

# POWERING YOUR GROWTH OPPORTUNITIES – TODAY AND TOMORROW

DATA, IP AND NETWORK  
APPLICATIONS AND SERVICES (NAS)





# SUMMARY

Globally, almost every industry is adapting to changes brought on by rapid advances in information and communication technologies.

One aspect of this is the greater empowerment of end users – both businesses and consumers. This in turn has produced a greater focus than ever on delivering the best possible 'customer experience' in enterprises of all kinds.

For telecommunications service providers, the impact of these changes is magnified. They face the same challenges and the same need to focus on delivering the optimal customer experience as every other business; and the products and services they provide their customers are key to achieving this objective. But in addition to these universal themes, the Australian telecommunications services industry is affected by another major industry development: the rollout of the National Broadband Network (NBN).

In this discussion paper, we take a closer look at the opportunities and challenges that these changes create for providers of telecommunications services. We also look at how Telstra Wholesale is evolving its products and services and the support structures around them, to help customers meet these challenges.



# INTRODUCTION

A dominant theme in almost every industry today is customer experience.

Power in the customer-supplier relationship is shifting to the customer, and suppliers of every kind of good or service are required to have a laser focus on delivering an optimal customer experience.

This means that high utility, high quality, value for money goods or services no longer guarantee business success. As most companies are able to deliver on these, scope for differentiation is limited. Equally as important now are all the policies, procedures and systems that underpin each interaction between supplier and customer: marketing and promotion, sales, distribution and delivery, and post sales support.

These, together with the underlying service, constitute the all important end-to-end customer experience, and provide scope for differentiation and achieving excellence.

These pressures permeate every component of the supply chain – from the manufacturer to the wholesaler and to the retailer that sells to the end customer, who is ultimately responsible for the end user experience.

Julio Coelho, General Manager of Data, IP & NAS for Telstra Wholesale, says that as a supplier of communications services and network-based applications to service providers, Telstra Wholesale must be cognisant of the need for its service providers to be able to focus on the experience they deliver to their customers.

“We need to empower our service provider customers, to add value to our services, give them tools and the connectivity layer to self provision, to turn things on and off for themselves. In wholesale there’s value to our customers in the B2B engagement that enables them to use us as a partner in their business processes”, said Mr Coelho.

This means that service attributes such as speed and certainty of provisioning, managing, monitoring and fault reporting, must rank equally with core functionality to enable service providers to focus their efforts on winning and serving customers. They need to be able to deliver services that can be customised to meet the needs of end users and that are differentiated from those of competing providers.

This discussion paper examines the market challenges facing retail telecommunications service providers, and how upstream wholesale providers can help them meet these challenges.

# THE MARKET CLIMATE FOR DATA, IP & NAS

## Industry developments

The enterprise IT market is undergoing rapid and profound change worldwide. In the telecommunications services market in Australia, these changes are compounded significantly by the introduction of the NBN. The NBN will replace Telstra’s copper network as the principal last-mile fixed access network as a wholesale-only network employing multiple technologies.

Telstra Wholesale sees consolidation among service providers and greater interaction between domestic and global markets. The world is getting smaller, and service providers need to provide greater product differentiation in an ever more demanding market, powered by rapidly evolving technologies on multiple fronts.

Industry analyst firm IDC talks about the era of the ‘Third Platform’ comprising mobile, social, cloud and data analytics technologies. Platforms one and two in IDC’s terminology were the eras of mainframes and client server computing respectively.

Gartner describes these four technologies (mobile, social, cloud and data analytics) as a ‘Nexus of Forces’ that, it says, have become the platform for new businesses that blur the line between the digital and physical worlds. It has recently added the Internet of Things (IoT) to its catalogue of developments saying, “a new digital world emerges from the dual impact of the Nexus of Forces and the Internet of Things”.<sup>1</sup> IDC agrees. For them IoT is, “one of the most important innovation accelerators for growth and expansion of IT-based value in the Third Platform era”.

IDC believes a number of industry disruptions driven by Third Platform developments will emerge in 2015. Examples it cites include alternative payment networks in financial services, expansion of IoT technologies into city safety, public works and transportation systems, and the expansion of location-based services in the retail industry.

“The number of industry platforms – industry-specialised cloud-based data and services platforms, usually created by leaders within the industry – will expand rapidly, easily doubling in 2015”, says IDC.

Forrester Research identifies the same set of forces and sees them giving consumers the ability to wrest power from the organisations that rely on them for survival. In The State of Digital Business in Asia Pacific in 2014, they say that many industries face the threat of disruption “brought about by a combination of factors – customers are using mobile, social and other digital technologies to take power from institutions, in particular from corporations. Customers can easily discover pricing, publicly critique products they don’t like, and buy from anyone at any time anywhere”.<sup>2</sup>

Josh Bernoff, Senior Research Executive at Forrester says this ability sweeps away any advantages that companies might think they have as a result of size, scale, longevity or product and service offerings. “The only source of competitive advantage now is a focus on knowledge of and engagement with customers”.<sup>3</sup>

Telstra Wholesale has a dual focus on helping businesses meet the challenges thrown up by these disruptive forces; serving their own service provider customers, and considering how their products, services and support structures (such as ordering, billing and activation) impact the interactions service providers have with their own end customers.

Graham Taylor, Group Manager for Ethernet & IP for Telstra Wholesale sees the biggest challenge facing his customers as differentiating their products and services in a highly competitive market. A key enabler will be the support and facilities from wholesale providers. “We aim to be the provider of choice through market leading service provisioning, assurance, billing and pricing”, says Mr Taylor.

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**Graham Taylor**  
Group Manager  
Ethernet & IP

## Impact of the NBN

In addition to these global factors, Australia is also facing NBN-driven change in the domestic landscape, although this is limited to the mass market so far. As the NBN rolls out, it will increasingly replace the last-mile copper network that service providers have relied on to connect their customers.

Graham Taylor says that, as NBN wholesale access products become available, they will be progressively integrated into Telstra Wholesale’s product portfolio.

“The first of the Wholesale products expected to be replaced by NBN-based products is WBDL, the equivalent of Ethernet Lite in the retail space. And the NBN’s multi-technology mix will cause an integration challenge across the board. It will see some of the legacy services like copper delivered frame relay disappear. We are working to integrate NBN inputs into our wholesale services”, he says.

Stuart Lee, Group Executive for Telstra Wholesale, says the process of getting millions of Australian consumers and businesses to move to the NBN will be a huge task that will require all stakeholders in the industry to play their part; Telstra as the operator of the legacy network, NBN Co as the operator of the new network, and service providers looking after their customers through the transition and Government and regulators looking to facilitate the change.



“We need to empower our service provider customers, to add value to our services, give them tools and the connectivity layer to self provision, to turn things on and off for themselves. In wholesale there’s value to our customers in the B2B engagement that enables them to use us as a partner in their business processes”.

**Julio Coelho**  
General Manager  
Data, IP & NAS

1. Gartner Press Release, ‘Gartner Highlights Five Reasons Why a Modern Data Center Strategy is Needed for the Digital World’, Stamford, Conn., April 15, 2015  
2. Clement Teo with Dane Anderson, Nigel Fenwick and Zhi Ying Ng, The State of Digital Business in Asia Pacific in 2014, Forrester Research 2014  
3. James McQuivey, Foreword to Digital Disruption: Unleashing the Next Wave of Innovation, Forrester Research, 2013



# CHALLENGES FOR TELCOS

NBN services will only be available from NBN Co at layer two, the data link layer of the OSI seven layer interconnection model. According to Ovum, this will accelerate the dominance of Ethernet and the consolidation of players in the wholesale market, and will push providers towards offering services at higher levels to differentiate their offerings and extract value.<sup>4</sup>

Graham Taylor agrees. He says retail service providers need scale and a layer one to layer seven solution. “Stopping at layer three or four at the OSI stack has become irrelevant. If you can’t extract the top-end value you won’t succeed. That’s about providing a cloud-based solution to do the whole suite of products. It’s about extending your product range into new areas”.

In addition to providing high level services, Ovum also expects to see competition shifting towards other factors, such as quality of service and customer experience. This, according to Ovum, “will require investment in new switching infrastructure to support quality of service, platforms for customer interfaces and automation and customer relationship management”.

This is precisely the focus of Telstra Wholesale’s recent investments in B2B systems. For Julio Coelho, the connectivity services themselves – although essential – are only a means to an end. Automation, streamlining and flexibility in the provisioning of those connectivity services will be the key differentiators that will separate winners from losers in the fight for end user customers.

“As a network service provider we have to provide an orchestration layer that empowers our customers to engage with us seamlessly and quickly,” he says. “In wholesale the real value for customers is the whole B2B system that enables them to use us a partner in their engagements. For example, we see exposing APIs as offering the opportunity to enable our customers to put Telstra Wholesale platforms at the heart of their order and delivery processes. That is what will enable them to differentiate themselves from their competition”.

## Impact of cloud

According to Frost & Sullivan, 69 per cent of organisations in Australia were using cloud computing services in July 2014, 41 per cent of cloud users were spending at least 10 per cent of their IT budget on cloud services, and 19 percent were spending more than 20 per cent of their IT budget.<sup>5</sup>



Terry Scerri, Executive Director of Products and Marketing at Telstra Wholesale, says that both Software as a Service (SaaS) and Infrastructure as a Service (IaaS) have the potential to make a huge difference to small and medium enterprises (SMEs) in Australia. “On the Software as a Service side, you could be talking about anything from virus protection and project management, to online payroll or even the ability for hotels or restaurants to let guests make online bookings”.

Don Inglis, Group Manager of Transmission and Cloud for Telstra Wholesale, adds that the company plans to launch a wholesale IaaS offering in the first half of FY16. “It will scale up or down as needed. This will help our customers innovate and grow whilst giving their customers a great experience. It will easily form an input into their own value-added, managed solutions”.

Currently, according to Frost & Sullivan, larger organisations are spending significantly more on cloud computing than SMEs. Forty five per cent of those with more than 250 employees are spending more than 10 per cent of their IT budgets on cloud-based solutions and services, compared to 35 per cent for SMEs.

However, Frost & Sullivan said the disparity between SMEs and larger organisations had reduced significantly over the previous 12 months and it hailed this as an indication of a maturing cloud market. It also noted that, compared with other regions, Australia’s adoption of cloud computing was very high.

“A high proportion of companies are moving to adopt a full range of cloud solutions, by migrating all their legacy applications to the cloud, relative to many other countries,” Frost & Sullivan said.

Also, sectors that have historically lagged in terms of cloud adoption – such as Education, Mining and in particular Government and Financial Services – had been strong adopters of cloud over the last six to 12 months.

Nonetheless, significant barriers to cloud adoption remain. Perceived issues with data security being the main obstacle, cited as a key challenge by 40 per cent of respondents to the Frost & Sullivan survey. Connectivity issues were also rated highly: latency and bandwidth issues associated with internet access were cited as barriers by 27 per cent of respondents.

Don Inglis believes that cloud services have the potential to enable resellers to scale quickly. “Some of our resellers might have small data centres, and the cloud infrastructure product we have on our roadmap will help them migrate from fixed costs to variable costs, to move from having capital tied up in assets that are diminishing in value and using that money as working capital,” says Mr Inglis.

However, there is also a lack of understanding of the full potential of cloud services among service providers. Mr Inglis adds, “some resellers see cloud as being just about cost saving with little margin but as a way of retaining customers. Others see it as a way of making their managed services much more competitive. They don’t plan to resell the cloud service, just the end service that it supports”.

Industry developments, the introduction of the NBN and the growth of cloud computing directly impact telecommunications service providers in multiple ways:

1. The topology of enterprise networks is changing with the advent of cloud computing. Demand for private mesh networks is declining in favour of hub and spoke networks to major data centres and connectivity to public cloud service providers.
2. On premises, IP PABX, contact centre and unified communications systems are being replaced with their counterparts in the cloud.
3. The move to the cloud is accelerating the decline in legacy services such as ISDN and frame relay.

Regardless of what services telcos are providing, the changing IT marketplace and the developments created by the ‘Nexus of Forces’ (cloud, mobile, social and data analytics) will present both challenges and opportunities. Some existing Wholesale customers will be absorbed, or fail. Others will prosper and grow, and new fast-growing potential customers will emerge.

For example, by enabling a business’s entire computing needs to be met for almost zero capital expenditure and to be scaled rapidly and massively, cloud computing has greatly smoothed the growth trajectory for start-up challengers. An IBM study of start-ups reported, “the combination of cloud computing and entrepreneurial spirit has led to the emergence of a new generation of technology-oriented start-ups – those that are born-on-the-cloud”.

The combination of near ubiquitous mobile devices and social networks has enabled many start-ups that exploit these channels to grow with unprecedented speed. By comparison, the World Wide Web was created in 1990 and took seven years to reach one million users. Taxi booking app Uber booked one million rides in less than a year after launching in Australia.

Established customer relationships will continue to be tested. New customers will come with a different mindset and will expect to be offered services with the rapidity, flexibility and digital-era customer service features that their own use of ‘Third Platform’ technologies enables them to provide their customers.

Retail providers of telecommunications services will demand of their wholesale providers the ability to offer services rapidly, predictably and with stable pricing. They will expect the configuration, management and customer interaction features that enable them to offer retail services with the features their end user customers demand and that are differentiated from those of their competitors.

As end user organisations look to outsource more of their IT requirements, retail telecommunications service providers are facing increasing competition from systems integrators and providers of managed IT services.

Graham Taylor notes, “Service integrators, the people who support desktop applications, who support the capital equipment required to run an office – servers, desktop computer, phone systems, etc – will sometimes purchase the communications services themselves and create competition against the other parts of the market”.

He adds, “While some data centres steer clear of providing higher layer services, others are getting into that business, introducing internet offerings and connectivity to other data centres, which can compete with the services our customers are offering”.

He also sees the shift of enterprise IT resources into data centres as directly impacting the market for resellers. “Fewer services are required by virtue of the fact that access is aggregated. Instead of a network hub being served by a VPN in the head office, they are now moving into a data centre or the cloud”, says Mr Taylor. This means that connectivity between those sites to the data centres may be internet-based rather than fixed line.



4. David Kennedy, ‘Fiber Drives Change in Australia and New Zealand Wholesale’ in Ovum December 2014

5. Frost & Sullivan, State of Cloud Computing in Australia, 2014

# TELSTRA WHOLESALE'S DATA, IP & NAS PRODUCT PORTFOLIO

This section takes a closer look at Telstra Wholesale's Data, IP & NAS portfolio – including the ordering, provisioning and support services with which they are delivered – in relation to the changing market environment and the demands placed on retail service providers.

## Telstra Wholesale Internet (TWI)

TWI services provide transit connectivity to the Australian and global internet via dedicated connections from Telstra Wholesale's suite of data access products to any one of 88 national points of presence (PoPs) and 47 global PoPs. There are two basic service types:

- **TWI Domestic** is for customers who have already invested in international internet capacity, but wish to complement this with connectivity to Telstra's Australian internet backbone. This service has the potential to provide end users with shortest path connectivity to the majority of Australian internet users, services and content.
- **TWI Global** is for customers wanting to quickly acquire both domestic and international internet connectivity, without incurring the costs and challenges of building and operating their own infrastructure. Planned enhancements to this service include improved security protections, service assurance and increased cost and operational efficiency.

Find out more about TWI at [telstrawholesale.com.au/products/data/telstra-wholesale-internet/index.htm](http://telstrawholesale.com.au/products/data/telstra-wholesale-internet/index.htm)

## Telstra Wholesale Ethernet Access

Ethernet is becoming the preferred solution for data transmission because it is cost-effective and provides reliable wide-area network connectivity, regardless of speed and capacity requirements. It is able to support data, voice and video on a unified network.

Telstra Wholesale's Ethernet access services have the flexibility and options to enable service providers to customise them to meet growing end user demands, improve operational efficiencies, decrease time-to-market and build customer loyalty.

Ethernet access services are available at more than 2,700 exchange service areas across Australia (over 1800 are fibre enabled) with four Classes of Service (CoS) allowing users to prioritise traffic according to their needs.

### MEF 2.0 certification

Telstra Wholesale Ethernet access services were the first in the Asia-Pacific region and second in the world, to receive Carrier Ethernet 2.0 E-Line certification from the Metro Ethernet Forum (MEF) – a global industry alliance with a mission to accelerate the worldwide adoption of Carrier-class Ethernet networks and services. Certification helps ensure greater inter-operability with MEF 2.0 certified services from other network providers, enabling a seamless experience for end users.

IDC has forecast a CAGR of 7.8 per cent for Carrier Ethernet in Australia from 2014 to 2019, driven by the relative reduction in cost for Ethernet equipment, the proliferation of Ethernet services in data centres and the use of public and hybrid cloud services. "There is also growth in hybrid WANs – with Ethernet services often providing high-speed internet and data centre connection alongside the existing IP VPN connecting enterprise branches and head office," IDC says.

For Graham Taylor, by adopting the standards of the Metro Ethernet Forum and obtaining Carrier Ethernet 2.0 certification, Telstra Wholesale has aligned itself with market leaders in Ethernet. Telstra Wholesale's Ethernet products were the first in the Asia Pacific region and second in the world to have received Carrier Ethernet 2.0 E-Line certification by the MEF; ensuring the products meet global industry standards.

"Being at the forefront of market and technology changes, we are able to deliver solutions that meet customers' future requirements. and work with them to help them achieve their goals".

More details about Telstra Wholesale Ethernet access can be found at [telstrawholesale.com.au/products/data/ethernet-access/index.htm](http://telstrawholesale.com.au/products/data/ethernet-access/index.htm)

## Wavelength services

Bandwidth use is continuing to increase, especially as a result of over the top (OTT) content providers such as Presto, Stan and Netflix, now offering services in Australia. Don Inglis says, "Wavelength services give service providers flexibility to scale without making multiple infrastructure purchasing and delivery steps".

Telstra Wholesale's Wavelength services provide high bandwidth point-to-point connections. These are currently sold in 1Gbps, 2.5Gbps and 10Gbps bandwidths. They are used for inter-capital connections as well backhaul for NBN Pols, DSLAM traffic and mobile towers. Recent upgrades include a new 100Gbps interface that will enable connectivity from 10 to 100Gbps in 10Gbps increments and from 1Gbps to 10Gbps in 1Gbps increments. New CPE will have a smaller footprint and lower power consumption than the current units.

Planned support for optical aggregation with a mix of channelised and fixed streams will enable service providers to provide elastic network connectivity that can easily support scaling up and scaling down on demand.

Greater resiliency options, including enhanced assurance options to expedite service restoration for critical networks, will enable service providers to offer increased service availability through protection options, and QoS with performance based routing to allow for self-healing networks. Increased service levels give service providers more confidence that, if there is a service incident it can be responded to with a corresponding level of urgency.

Find out more on the Telstra Wholesale website at [telstrawholesale.com.au/products/data/wavelength/index.htm](http://telstrawholesale.com.au/products/data/wavelength/index.htm)

## Wholesale Cloud

The movement of IT services to the cloud continues to gather pace. Telstra Wholesale intends to develop cloud products that will enable service providers to provide an end-to-end portfolio that will increase the 'stickiness' of their customers.

Telstra Wholesale's Wholesale Cloud will be an IaaS offering that service providers will be able to rebrand as part of their integrated, fully managed service offerings and offer to their customers or use internally to support their own services, such as cloud-based unified communications and collaboration.

"Virtual machines will be based on Open Stack and will offer both public and private cloud, with a layer two cloud connectivity into Telstra Wholesale's Ethernet", says Don Inglis.

"Features will include real-time infrastructure that will be self-healing, enabling applications to be launched faster and on demand. Applications will be able to reside on multiple virtual machines for failover management with redundancy and resiliency. These features will enable service providers to offer their customers services with high availability and a consistent customer experience".

Computer, storage and network resources will be available on a pay-as-you-go basis so service providers will be able to scale capacity up and down as required for their own operations, or by their customers.

Mr Inglis adds, "service providers and their customers will be able to migrate their services to the Telstra Wholesale Cloud or run services from the Wholesale IaaS offering in parallel with their own IT services and reduce the huge step-up expense of increasing data centre capability for IT machines.

"The shift from capital to variable expense saves service providers money and is a better business case than owning their own infrastructure. All services are supported from data centres in Melbourne and Sydney, so are fully Australian domiciled".

### Bundling with access services

Telstra Wholesale's cloud infrastructure will be bundled with its data access products. Service Providers will not need to invest in their own infrastructure or deal with multiple suppliers in order to deliver a managed cloud infrastructure solution to their customers. And with the data being rated as CBD traffic nationally, there are some compelling advantages to a more traditional 'direct-connect' only data service for partner cloud providers.

## Business Voice

Telstra Wholesale is developing a SIP trunking service that will enable multi-line business telephony services to be delivered over data services, including ISDN and NBN access services. Business Voice services will be available stand-alone or bundled with Telstra Wholesale's data products to provide highly reliable national coverage.

Telstra Wholesale Business Voice will be introduced in phases, starting from late 2015. It will be delivered from a BroadSoft IP PABX platform, the same market leading technology that underpins Telstra's retail IP telephony services.

Retail IP based voice telephony services supported by network based IP PABX functionality have been available for a number of years. Our Business Voice will be distinguished by being available as a complete end-end package that will include the access service and that will be managed end-to-end to ensure it delivers the quality of service that businesses demand.

It will have the flexibility to enable service providers to serve businesses of all sizes and to either resell a complete Telstra Wholesale offering or add components and value of their own.

Josef Kiss, Product Manager for Business Voice at Telstra Wholesale says the product is not simply a voice application, but an integrated solution. "We've designed Wholesale IP voice using our own Ethernet and DSL products and are leveraging our NBN contracts to pull everything together." The Telstra Wholesale Business Voice product will be a fully integrated data and voice solution that maintains a higher quality than a simple voice app.

Resellers will have the option to use their own NBN or other access services, or access supplied by Telstra Wholesale as part of the Business Voice package.

Service providers will be able to change their customers' access links at any time. So, for example, a service provider will be able to convert a customer's existing ISDN delivered standard telephone service to Business Voice and when that customer migrates to the NBN, seamlessly transition the service to an NBN access that they could retail themselves, or have provided by Telstra Wholesale as a component of the Business Voice offering.

Another key differentiator of Business Voice will be in cutting over from other services – churning and porting of numbers. Josef Kiss says, "The biggest issue with wholesale services is churn and port. The logistics of those can be a nightmare. We have that down pat. We provide the carrier grade quality of service".

Service providers will also have the option of receiving billing data that can be passed on to the end customer with little more than rebranding, or of receiving call records from which to generate their own bills.



# SERVICE DIFFERENTIATION WILL BE ESSENTIAL

Market consolidation, the entry of new players such as systems integrators that resell communications services as components of higher level offerings, hosted PABXes and contact centres for example, are putting pressure on retail providers of telecommunications services to differentiate their offerings. But for them to achieve this, supporting features and functionality must be available from wholesale service providers.

## Service provisioning

When a customer enquires about a telecommunications service, it's essential that a service provider can respond quickly and easily with a quote that details pricing, provisioning time and feature set, and have confidence in its accuracy. The energy and focus need to be on the customer and what they want, not on dealing with their wholesale provider to meet that customer's needs. The whole process – from quoting and ordering through to activation or service delivery – needs to be simple and streamlined.

Don Inglis says that one of the biggest challenges facing resellers when new services like those delivered over the NBN replace legacy products, will be achieving a seamless migration from the old to the new. "Because there is so much change with the move to NBN and to the cloud, we will need to help resellers migrate from one solution to the other. Resellers will need to have their feet in both camps – the old and the new – and Telstra Wholesale aims to smooth that migration".

Telstra Wholesale is working on a number of fronts to achieve these goals. A new Site Enablement Price (SEP) framework launched in December 2014 simplifies and accelerates the preparation of quotes for the upfront costs of data service provisioning. A new quote-to-order system will make it easier for resellers to price check, get quotes and place orders for services.

Graham Taylor adds, "the ease of ordering, the ease of adoption regardless of whether that is the initial sale, the contract element, the ordering and provisioning or service assurance has been a key focus to get services turned up a lot faster than previously. The Telstra Wholesale Agreement is a much simpler form of contractual agreement and the first step on the road to making Telstra Wholesale even easier to deal with".

## Looking to the future

Telecommunications networks are on the cusp of major technology shifts that will profoundly change the end user experience. It will give service providers the ability to offer their end users products with much greater differentiation; products that can be customised on the fly either by service providers or by the end users themselves.

These technologies are network functions virtualisation (NFV) and software defined networking (SDN).

With NFV, both core networking functions and specific user functions such as load balancers, firewalls, intrusion detection devices and WAN accelerators, are implemented in software that runs in a virtualised environment. This enables features to be provided to end users without the need to ship and install 'boxes' and for network functionality to be scaled up in capacity as required.

In SDN, all the control functions of switching and routing devices that have traditionally been implemented in the devices themselves are stripped out and implemented in software running on standard services. This software then controls very basic switching and routing devices via standardised interfaces.

When fully realised as in the Pacnet Enabled Network, recently acquired by Telstra, SDN enables end users via a web portal to instantly implement connectively between different locations, to increase or decrease bandwidth at will and to change grade of service. Application interfaces also enable these options to be activated automatically by software.

“Because there is so much change with the move to NBN and to the cloud, we will need to help resellers migrate from one solution to the other. Resellers will need to have their feet in both camps – the old and the new – and Telstra Wholesale aims to smooth that migration”.

Don Inglis  
Group Manager  
Transmission & Cloud

Service providers will be able to make the features and functions of wholesale NFV and SDN services directly available to their customers but the greatly increased options NFV and SDN provide, and the ease with which they can be activated and delivered, will enable creative service providers to develop their own innovative services at lower risk and to easily service niche market segments that have very specific requirements.

Don Inglis says, "We have released 100Gbps wavelengths so our customers can scale from 1Gbps to 100Gbps if their business demands it. We are also looking at providing the ability to switch bandwidth between different routes. This is what resellers will require with end user customers wanting to change cloud providers and quickly needing to change their routing, or their backhaul".

Service providers that have access to these technologies from their wholesale provider will gain immediate and significant advantage over competitors that are unable to offer such services. We are looking into how we can service the market's need for more elastic optical network into the future.

# CONTRIBUTORS



**JULIO COELHO**  
General Manager  
Data, IP & NAS

Julio leads Telstra Wholesale's Data, IP & Network Application Services (NAS) product portfolio. Julio has 20 years of telecoms experience across Australia and New Zealand in a range of sales, pre-sales and product roles. His particular focus has been on extensive national fibre network deployments and transforming these to customer solutions. He's been part of the Telstra Wholesale team for over four years.



**GRAHAM TAYLOR**  
Group Manager  
Ethernet & IP

Graham leads Telstra Wholesale's Ethernet & IP product portfolio; leveraging 15 years of telecoms experience across Australasia in a range of product management and product development roles. He's been part of the Telstra Wholesale team for over six years, and before that worked with Telecom NZ.



**DON INGLIS**  
Group Manager  
Transmission & Cloud

Don leads Telstra Wholesale's Transmission and Cloud product portfolio. With 15 years of telecoms experience across finance, network and product roles; Don worked with TCNZ and AAPT before joining Telstra Wholesale. He's been part of the team for eight years now, and is currently leading the portfolio's product enhancements and new product development.

# CONCLUSION

For providers of telecommunications services in Australia, the future is filled with challenges and opportunities in equal measure.

The advent of the NBN will require organisations of all sizes to review their communications services. They are likely to be presented with a plethora of choices as providers exploit the increased awareness to induce churn or expand the range of services provided.

The seemingly unstoppable migration of applications and data into the cloud will change the topologies of enterprise networks and make cloud connectivity critical to maintaining business continuity.

Industry consolidation will increase the size and scale of competitors but could also lead to reduced agility, inferior custom services and reduced focus on customers with specialised requirements

In short, there will be great opportunities for nimble and customer-focused retail providers of telecommunications services. But to exploit these, they will need access to a comprehensive range of integrated wholesale services that they are able to efficiently and effectively price, configure, deliver and support.

Graham Taylor sees customer acquisition as being the biggest challenge for service providers in this market, and says that enabling differentiation in services to end users will be the top priority for wholesale providers. "Our intent is that the changes we are making to Telstra Wholesale will enable our customers to add more value than their competitors".

Julio Coelho says Telstra Wholesale aims to be a key player. "What we can do to really differentiate ourselves is to open up the APIs and B2B interfaces, get people into the provisioning systems and become part of their operations... if our customers can see the network, we are getting in the way".

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