

Pacific ring

AUSTRALIA JAPAN CABLE IS REAPING THE BENEFITS OF THE INCREASE IN DEMAND FOR HIGH-SPEED NETWORKS IN AND OUT OF AUSTRALIA. PRISCILLA AWDE REPORTS

Demand for high-speed access is growing fast in Australia where current internet connections run at around 5Mbit/s. This, given the rise in advanced video services, is comparatively slow. Wanting to increase the number and speed of connections, the Australian government has put out a tender for a national broadband network.

Total download volumes are increasing year-on-year but there are few data centres in Australia: up to 70% of internet traffic connects to American servers with the Asian market growing, albeit at a lower rate.

The result is exponential demand for reliable high-speed networks carrying multimedia traffic in and out of Australia. All of which is music to the ears of Robin Russell, CEO of Australia Japan Cable (AJ Cable), the first direct subsea cable connecting the continent to Japan and via Guam, on to America. "There has been an annual 40% to 50% increase in total download volumes of data transmitted via cable," he says. "We are seeing a change in the overall topography and a small but growing shift in traffic in Asia, although the majority is still US-focussed. We are building an Asia-Pacific mesh network which will be ready in early 2009."

Originally the brain child of six major carriers, which remain the major shareholders, the 12,700km, two fibre pair cable was completed in 2001 on time and to budget. According to analyst Paul Budde, Telstra alone invested \$450 million in the original cable build.

Offering shore-to-shore connectivity, this north/south cable was built to handle the high traffic volumes across the Pacific. Designed with a total capacity in excess of 1Tbit/s the cable uses a ring architecture which, together with SDH, provides high levels of resilience, protection, security and route diversity. There are two landing sites in Japan, Guam and Australia each.

Dense Wave Division Multiplexing (DWDM), supports 10Gbit/s wavelengths with a design capacity of at least 32 waves



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CEO, AJ CABLE

per fibre pair, thereby maximising efficiency and providing high-capacity bandwidth to carriers and a growing number of ISPs.

DEEP SEA CABLE

Operations and maintenance costs are kept low and protection against failure is further enhanced by the collapsed loop cable linking all sites. Branching units are laid at depths of over 4,000 metres along an historically safe route: at this depth, the entire cable runs through a single armour guarded sheath. Most submarine threats from human activity (fishing or anchor drag), happen at depths of 200 metres or less but armoured cable is buried in the sea bed from landing sites to at least 1,000 metre depths off Australia and Japan.

Should there be any disruption between the shore and deep sea cable, traffic would be automatically rerouted around the ring via the redundant branch. In Australia and

Guam the terrestrial networks connecting onshore landing stations have a redundant path for resilience but in Japan, the fibre ring is completed via submarine cable.

The main Australian network operations centre (NOC), provides round-the-clock monitoring and visibility of the entire network. There are back-up NOCs in Sydney and Japan.

AJ Cable offers between one and five-year product leases for protected SDH capacity mostly with operation and maintenance rolled in. Co-location at all six landing sites allows carriers to interconnect to other national Asian or trans-Pacific cable systems. Service providers can also use AJ Cable as a back-up alternative route for any other networks they may have.

The cable was upgraded in April increasing capacity by 50%. Costing around \$30 million, international capacity

was raised to 240Gbit/s (120Gbit/s on each side). "Our upgrade goes a long way to filling the identified need for the foreseeable future even taking into account the large growth in demand," explains Russell. Costs were controlled because all the upgrade work was carried out in the cable stations – nothing needed to be done to any of the submarine elements.

ROUTE DIVERSITY

Amrish Kacker, head of Asia for research firm Analysys, says part of the reason for the upgrade was to provide route diversity for multinationals and to give Asian customers an alternative path to America. "AJ Cable acts as a transit hub. So far there is no competition although investors are considering landing a cable in Western Australia which is a shorter geographic route to Asia. However, it is unlikely that another cable will go in for one and a half years because the ships are deployed laying an American-Asian cable linking several south east Asian countries with the US," he says.

"AJ Cable wants to reach Indonesia as the traffic between the two countries is

significant, but Indonesian regulations make landing cables problematic," suggests Kacker.

Following the upgrade, the company now offers STM-1/4/16/64 SDH interfaces, plus gigabit Ethernet and 10Gb direct wavelength access interfaces on its three different routes: Australia-Japan; Australia-Guam and Japan-Guam. Carriers and ISPs can scale capacity to meet their needs, starting low and increasing as required up to buying wavelengths. "We can provide scalability starting at STM1 and building up to gigabit Ethernet or multiple wavelengths," explains Russell. "Until now there has not been lots of demand for Ethernet but wholesalers are starting to use it for terrestrial networks."

GUARANTEED PERFORMANCE

Competitively priced, the operator's Onramp offering gives customers unprotected capacity at STM1, 4 or 16 equivalent levels. Occasional use leases are available for as little as a day or for up to nine months to provide cover for one-off or special events.

Customers can add extra or what Russell calls "super protected capacity" to guarantee performance. Offering a redundant path to ensure uninterrupted service, Flexprotect also allows traffic to be prioritised. Carriers can double their throughput and reduce costs by routing mission critical traffic on the service path and less sensitive traffic via the protection path. Alternatively Flexprotect can be configured as two less protected circuits for IP traffic.

"The cable business is an increasingly commoditised market so the cost of providing capacity is very competitive. We have a low cost structure and the network is very reliable which reduces the costs of having maintenance ships on standby.

"The world is starting to wake up to the need for speed, making this an exciting world," continues Russell. "There will be changes in the way in which services are provided. We are starting to see the advent of exciting products and applications like IPTV and the mobile internet will come. Content providers may move into networks with carriers moving into content." ■

KEY FACTS

> **History:** Completed in December 2001, the Australia Japan Cable – AJ Cable – is the first direct connection between Australia, Japan and Guam. The original shareholders are major telecoms operators who wanted an efficient and reliable cable connection carrying multimedia traffic between Australia, America and beyond. Customers can connect to the rest of the world from Guam or Japan. International capacity was increased by 50% and SDH and Ethernet capabilities added in a phased upgrade completed in April which cost around \$30 million. Further upgrades will be carried out when needed.

> **Current Ownership:** Privately owned. Company shareholders are: Telstra; NTT Communications; Verizon Business; Concert and Softbank Telecom.

> **CEO:** Robin Russell

> **Customers:** Major carriers and ISPs

> **Network:** A two fibre pair system, AJ Cable has a design capacity of over 1Terabit/s and uses DWDM technology providing 10Gbit/s wavelengths with a design capacity of at least 32 waves per fibre pair. The 12,700km cable was upgraded in April increasing capacity to 240Gbit/s to handle continuing demand from Australia. The current technical network capacity is over 1,000Gbit/s. Essentially three fibre loops, the network has two landings in Australia, Japan and Guam each. The collapsed ring configuration provides all sites with redundant capacity and the entire cable is combined in one armoured sheath in waters below 4,000 metres. This design provides extra security and protection whilst minimising construction and maintenance costs. Further resilience is provided by SDH technology which re-routes traffic around the ring in case of failure.

> **Products and services:** Protected SDH capacity is the flagship product for customers needing resilience. Designed for IP traffic and with a migration to wavelength products, DWA Onramp offers unprotected capacity at STM 1,4 or 16 levels. Flexprotect guarantees diversity and redundancy by routing mission-critical traffic via the service path and the rest over the protection path. Flexprotect is also offered as two unprotected circuits for IP traffic. Product leases are available from one to five years with capacity starting at STM1 up to STM64 and up to wavelengths. Co-location is available at all six landing sites and backhaul is available in Australia, Japan and Guam with ongoing providers co-located at all landing points. ■