

GAP Workshop on CLOUD COMPUTING



Report of Proceedings

Global Access Partners Pty Ltd
Sydney, 24 June 2011



Australian Government
Department of Broadband,
Communications and the Digital Economy



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Executive Summary



On 24 June 2011, Global Access Partners (GAP), in collaboration with the Department of Broadband, Communications and the Digital Economy (DBCDE) and a number of industry partners, convened a workshop on Cloud computing for a select audience of policy makers, industry leaders, civil society and academia.

The workshop built on the findings of the GAP Task Force on Cloud Computing - a cross-disciplinary stakeholder group established in 2010 to address the potential impact of Cloud computing on the national economy, identify any issues of concern and work with the Australian Government to develop appropriate policy frameworks for vendors, businesses and consumers. The recommendations of the Task Force were summarised in a public report released in May 2011.

The Task Force acknowledged the enormous potential of the Cloud to reduce the costs of establishing and operating computer and communications systems and highlighted the opportunity for the Cloud, in combination with the National Broadband Network (NBN), to be a force for transformational change of the Australian economy and society. At the same time, the Task Force identified potential issues and challenges, including constraints on international connectivity, the multitude of industry standards, shortcomings in Cloud contractual terms and conditions, as well as the unresolved risks that have long existed for online privacy, data protection and authentication, which might be intensified by the Cloud.

The June workshop was structured around four broad sets of issues:

1. Cloud computing and opportunities for industry development in Australia
2. The ways in which the NBN, in combination with Cloud computing, can transform economic and social development and government service delivery
3. The implications of the use of Cloud computing by Australian consumers and small business
4. Policy frameworks, including privacy, standards and possible industry codes of conduct

The workshop was sponsored by GAP, DBCDE, CSC, Servcorp, HP and UXC.



Workshop Key Findings

The workshop included just under one hundred participants from a wide variety of stakeholder groups. Because of this, there was not unanimous support for many ideas canvassed in the workshop, however, there was strong support for a range of further actions, and these are touched on in the following paragraphs.

- ▶ **Cloud computing and Australian opportunities for industry development**

Cloud solutions will free organisations from the expensive burden of buying and maintaining extensive in-house IT infrastructure and allow them to concentrate on their core business. The Cloud can reduce costs and increase the speed and efficiency of operations, allowing applications to be scaled according to need and create exciting opportunities for flexibility and innovation.

Australia can place itself at the forefront of Cloud software development and the setting of global standards, but the problems caused by Australia's geographically imposed latency, limited economies of scale and higher costs must be addressed if it is to host more international data centres. Although connectivity between Australia and other countries can be improved through additional submarine cabling and other options to exploit worldwide potential, there is also a market opportunity for "premium private Clouds" offering domestic companies a guarantee that sensitive data is held in Australia and supported by strong and enforceable legislation.

The Government could drive the take-up of Cloud solutions and encourage open systems and interoperability through their own procurement patterns and through continued awareness raising within government about the benefits to be derived from Cloud computing.

In addition, the private sector should continue to raise awareness of the industry development opportunities which the various forms of Cloud computing offer, both to transform existing business operations and to create entirely new businesses and domestic and international markets.

► **How Cloud computing and the NBN can transform economic and social development and government service delivery?**

The Cloud will further the development of a dynamic global marketplace of ideas regardless of language or geographical boundaries and encourage the distribution of intellectual property at low cost to all. Success in the Cloud will therefore flow from intellectual property and innovation, rather than the geographical positioning of data centres, offering opportunities to Australians in all fields of endeavour. Although Australia has a proven record of producing system integration solutions, it has failed to scale them for global consumption, and this might be remedied by the Cloud.

The potential of Cloud data storage and the NBN's greatly increased connectivity untap the potential of information technology in education, health and business video conferencing. It will increase opportunities for collaboration with larger enterprises and aid the personalisation of government services and the delivery of metering and other applications. Telemedicine and e-health in particular have great potential to continue to transform health care in remote communities, and distance education can be revolutionised, not least by allowing Australian education to be marketed worldwide. Australian retailers and service providers should seize the opportunity to trade in world markets, and organisations should look to further outsource administrative functions, including accounting.

Australia is a small, sophisticated economy which, as an early adopter of technology, is also ideally positioned as a test market for products offered by major computing concerns.

There was considerable support at the workshop for governments and the private sector to continue to work together to identify evolving opportunities to use Cloud computing to transform government service delivery and develop new business opportunities as the NBN is rolled out.

► **The implications of Cloud use for consumers and small business**

Consumers are increasingly using Cloud services in their everyday computing, with services such as Gmail, Google Apps, Dropbox, iCloud and other services provided by Amazon, Microsoft, Google, Apple and other providers becoming seamlessly integrated into the Internet.

The Cloud will also revolutionise commercial data management by offering on-demand network access and a shared pool of infinitely scalable and configurable resources which can be rapidly deployed with a minimum of management effort or service provider interaction. It will end constraints and bottlenecks in performance, as functional and management interfaces,

such as databases, integration and development tools, will allow a virtual machine to move itself into the Cloud when nearing its maximum capacity. Management interfaces utilising the Cloud and the NBN will increasingly deal with billing, monitoring, security, quality of service, provisioning and metering issues. It will enable businesses to be both global in scope and local in focus and increase both their agility in the market place and levels of control of internal processes.

Cloud solutions will initially be chosen to reduce costs, but will increasingly turn business problems into opportunities as organisational barriers are broken down and collaboration between previously separated departments and personnel is facilitated. The growth of small businesses and start-ups will no longer be inhibited by major IT infrastructure investments, as the Cloud begins to offer much lower initial costs, scalable services, ease of management and device and location independence. It will enable new and nimble firms to quickly adapt to changing circumstances and outmanoeuvre larger, more traditionally structured firms which are often tied to cumbersome or obsolescent IT and methods of service delivery.

Non-standardised processes, devolved management of IT and heavy investment in legacy systems will inhibit migration to the Cloud, however, a failure to embrace the new computing paradigm may place firms at a severe competitive disadvantage in increasingly globalised markets. Cloud solutions may also tackle the high level of redundancy and duplication in the various tiers of Australian government and reduce the levels of bureaucracy currently inhibiting economic activity.

The Cloud can offer greater data security by holding critical information in several third party locations, rather than one. However, although it offers obvious opportunities for improved access in mobile solutions and data backup, users should still ensure critical data be stored on local hard drives, as well as in the Cloud. Users should ensure their Cloud suppliers offer both encryption and redundancy to protect the security and safety of data and that the provider has adequate business continuity and security arrangements.

Although cyber security remains an important issue, well-managed Cloud providers may offer better protection than companies or individuals could provide for themselves. Small and medium-sized enterprises (SMEs) and domestic consumers would benefit from education by government or trade organisations on such issues, while the building of uniform security structures into the NBN should be considered, as well as tax breaks to encourage digital education in SMEs.

There was considerable support for ongoing collaboration between government, industry and consumer groups to raise awareness of the advantages of Cloud computing services and help consumers and small business to be well informed when adopted these services.

► **Policy frameworks, privacy, standards and industry codes of conduct**

The Cloud should embrace open systems and interoperability and encourage, rather than inhibit, choice and flexibility. Technical or contractual conditions which 'lock-in' customers to particular suppliers are anti-competitive, and customers must be able to move easily between providers, with the security of their data assured, if the industry is to thrive.

Although government legislation may be required on some points, including the mandatory notification of data breaches, a combination of existing measures, self-regulation and industry's voluntary codes of conduct may suffice to support customer interests. Agreements on Cloud standards must be multinational and cross-jurisdictional in nature, as domestic laws and protections may not be enforceable in the event of disputes with overseas service providers. Copyrights in particular can only be effectively enforced within the holder's jurisdiction.

If Cloud providers attempt to unfairly constrain consumer mobility, then further regulation may be required, but such regulation should allow service providers the flexibility to offer economic benefits through highly leveraged, multi-tenanted infrastructure, while safeguarding the rights of consumers.

The Government should ensure the fairness and transparency of contractual terms and conditions, and the Telecommunications Industry Ombudsman (TIO) could assume some responsibility in the new Cloud-converged NBN environment. Care should be taken to differentiate between the different services and expectations of private, community, hybrid and public Clouds, but users should be able to use all such services with confidence.

There was widespread support for governments to continue to develop an understanding of Cloud computing issues, but not to rush towards any quick regulatory responses. At the same time, the legitimate concerns of consumers and privacy advocates need to be considered in future work. In addition, there was support for industry to anticipate these issues through the development of 'trust marks' and codes of practice.

Report of Proceedings



Lisa Middlebrook opened the workshop. She outlined GAP's achievements and their leading role in provoking discussion to generate policy changes, business opportunities and better governance. She introduced Keith Besgrove, First Assistant Secretary, Digital Economic Services Division, DBCDE, as Chairman of the day's proceedings.

Keith Besgrove thanked attendees for their interest. He said the GAP Task Force on Cloud Computing had recently examined the Cloud's potential to reduce costs and increase the speed and efficiency of operations, not least for government agencies. The Cloud allows applications to be scaled according to business need and offers new opportunities for flexibility and innovation. The research community are already collaborating in the Cloud, while small businesses and consumers are beginning to embrace Cloud services without, perhaps, fully understanding their implications regarding standards, privacy, trust and security. The nexus between the Cloud and the NBN is vital, but unpredictable, and Australia's future role in hosting Cloud services remains unclear.

The Task Force recommended the Government assume an ongoing role and praised the work of the Australian Government Information Management Office (AGIMO) and the Department of Finance and Deregulation in establishing a vision for the future. The DBCDE is particularly interested in exploiting Cloud platforms and the NBN to transform the web services offered by Australia's 500 or more local governments and allow ratepayers to access government services online.

The Task Force explored the need for change to the regulatory framework, canvassed methods of raising awareness among consumers and SMEs and debated the merits of a voluntary code of conduct for service suppliers.

Mr Besgrove concluded by outlining the proceedings of the workshop grouped around four key themes:

1. Cloud computing and opportunities for industry development
2. The potential for the Cloud and NBN to transform economic and social interactions and government service delivery
3. The implications of the Cloud for Australian consumers and small businesses
4. The development of policy frameworks

Government and business policies for the Cloud Computing Era – Prof Paul Strassmann



Prof Paul Strassmann, Distinguished Professor of Information Sciences at George Mason School of Information Technology and Engineering, USA, measured the progress of mankind in people’s ability to share information. Human beings are the only animals to record data and learn from its accumulation. Prof Strassmann stressed the democratisation of knowledge capital from its most primitive beginnings to the Google search engine as he traced the development of communication techniques from the origins of writing 11,000 years ago to Cloud computing today. He said the Internet has facilitated socialising and information retrieval, but is yet to penetrate “the business of business”. Government agencies and major banks and corporations in Australia have invested \$50 billion in isolated IT systems, which barely communicate beyond exchanges of email. Prof Strassmann believed Cloud solutions could encourage greater connectivity, but stressed the social context of the technology and the broader transformation required to embrace its technological possibilities.

The Cloud has the potential to ease the difficulties faced by small businesses previously unwilling or unable to embrace information technology. It will allow SMEs to avoid the expense and complications of owning servers and maintaining programmes in favour of renting the capacity they need over the Internet. Prof Strassmann noted that Apple now carries 442,000 apps in its inventory, while Android offers 224,000 and Microsoft over 100,000 - many of them written by individuals, rather than large computer companies. He envisioned the Cloud enabling **the distribution of intellectual property at low cost to all.**

Just as Gutenberg's printing press democratised reading in the past, the Cloud will liberate knowledge creation and its global dissemination in the future. Hundreds of thousands of people may start writing software in the near future, using tools provided by Apple, Google and others, to create **a dynamic global marketplace of ideas regardless of language or geographical boundaries.** Although authoritarian governments in countries such as China and Iran attempt to isolate their populations from the worldwide Internet, globalisation, democracy, common understanding and the sharing of knowledge will continue to advance.

Prof Strassmann noted that the ability to write had been restricted by power-hungry elites throughout history, while the pre-reformation church jealously guarded its monopoly on reading the Vulgate Bible until Gutenberg's printing revolution. This invention indirectly sparked the Thirty Years’ War (1618–1648) and other bloody religious conflagrations.

Nonetheless, institutions which hold information, be they churches, governments or corporations, inevitably defend its possession to protect their own standing. Prof Strassmann noted that software contractors often attempt to assure themselves of long-term contracts by selling proprietary software, and warned **against Cloud operators attempting to lock consumers into services by creating local monopolies.**

He argued that though the struggle between control and freedom is an eternal one, technology ensures that **the shift towards sharing is inevitable** over time. The cost of maintaining monopolistic enclaves becomes prohibitive and eventually they collapse under their own weight. He urged the Government to recognise the threat of monopoly control in the Cloud in the short term and ensure applications allow small businesses to take their data elsewhere without undue penalty. The Cloud must embody flexibility and **encourage, rather than exclude, competition.** He warned that Australian firms which attempted to tie local customers to proprietary Cloud services would lose out to firms which **embrace open systems**, such as those in Singapore.

Prof Strassmann criticised the stifling influence of telecommunication monopolies in the past, noting the history of AT&T in the USA, but observed that telephony protocols did not lock users into using particular environments. He saw **a bright future for Australia as success in the Cloud will flow from intellectual property and innovation**, rather than the geographical positioning of data centres. He envisioned Australian software being sold all over the world and concluded by restating his warning against telephone companies or other entities erecting obstacles to globalisation, customer choice and the free flow of information. The Internet should be a means to drive freedom for competition, collaboration and prosperity for all.

Lisa Middlebrook invited questions from the audience. The first responder argued that truly transformative technologies often exhibit an element of proprietary lock-in and, citing Apple and Facebook among current examples, asked if this lucrative business model should be accommodated, rather than opposed. It was agreed that the issue was not proprietary technology per se, as this is the means by which profit is generated, but ensuring **interoperability.** The role of government is to ensure that 'lock-in' monopolies are not created against consumer interest.

Although the questioner believed interoperability was desirable, he doubted that governments could insist on it and recommended a flexible approach when 'lock-ins' occurred. In answer, it was felt that customers should be able to move expensive applications to new hosts quickly and cost effectively as required.

Another questioner worried about the long-term security of data held in the Cloud and its vulnerability to loss or deletion. In response, Prof Strassmann recommended that **critical data be stored on local hard drives, as well as in the Cloud.**

Another participant was interested in the interaction between the commercial and social aspects of the Cloud and wondered how people's access to information, and therefore power, could be improved. It was then observed that over 2 billion people now have cell phones, with exponential growth in their use, particularly in Africa over the last 15 years, and that this revolution had been a gateway to information literacy.

Another speaker agreed that the Government had an important role to play in driving fair competition and educating SMEs on the need for openness and accessibility in Cloud solutions. He also worried about the 'de facto' lock-in of terrabytes of information being lodged with a particular provider and the difficulty in practice of porting elsewhere. This concern was countered by the point that transferring large quantities of information is routine today and would become even easier via the NBN. It was recommended that **users ensure their Cloud suppliers offer both encryption and redundancy to protect the security and safety of their data.** Data storage should never rely on a single source, as any particular data centre could suffer from technical problems or disaster. Google, for example, runs twenty seven data centres, with at least three running the same information at any one time.

Best practice approaches to Cloud: Managing security and privacy considerations – Alan Bennett



Alan Bennett, Managing Director and Vice President of HP Enterprise Services, offered thoughts on best practice for Cloud security and privacy. He said the overwhelming hype over Cloud computing should not blind prospective users, particularly in the public sector and in highly regulated industries, to the practical issues of utilising it. **Organisational issues** such as non-standardised processes, devolved management of information and communication technologies (ICT) and a high level of investment in legacy systems that are not virtualised or impossible to virtualise, are **significant inhibitors of migration to the Cloud**. Regulatory and security concerns are also valid considerations, including whether the security of the Cloud provider is auditable and clearly documented, or whether the data or information access provisions of a foreign jurisdiction could apply. The mission criticality of systems might also make some organisations nervous about Cloud models.

Organisations must consider the options available in the market and whether the Cloud fits their business requirements, particularly in regards to risk. Some risks are external factors beyond the customer's control – pandemics, natural disasters, power failures or security attacks – but even these can be managed through **adequate business continuity and disaster recovery measures and strong security responses**. Internal factors, such as compliance risk, human error, plant, hardware or software failure or planned downtime, are controllable through good processes.

There is an element of risk in the outsourcing of any process, and the Cloud industry must improve its standards, contractual arrangements and service levels to win the trust of clients. There is an increasing range of guidance from the industry and government to help organisations make informed choices about Cloud.

Within the Australian Government, AGIMO has published its **Cloud Computing Strategic Directions Paper** and established the Cloud Information Community to share information on Cloud issues across federal and state governments. **The Defence Signals Directorate (DSD)** published 51 considerations for government agencies to consider, including ensuring the availability of data and business functionality; the protection of data from unauthorised access by a third party, the vendor's customers or rogue vendor employees; and the handling of security incidents.

The **Australian Prudential Regulation Authority (APRA)** wrote to financial services firms with specific guidance on how its published standards and guides apply to the Cloud. Many of APRA's comments mirrored those of the DSD in underscoring issues of security, data privacy and data sovereignty.

Other non-Cloud specific standards including the Protective Security Manual from the Attorney-General's Department's portfolio, ASIO's processes for certifying physical security; and the DSD's Information Security Manual and process for certifying secure services, such as gateways and hardware, are also relevant in this area.

The US Government established the Federal Risk and Authorization Management Program (FedRAMP) process to assess and authorise Cloud services; and the SAJAC (Standards Acceleration to Jumpstart the Adoption of Cloud Computing) initiative to seed the development of standards and document cases of successful government deployment.

Other regulatory issues include **the fairness and transparency of contractual terms and conditions**; the impact of **emissions regulation and carbon pricing**; and the application of **the privacy regime**. The industry is responding, with initiatives such as the Cloud Security Alliance and the Australian Information Industry Association (AIIA) Cloud Task force, which specifically addresses privacy and security concerns.

In conclusion, Mr Bennett reiterated the importance of agencies researching the subject and ensuring the provider has adequate business continuity and security arrangements and is transparent on how and where the service is provisioned.

Asked if knowing the precise physical location of data held in the Cloud was important, particularly given the different jurisdictions this may involve, Mr Bennett said it would be prudent to **keep at least one copy of sensitive information**, such as banking or medical data, **within the citizen's own country**.

Another speaker raised the issues of the Copyright Act and intellectual property. It was acknowledged that the regulatory environment around copyright and ownership is jurisdictional and that questions of what constitutes the public domain are complex, particularly in China and India. **Copyrights can only be effectively enforced within the holder's own jurisdiction** and varying levels of enforcement make international agreements to protect copyright problematic, particularly for small companies which lack the legal resources of larger concerns.

The final questioner believed that **issues of interoperability and standards would be resolved through competition** and that the Cloud was about to shift from a seller's to a buyer's market. Others thought that SMEs still lacked the economic levers to wield power in the market, although it was agreed that competition would force suppliers to offer SMEs more attractive packages in the long run.

Government and major corporations will also begin to embrace the flexibility of the Cloud and review their existing commercial relationships with service providers. The goal of regulation was seen to be allowing service providers the flexibility to offer economic benefits through highly leveraged, multi-tenanted infrastructure, while safeguarding the rights of consumers.

Group Discussions



Lisa Middlebrook prompted group discussions on the business opportunities offered by the Cloud in Australia and the ways in which the NBN might be used to transform economic and social development and government service delivery. **Keith Besgrove** then invited spokesmen to report on their table's discussions.

The first table believed the high speeds and countrywide connectivity of the NBN would boost Cloud services, but that it was equally important that connectivity between Australia and other countries be improved through **improved submarine cabling** and other options. The Cloud will be the catalyst for a host of innovations, and the group cautioned against undue or heavy-handed regulation inhibiting progress by discouraging providers through fears of undue liability and onerous penalties for data loss or breaches. Consumers must be protected without providers being discouraged. The group hoped that Australia would develop the skilled workforce required to take advantage of the new online environment and that the country would be **at the forefront of setting global standards**.

The second group focused on the NBN and consumer access networks. They emphasised the importance of compatibility and open source solutions, noting that while Apple products were popular, they relied on proprietary connectivity and locked users into the Apple ecosystem. They also stressed that Cloud solutions could improve security standards as standalone computer systems and data are often poorly protected.

The third group were equally excited by the **NBN's potential in education, health and video conferencing**. They believed the NBN's open architecture will offer opportunities for SMEs in Australia and increase **opportunities for collaboration with larger enterprises**. They stressed the use of the Cloud in higher education and the work of the Australian Centre for Broadband Innovation, a working group involving the New South Wales Government, CSIRO and NICTA, in testing NBN solutions. They believed the NBN would aid **the personalisation of government services and the delivery of metering** and other applications.

The fourth table focused on opportunities for industry development in Australia. They saw Australia as well-placed, given its stable legal regulatory and financial system and Asian time zone. Its multicultural community, diverse language and technical skills and solid educational system could be a fertile seedbed for a new Cloud industry to thrive. The group identified a **market for "premium private Clouds"** offering

companies certainty that their data is held in Australia and supported by strong and enforceable legislation. However, the group believed Australia had lost any “first mover advantage” in hosting Cloud infrastructure and thought it unlikely Australia would host data on the scale seen elsewhere. They saw **major opportunities for Australians in software development**, but recognised the problems caused by Australia's geographically imposed **latency, limited economies of scale and higher costs**. They believed the Government could drive interoperability through their own procurement patterns, possible regulation and during international discussions. Any regulation must be Cloud-friendly, encouraging its uptake, rather than creating barriers to its use. The group noted that Google was still reluctant to set up operations in Australia due to the lack of proper **‘safe harbour’ provisions**.

Another speaker downplayed the often cited problem of Internet latency, while another felt Asian Internet latency problems could be tackled by constructing **data centres in Darwin, rather than Sydney or Melbourne**.

The next speaker praised the impact of Cloud-friendly regulation, noting how the Canadian Privacy Commissioner had successfully driven the issues of personal information security and privacy. Others sought a balance between consumer protection and market dynamism, and it was observed that legislators were still struggling to catch up with the changes wrought by Google's innovations. Setting desirable ends, rather than prescribing detailed technical means, might be fruitful, as shown by New Zealand air safety regulation.

The next group observed that the wheels of democratic law-making turn slowly, not through chronic inefficiency, but through the need to consider matters in depth, accommodate all viewpoints and produce the right solution. Law will therefore inevitably lag behind technological innovations. They listed a number of opportunities provided by the NBN and Cloud, including the concept of **‘Smart Citizens’** as seen in Dubai where government services, health records and a wealth of other information are readily available online for all citizens. Cheaper access to technology solutions for **the non-profit sector** will be valuable, allowing tasks to be scaled up or down at low cost, while **Australian retailers** should seize the opportunity to trade in world markets. **Tele-medicine** has great potential to transform health care in remote communities, while opportunities for **entertainment and social collaboration** will also overcome Australia's “tyranny of distance”. However, there will also be **opportunities for criminals** to exploit new platforms, and other problems include latency and data protection, particularly for SMEs. The group noted that planning for the NBN had focused almost entirely on delivery rather than security. As the market matures, people will become more educated about the uses and costs of the system, with buyers gaining more strength to negotiate service level agreements to meet their needs.

The following speaker agreed the NBN was needed to unlock the potential of the Cloud and that it could revolutionise **health and education services in remote regions**, allow businesses to scale their operations and, if latency problems were tackled, encourage **foreign trade**. The potential of the Government to leverage the popularity of social networking to improve service delivery was also touched upon.

The next group focused on opportunities for SMEs to use the Cloud to increase their flexibility, responsiveness and control. SMEs tend to overlook risk as a factor, but **continuity of service** will be at a premium when selecting a Cloud provider. The tendency to outsource all but core operations may accelerate, and it was felt computer companies will increasingly provide a wider range of services to cater for these trends. MYOB software, for example, is already used by many Australian businesses and if offered as a fully supported service via the Cloud, it might encourage businesses to **outsource their entire accounting departments**.

The next discussion also focused on industry development for SMEs. They too saw **the Cloud as an energiser of innovation** – enabling new business models, reinvigorating existing ones and levelling the IT playing field between smaller and larger organisations. The Cloud will lower barriers of entry and enable outsourcing, but just as SMEs will be able to compete on the world market, opportunities for foreign firms to compete against Australian businesses in Australia will increase. **Information auditing** may become as important as financial auditing to establish and credentialise trust with business partners and customers. The group agreed that Australia could show leadership in developing a progressive legal and regulatory framework which would in turn improve Australia's attractiveness as a global service provider. They itemised the advantages of the NBN as ubiquity, certainty and speed and concluded that it would benefit the 'third sector' in particular.

The next table agreed that economic efficiency could be improved by the speed and reach of the Cloud, the flattening of business structures and the lowering the barriers to entry for SMEs. It will improve their access to knowledge services, offering them enhanced online support and the ability to “crunch their own numbers”. However, they cautioned against undue hype and advocated hard-headed decision-making about whether a move into the Cloud would make economic sense for a particular firm. The Government's current system of ICT panels were seen as slow to react in a fast moving environment, while the undue influence of major players, such as Google and Facebook, in shaping what the Cloud means to individuals to their own advantage was criticised. Cloud solutions should guarantee the security and availability of critical business data, but suppliers, rather than buyers, currently dictate market terms. Threats such as **criminality, lock-ins, dubious practices, a lack of education** regarding the need for

encryption and **jurisdictional differences** regarding data handling were underlined. The group emphasised the need for **redress procedures in the event of data loss or corruption**.

The next group believed Australia should concentrate on developing tools to run in the Cloud. Australia is a small, but sophisticated economy tending to be an early adopter of technology, and therefore could be used as a **test market by the major players**. The ability to use the Cloud to forge cooperation between departments and organisations could be developed here and exported abroad. Though **Australia is skilled at producing system integration solutions, it has long failed to scale them for global consumption**, and this might be remedied by the Cloud. The need for federal, state and local governments to coordinate was emphasised, with the possibility of applications being developed for internal use then marketed commercially. **The building of uniform security structures into the NBN** was suggested, as well as **tax breaks** to encourage digital education in SMEs. The possibility of using the Cloud to create an Australian success on the scale of Google should not be dismissed.

The following table drew three main conclusions. Firstly, that innovations would emerge at the commercial or government level, rather than in households due to consumer “sticker shock” at high initial prices. Secondly, that most new ideas would initially be extensions of current uses of slower networks. Finally, that the future of technology cannot be predicted in the long term. The Cloud and NBN will enable better outreach in **health and social services** and provide enhanced **educational opportunities** to talented, but isolated, children. The group believed that household take-up might be slow at the lower end of the social spectrum, but that the Cloud might enable social democracy.

The penultimate discussion had focused on government's role in educating small business and consumers, particularly in regard to lock-in contracts. The Government might protect the rights of SMEs to leverage deals with suppliers and ensure cross-jurisdictional reliability, perhaps in sponsoring a code of conduct.

The final table did not see “sticker shock” as a problem, given better deals on bundling broadband and phone services. They believed there was little point in Australia seeking to host Cloud services due to the strong Australian dollar, its use of coal to generate power, the cost of that power and uncertainties regarding the carbon tax. They agreed that Australia was well-placed to produce Cloud-based software, given its sophisticated economy and sustained economic growth. They thought problems also facing other developed economies could be addressed here then marketed worldwide, with all sizes of firms, government and academia producing solutions in areas such as health and ageing. They argued that **the Government should produce a strategic vision** and put in place

mechanisms to foster and build that collaboration. They saw the most current innovation being generated by individuals and start-ups, and believed that recognising, incentivising and rewarding such activities would reap rewards in health, education and elsewhere. They hoped Cloud solutions would **tackle the high level of redundancy and duplication in the various tiers of Australian government**, while incentives to use the NBN should help the 25% of people who still lack Internet access, particularly among the remote, socially disadvantaged and non-tertiary educated. The falling price of tablet devices may mean they are distributed to people for the delivery of government services, such as Centrelink.

A representative from a major computing firm addressed some of the points raised. He disclosed that his firm had invested heavily in data centres in Australia, including a local Cloud, and had experienced no difficulty in obtaining electricity, which was cheap by international standards, though rapidly increasing in price. Latency was also much less of a problem than most people assumed, with Australians comfortably using data hosted in Singapore and organisations such as IBM, HP and Fujitsu processing significant volumes of the world's data in Australia over the last two or three decades, including a third of global funds management. **The problem lay less in getting data to and from Australia, than moving it around the country**, an issue the NBN should address.

The final speaker offered a government perspective. He expressed surprise at the widespread calls for government legislation and preferred a light touch for any such market interventions. He noted that the Government could insist on a variety of conditions for its own purchases of Cloud services through its procurement contractual clauses. Data.gov.au is already hosted in the Cloud, and further services will be hosted there as appropriate. Multiple tiers of government are already cooperating in sharing development work on Cloud solutions, while industry often wants to work with a specific tier of government for a specific purpose. The 'Click' forum is dedicated to improving government and industry cooperation while government and industry principles of engagement on ICT also play an important role. The speaker felt that the inability of SMEs to deliver the scale and reliability of service required for major government contracts precluded attempts to distort the market to their advantage.

Lisa Middlebrook thanked participants and the sponsors – the DBCDE, GAP, HP, UXE, Servcorp and CSC – before closing the session for lunch.

Implications of Cloud computing for consumers – Peter Kell



Peter Kell, Deputy Chair of the Australian Competition and Consumer Commission (ACCC), agreed that Cloud computing offers clear benefits and opportunities for consumers, but acknowledged that regulators must encourage appropriate market conduct to ensure these benefits are achieved. The ACCC aims to ensure that consumers can benefit from innovation and competition and works to minimise the impact of market failures, information deficits and rogue traders. His address focused on unfair and potentially anti-competitive contract terms, advertising and marketing practices and the resolution and enforcement of cross-jurisdictional complaints.

Mr Kell said most consumers would be offered standard “take it or leave it” contracts by Cloud vendors. These are an efficient method of service provision, but rely on **an imbalance in bargaining power between supplier and consumers** and so risk imposing unfair or anti-competitive terms. The recent introduction of prohibitions against unfair contract terms into national consumer law will help to prevent de facto “lock-in” caused by the imposition of excessive costs or fees when switching between products or services. The ACCC wants customers to be able to move easily, cheaply and quickly between Cloud providers with the security of their data assured. If providers attempt to lock-in consumers unfairly, further regulation may be required. The ACCC sees both risks and opportunities for the emerging Cloud industry regarding their advertising and marketing practices. Suppliers need the trust of consumers, and this will be undermined by a repetition of the more problematic advertising practices once common in other parts of the communications and ICT sector before ACCC enforcement action. Customers should be able to understand what they are signing up for, and providers have a unique opportunity to adopt and establish best practice from the outset.

Cloud computing raises cross-jurisdictional issues, and ensuring that consumers have **adequate avenues for redress** is a priority. This is uncontroversial within Australia, but, by definition, Cloud computing does not operate neatly within national borders, while enforcing Australian consumer protection law abroad is impractical. However, the ACCC currently participates in a range of international enforcement fora, including the International Consumer Protection and Enforcement Network and the International Competition Network, and is working to strengthen its existing international ties as well as collaborate domestically with relevant industry and government stakeholders.

Cloud standards: What, why, how and who – Bob Hayward



Bob Hayward, Chief Technology and Innovation Officer at CSC Australia and CSC Asia, likened Cloud contracts to “a hotel into which you can check in at any time, but never leave”. He entered into a technical discussion of Cloud standards, noting the Internet could not operate without standards such as Transmission Control Protocol (TCP) and Internet Protocol (IP) to ensure interoperability across networks, while HTML and XML permit browsing, hypertext and document creation. Similar standards are required for the Cloud to ensure **interoperability and portability** and so allow the market to take off. A seminal set of documents issued by the US National Institute of Standards and Technology (NIST) in late 2009 defined Cloud computing in terms of five characteristics, four service types and four deployment models, and these are now generally accepted. The NIST definitions of business process, software, platforms and infrastructure as services can be seen in products offered by SAP, Microsoft, VMware and CSC.

The issues of portability and interoperability are fundamental, but consideration of **standards regarding security, monitoring, billing and provisioning** are as important in the Cloud as they are in traditional IT environments. Functional and management interfaces, such as databases, integration and development tools, are required across and within platforms. A functional interface would, for example, allow a virtual machine to move itself into the Cloud when nearing its maximum capacity, while management interfaces could deal with billing, monitoring, security, performance change, configurations, provisioning, metering and quality of service.

At least 21 organisations are currently developing Cloud standards in some form, often representing the interests of either vendors or consumers. Despite this multiplicity of effort from bodies such as the Object Management Group, the Desktop Management Task Force and the Cloud Security Alliance, some topics remain largely uncovered.

The most developed de jure standards apply to virtual machine portability across infrastructure and include Open Virtualization Format (OVF), open source work sponsored by NASA and the OpenStack API developed by Rackspace in the USA. **De facto standards are created by dominant vendors** whose methods of implementing services becomes the industry standard by weight of market presence. Amazon dominates infrastructure standards, for example, with Simple Storage Service (S3) and Elastic Compute Cloud (EC2).

The Cloud Security Alliance is advocating **the Cloud Trust Protocol** to ensure interoperability. This encourages Cloud providers to supply 21 pieces of information to prospective customers, including their hosting location and policies regarding use, replication, certifications and back-up. Most major vendors are members of the Cloud Security Alliance, but progress is slow and it may be several years before such standards become universally adopted. The failure to adopt such standards may impede the take-up of Cloud services, but it should be remembered the industry is being held to a very high standard. While banks may want the ability to switch between Cloud providers at the touch of a button, they fail to offer anything close to this ability to their own customers.

Standards are relatively easy to produce for infrastructure, but become much harder to define for services such as email. The further up the “stack” one progresses, the harder such transitions become. The watchwords of management standards should be security and transparency and, with initiatives such as the Cloud Trust Protocol, progress is already being made.

Cloud control: Improving sales and business processes using the Cloud - Marcus Moufarrige



Marcus Moufarrige, Chief Information Officer and General Manager for Asia at Servcorp, discussed business applications of the Cloud, offering Servcorp as a case study. He believed that the Australian Government should take a sensible approach regarding policy, and saw no need for it to build its own Cloud infrastructure.

He also argued the Government should be incentivising the private sector to create the NBN. He explained the original business operations of Servcorp in subletting physical office space and its recent creation of “virtual” offices for its 30,000 customers in 20 countries in 130 locations around the world. These locations are interconnected, creating a “facilities Cloud”, which Mr Moufarrige believed will disrupt established business models and change the ways in which work is done. He saw the Cloud as a “state of mind” that rejects the ownership of infrastructure and prefers virtual and physical services to be provisioned, managed and billed from one central point. The data need not be held in Australia, or any one particular country, although websites are still commonly hosted in the jurisdiction they serve.

The Cloud enables a business to be both global and local and can offer greater cyber security by **holding critical information in several third party locations, rather than one**. The Cloud will enable the efficient remote management of physical services, as well as virtual ones. It will allow every customer to escape “technical debt” and enjoy state-of-the-art virtual computing systems, rather than the outdated legacy systems often in place today. Start-ups now commonly use the Cloud, rather than buying their own expensive hardware, and this approach will soon spread to larger established companies.

The Cloud is entrepreneurial, rather than bureaucratic, allowing businesses to divest themselves of technical baggage and remain nimble and responsive to change. It allows third parties to maintain services and so companies can concentrate on making money by their core business.

Mr Moufarrige hoped the Cloud would break down oligopolies by allowing local producers to market their products to consumers more easily than is possible today.

Lisa Middlebrook thanked the keynote speakers and invited comments from the floor.

The first questioner likened the move to the Cloud to the change from dial-up to broadband and worried about a similar lack of infrastructure to protect new customers from danger. He called for a **voluntary code of conduct to ensure minimum standards of infrastructure, security, resilience and redundancy**. He warned against encouraging firms to outsource their accountancy to Cloud platforms offered by new or unproven vendors, which lack such protective measures. He noted that the report of the GAP Task Force on Cloud Computing had identified **two types of Cloud users – sophisticated large companies** able to tailor services to their own requirements, and **less sophisticated small business and private clients** who may need greater protection. The Task Force did not favour heavy-handed legislation, as this would sap innovation, but preferred guidance and education, an approach the AIIA would be comfortable with.

Another speaker responded that, in a free market, consumers should have access to reliable information and be free to make decisions for themselves. Legislation may be necessary, but it would not be sufficient to ensure people's safety. However, codes of conduct can encourage better vendor behaviour, as they have in financial services.

It was noted that there was a risk of being too risk averse and that society would not have cars or aeroplanes today, had modern attitudes to risk been prevalent a hundred years ago. Problems with data centres occur every day without publicity, but one relatively minor Cloud failure can make headlines. It was also observed the Australia often legislates for the lowest common denominator, despite the fact that no amount of law will protect the foolish from themselves.

The question of whether standards should be government or industry driven, and the extent to which they should be international or domestic in scope, was raised. In answer, it was felt that government standards had proved ineffective in the past and that the dynamic Cloud industry required risks and rewards to grow quickly. Apple, for example, is a highly proprietary company, but has proven extremely successful of late. The Government has a role to play in ensuring the safe disposal of electronic products and mandating energy specifications, but otherwise, market forces should be allowed to take shape. Major operators, such as Microsoft, Google, Amazon and Salesforce, recognise they need to work collaboratively to improve interoperability and portability for collective commercial benefit.

Another speaker expressed concern regarding privacy issues. He pointed to a lack of solid privacy recommendations in the GAP Task Force report and thought a reliance on “trust marks” would be part of the problem, rather than a solution. He saw entrepreneurship as relying on the outsourcing of risk, an approach which may work for debugging software, but was not

satisfactory for vital personal information. He believed **Australia lacked serious privacy legislation or enforcement**, and hoped that better regulation and proactive government involvement could make the country an attractive centre of safe and reliable Cloud computing.

Differentiation was drawn between the regulatory requirements for public and private Clouds. Clouds used by the Government for e-health records, for example, would need markedly more stringent conditions than entrepreneurial offerings. It was agreed that law makers had to be cognisant of the allocation of risk between suppliers and customers. The recent introduction of the unfair contract terms and provisions section in consumer law explicitly refers to the way in which risks can be unfairly passed on to consumers and seeks to ensure a balance in the marketplace.

It was noted that Facebook, for all its success, had been beset by privacy issues of late and was beginning to lose users in developed countries, perhaps as a result of the increasing sophistication and scepticism of users. In answer, it was underlined that Australia does have privacy law, a privacy commissioner and that the issue was taken seriously in government circles.

The next speaker observed that only specific legislation had stopped telemarketers bombarding people at home with intrusive and unwelcome phone calls. Market forces alone would never have achieved this popular protection. He noted that large companies can bear risks and endure losses which would be devastating for individuals. A sum which would bankrupt a citizen would be two zeroes below rounding error for a bank. The speaker therefore hoped that if major players offered “take it or leave it” contracts to customers, they would bear losses on their behalf in return. He wondered if the Cloud would remain **a seller's market**, requiring more intervention and control, or whether it would soon mature, as buyers gained more power and **standards improved through competition**. He argued that efforts to ensure the cross-jurisdictional protection of data have proved entirely unsuccessful so far, and praised President Sarkozy of France for calling for online regulation at the G8 conference in May, a speech which had finally put the issue on the agenda in the face of much scepticism.

The following speaker agreed that Australia had no authority to enforce standards or contractual arrangements on unscrupulous Cloud providers abroad. He noted that demands for new legislation were a common response to new markets, and preferred a review of the effectiveness of existing regulation and its potential to cover new circumstances. APRA's note to the financial services market is a good demonstration of a regulator looking at existing guidelines and providing advice on their applicability to the Cloud. He said there was a need to analyse the nature of risk and the willingness of participants to bear it. The Government requires strict security and data sovereignty controls, so will favour locally hosted, locally

supported Cloud environments. Conversely, a Surry Hills entrepreneur is willing to bear greater risk because consequently lower service costs allow him to expand his business more effectively.

It was agreed that looking at existing provisions as an initial step would be sensible, particularly as the new provisions regarding unfair contract terms are generic across industries. Cloud services are in their infancy, and though some believe all IT will be run on a handful of large data centres in the foreseeable future, it is perhaps more likely that a proliferation of multiple Cloud providers, each with their own niche offerings and specialities, will evolve. These may be tailored for certain vertical industries, or high performance or highly complaint data regulations, and may excel at interoperability or integration. There would be a place in this scenario for Australian Clouds, as some customers would be unwilling or unable to allow their data out of Australian jurisdiction.

Group Discussions



Keith Besgrove invited attendees to discuss practical next steps for industry and government.

The opening table discussed **the problem of monetising copyright in the digital age** and the need for copyright holders to find **new business models**. iTunes proved that it was possible to succeed by selling content in a convenient way. A blanket tax on all downloads was rejected as unfair and unworkable. The group favoured **mandatory disclosure legislation**, but felt the entrepreneurs who would use the Cloud were already doing so, rather than attending conferences about it. This new generation of users should be consulted before heavy-handed regulation is imposed.

The following table examined the interests of consumers and unsophisticated users and also believed there should be a legal obligation by vendors to inform users of data breaches. They thought the Cloud Trust Protocol was a good idea, but that it was tailored to a sophisticated demographic, with ordinary consumers unlikely to understand what its 21 points meant for them. They favoured the creation of a simplified matrix for such users, facilitated by government, the private sector or an industry group. They thought too many codes and regulatory tools already existed and the need was to link existing regulations effectively, rather than create a host of new ones.

The next table looked at methods to enforce service levels within the Cloud environment and **the difficulties of attributing accountability**, given the existence of so many parties in delivering service. They did favour a code of conduct or a minimum standard, setting out how quickly data should be retrieved, for example, with like-minded players in the industry offering a self-regulatory system to deal with data breaches and a mechanism to resolve disputes. They believed **the Telecommunications Industry Ombudsman (TIO) should assume some responsibility** in the new Cloud-converged NBN environment.

The next group had debated the extent to which new regulation was required, with the free market entrepreneurs insisting on regulation, while the regulators argued it was unnecessary. The group doubted the extent to which customers understood the terms and services of the Cloud and wi-fi agreements they were signing up to, and advocated **better product information and education on risk**. It was agreed that **dispute resolution** had to exist within a broader framework of certainty and be

clear and transparent in its processes, whether it was government or industry run.

The following table wanted a **“naming and shaming” policy for suppliers**, which had breached their code of conduct. They advocated the implementation of **network-level safety protections in the NBN** itself, to ward off denial of service attacks, phishing and malware, rather than leaving it to individual service providers, in addition to educating users about how to protect themselves. Some form of **government “safety test” for providers** might also be launched. They, too, believed the Government should enforce existing law before creating any new ones and improve resources for regulators. They also believed the Government's response to the Australian Law Reform Commission report on privacy law had ground to a complete halt and should either be abandoned or completed, rather than left in abeyance. They recognised that domestic legislation was insufficient to deal with the cross-border nature of the Cloud and so **the negotiation of binding and enforceable international agreements** was vital.

Another speaker pointed out **legal and administrative problems with “naming and shaming” firms**, particularly if legal action regarding the case was ongoing. It was felt that **consumer advocacy groups could play a role in examining a firm's reputation**. He agreed that once a regulator had decided a supplier was in breach of the law, their findings should be publicised.

The next table did not think the Cloud required special treatment by government over and above other technology services, but agreed that in the future the Cloud may become as essential and ubiquitous as telecommunications are today. They favoured **a system of certification and minimum standards regarding data backup** and similar issues. The telecommunications industry and banks must conform to codes, as do services transferring electronic funds, and as these work well they could be models for codes for the Cloud. Any such codes would have to be international in scope.

There were different views regarding the Government's role in building trust in Cloud providers, but it was agreed that **transparency** was a vital component. The Government tends to be a trusted institution and so any service it used would tend to be trusted by the public. It was also agreed that Cloud services had to assure privacy, data security and interoperability and that competition and portability was required to prevent prices being endlessly hiked for committed customers.

The next group discussed the possibility of customers' data being automatically encrypted in the Cloud, although this then creates the problem of customer key management. They agreed that Cloud literacy was important and wondered if **the Small Business Advisory Service could**

play a role in informing SMEs. They saw opportunities for Australian firms to acquire infrastructure as a service, from Amazon or other large providers, and develop their own software to be marketed worldwide if jurisdictional issues allowed.

The next table also disagreed amongst themselves regarding the extent to which government intervention was required, but did agree that plain language contracts would help SMEs, while large organisations could guard their own interests. The fate of Cloud data if hosting bills are unpaid was raised, given that physical goods in storage would be locked and then sold off in lieu of unpaid fees. The idea of **an industry levy to pay for “trust marks” and a dispute resolution service** was offered. The creation of a **government sponsored crowdsourced website** offering reviews and experiences with various Cloud providers was also suggested. **The use of the Australian Tax Office to contact small businesses about Cloud services** was proposed, given that they know the location and business of every firm in the country.

The following group agreed that **a code of conduct** was necessary as Cloud providers offering services in Australia had already peddled dubious claims and exhibited a distinct lack of transparency and disclosure about their operations, data and privacy policies and other issues. The market is immature, with naïve customers and unproven vendors, and so mandatory data breach legislation was again seen as vital. Australian businesses must already comply with a host of rules and regulations, and conforming to certain minimum Cloud criteria should be no different. Large parts of the economy are becoming dependent on data held in the Cloud and, as the NBN rolls out, this reliance will only spread and deepen, so it is vital that Cloud services can be relied upon. Cyber security remains an important issue, especially given recent data attacks by entities in China, North Korea and Russia. Criminals see consumer technologies such as **games hosted in the Cloud as the “soft underbelly” of cyber security**, with the recent attacks on Sony occurring through their use of Amazon's service.

The next table did not favour a “one size fits all” approach to standards, however, they agreed that regulation was required to avoid a lowest common denominator approach. They, too, saw **the negotiation of multilateral treaties** as critical, as data can be fragmented around the world with vendors and consumers based on different continents. The standards should include **a prohibition on vendor “lock-in”** and ensure interoperability, **consumer ownership of data** and the right for the data owner to access their data once the contract terminates. The group expressed concerns about **the accessibility of data if the provider went bankrupt**. They considered **mandating data storage within Australia in some circumstances** or ensuring the encryption of data sent outside the country.

Another speaker agreed that **minimum standards could operate as seatbelt legislation does** in cars, with **basic requirements and advisory material mandated by government** and extra safety precautions offered by vendors. He also differentiated between trusted and trustworthy entities, observing these are very far from being the same thing.

The final table supported “trust marks” in the form of a varying scale presented to the consumer at the time of purchase, which clearly outlined the service criteria. They felt that SMEs tend to trust their accountant and so Cloud information could perhaps be funnelled through them. The group underlined the importance of security precautions and suggested **the auditing of Cloud data from an SME perspective**.

The following speaker suggested the Government **educate school children on a continual basis about cyber and security issues**, rather than concentrating their effort into dedicated weeks.

It was observed that the transition of computing to the Cloud was an ongoing and continuing process which might last many years. Putting complex rules into place today may prove inadequate for the needs of tomorrow. Many Australians are inevitably going to choose Cloud services hosted overseas, but **proactive advocacy and codes of practice** should aid the transition to a better informed marketplace and more responsible providers.

It was suggested that **all company CEOs undertake a course in cyber security** to understand the issues and risks at hand. The possibility of Australia perfecting the regulatory framework and so becoming a global centre of Cloud contracting, dispute resolution and hosting was raised again. The right kinds of regulation might develop the free market in Australia, rather than hamper its development.

Keith Besgrove thanked everyone for their contributions and summed up his thoughts on the day. He reassured attendees that the Government was in no rush to legislate and welcomed the concept of **industry self-regulation** wherever possible. He acknowledged the complex and intractable nature of the multijurisdictional issue and agreed that discussions regarding the **mandatory disclosure of data breaches** could be taken further by the Australian Communications and Media Authority, ACCC and TIO. Mr Besgrove acknowledged interest in “trust marks” from some, though not all, participants and the need for **cyber security** to come to the fore. He said a report on the forum's discussions would be distributed and that his department was keen that further activities take place on selected activities. He hoped the consumer groups and colleagues from the Australian Communications Consumer Action Network would be interested in participating in these.

Peter Fritz AM, Group Managing Director of TCG and Managing Director of GAP, said that while nobody could predict the future, those present had the ability to shape it. He announced the plans to establish a National Standing Committee on Cloud Computing to straddle commercial and non-commercial interests to benefit Australia. Mr Fritz thanked everyone for their participation, the industry and government sponsors and the staff of GAP. He promised the event would be held again next year.

Participants



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Attachments



Workshop Programme

Speakers Profiles

Discussion Topics

Sponsors Profiles



Global Access Partners

GAP Workshop on Cloud Computing

Friday, 24 June 2011 – Sydney, Australia

PROGRAMME

**NSW Trade & Investment Centre
Parkes / Hamilton Rooms
Level 47, 19 Martin Place, Sydney**

8:30am

Registration. Tea & coffee served

9:15am

Welcome & Introduction

Lisa Middlebrook
Executive Manager
Strategy & Policy
Global Access Partners (GAP)



9:20am

Chairman's Welcome
Objectives of the Workshop

Keith Besgrove
First Assistant Secretary
Digital Economy Services
Division, Department of
Broadband, Communications &
the Digital Economy



SESSION ONE

9:30am

Introduction of speakers

Lisa Middlebrook

Presentation

**“GOVERNMENT AND BUSINESS
POLICIES FOR THE CLOUD
COMPUTING ERA”**
Prof Paul Strassmann
Distinguished Professor of
Information Sciences
George Mason School of Information
Technology & Engineering, USA



Question & Answer

10:05am

Presentation

**“BEST PRACTICE APPROACHES
TO CLOUD: MANAGING SECURITY
AND PRIVACY CONSIDERATIONS”**
Alan Bennett
Vice President, Enterprise Services
Hewlett-Packard South Pacific



Question & Answer



Global Access Partners

GAP Workshop on Cloud Computing

Friday, 24 June 2011 – Sydney, Australia

10:30am

Group Workshop

1 – CLOUD COMPUTING AND OPPORTUNITIES FOR INDUSTRY DEVELOPMENT IN AUSTRALIA

2 – THE WAYS IN WHICH THE NATIONAL BROADBAND NETWORK, IN COMBINATION WITH CLOUD COMPUTING, CAN TRANSFORM ECONOMIC AND SOCIAL DEVELOPMENT AND GOVERNMENT SERVICE DELIVERY

GROUP LEADERS

- ▶ **Philip Argy** - Chairman, eCommerce Committee, Business Law Section, Law Council of Australia
- ▶ **Ian Birks** – Chief Executive Officer, Australian Information Industry Association (AIIA)
- ▶ **Nan Bosler** – President, Australian Seniors Computer Clubs Association
- ▶ **Chris Cheah** - Full-Time Member, Australian Communications and Media Authority (ACMA)
- ▶ **Teresa Corbin** - Chief Executive Officer, Australian Communications Consumer Action Network (ACCAN)
- ▶ **Malcolm Crompton** – Managing Director, Information Integrity Solutions
- ▶ **Martin Duursma** - VP Citrix Labs & CTO Office Chair, Citrix Systems
- ▶ **Dr Dean Economou** - Technology Strategist, National ICT Australia (NICTA)
- ▶ **Bob Hayward** - Chief Technology and Innovation Officer, CSC Australia & CSC Asia
- ▶ **Martin Kaldor** – Director, Shearwater Solutions
- ▶ **James Kelaher** – Director, Smartnet
- ▶ **Marcus Moufarrige** - Chief Information Officer, General Manager Asia , Servcorp
- ▶ **Holly Raiche** - Executive Director, ISOC-AU

11:00am

Plenary Discussion

Facilitated by Keith Besgrove and Lisa Middlebrook under a parliamentary rule of 3 minutes per speaker

12:00pm

Buffet lunch & networking opportunities



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GAP Workshop on Cloud Computing

Friday, 24 June 2011 – Sydney, Australia

SESSION TWO

1:00pm

Introduction of speakers

Lisa Middlebrook

1:05pm

Presentation

“IMPLICATIONS OF CLOUD COMPUTING FOR CONSUMERS”

Peter Kell

Deputy Chair
Australian Competition and Consumer Commission (ACCC)



Presentation

“CLOUD STANDARDS: WHAT, WHY, HOW AND WHO”

Bob Hayward

Chief Technology & Innovation Officer
CSC Australia & CSC Asia



Presentation

“CLOUD CONTROL: IMPROVING SALES AND BUSINESS PROCESSES USING THE CLOUD”

Marcus Moufarrige

Chief Information Officer
General Manager Asia
Servcorp



1:35pm

Question & Answer

2:00pm

Group Workshop

3 – THE IMPLICATIONS OF THE USE OF CLOUD COMPUTING BY AUSTRALIAN CONSUMERS AND SMALL BUSINESS

4 – POLICY FRAMEWORKS, INCLUDING PRIVACY, STANDARDS AND POSSIBLE INDUSTRY CODES OF CONDUCT

2:30pm

Plenary Discussion

Closing Remarks

Keith Besgrove

Vote of Thanks

Peter Fritz AM

Group Managing Director
TCG Group & GAP



3:50pm

Close



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SPEAKERS



Alan Bennett

Vice President, Enterprise Services
Hewlett-Packard South Pacific

Alan Bennett is Vice President for Enterprise Services, HP South Pacific. In this role, Bennett is responsible for business growth in Enterprise Services core areas of infrastructure services, business process outsourcing and application solutions across Australia and New Zealand.

Alan Bennett was previously the Industry Leader for Government & Defence for Enterprise Services, HP South Pacific, responsible for leading growth and setting strategy to optimise new opportunities within the government and defence industries. Alan's focus was leveraging HP's local and global credentials to further grow the business within these industries across the region, with particular emphasis on driving new business in applications development, system integration and shared services capabilities.

Alan has a wealth of government and commercial experience, having secured some of EDS', now HP Enterprise Services, largest contracts in Europe, Middle East, America and Asia Pacific and having spent over two decades working within or for government clients. Alan has gained extensive global industry experience since joining EDS in 1995 and has been responsible for helping secure major contract wins in both the government and corporate sectors, including telecommunications.

During his time at EDS, Alan has led both the Asia Pacific and UK sales organisations, and was acting president of EDS Japan during 2001-2002. His success in helping secure many of EDS' major outsourcing contracts saw him win multiple EDS Inner Circle Awards for sales performance. Alan began his career in the Federal Government in Canberra with the Australian Bureau of Statistics and Attorney General's Department.

Alan holds a Bachelor of Commerce degree majoring in Economics, Accounting, Law and Computer Science from the Australian National University.



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Keith Besgrove

First Assistant Secretary
Digital Economy Services Division
Department of Broadband, Communications &
the Digital Economy

Keith Besgrove is the First Assistant Secretary, Digital Economy Services Division in the Department of Broadband, Communications and the Digital Economy (DBCDE) in Canberra, Australia.

Keith provides advice to the Australian Government on strategic, legal and regulatory issues relating to communications and the digital economy. He is responsible for spectrum policy within DBCDE. Keith's other responsibilities include the Australia Post, regional and indigenous communications, the Do Not Call Register, spam, consumer issues, domain names and numbers and international telecommunications. He has been involved in various international groups including the OECD, APEC and ITU. He was the Chair of the OECD Working Party on Information Security and Privacy (WPISP) for five years until 2010. Keith is also a member of the Australasian Consumer Fraud Taskforce.



Peter Fritz AM

Managing Director
TCG Group & GAP

Peter Fritz is Managing Director of GAP, and Group Managing Director of TCG - a diverse group of companies which over the last forty years has produced many breakthrough discoveries in computer and communication technologies. In 1993, some of the 65 companies in the Group were publicly floated on the Australian Stock Exchange as TechComm Group Limited (now called Utility Computer Services UXC), with great success. Another former TCG company floated on the New York Stock Exchange in November 1997 for US\$600 million, making it the largest technology company to be established in Australia until that time. Today the TCG companies, and entities with TCG roots, employ well over 6000 people with a turnover in excess of \$1.3 billion annually.

In 2000 Peter established Global Access Partners (GAP) - a not-for-profit organisation which initiates high-level discussions on the most pressing social, economic and structural issues and challenges across a broad range of Australian economic sectors.



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Peter's innovative management style and corporate structuring has led to the creation of a business model which is being copied by many successful entrepreneurs, and has become part of university undergraduate and masters programs in business management in Australia and around the world. Peter Fritz also chairs a number of influential government and private enterprise boards and is active in the international arena, including having represented Australia on the OECD Small and Medium Size Enterprise Committee. He is the holder of six degrees and professional qualifications, is a recipient of the Order of Australia, and has received many other honours.



Bob Hayward

Chief Technology & Innovation Officer
CSC Australia & CSC Asia

Bob Hayward is the Chief Technology & Innovation Officer for CSC Australia and CSC Asia. He joined CSC in April 2009 and is based in Australia.

Bob is responsible for the overall direction and business management of CSC's technology offerings, product strategies and innovation programs. He is a key contributor to CSC's global and local Office of Innovation which includes the Leading Edge Forum, a team of global thought leaders who offer world-class research, ideas, frameworks, case studies and events that identify emerging business and IT practices.

Prior to joining CSC, Bob was a Director of IT Services for KPMG Australia, where he advised the global managing partner for IT Services on emerging technologies and helped create new international services matched to these growth opportunities.

In November 2008, Bob was nominated as a Director on the board of the Australian Information Industries Association (AIIA) and is the Chairman of AIIA Council for Environment and Sustainability Leadership.

Bob is a co-founder of Asia Online, an Asian based start-up focused on developing automated machine translation technologies. Until April 2006, Bob was Senior Vice President and Research Fellow Asia Pacific and Japan for Gartner, and was the first employee of Gartner in the Asia Pacific region, joining the firm in 1995. Bob is a significant recognised contributor to two Harvard Press books, "The New CIO Leader" by Broadbent/Kitzis and "IT and the East" by Iyengar/Popkin.

Bob attended Newcastle University in the UK where he studied Computer Science.



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Peter Kell
 Deputy Chair
 Australian Competition and
 Consumer Commission (ACCC)

Peter Kell was appointed a deputy chair of the ACCC in July 2008 for a five-year term. Peter chairs the Adjudication Committee and is a member of the Enforcement Committee. He serves on the Consumer Policy Committee of the Organisation for Economic Cooperation and Development and the International Consumer Protection and Enforcement Network. He is also a member of the Advisory Board of the federal government's Financial Literacy Foundation.

Before joining the ACCC, Peter was chief executive of CHOICE (the Australian Consumers Association) and a board member of the global consumer organisation Consumers International. He has extensive experience in advancing consumer and market reform issues in Australia and internationally.

Peter previously worked at the Australian Securities and Investments Commission, which he joined in 1998 when it took on a significantly expanded role in consumer and investor protection in financial services. He served as ASIC's executive director of consumer protection and as its New South Wales regional commissioner until 2004. Earlier in his career Peter was a policy adviser in the federal Department of Finance.

Peter has a BA with Honours in Economics from the University of Sydney.



Lisa Middlebrook
 Executive Manager
 Strategy & Policy
 Global Access Partners (GAP)

Lisa Middlebrook is Executive Manager for GAP's new initiative - a 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 task forces.

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 this, she served as the Director of Business Development at the Lowy Institute.



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Lisa spent six years with the Democratic Leadership Council (DLC) and Progressive Policy Institute in Washington DC where she was a Senior Adviser on trade policy and was also responsible for external relations with the corporate community and non-profit foundations. She was instrumental in helping establish political relationships for Australia with regard to the US/Australia Free Trade Agreement.

Prior to the DLC, she served at the Australian Embassy in Washington working on US Congressional Relations and trade issues. Lisa is a graduate of the University of California Los Angeles (political science and international relations) and serves on the Board of Directors of the Johnny Warren Foundation and the organising committee for the Steve Waugh Foundation.



Marcus Moufarrige

Chief Information Officer

General Manager Asia

Servcorp

Marcus Moufarrige has worked in the Serviced Office and flexible workspace industry for nearly 20 years. He is currently C I O and Sales Director for Servcorp an ASX listed multi-national company with a network that stretches across 130 locations in 26 countries.

Marcus has been instrumental in the transformation of Servcorp from a Real Estate business into a technology services organization with Real Estate at its core. His main focus has been on building a global interconnected network platform, managed by a single database, hosted in the Cloud. This vision has seen the growth of Servcorp Virtual Office business to 30,000 customers around the world and growing at better than 20% per annum. Marcus has also been involved in distributing services across this platform, digital asset management and social media start-ups.



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Prof Paul Strassmann

Distinguished Professor of
Information Sciences
George Mason School of Information
Technology & Engineering, USA

Paul A. Strassmann's career includes service as chief corporate information systems executive (1956-1978; 1990-1993, and 2002-2003), vice-president of strategic planning for office automation (1978-1985), and information systems advisor (1986 to date).

Paul is the Distinguished Professor of Information Sciences, George Mason School of Information Technology and Engineering and researcher at the Center for Secure Information Systems. He holds registered U.S. Trademarks for Return-on-Management®, R-O-M®, Information Productivity® and Knowledge Capital®. In 2009 he received an Honorary Doctorate degree from the George Mason University.

After serving as an advisor to the Deputy Secretary of Defense since 1990 he was appointed to a newly created position of Director of Defense Information and member of the US Senior Executive Service. He was responsible for organizing and managing the corporate information management (CIM) program across the Department of Defense which included a major cost reduction and business reengineering program of the defense information infrastructure. Paul had policy oversight for Defense Department's information technology expenditures.

He is a 1993 recipient of the Defense Medal for Distinguished Public Service - the Defense Department's highest civilian recognition.

In 2002 he was recalled to government service as the acting Chief Information Officer of the National Aeronautics and Space Administration, with direct responsibility and accountability for the NASA computing and telecommunication information infrastructure. After completing his assignments in 2003 he retired from government service after receiving the NASA Exceptional Service Medal for improving I.T. architecture, security, and services.

Paul joined Xerox in 1969 as director of administration and information systems with worldwide responsibility for all internal Xerox computer activities. From 1972 to 1976 he served as general manager of its Information Services Division which included all central computer operations, telecommunications networks, administrative services, software development and management consulting services. He introduced major innovations in global telecommunication management. From 1976 to 1978 he was corporate director responsible for world-wide computer, telecommunications and administrative functions. He was key contributor to shaping business Xerox strategy for office automation. He developed new methods for evaluating the productivity of computer investments.



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Until his retirement from Xerox he served as vice president of strategic planning for the Information Products Group, with responsibility for strategic investments, acquisitions and product plans involving the corporation's world-wide electronic businesses.

After his retirement he became author, lecturer and consultant to firms such as AT&T, Citicorp, Digital Equipment, General Electric, General Motors, IBM, ING, SAIC, Shell Oil, Sun Microsystems, and Texas Instruments. He has held appointments as Adjunct Professor at the U.S. Military Academy at West Point, Visiting Professor at the University of Connecticut, and Visiting Professor at the Imperial College, in London, England. His public involvement includes presentations to the US Senate, the US House of Representatives, the Board of Governors of the Federal Reserve, the British House of Commons, and the USSR Council of Ministers.

Paul served on the Boards of Directors of Alinean, InSite One, McCabe Software, Meta Software, and Trio Security. He is Contributing Editor at SIGNAL, the monthly magazine for the Armed Forces Communications & Electronics Association.

Prior to joining Xerox, Paul held the job of Corporate Information Officer for the General Foods Corporation and afterwards as the Chief Information Systems executive for the Kraft Corporation from 1960 through 1969. His involvement with computers dates back to 1954 when he designed a method for scheduling toll collection personnel on the basis of punch card toll receipts.

He earned an engineering degree from the Cooper Union, New York, and a master's degree in industrial management from the Massachusetts Institute of Technology, Cambridge, MA.

He is author of over 250 articles on information management and information worker productivity. His lectures are now available as video recordings on the Internet. He is recipient of the 2006 Neal Business Journalism award for a series of articles on the Economics of Information.

In 1997 Mr Paul was named to the CIO Hall of Fame by CIO Magazine as one of the twelve most influential CIOs of the decade. In 2000, he was cited by the Assistant Secretary of Defense for Command, Control and Intelligence for his pioneering work as one of the executives responsible for advancing the cause of U.S. information capabilities.

Paul is recipient of the Gen. Stefanik Medal for his actions as a guerilla commando from September 1944 through March 1945 in Czechoslovakia.



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DISCUSSION TOPICS

SESSION ONE

- 1- 'CLOUD COMPUTING AND OPPORTUNITIES FOR INDUSTRY DEVELOPMENT IN AUSTRALIA'
- 2- 'WAYS IN WHICH THE NBN, IN COMBINATION WITH CLOUD COMPUTING, CAN TRANSFORM ECONOMIC AND SOCIAL DEVELOPMENT AND GOVERNMENT SERVICE DELIVERY'

Issues

- ▶ **Encouraging innovation:** The NBN provides a catalyst for Cloud computing to increasingly transform the economy, including enabling business and the not-for-profit sector to reduce costs and boost competitiveness in the global market. It can also transform areas such as education, health, aged care and environmental sustainability, among others. The challenge for government is to explore where the specific possibilities lie and to encourage development and investment in these areas, in collaboration with the private and research sectors.
- ▶ **Opportunities and challenges:** Cloud computing can provide opportunities for small businesses to penetrate larger markets and new ways of collaboration. An issue for businesses is to ensure adequate risk management processes so that customers continue to trust that information is stored securely in appropriate private or public Cloud services. At the same time, it is important the regulatory environment balances risks with opportunities for innovation.
- ▶ **Research:** There are clearly many emerging opportunities presented by Cloud computing in public and private sectors. Government support for innovation should be able to encompass opportunities for cloud based innovation to assist business and enhance productivity. There is scope for collaboration between government, the private sector, academics and research bodies such as National ICT Australia and the Commonwealth Scientific and Industrial Research Organisation (CSIRO).
- ▶ **Social development:** The government is interested in how to best leverage the advantages of the Cloud to maximise benefits to sectors and groups such as regional and remote Australia, the not-for-profit sector or the disability sector. The ubiquity of the NBN is a key enabler in providing Cloud services to these groups. It is important to keep in mind that some Cloud services must be able to operate on wireless and satellite speed and capability rather than optic fibre.
- ▶ **Government services:** 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.



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Workshop Outcomes

- ▶ Gather and assess ideas targeted at industry development as well as sectors of the economy and the community.
- ▶ Highlight specific topics in which research is needed, and if the research should involve a combination of government, private sector, academic and research bodies.

Discussion Questions

- 1. What do you see as the opportunities in Australia brought upon by Cloud computing combined with the NBN?**
- 2. Are there factors that could prevent the effective development of the Australian Cloud computing sector?**
- 3. What knowledge about Cloud computing in an Australian context needs to be explored through research? Who could be best placed to carry out this research?**
- 4. Which sectors of the Australian economy and the community do you believe could especially be transformed from Cloud services enabled by the NBN? What Cloud services could assist these sectors?**
- 5. Is there scope for the government to gather ideas about potential Cloud services enabled by the NBN from the broader public including software developers, businesses and the wider ICT industry? How could the government carry this out?**



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DISCUSSION TOPICS

SESSION TWO

3- 'THE IMPLICATIONS OF THE USE OF CLOUD COMPUTING BY AUSTRALIAN CONSUMERS AND SMALL BUSINESS'

Issues

- ▶ **Contractual issues:** Cloud services offer many potential benefits to consumers and small businesses, but there appears to be the prospect that many consumers and small businesses will enter into contracts with Cloud providers without understanding the potential pitfalls. Since consumers and small businesses will not have the power to vary a Cloud provider's terms and conditions, some may not have the confidence to adopt Cloud services if they do not believe that they are adequately protected. There may be a need to enable consumers and businesses to seamlessly move from one Cloud provider to another, both in terms of technical systems and contract provisions.
 - Nationally, the government could support self-regulatory efforts by the sector on consumer protection codes of practice to uphold consumer rights.
 - The challenge for regulators will be to protect and enforce consumer rights across different jurisdictions and providers, especially with customer complaints and redress involving offshore Cloud providers. In the long term, the market may solve this problem as consumers will move their business to the Cloud providers that they trust. However, there is a role for government to monitor whether protection for consumers and businesses will be adequate.
- ▶ **Small business:** It is important to ensure that protections for small business are comparable to the level of protections for consumers. At the same time, regulation designed to protect small business users should not hinder large corporate customers.
- ▶ **Trust:** It is important for consumers to have trust in their Cloud provider. This is particularly true given that more and more sensitive and personal information will be stored in the Cloud, and fragmented across multiple jurisdictions. The private sector has previously used principles and best practice guidelines, but given the potential for high-scale breaches there may be a role for government to create enforceable standards.
- ▶ **Copyright:** Businesses and consumers may have less physical control over their intellectual property. Because of this, there are increased risks of infringement of intellectual property in the Cloud, which could create complexity in terms of who is liable and for what amount, especially if it involves multiple jurisdictions.
- ▶ **Educational materials:** Small businesses and consumers may need guidance to adopt Cloud computing. Government should support awareness raising activities by private sector and consumer organisations and may provide further materials and tools, especially if needed by small businesses.



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Workshop Outcomes

- ▶ Identify approaches to protect consumers and businesses in an environment in which Cloud providers may be offshore.
- ▶ Clarify expectations of the regulatory role of government, its agencies and the private sector. Assess which agencies are best placed to manage individual Cloud issues.
- ▶ Identify gaps in existing regulation, such as for small business or privacy.

Discussion Questions

- 1. Should Cloud computing be treated by the government in the same manner as other technology-based services?**
- 2. How can the government work with providers to promote contract terms and conditions that adequately protect consumer and small business rights, including privacy?**
- 3. How can government and Cloud computing providers work together to maximise trust?**
- 4. How could the government improve existing regulation to enable consumers and business of all sizes to be adequately protected?**
- 5. How can the government increase awareness and trust in Cloud computing among consumers and business?**



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DISCUSSION TOPICS

SESSION TWO

4- 'POLICY FRAMEWORKS, INCLUDING PRIVACY, STANDARDS AND POSSIBLE INDUSTRY CODES OF CONDUCT'

Issues

- ▶ **Privacy and security:** Privacy and security issues could be amplified, as Cloud computing enables data to be stored in locations across jurisdictions. Security risks, variability in international laws and lack of clarity around ownership of data could discourage businesses and consumers from trusting the public Cloud with their data. Alternatively, other businesses and consumers may choose public clouds due to the economies of scale that they provide without fully assessing the security risks.
 - **Variability in laws:** It may be more difficult for the government to monitor compliance and enforce Australian laws. Data stored in offshore countries can be subject to the laws of those countries, regardless of whether the customer is based in Australia. The risk of interception may affect where businesses and consumers choose to locate their data.
 - **Data breaches:** Cloud servers can be vulnerable to loss and failure, and as more data enters the Cloud there is a risk that security breaches, such as the Sony Playstation example, could become more commonplace.
- ▶ **Private sector and government collaboration:** There is an opportunity for the private sector and government to collaborate in the development of standards or codes of conduct for Cloud computing. The challenge is to define what could be included to be effective and how the standards of codes of conduct would relate internationally.
- ▶ **International agreements:** Engaging in international discussions to support global Cloud approaches could help protect consumers and businesses across jurisdictions, especially in situations where customers wish to complain or receive redress from offshore Cloud providers. A number of standards and international authorities already exist and the challenge is how to realistically achieve consistent agreement on Cloud issues and in what form, such as frameworks or treaties.

Workshop Outcomes

- ▶ Clarify what is seen as the government's and the sector's role in protecting privacy and security of Australians, given the multijurisdictional nature of Cloud computing.
- ▶ Decide whether the potential development of standards or codes of conduct for Cloud computing would be feasible and effective, and identify any criteria or features that could be covered.
- ▶ Identify goals when engaging about international Cloud standards or codes of conduct.



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Discussion Questions

- 1. What is the government's and sector's role in minimising the risk of major privacy and security risks?**
- 2. Would Australian standards or a code of practice for Cloud services be useful?**
- 3. If there were to be a standard or a code of practice, who would develop it and what would it include?**
- 4. How could an Australian standard or code of practice apply to overseas Cloud providers and what would be the relevance of an Australian code of practice internationally?**
- 5. Given the multijurisdictional nature of Cloud computing, will the ways that Australian laws interact with those of other countries need to change?**
- 6. How could international agreements on Cloud computing work effectively? How would they take into account existing frameworks?**



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SPONSORS



Australian Government
 Department of Broadband,
 Communications and the Digital Economy

The Department of Broadband, Communications and the Digital Economy has an ambitious and challenging agenda over the next three years.

The department's goal is to help develop a vibrant, sustainable and internationally-competitive broadband, broadcasting and communications sector and, through this, promote the digital economy for the benefit of all Australians.

Government's role in developing the digital economy includes laying the foundations for Australia's digital infrastructure, facilitating innovation and setting regulatory frameworks conducive to enabling individuals, households, businesses and the community to take up the associated opportunities.

The Department has four broad areas of focus.

Transforming the structure of telecommunications — enhancing access to digital economy platforms by promoting delivery of fast, affordable and reliable broadband and communications infrastructure across Australia.

Switchover to digital television and enhancing the broadcasting sector — coordinating the switchover from analog to digital television and enhancing the quality and diversity of the broadcasting sector to deliver content and services consistent with community expectations.

Realising the benefits of the digital economy — supporting all Australians to safely and securely realise the full innovative potential of the digital economy and ensure reasonably-priced, essential communications services are available to consumers and businesses.

Enabling a good consumer experience — supporting effective consumer information and research and working with industry to encourage industry-driven solutions to specific consumer issues, including cybersafety and cybersecurity.

www.dbcde.gov.au



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GAP is a not-for-profit public policy network based in Sydney that is comprised of government, industry, academia and community leaders across Australia and around the world. Established in 2000, GAP specialises in new approaches to public policy development and the facilitation of government / industry / community interactions on the most pressing social, economic and structural issues and challenges across a broad range of Australian economic sectors.

Through its pioneering 'Second Track' Process programme of initiatives, GAP seeks to foster links between community, government and academia to streamline the process of 'fast-tracking' solutions to key issues, increase stakeholder participation in policy formation and decision making, and develop novel, cross-disciplinary approaches to regulatory problems by engaging key stakeholders in high-level discussions and research.

GAP's diverse initiatives and ventures include long-term programmes and one-off projects in regulation and public policy, industry policy, healthcare, knowledge capital, innovation, information and communication technology, security & privacy, sustainability & climate change, education, deliberative democracy, and philanthropy & social investment.

GAP runs national and international conferences, multidisciplinary forums and executive roundtables, coordinates community & stakeholder research projects and feasibility studies, and oversees pilot projects to trial new business ideas. GAP's online think-tank, Open Forum, is a well-established online platform with an extensive community network, uniquely positioned to attract and engage the target audience and informed contributions.

GAP's partners include Federal and State governments, major corporate enterprises and industry bodies. Every dollar invested by government in GAP initiatives leverages two dollars from the private sector.

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CSC is a global leader in providing technology-enabled solutions and services. The company has been recognised as a leader in the industry, including being named by FORTUNE Magazine as one of the World's Most Admired Companies for Information Technology Services (2010). Headquartered in Falls Church, Va., CSC has approximately 91,000 employees operating in more than 90 countries and reported revenue of \$16.0 billion for the 12 months ended April 1, 2011.

For over 40 years in Australia, CSC has guided our customers through the maze of constant technology change while maintaining a focus on delivering business results.

With over 3,000 employees in Australia, CSC expands what's possible by evolving the way technology-enabled solutions create sustainable value for commercial and public sector customers worldwide.

CSC's advanced capabilities include system design and integration, information technology and business process outsourcing, applications software development, web and application hosting, mission support and management consulting.

The organisations that collaborate with CSC have benefited from every wave of IT innovation. Customers in industries and governments worldwide have trusted CSC with their business process and information systems outsourcing, systems integration and consulting needs.

Whether it's fuelling growth and performance, improving customer service, protecting information assets, enhancing agility, reducing costs or achieving globalisation — CSC brings business perspective, decades of industry experience and practical ingenuity to every engagement.

Here are just a few reasons why:

- Deeply committed – Your mission is CSC's mission
- Consistently inventive – Harnessing new ideas
- Determined to deliver – Promises kept

CSC is frequently honoured and recognised for its service delivery excellence. Its greatest resource is the combined education, real world experience and capabilities of its professional staff.

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HP is a truly global corporation, doing business in approximately 170 countries and creating technology that positively impacts individuals and businesses all across the globe. Doctors in Norway are providing up-to-the-second, life-saving care to their patients with HP systems that are always on and always connected. In Canada, a nonprofit organisation is using HP cloud computing technology to decrease the amount of time it takes to trace and remove potentially harmful food products from the supply chain once a recall has been issued.

Technology has made our lives better today, but that is nothing compared to what it will do for us in the future. At HP we believe technology can create new possibilities for people around the world—from high school students and soccer moms to budding entrepreneurs, government officials, and senior executives. We're the largest IT company on the planet, and we are committed to doing what we can to deliver that future.

We will listen to our customers to understand their needs and collaborate with them to discover solutions. Where others see challenges, we see opportunities. So we will never stop exploring. We will never stop at impossible. And we can't wait to show you what we think of next.

www.hp.com



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 **SERVCORP**

Servcorp is the world's second largest provider of managed workspace and is viewed as the market leader in premium serviced offices and virtual offices. Founded in Sydney in 1978, Servcorp now operates a growing international network of over 100 prime city locations. Servcorp's clients range from *Fortune 500* companies to small and medium-sized businesses and solo practitioners all over the globe.

A Servcorp Serviced Office is a fully managed corporate office space situated in a prime city building. It includes dedicated answering services and reception staff; access to a worldwide network of meeting spaces and boardrooms; secretarial support on hand and exclusive access to an online portfolio of business services and tools.

A Servcorp Virtual Office® gives clients access to the presence; facilities and services of a Servcorp Serviced Office including virtual addresses, phone numbers and meeting rooms whilst they work from home or alternate locations.

With a proud entrepreneurial history, Servcorp understands the challenges faced by businesspeople and strives to provide technology and services to help them succeed. By selecting only the finest city locations, the best team of service professionals, offering flexible contract conditions and developing in-house technology specifically for business people on the move, Servcorp enables clients to save time and money which can be better invested in their own business.

www.servcorp.com.au



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UXC is an Australian-owned company that makes a significant contribution to the Australasian economy as an employer and service provider. The company ASX listed and is Australia's largest locally owned ICT Services Company with over 1,800 ICT specialists. Dealing with us is easy as we make decisions 'on shore', quickly and with an eye to your business context for risk and value.

Technology for Business Outcomes

Our organisation manages our portfolio of services and technologies to ensure that we not only maintain relevance but also help lead the technology decision making with our clients. Our recent innovations around Cloud and Mobility evidence that we are leaders rather than followers and we always have our eyes on the value business can derive from their investments.

Our business units:

- ▶ **Research, Training & Consulting – Accelerating capability**

The UXC Consulting division provides independent research and advice to corporate and government organisations in the areas of ICT Strategy, Service Management, Project Management, and Information Management. Our consultants focus on developing your organisational capabilities to deliver business outcomes. Our training in management best practices will accelerate your team.

- ▶ **Applications – Enabling organisational transformation and optimisation**

The UXC Applications division is a leading implementer, integrator and support provider for market leading applications solutions. Offering a complete portfolio of business applications and ERP solutions, our business units apply industry leading products, strong capability and experience to deliver customer centric outcomes.

- ▶ **Infrastructure & Outsourcing for efficiency, reliability and security**

The UXC Infrastructure division ensures that customers have technology capabilities in place to support their critical business processes and applications. UXC provides expertise and processes to design, implement and manage on premises or cloud based delivery of infrastructure, unified communications and storage solutions.

A Strong Local Alternative to Multinationals

As the largest Australian owned ICT services organisation, UXC provides services and solutions that match, and often exceed the capabilities of multinational ICT providers. Selecting UXC as an ICT service provider is a smart choice: doing so ensures that the jobs and revenue generated from each engagement benefit the Australasian region and economy.

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