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Case Study

Ready for adoption: Internet telephony does the job

Sydney's Lane Cove Tunnel Project

Thiess John Holland workers and a road header machine after the mid-tunnel underground truck loop breakthrough.

It will take about four years to build the $1.1 billion Lane Cove Tunnel but when it opens to traffic in 2007, it will become a key link in Sydney's orbital motorway network.

With NEC's IP telephony solution, efficient project communications are **saving time and money**, and **improving safety** and **quality control**. The result is award-winning, ready-for-business technology.

The Customer

In October 2003, the NSW Roads and Traffic Authority selected the Lane Cove Tunnel Company to design, build, operate and maintain the Lane Cove Tunnel. In construction terms, the project is bigger than the Sydney Harbour Tunnel. A Thiess-John Holland joint venture is responsible for design and construction.

Overall, the tunnel will:

- Shorten journey times between the city and Sydney's developing north-west
- Improve local pedestrian, cyclist, private and public transport access
- Reduce traffic congestion and noise
- Improve air quality.

The logistics are mind-boggling. More than 150 staff direct and manage work from project headquarters - networked to at least nine project nodes. Works extend from North Ryde to North Sydney and include twin 3.6km multi-lane tunnels, new transit lanes for the Gore Hill Freeway, road and bridge widening, and several new traffic access ramps.

The project's IT Manager, Dirk Clapham, manages technology for the entire project. "Across quite a fragmented workforce, we've placed more than 300 computers - every one with Internet access supporting around 600 project staff," he said.

"Our IT network can be in use around the clock. It underpins everything from design to digging - including engineering, audit, document and quality control, safety, HR - and communications."
Dirk Clapham, Lane Cove Tunnel Project

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The Challenge

Across most of Australia, a working office telephone is taken for granted. But if your office is a culvert carved in the side of a major metropolitan road, having a fixed-line phone verges on the miraculous.

Challenges for the joint venture in setting up a telephone system that would service the multiple temporary construction sites included:

- Resources: traditional telephone systems need their own wiring, PABX and receptionists to route calls at every project office.
- Phone number consistency and scalability: Traditional telephony ties telephone numbers to locations – specifically, each number to a local exchange. These systems cannot extend number consistency across sites and limit businesses from adding new numbers within a consistent range.
- Number portability: New tunnel project groups would typically start together at head office and, maybe three months later, move to new project sites. Because traditional phone systems tie numbers to locations and not people, telephone numbers would have to change every time someone moved. The result would be inefficient, confusing communications.
- Network outage: Voice over Internet Protocol (VoIP) telephony is dependent on underlying network availability. If the network fails, so do the phones. A competent VoIP implementation would have to address this potential problem.
- Network bandwidth and fine tuning: Effective VoIP implementation requires bandwidth and correctly configured equipment (including software and routers), to process and protect voice traffic.
- Evolution of VoIP technology: Although VoIP is widely talked about, is it practical, and can it deliver real business benefits? Is it interoperable with other technologies and readily supportable?

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The Solution

It was clear that a traditional phone system would not satisfy the business needs. Could VoIP technology do any better?

“Although VoIP seems to be a relative new-comer, NEC already had the combined credibility of experience, evolved proprietary systems, and services capability,” Clapham said.

“Our underlying Internet Protocol network - Optus MPLS[1] - for data was already in place, and extending to every project site. The network had plenty of bandwidth –from 1 to 2 Mbps - to carry voice as well as existing data traffic.”

The NEC NEAXMail and NEAX 2000 IPS (Internet Protocol Server) carry all the functionality of traditional telephony, but with added, Internet-enabled features, including automated and centralised call routing, individual voice mail access, long term migration capability, and number assignment consistency and portability.

NEC partner, Voicepoint Communications worked with the joint venture’s IT consultants to design a cost effective solution and supplied, installed and tested the initial NEAX 2000 IPS system at construction headquarters in December 2003.

“NEC’s centralised VoIP systems readily piggy back onto existing networks, easily integrating any combination of traditional and IP equipment,” said Voicepoint’s Peter McDonald.

“It also scaled up very quickly. Within two weeks the whole system was up. Within three months, it was across all sites. Today 400 people are using it.”

Construction on the Gore Hill Freeway.

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[1] Multi-Packet Label Switching

The Benefits

Cost savings were immediate.

“Using our existing network allowed us to save on wiring. Centralising the system meant fewer receptionists and PABXs – something traditional systems couldn’t do,” Clapham said. “Savings were about $5,000 per office.

“Internal calls run over our own data links, and cost nothing. Call reliability and ease-of-use also cut our reliance on mobile phones. This led to further savings.”

According to Voicepoint’s Peter McDonald, IP systems are **flexible** and **convenient**.

“Tunnel project offices can have new phone numbers within consistent and desirable ranges, and move people without having to change their numbers. They have simpler message management - picking up mail from different sites is easy. As a result, the business is more efficient and customers receive better service.

One of the early concerns about VoIP was network vulnerability. Dirk Clapham has now shelved his early concerns.

“Building-in network redundancy (over supply) means that twelve months since our first connection, we’ve had no major system outage. And security has not been a problem.”

“The other benefit is that standardised plugs, connections etc make the whole system relatively **easy to modify** and **scale**.”

For NEC’s John Fekete, IP solutions are becoming the way of the future, now.

“NEC builds all the functionality of its traditional systems into its IP systems – nothing is lost. Add to that the benefits of cost savings, convenience, scalability, reliability and security, and the benefits are measurable, real, and significant.”

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Problem

Disparately located and staged, multi-site offices requiring centralised corporate telephony, with number choice and portability.

Process

NEC partner Voicepoint Communications appointed to progressively roll out the NEC 2000 IPS telephony system as the construction project proceeded. Voicepoint initially delivered basic telephony serving construction headquarters and back office functions. This included providing NEC AT30 analogue handsets and traditional telephony to some 300 project staff. As new construction sites opened, Voicepoint rolled out IP infrastructure including IP handsets. At the peak of construction, nearly 500 handsets were in use.

Shotcreting, on the Mowbray Park worksite.

Solution

NEAX Mail and NEAX 2000 IPS Server, D-Term 8i handsets and AT30 analogue handsets, Integrated PC-based Attendant Console (IAC) and NEAXMail at construction headquarters.

D-Term 8IP handsets and NEC Power Patch panels providing PoE (power over Ethernet) and uninterruptible power supply back up for all handsets at the construction sites.

About NEC Business Solutions

NEC Business Solutions Ltd provides voice, data and video solutions for business and government. The company uses its expertise in Internet-based telephony, contact centres and managed services, and strong partnerships with other leading companies to creatively and affordably solve business problems.

NEC Business Solutions employs 750 staff nationally, and is a wholly owned subsidiary of NEC Australia.

About Voicepoint Communications

Voicepoint Communications is an NEC Channel Partner specialising in providing the next generation of evolutionary telecommunications products. In the last 10 years, Voicepoint has worked with some of NEC's largest corporate and government customers. Voicepoint also offers innovative NEC solutions to small and medium businesses.

Voicepoint offers specialist consultancy and solutions in: VoIP (Voice over Internet Protocol), teleconferencing, network applications, Intranet and Extranet integration, unified messaging and integrated call centre technology.

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John Fekete, NEC Business Solutions