommended Allied Telesis primarily because of the quality of product, and its reliability is proven in many Telco’s around the world,” he continued.

Network Tasman is extending their fibre to Blenheim which would enable the Loop to grow or collaborate with a Marlborough school’s network. There is also interest from schools on the West Coast. Allied Telesis products are also being used to link Network Tasman’s sub stations, and will be implemented along the new fibre link extension from Nelson to Blenheim.

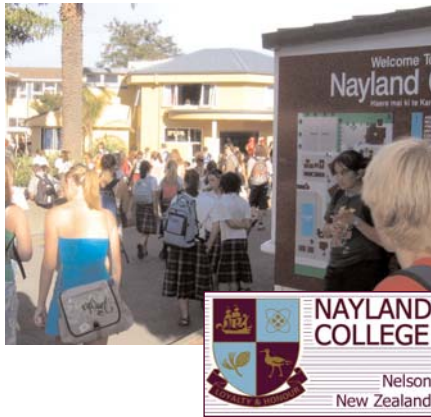




Implementation and Multimedia Demonstration

The first stage of the project in mid 2005 was to demonstrate that the Loop would cater for primary and secondary schools.

"We demonstrated that we could have two video conferences, streaming video, VoIP, security cameras, internet, and DVDs going back and forth over the fibre simultaneously, and all on an IP environment – none of which was going through a Telco. It was the first time anything like this had been set up in New Zealand," said Mr Newton.



The next stage in 2006 is to take the Loop to the rest of the schools in the region by a combination of fibre and wireless networks. It is hoped that up to 50 schools in the Nelson and Marlborough region can be connected to the Loop.

Mr Newton expects that the Loop will be most beneficial to the community and other organisations by becoming part of the NMIR MUSH initiative (Nelson Marlborough Info Region and the Municipalities Utilities Schools and Hospitals), championed by the two Economic Development Agencies of Marlborough and Nelson.

He added, "Another thing that is happening is the building of a government sponsored tertiary 'Advanced Network for Research and Education', and one of the nodes for that is going to be here in Nelson. They are allowing schools to go on the network as 'partner organisations', which means if we can get access to the Nelson node, the Loop traffic can go up and down the Advanced Network. This will eventually hook up with the equivalent networks in Australia, Singapore, and the States. So again you can see another network forming which doesn't involve the Telcos."

Key Outcomes

In addition to increased network performance and reliability, the Loop is expected to add significant value to productivity and learning within schools and the community.

Thanks to the new technology those connected are already benefiting with:

- Centralised file servers for data storage
- Off-site backup
- Access to high speed Internet
- Ability to share data
- V-LANs
- VoIP
- Security cameras
- Video conferencing

Mr Newton explained, "The Loop began as a collaborative effort between Network Tasman, TorqueIP and Allied Telesis, the Ministry of Education, and leading Nelson educational institutions. Now nearly 30 organisations are supporting this ground-breaking initiative, each helping to build communities through shared expertise and resources. Our aim is for the Loop to operate as a self-funding and self-sustaining commercial concern, and be a vehicle through which all interested educational and business interests can seek synergies rather than replication, and cooperation rather than competition."

At the launch of the Nelson Loop in 2005, Trevor Mallard, the then Minister of Education, said, "This is an initiative that reflects the sorts of project the government is encouraging through the Digital Strategy - where open-access fibre networks in regional centres are developed."

Paul Batchelor, Allied Telesis Regional Director for Australia and New Zealand said, "It is fantastic that this rural community has rallied together to achieve a first-class network that is not only open-access, but is one of the best in the country. We are proud that Allied Telesis technology has helped shape the Loop into a powerful and superior network that will serve and benefit the community for many years to come."

Mr Newton concluded, "One of the difficulties of ICT infrastructure development in NZ schools has been the lack of robust and tested models. Through trial and tribulation we now have a model for that next big step up in ICT sophistication where schools' capacity will grow through regional, cross-sector collaboration. It's about people working together to solve problems and defeat barriers. The Loop is one of the first networks being set up in the new paradigm: open-access, IP, and uniquely collaborative."

USA Headquarters | 19800 North Creek Parkway | Suite 200 | Bothell | WA 98011 | USA | T: +1 800 424 4284 | F: +1 425 481 3895
European Headquarters | Via Motta 24 | 6830 Chiasso | Switzerland | T: +41 91 69769.00 | F: +41 91 69769.11
Asia-Pacific Headquarters | 11 Tai Seng Link | Singapore | 534182 | T: +65 6383 3832 | F: +65 6383 3830
www.alliedtelesis.com

© 2006 Allied Telesis Inc. All rights reserved. Information in this document is subject to change without notice. All company names, logos, and product designs that are trademarks or registered trademarks are the property of their respective owners. C618-18001-00 REV A