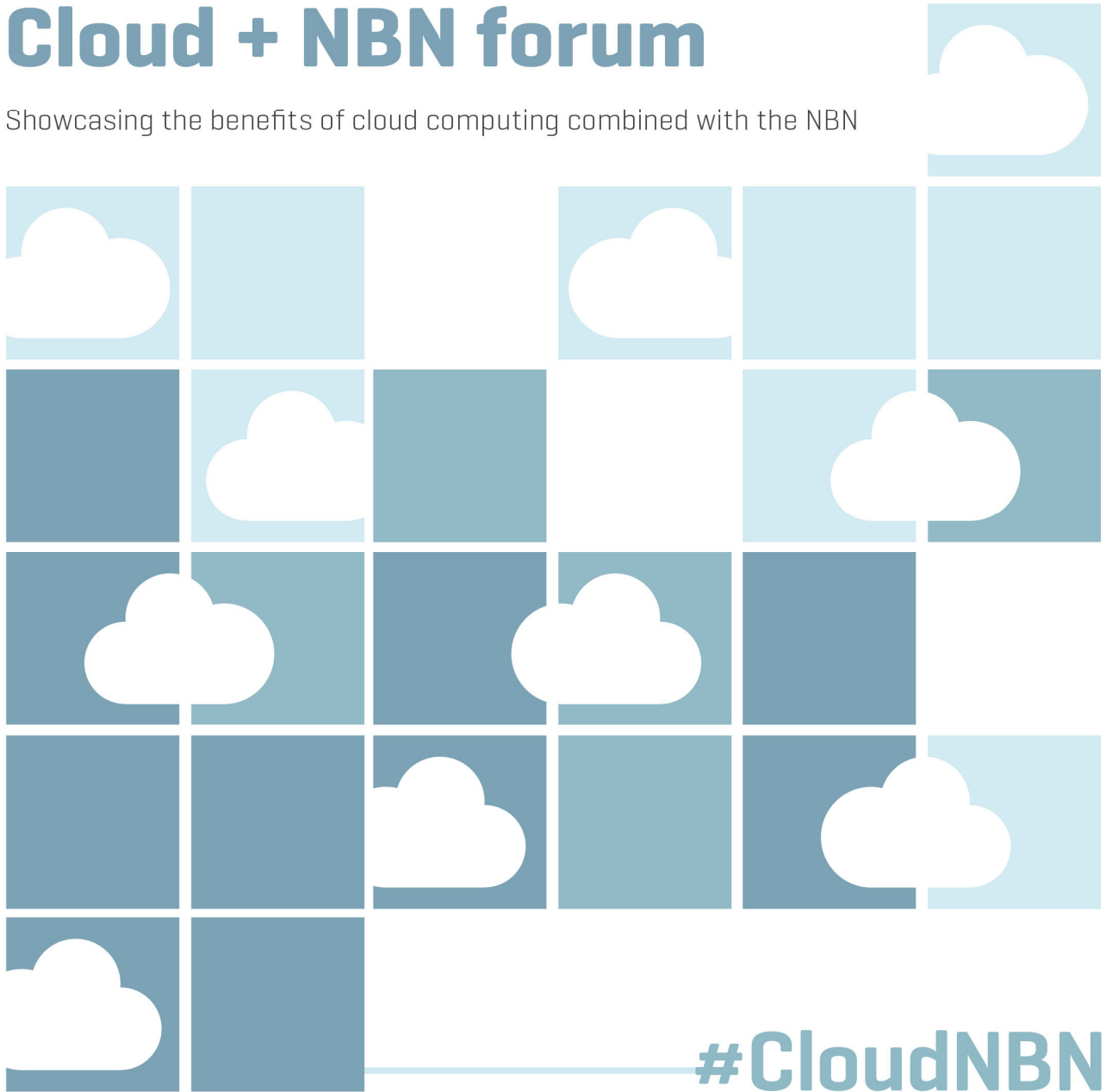**Australian Government**

**Department of Broadband,
Communications and the Digital Economy**

Cloud + NBN forum

Showcasing the benefits of cloud computing combined with the NBN

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Cloud + NBN Forum

Report of Proceedings

Four Seasons Hotel

Sydney, 8 August 2012

DISCLAIMER: This report represents a range of views and interests of the individuals and organisations participating in the forum. They are personal opinions that do not necessarily reflect those of the organisers and sponsors of the forum.

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Executive Summary

The Minister for Broadband, Communications and the Digital Economy hosted the Cloud + NBN Forum on Wednesday, 8 August 2012 at the Four Seasons Hotel in Sydney.

The forum was attended by 230 invited guests from information and communication technology (ICT) and non-ICT industries, Cloud vendors and enterprise customers, representatives from the small business and not-for-profit sectors, policy makers, regulators, industry bodies including consumer representative groups, and business and technology media. The proceedings of the day were broadcast live on *www.webcasts.com.au/dbcde80812/*.

Recent research has confirmed Cloud computing offers enormous potential to improve the efficiency and competitiveness of a business across multiple industry sectors by triggering innovation, savings and productivity gains.

The Cloud + NBN Forum provided an opportunity to showcase examples of companies, not-for-profit agencies and community groups which are already adopting Cloud computing solutions, and to hear from their experiences.

The programme included presentations from the following speakers:

Senator the Hon. Stephen Conroy MP, Minister for Broadband, Communications and the Digital Economy
Kevin Bloch, Chief Technology Officer, Cisco
Brendon Riley, Chief Operating Officer, Telstra
Nick Abrahams, Partner & Asia Pacific Technology Leader, Norton Rose Australia
Chris Ridd, Managing Director, Xero, and **Steph Hinds**, Managing Partner, Growthwise
Dr Darrell Williamson, Director, e-Research, Information Management & Technology, CSIRO
Liam Fraser, Director, Cloud Services, Optus
Craig Baty, Executive General Manager, Chief Innovation & Technology Officer, Fujitsu ANZ
Dr Scott Hollier, Project Manager & Western Australia Manager, Media Access Australia
Dr Dean Economou, Technology Strategist, and **Dr Anna Liu**, Project Leader, Business Adaptation and Interoperation, National ICT Australia

Presentation slides are available at *www.dbcde.gov.au/digital_economy/ public_engagement/cloud_nbn_forum*.

The forum included three breakout sessions during which the participants discussed the opportunities and challenges for governments, businesses and consumers in moving to Cloud-based services.

National ICT Australia, the Institute for a Broadband-Enabled Society, CSIRO and DBCDE's National Telework Week team demonstrated their offerings during the breaks.

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Forum Key Findings

- Cloud computing and National Broadband Network (NBN) are **transformational technologies** and their combined impact promises unprecedented flexibility, efficiency, and opportunity for Australian business. Facilitated by the NBN, the Cloud will cut ICT costs, increase capacity and drive a new generation of economic models, while the improved upload speeds of the NBN will encourage video conferencing and teleworking and allow small and regional Australian companies to offer their services to the world.

- **Internet use** and **mobile computing** will continue their explosive growth, notably in Asia and China, creating rich opportunities, but also posing significant challenges for Australian firms. Given the endemic digitisation of content and services, the radical disruption suffered by the publishing and recording industries will soon impact many others. The new digital economy is infinitely scalable, has unbounded potential and may soon overtake the size of the traditional economy.

- Issues of **privacy**, **data security**, **vendor lock-in**, **service standards**, **interoperability** with legacy systems, **jurisdictional responsibilities** and **law enforcement access to data** are similar to those posed by any adoption of technology or outsourcing. Customers are becoming increasingly comfortable with managing them in the Cloud. Marketing, accounting and other departments are now by-passing their own IT sections to find quick and cost-effective Cloud solutions.

- "Digital Ready" research by Optus shows that **59% of SMEs are still unsure** what Cloud computing is and only 4% currently use Cloud services. Many businesspeople still view the Cloud as an interesting concept, rather than a productive reality. **Greater collaboration** between advocates, industry and government must "remove Cloud from the abstract" by highlighting its benefits to organisations of all kinds. Industry associations, accountants, financial advisers and business efficiency professionals also have a vital role to play.

- The Cloud and the NBN will support "**the workplace of the future**", allowing employers to connect easily and reliably with remote employees, stakeholders and clients. Beyond its business implications, the NBN and the Cloud will change how people engage with technology and reshape the way they interact with each other.

- Cloud solutions tend to increase, rather than imperil, **data security**, given the greater resources and expertise of major Cloud vendors. Data should not be treated as a homogeneous entity, but clearly differentiated between highly sensitive data which should not leave the organisation, less sensitive information which can be stored in Australian Clouds and non-sensitive data which can be processed or stored overseas.

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- The Government should examine adopting public and transparent rules about its **classification of data**, rather than an opaque or blanket approach. Such a framework would help government departments assess risk more effectively, reassure public concerns and help vendors and the industry to respond.

- Australia must play a positive role in framing **international Cloud conventions and standards**, while **voluntary codes of conduct** should be explored and encouraged to underpin public confidence and reduce pressure on the Government to regulate.

- A government trial of a common middleware interface, focusing on **disability issues** in travel, education or health, could be driven by a prize, competition or the involvement of TAFE students.

- Australia has a limited window to capitalise on new digital opportunities provided by Cloud computing before they are grasped by its competitors. Although manufacturing and service industries are being transformed, **government**, as yet, has been largely unaffected, but the seamless convenience of modern mobile devices synchronising personal data through the Cloud will inevitably spur demands for government services to follow suit.

Report of Proceedings

Welcome & Introduction

Abul Rizvi, Deputy Secretary, Department of Broadband, Communications and the Digital Economy (DBCDE), welcomed Senator Stephen Conroy and the day's speakers and guests to discuss the combined implications of Cloud computing and the National Broadband Network for Australia's digital economy.

He identified Cloud computing and the NBN as key elements of the Government's digital productivity agenda, but acknowledged that realising their full potential will pose a challenge for policy makers. Despite significant take-up of the Cloud and the ongoing rollout of the NBN, Australia is still to fully appreciate the exciting possibilities of economic transformation and productivity improvements which lie ahead.

The Government's digital economy agenda is already driving innovative initiatives in e-health, e-education and the delivery of aged care, while businesses and government agencies are examining opportunities for teleworking using high-speed broadband and Cloud solutions.

To reap these and further benefits, however, a range of issues including privacy, data security, vendor lock-in, appropriate standards, interoperability with legacy systems, jurisdictional responsibilities and law enforcement access to data must be addressed.

Mr Rizvi invited all present to engage in a robust, informative and intelligent debate on the challenges and opportunities of the Cloud and the NBN at home and abroad. He then introduced the forum's roster of speakers from industry, research agencies and government and invited attendees to contribute to interactive breakout sessions to examine the impact of the Cloud and NBN on small and medium enterprises (SMEs), non-profit organisations, government operations and health and disability services.

He hoped these discussions would produce tangible outcomes and potential directions for future work, particularly in terms of how the Government can help Australia's SMEs and not-for-profit organisations take full advantage of the opportunities that the Cloud and high-speed broadband have to offer.

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Session One

Relationship between Cloud and NBN
Kevin Bloch, Cisco

Lisa Middlebrook, deputy chair of the National Standing Committee on Cloud Computing, introduced the opening speaker, Kevin Bloch, Chief Technology Officer at Cisco.

Kevin Bloch emphasised the significance and scope of the "great revolution" underway and offered projections of rapid change and explosive growth over the next four years based on Cisco's Visual Networking Index Report.

He traced the growth of Cloud computing through the development of Amazon Web Services, which originally used spare capacity in Amazon's book selling data centre, to the present day. New companies such as Animoto, which creates short videos from customer's photographs, can now expand tenfold over a weekend, from 25,000 to 250,000 subscribers, without having to invest in IT equipment of their own.

Amazon's business continues to boom. E-books are now overtaking traditional book sales, and virtual capacity has become a commodity in its own right, with spot markets already beginning to develop. The radical disruption which the book publishing, music recording and newspaper industries have undergone, will soon impact many others, given the rapid development of mobile, tablet and Cloud computing and the endemic digitisation of media content. Long-established retail chains, such as Harvey Norman and David Jones, are already seeing significant falls in profits as customers opt for cheaper, more convenient deals on the internet.

Tying into the forum's twin themes of Cloud storage and NBN distribution, Mr Bloch believed that a double transformation was under way. Everything that can be digitised, is being digitised and stored by the client or the Cloud and secondly, this data is being distributed everywhere, instantly, through the global internet and Australia's incipient NBN. Many companies, including Seek, LinkedIn and Groupon as well as Google and eBay, are essentially software and sophisticated operating systems. Mr Bloch warned that any business whose product could be digitised would have to join this revolution or be destroyed by it as prices were driven down to a marginal cost of near zero, while any company producing a physical good would see its value rise.

Cisco's Visual Network Index of projected data transfers predicts that global IP traffic will grow by an annual compound rate of 29% in the coming half decade and reach 1.3 zettabytes in 2016. This is, if anything, a conservative estimate as the Index has underestimated future use by around 10% in the past. The fastest growth, of around 57% per year, will be seen in the Middle East and Africa, followed closely by Latin

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America. Annual global business traffic will increase by 22%, with business video-conferencing increasing six fold. Average data consumption by Australians is projected to quadruple in the same period from 5 gigabytes a month to 20.

Individual internet use in Asia will increase from about 12 gigabytes per month today to 32 by 2016, spurred by ever more people using many more devices with ever faster broadband speeds. While the centre of gravity is shifting to Asia, it is shifting within Asia towards China, with its percentage of Asian internet bandwidth set to increase to 29% by 2016, compared to Australia's 2%.

Cisco predicts that 3.4 billion people will be using 19 billion internet connected devices by 2016, with 8.7 billion devices in Asia alone. Each Australian will have an average of 5.7 connected devices, with 142 million devices used by its 23 million citizens.

Much of this growth in traffic will be generated by video. The gigabyte equivalent of every film ever made will cross the global internet every 3 minutes by 2016 - equivalent to two years of video every second - with 91 hours of video transferred every second in Australia alone.

While Australia's NBN will boost average capacity up to 36 megabytes per second, Australia's broadband speeds will still be dwarfed by those enjoyed in South Korea and Japan, which will see increases from 23 to 82 Mbps and 16 to 61 Mbps respectively. India will also open new opportunities amongst its vast population with a 4.2 fold increase in average speed from 1.5 to 6 Mbps. 74% of the world will enjoy 5 Mbps download speeds in 2016, with 44% having at least 10 Mbps.

Wireless traffic will account for 61% of the total traffic, with worldwide mobile data traffic increasing 18 fold by 2016 and 14 fold in Australia, due to its higher starting base, to 119.3 petabytes per month. There are already 30 countries in the world with more mobile subscribers than electricity customers, and global mobile data is growing four times faster than fixed connections. In 2011, about a fifth of this mobile data was video streamed to phones or tablets, a percentage which is projected to rise to 86% by 2016.

Fixed wifi connections will also boom, accounting for 51% of the global total in 2016, compared to 39% for fixed wired connections and 10% for mobile data. New generation 'ultrabooks' are already dropping their fixed Ethernet port. Cisco predicts that most telecoms will offer wifi and licensed connections to service ubiquitous smartphones, tablets and slim laptops without physical connections. Average traffic per smartphone will increase from 150 MB per month in 2011 to 2.576 GB in 2016, while the percentage of data derived from the Cloud and streamed to mobile devices will increase from a third to two thirds of the total.

Australia ranked fourth in a recent survey by the Asia Cloud Computing Association assessing international Cloud capabilities over ten indices. Although the NBN will

ameliorate them to some extent, Australia's relative weaknesses in broadband speed and international connectivity create issues of latency. Quality of service will become ever more crucial in the future, given that two thirds of mobile data will be sourced from the Cloud in less than five years.

Mr Bloch also stressed the need to increase upload speeds to match download speeds as more people become producers of content as well as consumers. He urged the creation of fibre networks to handle the growth in streaming home video. He argued that servers would increasingly be rented as a service from telecoms or new service providers with variable, rather than fixed, pricing terms.

He closed with an observation made by former President Simon Peres of Israel in connection with the MaanTech project, which worked with nearly two dozen multinationals to provide high-tech training and jobs for Arab Israelis. Mr Peres hailed "a second industrial revolution…of personal production" which, without bloodshed or coercion, was proving the most successful the world has seen.

In subsequent questions, one speaker criticised the asymmetry of current broadband plans and urged a focus on the "practical delivery of good, symmetrical bandwidth". He confirmed the potential of the NBN's higher upload speeds to allow individuals and companies to become competitive producers of services and content on the global stage.

Mr Bloch emphasised the importance of new fibre networks to deliver high upload as well as download speeds and reiterated the need for latency issues to be addressed to allow real-time video-conferencing.

Another participant warned that similar predictions of economic transformation had been made in the failed dot-com boom of 1999, albeit led by commercial firms rather than government investment, and asked what was different this time.

Mr Bloch observed that the previous bubble had burst through its lack of revenue-generating business models, while today's internet businesses can be highly profitable. Multichannel retailers, for example, are thriving while bricks and mortar stores struggle to survive. Australian retailers are not suffering from the high value of the dollar or the GST, but through online competition they must either join or surrender to, as market protection from internet outlets is both technically impossible and economically undesirable.

Mr Bloch reiterated the need to accelerate the creation of symmetrical and affordable broadband and mobile networks to help Australian businesses adapt and thrive in the new international internet-based marketplace. He also underlined the importance of education for Australian businesses, which have been slower than some around the world to realise the need for change. If they do not embrace the new paradigm, they will be destroyed by it, as "business as usual" is no longer an option. He urged attendees to remember that the point is not the technology in itself so much as what the technology enables.

Keynote presentation
Senator Stephen Conroy MP

Senator Conroy thanked the speakers and attendees before noting that although many forums have focused on either the Cloud or the NBN over the last 18 months, this was the first to consider their joint potential. He characterised them both as transformational technologies delivering unprecedented flexibility, efficiency and opportunity to users, and emphasised their combined force in driving Australia's future.

Although Cloud computing is "many things to many people" and covers a range of different services and business models, they all involve links to remote software, platforms, infrastructure and storage and promise users lower costs and greater scalability, security and flexibility than such users could provide for themselves.

Pointing to Australia's high ranking in the Asia Cloud Index in regard to regulatory settings, power grid quality, and data protection, Senator Conroy said Australia was ready to take advantage of NBN-enabled Cloud computing and pursue growth and competitiveness in the global digital economy. He appealed for the support of the business and service community in harnessing its potential, given that the NBN would have commenced or completed construction for 758,000 premises by the end of 2012. He underlined the importance of building a vibrant digital economy to ensure future prosperity, rather than fall back into stagnation and rely on the current mining boom. He highlighted online service delivery improvements in education, health and aged care driven by the Government's adoption of modern e-solutions, and argued the NBN and Cloud computing could also improve local government service delivery and community engagement. DBCDE has recently announced $5 million in grants to help 14 more local governments take advantage of the NBN.

In addition to the Government's ongoing consultations with stakeholders, Senator Conroy praised the work of the National Standing Committee on Cloud Computing in bringing together government, consumer, industry and business community interests to explore the issues. He confirmed the Government's commitment to participating in international Cloud standard formation.

Senator Conroy underlined the need to communicate the Cloud's advantages to small businesses and support their transition where required. He accepted that recent research by KPMG, commissioned by the Australian Information Industry Association (AIIA), had revealed the penetration and adoption of mature Cloud solutions to be low across many sectors, with many businesspeople still viewing it as an interesting concept, rather than a productive reality. He urged greater collaboration between the industry and government to "remove the Cloud from the abstract" by highlighting examples of its benefits to those who remain to be convinced.

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He acknowledged the risks of Cloud computing, but believed these could be appropriately managed and should be balanced against the risks of not gaining their benefits. A small business which fails to transition to the Cloud will have to spend more on its own IT systems and software, while a Cloud vendor can often provide higher standards of security. The advantages extend beyond the purely financial, with Cloud solutions offering greater business agility and opportunities for collaboration to help new products and services to reach the market faster. Cloud solutions will benefit both individual small businesses and the nation as a whole and directly increase employment through new data centres and service companies. A recent report for Microsoft estimated that 8.8 million such jobs will be created around the world over the next four years.

The Cloud and NBN will not only help create jobs, but in combination they will change the way many Australians work. The NBN will allow Cloud computing to become universally accessible, which in turn will prompt new business models for SMEs and facilitate the rapid take-up of teleworking. Senator Conroy believed the Cloud and the NBN may provide the centrepiece of the workplace of the future, creating a "work-anywhere" world allowing employers to connect easily and reliably with remote employees, stakeholders and clients. DBCDE is working with organisations across Australia to increase awareness about teleworking through the NBN.

Senator Conroy encouraged participants to raise any concerns or identify areas which still require attention, but believed that Australia was already in a strong position and should focus on improving public perceptions and ensuring trust in the Cloud. He recognised that consumer and vendor contractual arrangements, privacy and data security concerns continued to be important issues and require ongoing commitment to resolve, but observed that although policies and protections could be put in place, consumers would judge Cloud computing by what they experience first-hand. He therefore urged the industry to ensure that the customers' Cloud experience was a positive one and underscored the importance of self-regulation to ensure customer satisfaction and reduce the need for government legislation.

He also urged improvements in the provision of information and resources, and emphasised the role which accountants, financial advisers and business efficiency professionals could play to encourage businesses to explore the Cloud. The Government is looking for industry to take the lead in establishing such collaborative relationships and hopes to work together with such stakeholders to improve the consumer experience.
In conclusion, Senator Conroy lauded the forum as a landmark event which promised a vibrant exchange of ideas and experiences on the road to a digital future.

Presentation
Brendon Riley, Telstra

Brendon Riley related his recent experiences in meeting the Northern Territory Minister for ICT. He contrasted the Minister's evident enthusiasm with the problems he had encountered while working with state departments in Western Australia in the 1980s on software to run hospitals, manage electricity grids and plan roads and traffic networks. Such projects took years to complete, cost tens of millions of dollars, required dual data centres for disaster recovery and carried a high risk of failure. Even when finally completed, they often under delivered or were obsolete by the time they were deployed.

Today's state ministers of ICT do not have to compile expensive stacks of technology, but can instead source a range of consumption-based Cloud services with built-in capital, security, backup, recovery, and integrated management. Specialised and hard-to-find skills, especially in the Northern Territory, can be supplied through the Cloud, allowing a project's risk-benefit equation to be properly managed. Government departments can switch Cloud services at relativity low cost, with alternate options expanding by the day, instead of being forced to maintain and defend an unpopular or underperforming multimillion dollar investment unpopular with staff and the public.

Mr Riley differentiated between "IT", "Network" and "Customer" views of the Cloud. The IT perspective sees the Cloud as the modern incarnation of a 1970s bureau which offered companies a massive purpose-built internal IT environment to consolidate all IT processing and usage within the organisation. The network view sees the Cloud as a natural evolution of long standing telephone, data packet and salient networks, while a customer focus stresses the need to service users, wherever they may be, in a convenient, pre-packaged and affordable manner which masks the great technological complexity involved.

However it is analysed, he agreed that Cloud computing was developing exponentially, with Telstra already supplying more than 13,000 business customers with virtual computing infrastructure, software as a service or self-managed Cloud portals that allowed them to manage their requirements in real time. Telstra is investing over $800 million to expand and modernise its Cloud based infrastructure, skill sets and operations and is building partnerships with Accenture, Microsoft, VMware and Cisco. Mr Riley also outlined Telstra's network intelligence services which allowed firms to buy network capability on a consumption-based model unconstrained by static network architectures.

SMEs usually seek immediate business outcomes from a single provider. Telstra's most recent business census shows that over 90% of Australian businesses have an internet connection, with 60% allowing staff to work from home and a third having workers who spend more time away from the office than inside it. More than 50% of companies use mobile broadband regularly, and two-thirds of them involve smartphones with email and internet access.

Telstra's T-Suite service is used by SMEs and not-for-profit organisations to access a variety of network-hosted email, security and office suite applications and allows them to enjoy the same cost and redundancy advantages as much larger enterprises. The Salvation Army's Employment Plus division saves about $500,000 in ICT costs through using Cloud services, for example, while improving its control over its digital assets and bolstering backup and security arrangements.

Large enterprises have proved more cautious in their take-up, having to consider existing infrastructure and unique business applications, as well as security and data sovereignty concerns. Major firms tend to take their first steps towards the Cloud by virtualising their data centre environment, implementing a degree of dedicated hosting and using it for developing and testing. Domino's Pizza, for example, use a Cloud solution which took just 8 weeks to develop, but saves them $750,000 a year and has tripled their ordering processing capacity from around 300 orders per minute to over 900. Telstra is also entering a new partnership with Australia Post to deliver a range of communications and Cloud services, including Australia Post's new digital mailbox service for utility bills and government notices.

Mr Riley reiterated the importance of network security, reliability, performance and reach in building successful commercial and government Cloud services, and was confident the NBN would further boost performance in conjunction with the Next IP core and Next G wireless networks.

He did not see a single Cloud model emerging to dominate the commercial landscape, but envisioned a hybrid approach in which an organisation's applications are drawn from various Clouds. This scenario requires seamless federation between Clouds to allow dynamic process integration, as well as scalable and intelligent networks to integrate applications, security, identity management, telephony and Cloud software.

The Cloud will become the dominant method of delivering ICT and drive more collaborative and innovative ways of working for a new generation of more integrated and adaptive business models. It is already changing the way in which Telstra itself consumes IT, with the company buying more specialised applications from smaller suppliers instead of attempting to supply all its own needs in-house. Customer expectations are also changing, with increasing demand for the immediate delivery of services and a full range of contact methods from online chat, 24/7 apps, Twitter and Facebook as well as telephone helplines. New ICT is also transforming the culture of communication between workers and managers as well as with their customers.

In conclusion, Mr Riley underlined the opportunities available to large enterprises, government agencies and small businesses in using the NBN and Cloud to improve Australia's competitiveness, productivity and service innovation. He looked forward to the day when a "Minister for National Services" might oversee the seamless, secure and

reliable delivery of a full range of public facilities from the government Cloud. During the question and answer (Q&A) session, the forum was assured that the industry realised the importance of customers receiving a seamless service, regardless of how many Cloud vendors were involved in its delivery. This will require improved techniques to federate data across Clouds around the world, perhaps through new commercial intermediaries between customer and Cloud service provider.

One speaker questioned how federations of service providers would deal with possible conflicts in the systems used in state health and education services.

Mr Riley acknowledged this as a potential problem, but pointed to the potential of more vertical integration through federated Cloud services, rather than unwieldy all-encompassing systems, such as those tried in the British National Health Service.

Another speaker pointed to the tension between Cloud solutions operating in a borderless world and national governments attempting to protect the security and sovereignty of sensitive national data.

Mr Riley agreed that some data would not be amenable to full Cloud solutions for this reason, but that degrees of federation between Clouds could balance ease of access with security as required.

The following speaker asked what steps Telstra was taking to help SMEs embrace Cloud technology. She believed that SMEs needed personal guidance rather than booklets, internet pages or warnings of imminent doom to encourage their take-up of modern ICT.

Mr Riley acknowledged that much work remained to be done, as almost half of Australia's businesses did not have an online presence, but said that many companies were looking to the Cloud to reduce the costs and burdens of running their own IT. He said Telstra prioritised customer service when dealing with the Cloud and related issues.

Session One Key Findings

- The world is in the midst of an **unprecedented transformation** driven by digitisiation and connectivity. This will have a profound and potentially disruptive impact on every industry, opening new opportunities and leaving some traditional industries behind.

- The penetration and adoption of mature Cloud solutions in Australia remains low across many sectors, with many businesspeople still viewing it as an interesting concept, rather than a productive reality. **A greater collaboration between the industry and government** is required to "remove the Cloud from the abstract" by highlighting examples of its benefits to those who remain to be convinced.

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- Consumers will judge Cloud computing by what they experience first-hand. The industry needs to **self-regulate** to ensure customer satisfaction and reduce the need for government legislation. The Australian Government is looking for industry to take the lead in establishing such collaborative relationships and hopes to work together with such stakeholders to improve the consumer experience.

- Australia ranked fourth in a recent survey by the Asia Cloud Computing Association assessing international Cloud capabilities over ten indices. Australia's relative weaknesses in broadband speed and international connectivity create **issues of latency**, although the NBN will ameliorate them to some extent.

- Quality of service will become ever more crucial in the future, given that two thirds of mobile data will be sourced from the Cloud in less than five years. Australia needs to accelerate the creation of **symmetrical and affordable broadband and mobile networks** to help Australian businesses adapt and thrive in the new international internet-based marketplace.

- The NBN will allow Cloud computing to become universally accessible, which in turn will prompt new business models for SMEs and facilitate the rapid take-up of **teleworking**. The Cloud and the NBN may provide the centrepiece of the workplace of the future, creating a "work-anywhere" world allowing employers to connect easily and reliably with remote employees, stakeholders and clients.

- Cloud solutions will benefit both individual small businesses and the nation as a whole and directly **increase employment** through new data centres and service companies. A recent report for Microsoft estimated that 8.8 million such jobs will be created around the world over the next four years.

- Servers will increasingly be rented as a service from telecoms and new Cloud service providers with variable, rather than fixed, pricing terms. As more people become producers of content as well as consumers, **upload speeds need to be increased to match download speeds**. Fibre networks will have to be created to handle the growth in streaming home video, while latency issues need to be addressed to allow real-time video-conferencing.

- It is unlikely that a single Cloud model would emerge to dominate the commercial landscape. A **hybrid approach** will allow an organisation to draw its applications from various Clouds. This scenario requires seamless federation between Clouds to ensure dynamic process integration, as well as scalable and intelligent networks to integrate applications, security, identity management, telephony and Cloud software.

- A new portfolio of the **Minister for National Services** might be created to oversee the seamless, secure and reliable delivery of a full range of public facilities from the Government Cloud.

- With Cloud solutions operating in a borderless world and national governments seeking to protect the security and sovereignty of sensitive national data, it is acknowledged that **some data will not be amenable to full Cloud solutions**. However, degrees of federation between Clouds can balance ease of access with security as required.

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Session Two

The risk in the Cloud versus the risk out of the Cloud
Nick Abrahams, Norton Rose

Mr Abrahams said customers were becoming increasingly comfortable with the oft cited legal and security risks of the Cloud. Marketing and other departments in major firms are now bypassing their own IT sections and seeking quick and cost effective Cloud solutions to problems, which traditional in-house solutions would find too expensive, slow or cumbersome to implement.

He offered the examples of a large Australian logistics company and a financial services firm which have moved almost all their operations into the Cloud, including core and mission critical activities, with the blessing of regulators. The cost savings and competitive edge offered by the Cloud will continue to encourage its adoption, with much of the pressure coming from adventurous employees who already appreciate its benefits in their personal lives outside the office. Mr Abrahams acknowledged that Cloud services did have their risks, but argued that these were little different to the problems firms and individuals successfully managed when using any modern ICT.

He itemised five risk areas, the first of which was the transparency of the arrangement between service provider and customer. Although the customer may be dealing with a single service provider, their data may be distributed, processed and stored on underlying infrastructure owned and operated by a host of other companies, none of which have a direct relationship with the customer or are known to it. If one of these suppliers fails, for whatever technical or financial reason, then the service or data could be at risk with little recourse or support for the customer. However, these issues are similar to those of any large-scale procurement of technology involving a head contractor subcontracting out supplies and services to a host of other companies. The key is to ensure that the due diligence expected in other contracts and arrangements is also applied to the Cloud.

Customer trust in the vendor is vital, whether it is generated by brand recognition, personal recommendation or satisfactory experience. Customers will rely on their Cloud service vendor to ensure that their subcontractors are reliable and have appropriate disaster recovery arrangements. Alternatively, companies might outsource the service to a third party offering a guaranteed and bespoke solution, albeit at a higher cost.

The second risk is vendor or technology lock-in, a problem also faced when using proprietary software or equipment in-house. This can be mitigated through discussions with the vendor before a contract is signed to ensure that the relationship can be terminated to the satisfaction of both parties as required, with the data released back to the customer at will. The retrieval of data should also be tested at regular intervals to ensure that the measures in place actually work.

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Practical deployment issues must also be considered, as several high-profile Clouds have collapsed or been withdrawn from service in the recent past. Once again, this risk is no different to that of any large scale technology deployment and, for major companies at least, such risks can be mitigated through negotiating service levels and key performance indicators with penalties for failure to perform. Although small businesses are usually offered standard contracts, often governed by US law, such requirements are little different to those experienced in other areas such as software licenses which are habitually used without problems.

Security and privacy can be seen as two different issues. Rather than being a security risk, major Cloud providers can afford far more sophisticated security arrangements than companies could maintain in-house, while in terms of privacy vendors should be transparent about the circumstances under which the data could be shown to a third party. Firms requiring a high level of security, such as financial services companies, could achieve this through using, rather than avoiding, Cloud solutions, while other firms will be able to increase their previous levels of security through using the Cloud.

Finally, Mr Abrahams spoke about regulatory and compliance issues, particularly the export of sensitive data outside Australia. He urged government departments and other potential customers to consider which types of data could be safely stored overseas and which, due to Australian privacy principles, legislation or interorganisational rules, must be hosted within the organisation or country. He believed the concept of data classification would be embraced by financial services regulators, given that the Australian Prudential Regulation Authority (APRA), after initial hesitation, has increasingly sanctioned Cloud solutions. Organisational data should not be treated as a homogeneous entity, but clearly differentiated between highly sensitive data which should not leave the company, less sensitive information which can be stored in Australian Clouds, and non-sensitive data which could be processed or stored overseas as required.

He downplayed the significance of the US Patriot Act, which gives the US Government intelligence agencies the right to investigate data held by US providers for reasons of national security. The Australian government would have a very different risk profile in this regard to an ordinary Australian business. At least one large Australian bank has examined the risk and is comfortable with it.

In summary, Mr Abrahams believed that people within organisations, rather than IT departments themselves, would increasingly push organisations towards Cloud solutions, particularly in not-for-profit and small business organisations without access to major computing resources. He acknowledged that Cloud solutions carried a degree of risk, but that these were similar to those managed in any use of technology and outsourcing, rather than novel or particular to the Cloud. He did not believe that Australia could say "no" to the Cloud and predicted that its use would soon sweep through businesses, banks and government. One forum participant asked to what extent customers should be informed about how their data was handled, particularly in regard to the US Patriot Act or privacy breaches.

Mr Abrahams repeated his point that the Cloud posed no new issues in this regard and that if US intelligence agencies wished to access Australian consumer information, they could do so through bilateral agreements with Australia without recourse to the Patriot Act.

In response to a question about practical steps an SME should take before adopting a Cloud service, Mr Abrahams emphasised the importance of exercising due diligence and warned smaller companies that they would not be able to renegotiate the standard terms offered by most providers. Such terms and conditions should at least be read and saved for future reference before any commitments are made. He underlined the importance of trust in established brands and did not believe that SMEs should routinely resort to legal advice before using a non-critical Cloud solution, as this would erode the financial advantages of doing so. However, once a company plans to put its entire business into the Cloud or commits mission critical processes to it, then further advice from bodies such as the AIIA should be sought before making an irrevocable commitment.

Another speaker remarked on the tension between ensuring the security and privacy of highly sensitive personal information and allowing its free flow between health professionals in real time to prevent lives being lost.

Mr Abrahams agreed that healthcare data constitutes a key risk area which had been excluded from recent government-to-government discussions regarding data flow, while the Healthcare Identifiers Act 2010 imposed a blanket prohibition on the export of healthcare data under its purview. He appealed for a balance to be found between the security of personal data and its accessibility for relevant professionals and warned against confusing security with geography, as the export of data does not necessarily render it less secure. He advocated re-framing the discussion around security, rather than location, but appreciated its political sensitivities. He returned to the need for intelligent data classification to manage such issues appropriately.

One participant raised the recent closure of BitLocker storage sites by US authorities clamping down on pirated media.

Mr Abrahams agreed that although the 2011 Stop Online Piracy Act and similar proposed legislation had provoked a strong public backlash, media companies would continue to press for vigorous action against sites deemed to facilitate unauthorised file sharing.

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Small business in the Cloud

Chris Ridd, Xero
Steph Hinds, Growthwise

Chris Ridd discussed the start-up funding and history of Xero, an online accounting services company founded in New Zealand in 2007, which now has over 100,000 customers worldwide and over 30,000 in Australia. Underlining the international nature of the Cloud, Xero's data centre is hosted by Rackspace and based in the USA. He lamented the difficulty of reaching the small business sector en masse, given its naturally fragmented nature, but championed the productivity gains small firms could generate through adopting Cloud solutions.

Mr Ridd said most small business owners were pragmatic and would consider the Cloud if it offered a better service at lower cost than traditional IT provision. Quoting the example of a small printing firm, he revealed that 30% of Xero's small businesses clients moved straight to Cloud solutions without having used in-house computing before. His firm can offer accounting, banking reconciliation and payroll services for $49 a month and, in addition to saving money, the printing firm quoted has seen its aged debtors fall from a quarter to less than 1% of the total accounts owed. The Cloud also allows firms and their accountants to run a single ledger and allows accountants to advise clients in real time, rather than work on large blocks of information at the end of each quarter merely to ensure compliance with the law.

Mr Ridd underscored the growing importance of mobile solutions and smartphone apps which allowed small business owners to conduct their affairs while out of the office. He quoted the case of a consulting company which used Cloud services for all its requirements and spent just a tenth of the cost of traditional servers and software. This nimble approach allows the company to relocate with ease, with a car boot-full of laptops replacing the truckload of servers previously required. The Cloud also allows firms to change and scale their service requirements much more quickly and precisely than before, with trials and adoption of new software achievable in days, rather than weeks or months.

He believed the Cloud was realising a twenty-year-old dream of seamless interoperability and open systems within industry standards. He foresaw the evolution of a new eco-system of Cloud providers, with services such as Xero using an open API which other providers could plug into at will. He suggested that many businesses which began by trying a niche Cloud solution for a particular purpose would soon realise its advantages for much of their operations.

Steph Hinds recounted how her three-year-old, five member accountancy business had reduced its IT overheads by around $60,000 a year by using Xero's services. Cloud computing allows it to service firms around the country from its Newcastle base, and instead of concentrating on compliance work with quarterly accounts, means it can advise

its clients on budget, cash flow or payment problems in real time. Small businesses can slip into difficulties or even go bankrupt because they lack access to important short-term financial information regarding revenue, debts, loans and cash flows and so Cloud based solutions offering a dashboard of their current position may save not only money, but sometimes the firm itself. Cloud solutions also allow providers of accounting, legal and other services to run their business while away from the office, or even on holiday abroad, without inconveniencing their clients or losing business themselves.

She underlined the hope that Cloud based-services would allow more accountants and other professionals to concentrate on proactive business advice, rather than retrospective compliance issues, to improve their clients' efficiency and productivity. Similarly, small businesses now have access to computing power and software which would once have cost millions of dollars and been available only to much larger firms, and so can concentrate on their core business, rather than worrying about their in-house IT infrastructure.

She said her firm was working to educate businesses in Newcastle about the benefits of the Cloud, a quest bolstered by new links to the NBN. The NBN and Cloud solutions will allow her firm to employ people across Australia, rather than rely on those within commuting distance, and enable people, such as mothers with small children, who could not commit to a full schedule, to telework to their convenience part time.

She offered examples of how Cloud services allowed a furniture manufacturing company, a scaffolding firm and a young woman selling vintage clothes from home to improve their flexibility and productivity while cutting costs. Inventory and orders can now be monitored in real time from tablets and smartphones, for example, in ways which were impossible just a few years ago.

Questions from the floor raised the point that the same Cloud and broadband solutions which allowed a Newcastle-based company to service a client in Perth would allow a business in Bombay or Shanghai to do the same. Ms Hinds recognised the point, but said that Australian freelancers would also be empowered by the technology and that many Australian companies still preferred to deal with home-grown suppliers and entrepreneurs.

Asked how business could be sure that online services offered up to date information regarding employment contracts and other matters, Chris Ridd said that new companies were already specialising in these fields and that the Cloud enabled a much wider range of specialist services to be used.

Another participant affirmed that while traditional IT consumed 80% of its resources merely "keeping the lights on" and just 20% adding value, Cloud solutions offered 80% productivity with just 20% in maintenance costs. Chris Ridd agreed this meant that accountancy firms which retained their focus on traditional compliance issues would be swept away by those offering higher-value advice to their clients.
Another speaker asked if accountants needed any help in spreading the message to small

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firms. Ms Hinds replied that accountants were already 'oversold', but that an education package which explained what the Cloud was, why it could be beneficial and what kinds of sale, inventory and CRM systems were available, would enable busy accountants to facilitate the required dialogue with their clients.

Future in the Cloud

Dr Darrell Williamson, CSIRO

Darrell Williamson drew attention to the potential of the Cloud and NBN to improve efficiency and establish new business services. He explained how online services could be used to create a complex multi-sourced video clip and how trusted store devices could help tackle concerns regarding security, denial of service attacks, insecurity of data, interoperability, vendor lock-in and the ability to migrate technology.

He defined a 'trusted store device' as a Cloud storage locker, whose encryption keys were held by the customer, rather than a vendor, such as Dropbox. This would allow the customer to deposit their data with a range of Cloud providers, but retain complete control over its content, with a separate service managing those keys and therefore the integrity of the data.

Dr Williamson discussed new techniques to speed homomorphic filtering and encryption and allow work to be done on sensitive financial and other data encrypted in the Cloud. He also explained how a USB key-stick could store one's key management system to create a 'trust extension device' which would not be affected if a laptop's security had been compromised.

He was convinced that standards would inevitably emerge to facilitate greater interoperability between Clouds, but warned that deciding on standards too early might result in the wrong standards being chosen and hampering future development. In the meantime, solutions such as MediaWise can automatically find the best Cloud vendor options for any particular set of costs, storage requirements and service standards.

In discussing collaborative methods of content production and distribution management, he mentioned the development of specialised Clouds. A sensor Cloud, for example, could use "the internet of things" to capture information from web and video cameras or exploit crowdsourcing models. Dr Williamson described how this sensor Cloud might enable real-time data analysis of crop growth in a farmer's fields, with the data placed in a common repository, under appropriate conditions protecting commercially sensitive information, to generate agricultural analysis of benefit to all. Such distributed database systems would aggregate, correlate and process data in ways impossible for standard database systems to contemplate.

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The Cloud can also be used to distribute material at almost zero marginal cost to whoever wishes to consume it, rather than rely on laborious, expensive and outdated distribution methods controlled by legacy publishers and companies. Indeed, even proprietary ISP or telecom networks are no longer required, now individuals and companies can build their own content distribution networks. Independent groups can organise their own multiplicity of Cloud providers, with the technical difficulty of the operation hidden within the infrastructure, and control the end-to-end management of the content life cycle.

Session Two Key Findings

- The **cost savings** and **competitive edge** offered by the Cloud will continue to encourage its adoption. Customers are becoming increasingly comfortable with the oft cited legal and security risks of the Cloud. Marketing, accounting and other departments are now by-passing their own IT sections to find quick and cost-effective Cloud solutions, with much of the pressure coming from adventurous employees who already appreciate the benefits of the Cloud in their personal lives outside the office.

- Cloud solutions are particularly attractive to **not-for-profit and small business organisations** without access to major computing resources. Most small business owners are pragmatic and will consider the Cloud if it offers a better service at lower cost than traditional IT provision.

- Cloud based-services allow **accountants** and other professionals to concentrate on proactive business advice, rather than retrospective compliance issues, to improve their clients' efficiency and productivity. Accounting firms which have already embraced the Cloud, can champion Cloud solutions to their clientele. **An education package** explaining the benefits of the Cloud and what kinds of sale, inventory and CRM systems were available would enable busy accountants to facilitate the required dialogue with their customers.

- Issues of privacy, data security, vendor lock-in, practical deployment, service standards and interoperability with legacy systems are not novel and in many ways similar to those posed by any adoption of technology or outsourcing.

- Cloud solutions tend to increase, rather than imperil, **data security**, given the greater expertise and resources of major Cloud vendors who can afford far more sophisticated security arrangements than those companies could maintain in-house.

- **Customer trust** in the vendor is vital, whether it is generated by brand recognition, personal recommendation or satisfactory experience. The **due diligence** expected in other contracts and arrangements must be applied to the Cloud. SMEs should not necessarily resort to legal advice before using a non-critical Cloud solution, as this would erode the financial advantages of doing so. However, once a company plans to put its entire business into the Cloud or commits mission critical processes to it, further advice from bodies such as the AIIA must be sought before making an irrevocable commitment.

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- **Standards** will inevitably emerge to facilitate greater interoperability between Clouds. However, deciding on standards too early might result in the wrong standards being chosen and hampering future development. In the meantime, solutions such as MediaWise can automatically find the best Cloud vendor options for any particular set of costs, storage requirements and service standards.

- The concept of **data classification** should be embraced by regulators, following the example of APRA which, after initial hesitation, has increasingly sanctioned Cloud solutions. Organisational data should not be treated as a homogeneous entity, but clearly differentiated between highly sensitive data which should not leave the company, less sensitive information which can be stored in Australian Clouds, and non-sensitive data which could be processed or stored overseas as required.

- **Healthcare data** constitutes a key risk area which has been excluded from recent government-to-government discussions regarding data flow, while the Healthcare Identifiers Act 2010 imposes a blanket prohibition on the export of healthcare data under its purview. A balance needs to be found between the security of personal data and its accessibility for relevant professionals. Security should not be confused with geography, as the export of data does not necessarily render it less secure. The discussion need to be reframed around security, rather than location. Intelligent data classification will help manage such issues appropriately.

- **The US Patriot Act** gives the US Government intelligence agencies the right to investigate data held by US providers for reasons of national security. The Australian government would have a very different risk profile to an ordinary Australian business. The Cloud poses no new issues in this regard. If US intelligence agencies wished to access Australian consumer information, they could do so through bilateral agreements with Australia without recourse to the Patriot Act.

Panel Session

Cloud Futures: Trends and Technologies

Dr Dean Economou
Dr Anna Liu, NICTA

Dr Dean Economou explained the role played by NICTA, Australia's largest ICT research organisation, in developing new ways to create wealth and cut costs through improved software systems and hardware infrastructure. NICTA partners with East Coast universities, engages with individuals and industries across the country and receives around $80 million every year in government funding.

He argued that while exports in the physical economy could consume vast amounts of resources, digital exports used relatively few. ICT accounts for just 2% of the planet's energy consumption while generating economic benefits out of all proportion to its demands. The growth of digital companies can be extremely rapid and global in scope, as there are no physical boundaries to the export of its services. For example, the commercial plane manufacturer Boeing was founded almost a century ago and is now worth $50 billion, while Google, founded 15 years ago, is worth four times as much.

Growth in the digital economy is infinitely scalable, and has almost infinite potential as its use of resources is so low. Indeed, it may soon overtake the size of the traditional economy. Digital technology also has great potential to optimise the operations of physical operations such as traffic flows with the promise of smart solutions for water, energy and cities already commonplace.

He identified "bandwidth everywhere" as the raw material required to feed the digital economy and affirmed the need for pervasive coverage, through the NBN and 4G mobile networks, as well as improved broadband speed. He said that interfaces between the real and virtual realms - cameras, screens and audio devices - must also be cheap, reliable and trustworthy.

Given that the digital economy will become an inescapable reality, it should be embraced, rather than feared. Dr Economou praised Xero for exemplifying the possibilities of the new economy in building a business from a web browser. He offered another example in the form of Zenith, a Melbourne company which offered turnkey solutions for businesses to run themselves in a web browser, without worrying about software licenses, equipment purchases or IT administration. As previous speakers have observed, such services not only drastically cut business IT costs, but allow firms to be run from anywhere, from Hobart to Hawaii, with pervasive, high-speed broadband.

Dr Economou traced the development of business computing from mainframes through client servers to outsourced data centres in the Cloud. He saw this evolution as a product

of the relative costs of transferring, storing and processing information, with the choice of solutions often determined by the cost of managing the whole. Data must also be easily transferable across different providers, and Dr Economou warned that current barriers to porting information reduced the degree of effective competition between vendors, such as Amazon, Rackspace, Azure, Ninefold and OrionVM. As the performance of data in the Cloud must match or surpass the metrics achievable by traditional means, he urged the creation of simulations to prove the claimed performance gains and so encourage take-up.

Finally, he flagged the potential of predictive analysis based on the vast amounts of data collected by the myriad sensors of "the internet of things". He underlined the interest of NICTA in machine learning in which software which examined patterns in past data could use its findings to predict results in the future.

Dr Anna Liu said NICTA was also producing a range of technologies to help a much larger set of companies streamline their transition to the Cloud. These techniques will help firms choose an appropriate Cloud solution, migrate effectively, control costs and also manage service level agreements and Cloud use by employees.

One flagship product, known as *Bolt*, uses Cloud technology to enable disaster recovery by taking automated snapshots of a company's system and replicating that data in other parts of the world more cheaply, quickly and comprehensively than traditional back-up and mirroring methods can achieve. Another tool, *Monitor*, provides an opportunity for companies to manage their IT assets and system health across a number of different Clouds, allowing informed decisions to be made to optimise deployments, while *Compare* helps chief financial officers and chief information officers make accurate forecasts of their company's likely operational usage of a Cloud.

Dr Liu's final example, *Trim,* helps IT professionals run applications in a Cloud more economically by ensuring that resources are switched off when idle.

Dr Liu invited attendees to study these and other applications and welcomed expressions of interest as beta trial customers.

One contributor questioned the lingering assumption that Australia needed to build its own data centres and related infrastructure to take advantage of the Cloud, rather than develop services which it could market around the world using Cloud technology.

Dr Dean Economou agreed that infrastructure should be built and used where it was proved most profitable and efficient. This means that Australian firms doing business with American clients might host that data in the United States, but also that the Australian government might host sensitive information domestically. He believed Australia could also host specialist data centres.

Dr Anna Liu reminded the meeting of the overall dangers of not innovating as a nation.

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Breakout Session Summaries

"What are the challenges and barriers of adoption to Cloud services, particularly for the small business and not-for-profit sectors?

Speaker: Liam Fraser, Optus
Facilitator: Darren Alexander, Autech Software & Design
Presenter: Dave Abrahams, Youth Connections

Lisa Middlebrook introduced the panel debriefing session, in which representatives from three participant groups reported back on their discussions.

Dave Abrahams, chairman of Youth Connections, said his panel had focused on the implications of the Cloud and NBN for SMEs and the non-profit sector. The first point the group had underlined was the need for education. "Digital Ready" research by Optus showed that 59% of SMEs are still unsure what Cloud computing is and only 4% currently use Cloud services.

Industry groups, such as builders groups and plumbers associations, should be engaged to encourage their members to use the Cloud were appropriate, as industry-specific messages are more likely to be noted than broad exhortations from government or self-interested industry vendors.

The group also believed that simpler and clearer pricing plans for Cloud services would encourage their take-up, as existing terms and conditions often resemble impenetrably complex mobile phone plans. The simple message that Cloud services offer more capability for less money should therefore be targeted at each specific sector.

Encouraging SMEs to adopt Cloud solutions with the message that their competitors were already cutting their IT costs in half by doing so could also prompt action, particularly at the end of a company's IT investment cycle. The opportunities to transform and improve a business by moving administrative and other services online, rather than continue to pay more for business as usual, should be emphasised.

Finally, the group urged consideration of an approach which sold the benefits of the Cloud without using the term itself, as that tended to raise doubts in the minds of potential customers. They believed the roll-out of the NBN would do much to boost business confidence and spur the growth of regional digital economies.

"What are the opportunities and challenges for federal, state and local governments in moving to Cloud based services?"

Speaker: Craig Baty, Fujitsu
Facilitator/Presenter: Heather Tropman, Macquarie Telecom

Heather Tropman of Macquarie Telecom said her session had focused on the opportunities and challenges for federal, state and local government. She agreed with points made in Senator Conroy's address that appreciation of the possible risks of Cloud use should not deter firms from reaping the many benefits of scalability, security, market agility and collaboration. The group had agreed that different sectors were adopting Cloud services at different rates, but that the biggest risk of all would be to miss out on the opportunities it offered.

Her group had urged the "myth busting" of fears over Cloud security, as major Cloud providers, such as Microsoft, Amazon, Fujitsu and Macquarie Telecom, had far greater resources to ensure the security of data than all but the largest corporations could provide for themselves.

Secondly, Ms Tropman underlined the need to differentiate between different types of data. Defence data, for example, might well have to be securely stored within Australia, while information pertaining to a state school reading program could easily be stored and processed overseas. She cited recent legislation which mandated the storage of personal health records in Australia as evidence that the Government was taking this point on board.

Thirdly, issues of in-house job losses were raised, with IT specialists in government and business fearing for their positions whenever Cloud transitions were mooted.

Cross-border data issues were also a topic of debate, with the US Patriot Act and the privacy risks of holding data offshore still concerning some businesses despite many industry and legal specialists believing that such issues have been "played out".

The group suggested the Government adopt public and transparent rules about its classification of data, rather than have a hidden or blanket approach to holding data offshore. Some highly sensitive data, such as visa applications, inevitably straddles more than one country, while local health data may always be stored domestically. Such a framework would not only help the Government assess risk more effectively, but mollify public concern and help vendors and industry to respond to that need.

Whatever the discussions about the US Patriot Act or Australian privacy legislation, the Cloud is global by its very nature. Safe harbour approaches might be a first step towards driving standardisation around the world, as countries such as Canada and supra-national

bodies such as the European Union have broadly similar approaches and could be liaised with in the first instance. Ms Tropman also emphasised the need for Australia to play a positive role in framing Cloud international conventions.

She made clear that different approaches would have to be adopted by governments and departments at the local, state and federal level. As urged by Senator Conroy, the group believed the vendor community should also play a more prominent role in improving business awareness, as there was still a surprising amount of confusion among potential customers of the definition of the Cloud and its uses.

"How can better outcomes for consumers,
particularly through improved access to health and
disability services, be delivered by the adoption of
Cloud-based services?"

Speaker: Dr Scott Hollier, Media Access Australia
Facilitator/Presenter: Graeme Innes, Australian Human Rights Commission

Graeme Innes of the Australian Human Rights Commission said his group had considered the nature of a possible trial project. He called attention to the role that modern technology could play in addressing disability issues, suggesting, for example, that a teacher's words to a class might be captured and close captioned in real time on tablet devices for students with hearing problems. Patients with disabilities might also undertake health assessments via NBN-facilitated video links, to spare the expense and inconvenience of travel, and find new employment possibilities through telework.

The group brainstormed a trial, possibly entitled *My Access*, relevant to older Australians and people with health issues as well as those living with disabilities. The trial would involve a common interface for all devices and might lead, for example, to every bus stop and train station having NBN access to offer comprehensive public transport information, given that RailCorp do not give consistent announcements at stations. Alternatively, the trial could focus on telehealth or human services delivered through Centrelink and be used for reporting for the National Disability Insurance Scheme. The trial should be middleware, situated in a web browser between government and the user. It should also have an access profile which recognised the needs of the users and, if required, offer output through speech, rather than on a screen. Such a device would also offer lower on-screen access buttons to people in wheelchairs, while for the deaf it would focus on text delivered on screen. It could also include translation services, including Auslan.

The group suggested that the government donate a prize, run a competition or have TAFE students develop the trial. Its results would also produce advantages for the able bodied community, just as ramps designed for wheelchair access were often helpful to able bodied people wheeling loads.

Where to now?

Panel Discussion

Lisa Middlebrook then welcomed Keith Besgrove of DBCDE, journalist Brad Howarth and Greg Stone of Microsoft to join David Abrahams on the stage to discuss the concepts raised during the forum and outline future directions.

Keith Besgrove said the forum had underlined the need for Australia to play an active role in setting international standards. He said that the Australian Government Information Management Office (AGIMO) and DBCDE were already working closely with Standards Australia and a number of industry figures to elevate Australia's participation in the relevant bodies. He also praised the efforts of Rob Forsyth, Dr Nick Tate of the Australian Computer Society, industry colleagues and the Australian Communications Consumer Action Network in examining whether voluntary codes of conduct could be developed for Cloud service providers in Australia. Such a code would buttress public confidence and reduce pressure on the Government to regulate.

DBCDE is currently engaged in a series of trials of NBN technologies in healthcare, education and local government, and these trials are increasingly embedding Cloud computing into service provision. Mr Besgrove believed that the combination of high-speed connectivity delivered by the NBN and a broad range of Cloud services constituted a significant opportunity for Australia's economy and society as a whole.

Dave Abrahams expressed his passion for regional enterprise and affirmed that many innovations were occurring outside the major metropolitan centres. He also believed that not-for-profit organisations were particularly active in their search for Cloud solutions, given their limited resources. He underlined the boost in confidence which announcements of NBN services can engender among regional enterprises, quite apart from their practical advantages when they arrive. He emphasised the boost to local business confidence in Coffs Harbour and Port Macquarie, for example, with local firms now viewing the world as their marketplace.

Brad Howarth asserted the need for urgency in Cloud discussions and decisions. It is a revolution that is already well underway, and the same structural adjustments which saw the music industry overturned and online competition from Amazon and others destroy book sellers Borders will be repeated in many other industries in the short and medium term.

He accepted that his own newspaper industry faced the same changes as part of a wider and ongoing structural realignment. These changes require immediate planning for new skills and jobs if the future is not to prove bleak for those left behind. Echoing the observation of Simon Peres, Mr Howard stressed that this revolution was happening everywhere at the same time, unlike Britain's industrial revolution, or the agrarian revolution in the fertile crescent which began around 8,000BC and took thousands of years to spread around the globe.

Australia has a limited window to capitalise on these new opportunities before it is overtaken by the efforts of billions of other people around the world. Mr Howarth reminded the forum that Australia enjoys no inherent cultural or educational advantages which will underpin its plans to provide services to the rest of the world. India alone produces around three quarters of a million newly qualified engineers a year, and fast developing new economies are driven by bright entrepreneurial people with whom Australia will be competing in a global market place.

He urged attendees to broaden the discussion and engage with other industry associations, propagating the message, delivering case studies and educating the rest of the Australian society about the benefits of the Cloud.

Greg Stone emphasised the potential of the NBN and the Cloud to change how people engaged with technology, as well as its obvious potential to increase business efficiency and reduce IT costs. He offered the example of Booko.com, an Australian company whose aggregation service allowed customers to pick the cheapest way to buy any particular book from a full range of domestic and international sources. Apps will soon be developed for smartphones which will immediately provide similar information for any book seen in a book store or library, recognising the book by its cover, rather than its barcode or ISBN. Mr Stone said people would interact in increasingly sophisticated and yet ever more casual ways with media in the real and digital world, seamlessly blending the two through technology, and this would fundamentally change the way people worked and lived their lives.

During the Q&A, one speaker remarked on the irony of newspapers, which existed to find out about the world and opine on how best to run every aspect of it, being caught "on the hop" by the technological transformation sweeping across it. He believed the potentially swift and stressful changes facing Australia's economy and society could be prepared for, through education and discussion, not least through peer groups talking to each other, rather than being lectured by the Government or industry professionals.

Brad Howarth offered the Australian Government's Broadband Champions programme as a step in the right direction, and recounted how Steph Hinds' company Growthwise had successfully encouraged clients to embrace the Cloud. In contrast, he argued if he wrote a case study as a journalist of how a particular business had successfully adapted to technological change through the Cloud, it would inevitably be placed in the IT section of a newspaper and read only by people interested in IT, rather than small business people and managers who might actually benefit from its conclusions. He agreed that the newspaper industry had simply ignored the predictions of the technology journalists writing for them, particularly after the crash of the initial dot-com boom. He said newspapers had profited for decades from classified advertising revenues and had seen little reason to heed the warnings of a handful of internet advocates until that bedrock business vanished almost overnight.

Australia should learn from countries such as India, China and the Philippines, which appear willing and able to reshape their entire economies. Australia should also engage

with these and other regional players to shape regional and global developments. Mr Howarth foresaw the increasing erosion of national boundaries, and perhaps the concept of nationalism itself, given the global nature of the internet, with companies in Australia employing teleworkers in Manila and Bombay, and vice versa. The whole notion of what constitutes an Australian business will change when many of its teleworkers do not hold Australian passports.

Another forum participant said the concept of being online was becoming meaningless, as more and more people carried devices which were connected all the time. She observed that while manufacturing and service industries had already been transformed, government, as yet, had been generally unaffected.

Greg Stone agreed that "always online" devices are changing the concept of the internet being a repository of published pages to be visited for discrete lengths of time. Small, focused mobile apps are transforming how people interact with businesses, the web and each other. Modern devices synchronise data across the Cloud, allowing people to access their information on any device at any time, and such seamless convenience will inevitably spur demands for government services to follow suit.

Another participant agreed that people wanted instant and ubiquitous connectivity with each other, rather than to visit a range of curated and relatively static internet sites. He hoped that optimism and an entrepreneurial spirit would ensure these developments had major positive impacts - and begin to bypass government itself. He offered a global child support network *Big Ones Little Ones* as an example of what could be achieved.

Lisa Middlebrook thanked the panel and Keith Besgrove and his team for their contributions to the forum. She paid tribute to the day's speakers and praised attendees for their participation before handing over to Abul Rizvi to close the event.

Abul Rizvi saluted the broad range of ideas aired at the forum and explained how DBCDE intended to progress matters. The Department will undertake a stocktake of government and industry actions already in place, incorporating feedback from forum participants as to the success of these initiatives, to produce a ministerial brief and set priorities for further consultation and action. Mr Rizvi reminded the audience that the 2010 forum *Realising Our Broadband Future* had been followed by the National Digital Economy Strategy and $180 million of government support, and invited attendees to email him with suggestions and ideas.

He expressed his gratitude to Graeme Innes for his trial proposal, and to CSIRO, NICTA, IBES and staff from the Department of Broadband for their contributions to the day. He then thanked the team from Global Access Partners for organising and running the event and drew the forum to a close.

Panel Session Key Findings

- The new digital economy is infinitely scalable, has unbounded potential and may soon overtake the size of the traditional economy. Pervasive high-broadband coverage, through the NBN and 4G mobile networks, is crucial, while interfaces between the real and virtual realms - cameras, screens and audio devices - must also be cheap, reliable and trustworthy.

- Data must be easily transferable across different providers. Current **barriers to porting information** reduce the degree of effective competition between vendors, such as Amazon, Rackspace, Azure, Ninefold and OrionVM.

- The **performance of data** in the Cloud must match or surpass the metrics achievable by traditional means. Cloud take-up can be encouraged through the creation of simulations to prove the claimed performance gains.

- Cloud will unlock the potential of **predictive analysis** based on the vast amounts of data collected by the myriad sensors of "the internet of things".

- NICTA is producing a range of technologies to help companies streamline their transition to the Cloud. Applications such as NICTA's *Bolt, Monitor, Compare* and *Trim* help businesses choose an appropriate Cloud solution, migrate effectively, control costs and manage service level agreements and Cloud use by employees.

- Building **data centre infrastructure** in Australia should be driven by considerations of profitability and efficiency. Australian companies doing business with American clients might host that data in the US, while the Australian Government might host sensitive information domestically. Australia can also host specialist data centres.

- Different sectors are adopting Cloud services at different rates, but the biggest risk of all would be to miss out on the opportunities the Cloud offers. **Small business** and **not-for-profit** in particular need to be educated. "Digital ready" research by Optus showed that 59% of SMEs are still unsure what Cloud computing is and only 4% currently use Cloud services. The term "Cloud" itself tends to raise doubts in the minds of potential customers. Industry groups, such as builders groups and plumbers associations, should be engaged to encourage their members to use the Cloud were appropriate. **Simpler and clearer pricing plans** for Cloud services will encourage their take-up, as existing terms and conditions often resemble impenetrably complex mobile phone plans.

- The Government should examine adopting public and transparent rules about its **classification of data**, rather than have a hidden or blanket approach to holding data offshore. Some highly sensitive data, such as visa applications, inevitably straddles more than one country, while local health data or defence data may always be stored domestically. Such a framework would help the Government assess risk more effectively, reassure public concerns and help vendors and the industry to respond.

- Modern technology can play a key role in addressing **disability issues**. A government trial of a common middleware interface, focusing on disability issues in travel, education or health, possibly entitled *My Access*, could be driven by a prize, competition or the involvement of TAFE students.

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- Australia must play a positive role in framing **Cloud international conventions** and actively participate in setting **international standards**. Safe harbour approaches might be a first step towards driving standardisation around the world, as countries such as Canada and supra-national bodies such as the European Union have broadly similar approaches and could be liaised with in the first instance.

- Australia has no inherent cultural or educational advantages which will underpin its plans to provide Cloud services to the rest of the world and has a limited window to capitalise on new digital opportunities before they are grasped by its competitors. It must learn from countries such as India, China and the Philippines, which appear willing and able to reshape their entire economies. It should also engage with other regional players to shape regional and global developments.

- The Cloud is global by its very nature, and the increasing **erosion of national boundaries** will lead to Australian companies being able to employ teleworkers in Manila and Bombay, and vice versa. The whole notion of what constitutes an Australian business will change when many of its teleworkers do not hold Australian passports.

- Although manufacturing and service industries are being transformed by the Cloud, **government**, as yet, has been generally unaffected. The seamless convenience of modern mobile devices synchronising personal data through the Cloud will inevitably spur demands for government services to follow suit.

- **Voluntary codes of conduct** should be explored and encouraged to underpin public confidence and reduce pressure on the Government to regulate.

Participating Organisations

- 21 think
- ACCC
- Advent Group
- AGIMO, Department of Finance and Deregulation
- AGW Consulting
- Alphawest
- Amazon Web Services
- ARC Centre of Excellence in Policing and Security
- ArgyStar.com
- Ashurst Australia
- AUSLAN
- Australia Post
- Australian Business Foundation
- Australian Centre for Broadband Innovation
- Australian Communications and Media Authority (ACMA)
- Australian Communications Consumer Action Network (ACCAN)
- Australian Computer Society
- Australian Financial Review
- Australian Human Resources Institute
- Australian Information Industry Association (AIIA)
- Australian Institute of Criminology
- Australian National Consultative Committee on e-Health
- Australian Taxation Office
- Brighton Council
- BT Global Services Australasia
- Budde Communication
- buroserv Australia
- Business Success Group
- CA Australia & New Zealand
- CenSoc
- Cisco Systems
- Citrix Systems
- Cloud Logic
- Commonwealth Bank

- Communication Workers Union
- Communications Alliance
- Communications Day
- Computer Choice
- Computer Daily News
- Computerworld
- Connecting Up
- Content + Technology
- Country Women's Association of NSW
- Crossbeam Systems
- CSC Australia
- CSIRO
- CSIRO ICT Centre
- CSN Technology
- Department of Broadband, Communications & the Digital Economy
- Department of Immigration and Citizenship
- Department of Industry, Innovation, Science, Research & Tertiary Education
- EMC Australia & New Zealand
- Energetica
- Equinix
- Ericsson Australia
- Favelle Enterprises
- Financial Counselling Australia (FCA)
- First 5000
- Fujitsu Australia and New Zealand
- Global Access Partners
- Global Mindset
- Google Australia and New Zealand
- Growthwise
- Hitachi Data Systems Australia
- HP Enterprise Cloud Services
- HP Enterprise Services South-Pacific
- HWL Ebsworth Lawyers
- Information & Privacy Commission NSW
- Information Integrity Solutions
- Institute for a Broadband-Enabled Society (IBES)
- Integrated Research
- Integrated Wireless
- Intel Australia

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- Intel-GE Care Innovations
- International Centre for Complex Project Management
- International Negotiation Consultants (INC.)
- ISOC-AU
- IT News
- IT Wire
- Lazu
- Macquarie Telecom
- Macquarie University
- Media Access Australia
- Michael Legg & Associates
- Microsoft Australia
- Motor Neurone Disease Association of NSW, Inc.
- National Consultative Committee on Security & Risk
- National ICT Australia (NICTA)
- NBN Stakeholder Engagement & Communication
- NetApp
- Netsmarts
- Ninti One Limited
- Norton Rose Australia
- NSW Information and Privacy Commission
- NSW Sports Federation
- Object Consulting
- Office of the Australian Information Commissioner
- Office of the Minister for Broadband, Communications and the Digital Economy
- One Laptop Per Child
- Optus
- Orange
- OrionVM
- PC Word
- Physical Disabilities Australia
- Pitney Bowes Software
- Precedence Health Care
- Public Relations Institute of Australia (PRIA)

- QLD Government
- Redfern Legal Centre
- Regulatory and Financial Services Practice Group
- RSPCA
- Sainty Law
- SAP ANZ
- Schiavello Group
- SERVCORP
- Shearwater Solutions
- SKRIB Pty Limited
- Smart Services CRC
- Smartnet
- SME Association of Australia
- SMS Management & Technology
- Sophos - Computer Security
- SPC Consulting Group
- Standards Australia
- Sydney Morning Herald
- TAFE NSW - Western Sydney Institute
- TCG Group
- Telecommunications Industry Ombudsman
- Telstra Corporation Ltd
- Telstra Enterprise & Government
- Terem Technologies
- Thales Australia
- The Allen Consulting Group Pty Ltd
- The Australian
- The Futures Project
- The Pharmacy Guild of Australia
- The Point Duty Group
- The University of Queensland
- tJP
- Trade & Investment NSW
- University of New England
- University of New South Wales
- University of Sydney
- University of Technology, Sydney
- University of Western Sydney
- US Department of Commerce
- US Embassy, Canberra
- UXC Consulting
- Verizon Business
- Victor Chang Cardiac Research Institute

- War Widows' Guild of Australia NSW Ltd
- Westpac Banking Group
- Woolworths Limited
- WorkVentures
- WW & Associates Pty Ltd
- Xero
- Yuruware NICTA
- ZD Net
- Zurich Financial Services Australia

Attachments

Forum Programme

9.00 – 9.30	**Registration**		
9.30 – 9.40	Welcome	Abul Rizvi, DBCDE, Deputy Secretary	
9.40 – 9.55	Relationship between cloud and NBN	Kevin Bloch, Cisco	
9.55 – 10.10	Q&A		
10.10 – 10.30	Minister's keynote	Senator Stephen Conroy	
10.30 – 10.45	Telstra	Brendon Riley, Telstra	
10.45 – 11.00	Q&A		
11.00 – 11.30	**Morning Tea**		
11.30 – 11.45	The risk in the cloud vs the risk out of the cloud	Nick Abrahams, Norton Rose	
11.45 – 12.00	Q&A		
12.00 – 12.15	Small business in the cloud	Chris Ridd, Xero / Steph Hinds, Growthwise	
12.15 – 12.30	Q&A		
12.30 – 12.45	Future in the cloud	Dr Darrell Williamson, CSIRO	
12.45 – 14.00	**Lunch**		
14.00 – 15.30	Breakout sessions	Facilitator	Speaker
Session 1	What are the challenges and barriers of adoption to cloud services, particularly for the small business and not-for-profit sectors?	Darren Alexander, Autech Software & Design	Liam Fraser, Optus
Session 2	What are the opportunities and challenges for federal, state and local governments in moving to cloud based services?	Heather Tropman, Macquarie Telecom	Craig Baty, Fujitsu
Session 3	How can better outcomes for consumers, particularly through improved access to health & disability services, be delivered by the adoption of cloud based services?	Graeme Innes, Australian Human Rights Commission	Dr Scott Hollier, Media Access Australia
15.30 – 17.00	Panel Sessions	Facilitator	
15.30 – 15.45	Future in the cloud	Dr Dean Economou, Dr Anna Liu, NICTA	
15.45 – 16.15	Breakout session summaries	Group Facilitators 1, 2 & 3	
16.15 – 16.50	Where to now?	Dave Abrahams, Regional Development Australia Central Coast Keith Besgrove, DBCDE Brad Howarth, Author and Journalist Greg Stone, Microsoft	
16.50 – 17.00	Summary of the day	Abul Rizvi, DBCDE, Deputy Secretary	
17.00 – 18.00	**Networking drinks**		

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Speakers Profiles

Dave Abrahams
Dave is an online entrepreneur and regional enterprise campaigner, chair of Regional Development Australia Central Coast, co-founder and immediate past chairman of YouthConnections.com.au and co-founder of private social networking company vTeam.com.au. He is an independent technology commentator on regional local radio stations.

Nick Abrahams
Nick, Partner at Norton Rose, has been practising law for 20 years. He took time out of the law in the late nineties and worked as an executive at Warner Brothers and then as COO of listed dot com, Spike Networks, also in Los Angeles. Nick works on all aspects of technology, media and telecommunications law, including outsourcing, e-business, privacy and M&A.

Darren Alexander
Darren is Chief Executive Officer, Autech. Darren has been involved in the Tasmanian ICT industry for the past 14 years, regularly travelling the world to promote Autech and the Tasmanian ICT sector. Darren serves on a number of boards including the Premiers Digital Futures Advisory Council, the Brand Tasmania Council, and chairs the 5 Days of Innovation festival, Darren is also a past President of TAS ICT, Tasmania's peak ICT industry body, and past Chairman of TCCI's Small Business committee. Darren was also appointed to the NBN TAS Board in 2010.

Craig Baty
Craig is an Executive GM and CTO at Fujitsu ANZ and reports to the CEO Mike Foster. Craig holds more than 30 years of international ICT experience and is a well-known technology industry adviser having been a senior executive in the ICT advisory arms of Gartner Asia/Pacific and Japan and other research and advisory firms including Dataquest and Frost & Sullivan for 14 years prior to Fujitsu. Craig

chairs the AIIA Digital Economy Sig, is a member of AIGs Technology Industry Development Council and NICTA E-Gov Cluster committee and on the Standards Australia Cloud Standards Committee.

Keith Besgrove
Keith is the First Assistant Secretary, Digital Economy Services Division in the Department of Broadband, Communications and the Digital Economy in Canberra. Keith provides advice to the Australian Government on strategic, legal and regulatory issues relating to communications and the digital economy.

Kevin Bloch
Kevin is Chief Technology Officer at Cisco. He provides leadership of technology vision as well as leadership of people within Cisco to communicate and execute on that vision. Kevin is a member of the global Cisco CTO Forum, Cisco's most senior technology leadership board, representing APAC, Japan and China (APJC). He is also currently active on several external commercial and government technology advisory boards.

Senator the Hon. Stephen Conroy MP
Senator the Hon Stephen Conroy was appointed Minister for Broadband, Communications and the Digital Economy and Minister Assisting the Prime Minister for Digital Productivity in September 2010. He is also Deputy Leader of the Government in the Senate. Stephen has a broad range of portfolio responsibilities, not least the National Broadband Network, the largest nation-building infrastructure project in Australian history, and the enabling foundation for our digital economy.

Dr Dean Economou
Dean's career spans the research, commercial and government sectors. During his PhD he co-founded QPSX Communications, his work forming part of the IEEE 802.6 standard for Metropolitan Area Networks. He also designed high speed telecommunications products which were sold to global markets by Alcatel and Siemens. Dean joined NICTA in 2008 reporting to the CEO to investigate the use of ICT in urban environments and to develop Smart Infrastructure capability.

Liam Fraser
Liam is General Manager, Cloud Services, Optus and is responsible for building Optus' enterprise cloud strategy and service portfolio. Liam has a strong marketing background and extensive experience as an IT professional from his time at Optus subsidiary Alphawest where he helped customers integrate their IT and telecommunications technologies.

Steph Hinds
Steph is the founder of Growthwise, a boutique accounting business in Newcastle helping clients 'Think, Learn, Grow & Kick Arse'. Steph has a passion for technology and new things that help propel business into the future.

Dr Scott Hollier
Scott is a Project Manager and the Western Australia Manager for Media Access Australia (MAA), a not-for-profit, public benevolent institution. Scott's work focuses on making computers and Internet-related technologies accessible to people with disabilities. Scott also represents MAA on the Advisory Committee of the World Wide Web Consortium (W3C), the organisation primarily responsible for developing and promoting access to media through technology for people with disabilities.

Brad Howarth
Brad is a journalist, author and speaker, whose career includes periods with The Australian and BRW. In 2004 Brad authored his first book, Innovation and Emerging Markets, which was a study of the process of commercialisation for innovative Australian high-tech companies. In February 2011 he released his second book, A Faster Future, co-authored with Janelle Ledwidge, which analysed the challenges and opportunities for business and society that arise from new technologies. Brad is currently contributing to numerous publications in Australia, and is a regular speaker on topics related to broadband, technology and business.

Graeme Innes

Graeme has been Australia's Disability Discrimination Commissioner since December 2005. During that time he has also served as Australia's Human Rights Commissioner for three and a half years and as Race Discrimination Commissioner for two years.

Dr Anna Liu

Anna is currently appointed as the Research Group Leader for Software Systems at NICTA. She has been co-leading this team of 80+ people with Professor Gernot Heiser since the beginning of 2011, with the vision to deliver game changing software research results targeting both enterprise and embedded systems. Previously at NICTA, she was a Principal Researcher and Research Leader for one of the largest and most successful research projects at NICTA, Business Adaptation and Interoperation consisting of 30+ researchers and PhD students from the Software Engineering and Software Architecture areas.

Lisa Middlebrook

Lisa Middlebrook is Executive Manager for National Economic Review, Global Access Partners' series of annual Growth Summits. She is responsible for external relations, programme development and general management of the Summit. She also manages the Summit's steering committee and helps guide the Summit's long-term taskforces, including being a Deputy Chair of the National Standing Committee on Cloud Computing. Prior to assuming her role as Executive Manager, Strategy & Policy, at GAP in September 2009, Lisa spent two years as Director of the Federal Labor Business Forum, handling external relations and business affairs. Immediately prior to that, she served as the Director of Business Development at the Lowy Institute.

Chris Ridd

Chris is Managing Director of Xero Australia. Chris has been in the Australian IT industry for over 20 years. His experience spans a range of disciplines including enterprise sales and marketing, product management, strategic planning, business analysis and channel development. Before joining Xero, Chris was Director of the Microsoft Dynamics Business Group for Australia.

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Brendon Riley
Brendon is the Chief Operations Officer for Telstra. The COO is responsible for all aspects of Telstra's operating environment, including networks, IT, field services, construction, cloud, media, core operations and key processes. Brendon is also responsible for growing and developing Telstra's Network Applications & Services (NAS) business, which provides ICT solutions to Telstra's corporate, government and small business customers.

Abul Rizvi
Abul is Deputy Secretary responsible for promotion of the digital economy and in particular the opportunities presented by the National Broadband Network (NBN). This includes coordinating development of Australia's National Digital Economy Strategy which was launched in May 2011. This strategy sets out eight high level goals for Australia's digital economy including the goal of improving online government services delivery and engagement using the NBN. In the 2004 Australia Day Awards, Abul was awarded the Public Service Medal for outstanding public service in the development and implementation of Australia's immigration policy. In 2001 he

was also awarded the Centenary of Federation medal for services to immigration policy and programs.

Greg Stone
Greg is CTO for Microsoft Australia, and supports Microsoft's technology policy and strategy initiatives working across Public and Private sectors as well as contributing to Microsoft's long term technology blueprints - particularly in the areas of identity, collaboration and human-machine design. Greg joined Microsoft Australia in 2001 with over 20 years of executive business and IT experience across a broad range of industry sectors.

Heather Tropman
Heather is General Counsel and Head of Data, International Data and Voice at Macquarie Telecom. She has co-authored a series of whitepapers on cloud computing and cross-border risks which have been widely quoted including in the Senate Committee's report on privacy. Heather regularly chairs industry roundtables on cloud opportunities and risks and has been interviewed and quoted on cloud compliance issues in a variety of media

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outlets including participating in a Sky Business News panel and being interviewed on the Tech Report. Heather has also been a featured General Counsel in Australasian Legal Business.

Dr Darrell Williamson

Darrell has undergraduate degrees in science and electrical engineering, a masters degree in electrical engineering from the University of Newcastle and a doctoral degree in applied mathematics from Harvard University. During his academic career, he was Associate Professor at the University of New South Wales, Senior Research Fellow in the Institute of Advanced Studies at ANU, and Professor and Head of the Department of Engineering, Faculty of Engineering & Information Technology at ANU and then Dean of the Faculty. In 2007, Darrell joined the CSIRO whereas e-Research Director and Deputy Director of the ICT Centre he has had responsibility for the research and development programs in ICT.

Breakout Session Discussion Guides

Session 1	What are the challenges and barriers of adoption to cloud services, particularly for the small business and not-for-profit sectors?	Speaker: Liam Fraser, Optus Facilitator: Darren Alexander, Autech Software & Design

Background

KPMG published research from earlier this year lists the following as barriers to uptake of cloud services:
- speed/latency issues and reliance on telecommunications services providers
- consistency of current processes and applications with cloud offerings (for example, 'off the shelf' cloud services may not integrate well with a business' existing operations)
- location of data and related security and data sovereignty issues (including implications of the US Patriot Act)
- business continuity/disaster recovery and integrations
- In Australia at present there may be a limited knowledge of product offerings and a lack of familiarity of businesses with the opportunities presented by cloud based services

Speaker to address the following topics in address
- Overcoming lack of awareness of the benefits of the cloud
- Quantifying cost related benefits to SMEs/NFPs
- Quantifying other non-cost benefits to SMEs/NFPs

Possible Speaker Questions
- A hypothetical small business of three staff designs and builds branded paper planes. All its business administration is still paper-based. What specific benefits would in you include in your IT solution pitch to them? (Left side of room: 'traditional' IT, right side: cloud)
- How has marketing of cloud computing created public misunderstanding of cloud? Can the term 'cloud computing' be salvaged? Is this a job for government?
- Saas on NBN could be the 'killer app'. How can the speed and usability improvements a SME proprietor can get with cloud software-as-a-service apps be quantified or explained?
- Chris Ridd mentioned earlier in the day how accounting cloud service provider Xero has increased penetration by using intermediaries like accountants as agents. Could this apply to all cloud services, and what role could government play in this interaction?

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Session 2	What are the opportunities and challenges for federal, state and local governments in moving to cloud based services?	Speaker: Craig Baty, Fujitsu Facilitator: Heather Tropman, Macquarie Telecom

Background

The scalability of Cloud computing presents an opportunity to address similar needs among a number of federal, state and local government agencies. Collaboration between governments at all levels will be valuable to share ideas, fund mutually beneficial Cloud services, and avoid duplication of costs.

Tasked with providing services to citizens across a broad range of areas from health care to national security, government is constantly looking for ways in which its investment in IT can deliver bigger returns. The cloud can help meet this requirement.

However, while cloud computing offers big benefits, there are a number of challenges to be considered in association with its use and these include data security and sovereignty, privacy, and application performance.

One of the opportunities for government agencies is that the cloud may empower them to access cost savings and innovation without the risk and imposts of whole of government procurement processes and shared service arrangements.

Speaker to address the following topics in address

- What is the current state of adoption of cloud computing solutions across the three tiers of government?
- What are some of the issues that need to be addressed for the government sector to become fully engaged with the cloud?
- What kind of benefits can the government sector expect to receive from greater adoption of cloud solutions?

Possible Speaker Questions

- Is the rate of adoption of cloud computing services in the public sector a consequence of overstated risks, particularly about security? Or are the issues more complex involving organizational change?
- Cross-border data issues present significant challenges for government and industry particularly around privacy and data security. What do you think the key issues are for the government sector to consider in this area?
- Do you think that the major challenges are for government in moving to the cloud?

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Session 3	How can better outcomes for consumers, particularly through improved access to health and disability services, be delivered by the adoption of cloud based services?	Speaker: Dr Scott Hollier, Media Access Australia Facilitator:: Graeme Innes, Australian Human Rights Commission

Background

Cloud technologies allow accessibility innovations to be distributed more widely than before at lower and per-use cost models. New capabilities can be served directly to consumers or delivered to providers who pass on cost savings and new capabilities to consumers to increase social equity.

For example, Ozdocsonline.com.au allows mobility-impaired patients to engage directly with their GPs online to request a prescription, get test results, request a referral or arrange an online consultation.

Speaker to address the following topics in address
- Snapshot of Australia's populations of impairment
- Using technology to overcome impairment

Possible Speaker Questions
- The Personally Controlled Electronic Health Record is an example of an ambitious cloud delivery transition for a government service. Despite the efficiencies that the project promises to deliver, the project has received adverse press, particularly relating to its security and privacy vulnerabilities. How can the benefits of such projects be better communicated to the wider public and to specific classes of consumers to maintain public support for innovation in government service delivery?
- Which other government services do you believe are well suited to or could benefit from cloud-based delivery models to create benefits for consumers?
- How influential must the federal government be in the transition of government services to cloud-based delivery at state and local government levels? What effect might centralised, cloud-based government-service delivery on lower levels of government?