Australian Government

Department of Broadband,
Communications and the Digital Economy

The National **Cloud Computing** Strategy

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National Broadband Network

Contents

Executive summary

On 5 October 2012 the Prime Minister announced that the Australian Government would develop a National Cloud Computing Strategy. This announcement recognised the synergies between the National Broadband Network (NBN) and cloud computing, but also the important role for government in providing the tools that small business, individuals and government agencies need to realise the promise of cloud computing. This strategy has been developed in a partnership between government, industry and consumer groups and outlines a vision for cloud computing in Australia:

Australians will create and use world-class cloud services to boost innovation and productivity across the digital economy.

When organisations adopt cloud services, they are generally more productive, innovate better and operate with greater agility. As a nation, Australia is well placed to take advantage of cloud computing for a range of reasons—including a stable socio-economic system, a strong rule of law, and a highly diverse and skilled Information and Communications Technology (ICT) sector.

At the individual level there are many organisations across the economy that have implemented innovative cloud computing services that have transformed the way they operate. However, as a group, Australian small business and not-for-profit organisations lag behind their counterparts in Organisation for Economic Co-operation and Development (OECD) countries in the use of online technology. This places these organisations at a competitive disadvantage, which could be overcome through the use of cloud computing services.

One reason for this has been insufficient access to the necessary infrastructure to support sophisticated cloud services—the relatively slow download or upload speeds in many parts of Australia have limited the adoption of cloud services. The NBN is changing this and is a key enabler of the digital economy more broadly. There are other reasons that cloud computing has not been adopted more generally in Australia, including a lack of awareness of how to make best use of cloud computing and a lack of confidence that some organisations and individuals have in adopting cloud computing services.

This strategy has identified three core goals and a set of actions to achieve the government's vision. However, as the cloud services market continues to evolve, users and providers of cloud services must remain responsive to change. Likewise, the government will continue to adapt its strategy in response to market and technological changes.

1. Maximising the value of cloud computing in government

Goal: The Australian Government will be a leader in the use of cloud services to achieve greater efficiency, generate greater value from ICT investment, deliver better services and support a more agile public sector.

Key actions:

> The Australian Government Information Management Office (AGIMO) will enhance the guidance available to government decision makers on how to evaluate the benefits of cloud services and how to procure and manage them.

> AGIMO and the Department of Broadband, Communications and the Digital Economy (DBCDE) will establish information sharing initiatives to facilitate continual improvement based on a repository of case studies, better practice risk approaches and practical lessons to enable agencies to learn from each other.

> The Department of Finance and Deregulation (DOFD) will enhance procurement practices to ensure that government agencies are required to consider public cloud services for new ICT procurements.

> Government agencies will transition public-facing websites to public cloud services as their refresh cycle allows, where those services represent the best value for money.

> The government will develop a business case by the end of 2013 to analyse the benefits and drawbacks of a more centralised approach to the provision of cloud services to Australian government agencies.

2. Promoting cloud computing to small businesses, not-for-profits and consumers

Goal: Australian small businesses, not-for-profit organisations and consumers will have the protection and tools they need to acquire cloud services with confidence.

Key actions:

> DBCDE and the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) will jointly:
  - work with intermediaries and member associations to promote informed decision making about cloud computing and tailor information to the needs of particular industry segments
  - enhance the online information available to small business and not-for-profit organisations about the use of cloud services
  - enhance the existing successes of the Digital Enterprise, Enterprise Connect, Technology and Knowledge Connect, the Digital Local Government and Small Business Advisory Service programs.

- The Australian Computer Society will co-ordinate with the National Standing Committee on Cloud Computing (NSCCC), the Australian Information Industry Association and other government and industry stakeholders to develop a voluntary Cloud Consumer Protocol to encourage information disclosure by cloud providers and support consumers of cloud services in being well informed.
- DBCDE and the Office of the Australian Information Commissioner (OAIC) will publish guidance for the cloud services industry about the new privacy reforms that are due to commence in March 2014.

3. Supporting a vibrant cloud services sector

Goal: Australia will have a vibrant cloud sector supported by:

- **a skilled and cloud-aware ICT workforce, able to create as well as adopt cloud services**
- **effective competition in cloud services**
- **regulatory settings that support growth, foster innovation and protect users.**

Key actions:

- The government will continue to work in close collaboration with industry and tertiary institutions to ensure the development of skilled and cloud-aware ICT professionals.
- Austrade will work in partnership with industry to promote Australia as a trusted hub for data storage and processing, and will encourage foreign investment and participation.
- DBCDE will continue to engage through the NSCCC to examine ad hoc cloud computing issues, opportunities and challenges.

The National Cloud Computing Strategy

Australians will create and use world class cloud services to boost innovation and productivity across the digital economy.

GOAL
Maximising the value of cloud computing in Government

ACTIONS
- Drive cultural change
- Share lessons on successes and failures
- Empower agencies with tools to assess benefits and risks
- Improve procurement practices
- Measure progress

GOAL
Promoting cloud computing to small businesses, not-for-profits and consumers

ACTIONS
- Work with trusted organisations
- Promote benefits and debunk myths
- Provide tools that support good decision making
- Measure progress

GOAL
Supporting a vibrant cloud services sector

ACTIONS
- Promote Australia as a trusted cloud hub
- Encourage competition and investment
- Support regulatory certainty
- Measure progress

Review, assess and adjust

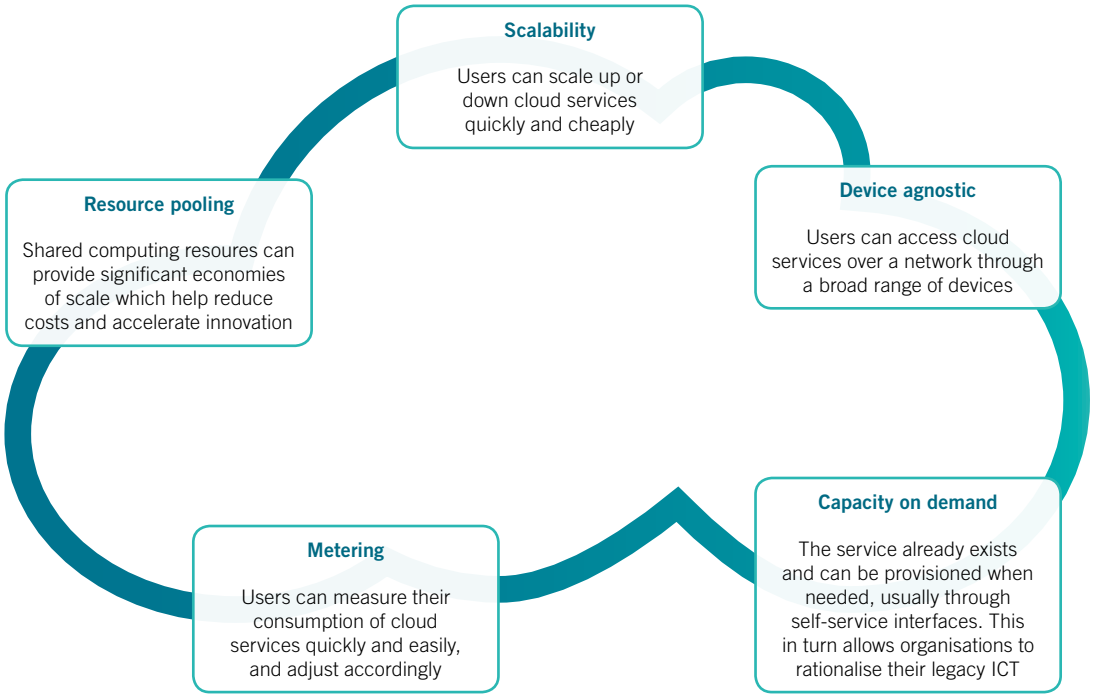
Introduction

In earlier years, businesses generated their own electricity to power individual factories. Electricity generation was costly and required specialist skills which not all businesses could afford. The rollout of electricity grid infrastructure enabled electricity to be delivered as a utility, which in turn allowed businesses to consume electricity as a service. The centralisation of electricity generation allowed for greater efficiencies, which meant that more businesses and even individuals could afford electricity by only paying for what they used. This evolution delivered transformational productivity gains across all segments of industrialised economies, improved the quality of life in communities and created opportunities for new industries.

Information and Communications Technology (ICT) is undergoing a similar evolution. For many decades, public and private sector organisations and individuals have consumed ICT as a product by investing in onsite computer hardware and software. However, high-speed broadband infrastructure is enabling the consumption of ICT over the internet as a service.

This new way of delivering ICT services has evolved rapidly over the past decade and has come to be called cloud computing. Like widespread access and use of electricity, cloud computing is a potentially disruptive and transformative innovation. The term 'cloud' refers to the fact that a user of a service no longer needs to buy, build, install and operate expensive computer hardware. Users simply access computing resources as a utility service via a ubiquitously available wired or wireless network—from 'the cloud'. Figure 1 illustrates five important qualities that differentiate cloud services from traditional ICT[i]:

Figure 1: Qualities of cloud services



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Cloud computing is already a major part of many people's lives. Services such as Google Maps, Apple iTunes, Amazon Web Services and Microsoft's Hotmail are taken for granted as simple and convenient ways to access sophisticated computer systems. As these examples demonstrate, cloud computing services can be used to deliver a wide range of services to users and have been in use for many years. Table 1 provides examples of three main categories of cloud services. In practice, virtually all types of computer systems and applications are now available as cloud services. Some of the more mature cloud services, such as Salesforce, have been operating for over a decade.

Table 1—Example of cloud services

Infrastructure	Platform	Software
Data storage	Operating system	Email and Word Processing
Processing power	Web servers	Human Resource Management
Server virtualisation	Development platforms	Customer Relationship Management (CRM)

Irrespective of the type of cloud service, there are different deployment options available. The type of deployment used is an important consideration and can be influenced by different factors such as business needs, security requirements and degree of control required. Table 2 provides an overview of two deployment types.

Table 2—Cloud deployment options

CLOUD SERVICE TYPE	DESCRIPTION
Public Cloud services	A public cloud provides services to users over the internet. Infrastructure is shared, and data can be located in different locations across the globe. Some of the most well-known public cloud providers are Google, Amazon Web Services and Microsoft. Public cloud services offer all of the characteristics referred to in Figure 1. Public cloud services are used by ordinary consumers and an increasingly large number of organisations.
Private Cloud services	A private cloud supplies ICT services to an organisation or restricted group of organisations over a dedicated network link. The private infrastructure can be located on site or managed through an external provider. While private cloud services are quite similar to traditional ICT, they can offer some of the benefits of public cloud services to a limited degree. Private cloud services can also have better latency than other options. Private cloud services are typically used by large organisations that are able to generate some efficiencies of scale including government agencies, banks and insurance companies.

Private and public cloud services are on either side of a continuum. Most large organisations will consume a mix of different types of cloud services (sometimes referred to as 'hybrid cloud'). "community cloud" is another type of cloud, which is particularly relevant to the public sector. Community cloud allows infrastructure to be shared by a range of agencies with common interests. A community cloud may have components of public and private cloud. In the context of this paper, the term "cloud services" may apply to private, public, community or hybrid approaches. However, in a strict definitional sense, only public cloud can realise all of the characteristics outlined in Figure 1. It is important to emphasise that the benefit and risk profiles of various cloud service models will not remain static over time. As the cloud computing industry continues to evolve, so will the relative benefits and risks.

Different clouds for different needs

Why cloud?

The banking industry is dependent on ICT for its operations and delivering quality customer service. High technology costs for secure systems and under-utilised hardware are additional obstacles that banks commonly face. Pay-for-use cloud services can provide banks and other financial institutions opportunities to reduce costs by utilising hardware more efficiently and can give them the ability to scale operations as needed.

Over the past few years the Commonwealth Bank has progressively moved to identify and utilise public, hybrid and private cloud solutions. The Commonwealth Bank has taken a selective approach: it has gone through the process of matching the right cloud service to different information security environments across its business. For example the Commonwealth Bank stores sensitive information in a private cloud to retain maximum control, but uses public cloud services to access, store and protect non-sensitive information efficiently.

Benefits so far

The use of cloud services by the Commonwealth Bank has:

- resulted in a halving of data storage costs
- produced 40 per cent savings in software services that have been migrated to the cloud
- reduced testing and development costs by 50 per cent.

Take away message

The use of cloud services by the Commonwealth Bank has demonstrated that there are opportunities to realise substantial benefits in very complex business environments by matching the right service to each need.

Benefits and risks of cloud computing

Benefits and risks to individual organisations

The adoption of cloud computing globally has been accelerating, which reflects the maturity of cloud services on offer and the value proposition that cloud computing offers for an increasingly large number of organisations. This rapid growth has been highlighted by Ovum Research which forecasts the global cloud services market will reach revenues of US$66 billion in 2016, with an annual growth rate of almost 30 per cent.

Cloud computing enables many organisations to reduce costs and outsource support and maintenance to providers that have lower marginal costs and better expertise. Cost savings are achieved through more efficient utilisation of infrastructure and by pooling demand for ICT services across many customers to enable lower prices.

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Cloud services are particularly attractive to Small and Medium sized Enterprises (SMEs), because cloud services can allow SMEs to easily outsource ICT and focus on what they are good at: their business. The productivity and cost saving benefits of cloud services are becoming increasingly well quantified.

- A 2011 study conducted by Microsoft surveyed over 3000 SMEs across 16 countries and found that firms which embraced cloud services had 40 per cent more revenue growth in the previous year compared to those which had not[ii].
- A 2012 study commissioned by the European Union (EU) found that over 80 per cent of enterprises surveyed had reduced ICT costs by 20 per cent through cloud services[iii]. These firms also reported improved productivity (40 per cent) and improved business processes (35 per cent). The adoption of cloud services had also significantly improved the agility of these businesses. In addition, 46 per cent of respondents to this survey reported they were more efficient and effective in working from mobile devices in the field.

Productivity improvements for small businesses will lead to benefits for Australian consumers. A 2012 survey by Mind Your Own Business (MYOB) found that 33 per cent of SME respondents indicated they would be quite likely to pass on cost savings achieved through the adoption of cloud services to their customers[iv].

Cloud computing can offer individual organisations many benefits in addition to productivity increases. These include:

- ***Functionality:*** the economies of scale of cloud services mean that providers are able to make significant investments in the functionality of their products. This means that many cloud services provide 'best in class' functions and features, superior to what any individual organisation could ordinarily afford on their own.
- ***Mobility:*** increased capacity to work from a mobile device is a key reason for some organisations in acquiring cloud services. Cloud services have enabled a new wave of mobile applications and virtualised work environments, accessible on any device, anywhere. Cloud computing supports a more flexible and agile workforce through teleworking and secure virtualised work environments.
- ***Scalability:*** cloud services enable an individual or company to access computer services on a pay-as-you-go basis, with the flexibility to scale up and down as needed for little marginal cost.
- ***Strong security:*** cloud service providers can offer small business better security, reliability and access to the latest upgrades than would otherwise have been possible through traditional in-house solutions.

However, these benefits can only be fully realised following an assessment of the relative benefits and risks of any individual cloud service offering. All ICT has risk associated with it. For example, data stored at home is susceptible to theft or hardware failure. Cloud computing is not inherently more or less risky than traditional ICT, but the relative risks are different. Consultations and research commissioned by DBCDE have identified the following issues of vulnerability for small business and individual consumers[v]:

- ***Lack of quality information about the risks and benefits of cloud services:*** There is a significant amount of information available in the marketplace about cloud services. However, much of this information can be difficult for consumers, small businesses and other organisations to understand or trust. Provision of information tailored to the specific needs of organisations can be a useful way for the government to assist in the efficient functioning of a marketplace which benefits suppliers, users and intermediaries.
- ***Data ownership, privacy and security:*** Consumers—including individuals and small businesses—should have full ownership of their personal and organisational data. Privacy and security risks remain a key issue for some individual consumers and small businesses. A recent MYOB survey found that 16 per cent of SMEs identified data ownership as a key concern inhibiting adoption of cloud services. The industry has reacted to this concern to some extent. For example, some vendors allow users to specify the physical location of data stored. It is worth noting that the economy wide *Privacy Act 1988* already obliges organisations (including cloud service providers) to deal with personal information appropriately (including where data is stored and processed in jurisdictions outside of Australia).
- ***Vendor lock-in and interoperability:*** Lack of understanding or transparency about the transfer of data from one provider to another discourages consumers and small businesses from adopting cloud services due to fears of vendor or service provider lock-in. Data portability is a key mitigating strategy against vendor lock-in for cloud data storage services.
- ***Unequal bargaining power:*** There is the potential for consumers and small businesses to enter into contracts with cloud services providers without understanding the potential risks. Since consumers and small businesses do not have the power to vary a cloud provider's terms and conditions, some may not have the confidence to adopt cloud services. This is also potentially a problem of traditional ICT and many other services in the broader economy. The economy-wide Australian Consumer Law already provides protections to users of cloud services and counteracts the impact of unequal bargaining power to some degree (see *Schedule 2* of the *Competition and Consumer Act 2010*).
- ***Loss of internet connectivity and availability of a quality connection:*** As small businesses integrate more business capabilities with cloud computing there is a greater need for reliable internet connectivity. Downtime has the potential to have a negative impact on operations, similar to the loss of other services such as electricity or water. To a large extent the NBN will address this issue, but in addition there are options—for example the use of mobile broadband internet or accessing internet services off-site in the event of a natural or man-made disaster—which can further mitigate some risk.

Data liberation: Some vendors are already taking steps to improve interoperability between providers and reduce vendor lock-in. Google's product 'Takeout' for example allows users to migrate their data out of some Google products and into the systems of other vendors, and vice versa.

Benefits to the economy as a whole

There is a stream of evidence highlighting the economic growth that cloud services promote:

- KPMG modelling shows the increased adoption of cloud services across the Australian economy would grow annual GDP by $3.3 billion by 2020[vi].
- An EU study into the impact of cloud computing predicts that if all EU member countries successfully adopted public cloud it would boost GDP by 1 per cent and create 2.5 million jobs by 2020[vii]. The study also reported that a scenario driven by government policy was three times more effective in creating jobs and economic growth compared to a scenario with no government policy.
- The International Data Corporation estimates that by 2015 cloud computing will, on a global level, create 14 million new jobs and USD $1.1 trillion a year in new business revenues.
- Research firm Forrester has projected public cloud services worth US$14.7 billion in 2010 will generate a six-fold increase in revenue for cloud vendors of $94.1 billion by 2015[viii].

Cloud computing can also help to reduce carbon emissions. A report commissioned by the Carbon Disclosure Project looking at data centre emissions found that large US companies can achieve annual energy savings of US$12.3 billion through the efficient server utilisation and resource pooling offered by cloud infrastructure[ix].

Research of this nature underscores the great potential for cloud services to boost economic growth and drive productivity across the Australian economy. At the same time there is clearly huge potential at the individual firm level to create new business models, innovate, and reduce costs.

The role of the Australian Government

The benefits that broader adoption of cloud computing could offer the Australian economy are compelling. This strategy was put together in close consultation with key stakeholders and aims to address barriers to adoption while maximising the benefits of cloud computing in Australia.

Vision: Australians will create and use world-class cloud services to boost innovation and productivity across the digital economy.

There are a number of initiatives already in place to help realise this vision. The government's investment in the NBN will give all Australians the opportunity to engage in the digital economy, of which cloud computing is an important part.

There is more to do. Beyond the necessary upgrades to physical infrastructure, government has an important role on a number of fronts:

- ***the government procures services.*** With an annual spend of around $5 billion on ICT, the government has a role leading the adoption of cloud services where these services represent the best value for money and management of risk.
- ***the government acts as a regulator to address market shortcomings.*** There is already economy-wide consumer protection and privacy regulation in Australia which applies to cloud services. The government does not consider there is any present need for cloud service specific regulation, but will closely monitor the cloud services market to ensure that Australians are able to take full advantage of cloud services. The government can address information asymmetries by developing and promoting information to allow individuals, small businesses and not-for-profit organisations to understand the relative benefits and risks of cloud computing compared to the benefits and risks of traditional ICT.
- ***the government can help ensure that the Australian cloud services industry is vibrant, and is in a position to capitalise on Australia's natural advantages, while encouraging foreign investment and participation.*** The government can foster strong links across research, vendor and the end-user community to support the supply and creation of innovative, globally exportable cloud technology.

This Strategy sets out the priorities, goals and actions that the government will take to fulfil its vision.

Maximising the value of cloud computing in government

Many stakeholders have identified the importance of the government's own adoption of cloud services as central to encouraging informed adoption more broadly. There are a number of reasons for this:

- As a significant procurer of ICT services, there is a substantial flow-on effect from terms and products procured by the government to other organisations in the economy. Standards established by government through procurement can flow through to the broader Australian cloud services market.
- Businesses, not-for-profit organisations and individuals look to the government for leadership. If government agencies were perceived as unduly treating cloud services as risky, this could inhibit adoption in the economy more broadly.

There is also a tangible benefit to agencies, taxpayers and citizens in the informed adoption of cloud services by government. For example, the adoption of cloud services can assist agencies to reduce costs and improve their service delivery. Agencies can leverage their purchasing power to drive common standards and achieve secure cloud service solutions at a lower cost. The adoption of cloud services also enhances the ability of agencies to improve business outcomes through innovation and improved service delivery as they enable new ways for governments to interact with the community. As with any ICT procurement, it is important that agencies adequately manage risks to ensure the confidentiality, availability and integrity of information.

Software as a service in the public sector: The NSW Department of Trade and Investment uses Google Docs for email and collaboration and is implementing SAP Business ByDesign software as a service solution for its core finance and Human Resource applications.

Government agencies are no strangers to cloud computing. Individual agencies are already using private, public and community cloud services. In many cases these are significant ICT projects delivering tangible benefits for the community. These services have provided better value for money and more innovative services than was possible though traditional ICT sourcing. For example, the Department of Human Services has a community cloud in development that will provide significant flexibility and scalability at a low unit cost for client departments.

In April 2011 AGIMO released the *Cloud Computing Strategic Directions Paper*, which outlines a number of initiatives including a series of better practice guides that provide a suite of tools for government decision makers to evaluate cloud services and adopt better practice. In addition, in October 2012, AGIMO published the Data Centre as a Service Multi Use List which selected approximately 30 leading vendors to provide cloud services to the government. The number of providers on the Data-Centre-as-a-Service Multi Use List has now almost doubled since its launch.

Consultation with stakeholders has identified ways that these existing initiatives can be built on to enhance government use of cloud services, to ultimately deliver better services for the community.

Goal: The Australian Government will be a leader in the use of cloud services to achieve greater efficiency, generate greater value from ICT investment, deliver better services and support a more agile public sector.

This strategy has identified two areas that need to be progressed to achieve this goal.

1. Helping government agencies adopt cloud services

The government continues to support agency based decision making for ICT procurement. This policy has provided agencies with flexibility in approaching the market for ICT services, and is well suited to the acquisition of cloud services to meet business needs.

Government agencies face a number of challenges when acquiring ICT services. For instance, they must carefully consider the security aspects of ICT services. The Protective Security Policy Framework (PSPF) establishes the risk management framework that agencies must use in addressing risks to Australian Government information holdings. The PSPF directs agencies to apply sound security risk management practices, and is complemented by the Information Security Manual (ISM). The Defence Signals Directorate's 35 Cyber Security risk mitigation strategies (available at www.dsd.gov.au/publications/Top_35_Mitigations_2012.pdf) must also be incorporated in any implementation.

For example, agencies must implement policies and procedures for the security classification and protective control of information assets (in electronic and paper-based formats) which match their value, importance and sensitivity. This risk-based approach to information security management is progressive in recognising that government data is not a homogenous entity, and that different deployments of cloud—public, community and private—will be suitable for different categories of government information and services. For example, these obligations require that classified data should never be stored in an offshore public cloud, but is quite suitable for a private or community cloud deployment with sufficient security protocols in place. However, a significant amount of government ICT business relates to unclassified information. Much of this relates to testing and development. Subject to individual agency assessments, this kind of business appears well suited for deployment in the public cloud.

New and better services: Victorian State Government's Department of Business and Innovation (DBI) switched to a Salesforce cloud based customer relationship management (CRM) tool in 2011. So far the CRM has enabled DBI to:

- save money by decommissioning legacy systems
- streamline stakeholder engagement
- allow employee access to the CRM tool on mobile devices in the field.

Already in the cloud: Public Cloud services are already being used by governments around the world. For example, Amazon Web Services reports that its customers include hundreds of government agencies worldwide and thousands of educational institutions.

Aside from security, government agencies must also consider other aspects including the government's responsibilities under the *Privacy Act 1988,* the *Freedom of Information Act 1982,* the *Archives Act 1983*, and other legislation. These obligations are not barriers to cloud adoption

for agencies, but act to provide the community with assurance that any ICT (cloud or otherwise) is adopted in line with community expectations. AGIMO has been doing important work in helping government agencies consider these issues, and has developed a series of better practice guides (available at http://agimo.gov.au/policy-guides-procurement/). This work has been a critical contribution to consideration of cloud services by government agencies, and will be enhanced further.

Many agencies, however, have not yet had significant experience in procuring and taking advantage of cloud services. To some extent these adoption delays are a product of the evolving cloud services on offer in Australia, but also concerns that cloud service providers have not been responsive to the government's information security requirements.

Government agencies should continue to undertake trials of cloud services to determine how and whether more extensive and intensive use of cloud services should be accelerated within their agency. The successes and lessons learned by agencies in these trials, and in production of cloud computing deployments, should be shared among government agencies from a central repository. The repository should be available for any area in an agency to access, including officers from the IT, finance and business/service delivery areas. This repository will provide agencies at all levels of government valuable and practical knowledge about procuring and deploying cloud services. Consideration should be given to releasing high level information from the repository publicly to give vendors and potential entrants insight into the needs of agencies and allow them to better design services to meet those needs. Given that large private sector organisation often have similar needs to government agencies, consideration should be given to whether such a repository could be access by the private sector.

As noted in the examples given, state and local governments are already benefitting from the use of cloud services. Many of the issues faced by Australian Government agencies are similar to the issues faced by state and local government organisations in their use of cloud services. State and local government organisations could contribute to and benefit from accessing such a repository.

There may also be some opportunities for whole-of-government clouds to improve the efficiency of government. By early 2014, AGIMO will explore the feasibility of the development of a government cloud in order to analyse the benefits and drawbacks of a more centralised approach to the provision of cloud services to government agencies.

In some cases technical measures have enabled a high level of security for data, irrespective of where the data is physically located. It is important that the government continues to monitor developments in cloud computing to ensure that government regulations are consistent with, and take account of, advances in technology and technical standards.

	Action	Implementation
1.1	The government will: > identify training and skills development opportunities available to agencies on how to evaluate the benefits of cloud services and how to procure and manage them. > clarify obligations on agencies in relation to risk management, data security, privacy and the storage and processing of data offshore.	AGIMO, with input from DBCDE, OAIC and AGD: to complete in 2014

	Action	Implementation
1.2	The government will identify opportunities for cloud services trials in agencies and establish information sharing initiatives to facilitate continual learning, establish a repository of case studies, better practice risk approaches and practical lessons learned. Interested State and Territory government organisations will be invited to participate.	AGIMO: ongoing, with work beginning in 2013 through the Chief Information Officer Committee.
1.3	The government will publish and report on the use of cloud services in the public sector. Using this information, the government will consider whether additional tools are necessary to assist agencies to self-assess their own cloud computing needs, and investigate whether current ICT funding models are suitable to encouraging adoption of cloud services in government.	DBCDE with support from AGIMO: to report annually beginning in early 2014
1.4	The government will explore the feasibility of a community government-cloud.	AGIMO: to report by early 2014
1.5	The government will review the current cloud strategic directions paper, and issue an updated version shortly after the release of the National Cloud Computing Strategy.	AGIMO: by mid-2013

2. Value first through cloud services

Government procurement requires agencies to select the service that represents best value for money. Increasingly, cloud services (especially public cloud services) are providing competitive services that need to be considered for new ICT investments. Cloud vendors should have the same opportunity as traditional ICT vendors to demonstrate how the services they offer can deliver on the vision for the digital economy already expressed by the government.

As noted above, AGIMO has published the Data Centre as a Service Multi Use List. The list provides an easier way for government agencies to choose cloud solutions than the normal procurement processes. Feedback from stakeholders has been that the list is a step in the right direction, but that the government should consider expanding its reach. In particular the scope of the list should be expanded to allow greater access for public cloud service providers.

A step in the right direction: The Data Centre as a Service Multi Use List (DCaaS MUL) provides agencies with a simple way to procure Cloud and Cloud-like services. Over 1200 services can already be accessed by agencies through the DCaaS MUL.

The Data Centre Facilities Panel is also an initiative that offers an easy way for government agencies to procure data centre services. However, the government recognises that there have been significant market and technological changes since the panel was established, and therefore will seek to refresh the panel.

In a similar way, AGIMO is developing a certification framework. This framework will provide agencies with a user friendly way of determining whether the services offered by a cloud vendor meet the legal and operational requirements of government. The certification framework being considered by AGIMO will be a light touch framework that builds on, rather than duplicates, the existing framework of relevant technical standards. The framework will differentiate between different kinds of cloud

service, and allow agencies to assess whether different platform, software or infrastructure cloud service offerings meet their needs.

Moving public-facing websites to cloud hosting and development systems to public cloud platforms are two examples of ways for agencies to gain additional experience in using public cloud. There may be some public websites that are not appropriate to be hosted on public cloud services (for example, websites with significant functionality that would require redevelopment). However, where appropriate and where the service represents value for money, agencies should move their public facing websites to public cloud services in line with natural ICT refresh cycles. Likewise, where possible and where the services represent best value for money, agencies should use public cloud services for their development and testing needs.

Government is also an important source of funding for not-for-profit organisations and Non-Government Organisations (NGOs) that work every day to improve the lives of Australians in a way that government and the private sector cannot. Cloud computing has the potential make NGOs more efficient. Because the government interacts very closely with NGOs that receive government funding, it is a potential opportunity to provide education material on cloud services. The government will therefore consider how cloud services can be best promoted to NGOs that receive government funding and identify the material which could be provided to them.

	Action	Implementation
1.6	Government agencies will be required to consider cloud services (including public cloud services) for new ICT procurements. Government agencies will choose cloud services, where the service represents the best value for money and adequate management of risk, compared to other available options.	DOFD/AGIMO: to release guidance by end of 2013.
1.7	The government will: > consider the ways that the early successes of Data Centre as a Service Multi Use List can be built upon. > refresh the Data Centre Facilities Panel.	DOFD: to refresh The Panel in 2013 and to review the DCaaS MUL in 2014.
1.8	Government agencies will migrate public facing websites to cloud hosting at natural ICT refresh points, where those cloud services demonstrate the best value for money and is fit for purpose. Agencies will also adopt public cloud services for their testing and development needs, as appropriate and where the service represents best value for money and is fit for purpose.	AGIMO: to publish guidance for agencies in 2013. Agencies: to implement at natural ICT refresh points.
1.9	The government will investigate how the use of cloud services can be promoted to NGOs that receive government funding, and consider what assistance could be provided to NGOs in procuring cloud services.	DBCDE: to conduct initial investigations by the end of 2013.

Case study: Government use of cloud services

Australian Maritime Safety Authority

Why cloud?

In 2009 the Australian Maritime Safety Authority (AMSA) needed to expand access to its Excel-based application used to track the compliance of international ships to safety standards to 14 geographically separated ports. The agency's need for web access combined with its low risk profile made the business process an ideal candidate as a pilot for cloud services.

Benefits so far

AMSA's use of cloud services through Salesforce.com has:

- enabled AMSA to acquire a solution that was significantly cheaper and faster to deploy compared to more traditional non-cloud solutions
- resulted in business users who were very satisfied with the service for its ease of use and web-based access on mobile devices
- accelerated organisational learning and maturity in engaging and managing cloud services vendor relationship, and has helped develop the internal skills and knowledge to successfully procure and manage cloud services.

Take away message

To make the best of cloud-adoption opportunities it is necessary to have had exposure to cloud-adoption experiences in order to develop appropriate organisational learning and internal skills.

Promoting cloud computing to small businesses, not-for-profits and consumers

ICT is as a major driver of innovation and productivity improvement in all facets of society. Over the past decade ICT has contributed to over 50 per cent of labour productivity growth[x]. ICT, however, is costly and requires specialist skills and effort to keep systems up to date and running properly. Not all individuals or businesses are able to buy and operate the latest dedicated computer systems.

As noted above, public cloud services (and to a lesser degree, community and private cloud services) can overcome these barriers. Big business and some individual government agencies have already begun to take advantage of the opportunities of public cloud services. However, it is small organisations (small business and not-for-profit organisations) which stand to benefit the most from the cloud revolution. Cloud computing will fundamentally change the ability of small organisations to acquire new ICT capabilities that can increase productivity and foster innovation.

To date, Australian small business and not-for-profit organisations lag behind their counterparts in other OECD countries in the use of online technology. For example, overall Australia lags behind other OECD countries in the contribution of the digital economy to GDP[xi]. This places small businesses at a severe competitive disadvantage, which could be overcome though the use of cloud computing services[xii]. Table 3 summarises the benefits that small businesses can experience when adopting cloud services.

Table 3—Benefits of cloud services to small business and not-for-profit organisations

BENEFIT	DESCRIPTION
Cost savings	SMEs can make immediate cost savings of between 25 and 50 per cent by simply shifting basic services such as email and data storage into the cloud[xiii].
Productivity	Cloud services use subscription pricing models that outsource support and maintenance to providers that have greater resources and expertise. This allows small business to free up resources and focus on core business.
Lower time to market, increased scalability	Smart adoption of cloud services reduces time to market for new products and services and allows almost limitless scalability for almost no marginal cost. In the face of global competition and the opportunities of the Asian Century, reducing time to market will be a key competitive edge for Australian small businesses.
Overcome barriers to capital and expertise	Cloud computing can help overcome the traditional barriers SMEs face through limited capital and expertise. In comparison to traditional ICT, cloud services can allow small businesses to acquire new capabilities at only a fraction of the cost.
Improved reliability and security	Cloud services offer a range of benefits including increased security, access to the latest upgrades, integrated management and backup that may not be available to small organisations that are not ICT focused.

BENEFIT	DESCRIPTION
Mobility, flexibility and a platform for growth	Mobility supports faster decisions and agile business models with a greater potential for growth. Mobility has been identified by 42 per cent of SMEs surveyed as a key driver of cloud service adoption. MYOB research in 2012 found businesses that had adopted the cloud were: > 53 per cent more likely to have seen a revenue rise in the past year > twice as likely to grow their range of products and services compared to those who had not adopted cloud > almost three times as likely to increase staff numbers in the coming year.

Adoption of cloud services by small organisations to date

Despite the advantages of cloud computing, and some impressive individual examples, adoption of cloud services by small organisations in Australia has generally been slow. Digital Ready research by Optus found that cloud services are not well understood by many small businesses[xiv]. Findings included:

> only eight per cent of small businesses report that they understand what cloud services are, with almost 60 per cent reporting they are unaware

> only four per cent of small businesses currently use cloud services.

A separate survey undertaken by MYOB more recently in 2012 found that almost 80 per cent of SMEs are not using cloud services. New digital technologies such as cloud services are the critical internal drivers for efficiency and innovation in small businesses. A failure to adopt new technologies will leave small business at a severe disadvantage against competitors both domestic and abroad. Cloud services also make it easier for businesses to introduce new products. The importance of this was outlined in a 2011 McKinsey study which found an internet presence enabled SMEs to grow twice as fast as those without one, and enabled an average 10 per cent increase in profitability.

There can be some significant barriers to the adoption of cloud services by small business and not-for-profit organisations (see Introduction for more detail), but these are also issues that are common to traditional ICT, other industries and other technologies.

Take away message: The Rashay's Pizza Bar Grill family of restaurants decided to automate its existing paper processes for rostering and payroll through a cloud-based service. To date this has enabled Rashay's to:

> develop end-to-end automation of its payroll process

> realise $50,000 in savings

> allow staff to interact with the business via mobile smartphone

> have full visibility of day-to-day operations.

Given that economy-wide protections are already in place and that the cloud services industry is still an emerging delivery platform, the government considers that sector-specific regulation is not currently warranted. Self-regulation in the cloud services sector is an opportunity for key players in the cloud industry to promote their own efficiency and growth, while taking responsibility to ensure consumers are treated fairly, receive clear information, and have adequate safeguards.

Goal: Australian small businesses, not-for-profit organisations and consumers will have the protection and tools they need to acquire cloud services with confidence.

This strategy has identified three areas that need to be progressed to achieve this goal:

1. A comprehensive suite of tools and online resources

Accessible online information and tools are touch points for small businesses searching online to:

> find basic information about cloud services

> better understand the benefits of cloud services

> make informed decisions about any perceived risks.

Better decision making will, over time, have a long term impact on cloud computing. As small organisations become more informed about cloud computing, they will have the tools to distinguish between the different services offered by the cloud industry. This in turn will have a positive impact on the cloud market: cloud providers will react to demand and adjust their service offerings to ever higher standards.

There is an opportunity for government, industry and peak associations to work together in educating and informing small businesses about the benefits of cloud services and ensuring that small businesses are:

> informed and educated about the benefits of cloud to their business

> diligent in identifying risks and confident in their ability to manage them

> confident in seeking out cloud providers, brokers and vendors to implement solutions.

Additional information about the security benefits of cloud computing is a key priority. Small businesses have consistently identified security concerns as one of the key barriers to cloud services adoption. Many small organisations are unaware that public cloud providers have greater scale and resources to provide better data security, redundancy and resilience than is generally possible for in-house solutions available to small organisations.

	Action	Implementation
2.1	The government will enhance the online information resources about cloud computing through digitalbusiness.gov.au and other online information portals.	DBCDE and DIICCSRTE: beginning in 2013.
2.2	The government will work with intermediaries and members of peak body associations to: > promote informed decision making about cloud computing, particularly in relation to the productivity and security benefits > develop information tailored to the needs of particular industry segments.	DIICCSRTE and DBCDE: beginning in 2013.
2.3	The government will publish guidance targeted towards industry and users on how existing privacy legislation fits with cloud computing.	DBCDE and OAIC to publish guidance by mid-2014.

2. Consumer protection and effective law

A key element of a self-regulatory approach is to work in partnership with industry and consumer groups to promote:

- adequate protection for consumers of cloud services
- clear and relevant information about products and services before, during, and after point of sale for consumers
- open, honest and fair dealings between cloud service providers and consumers
- adequate privacy protection
- responsiveness to market and technology developments.

A working group of relevant organisations is an effective way to examine how the cloud services market is operating and engage with any emerging consumer cloud computing issues.

The development of a cloud computing protocol will allow forward-looking cloud providers to agree on a range of consumer-focused measures, such as interoperability between providers, ownership of data, and accurate and easy-to-understand information about pricing. A protocol of this nature would provide consumers with objective information, and enable them to make better decisions about which cloud services meet their needs.

Partners in cloud: The National Standing Committee for Cloud Computing (NSCCC) is a collaboration between industry, consumer groups and government. Chaired by DBCDE, and co-chaired by Global Access Partners (see www.globalaccesspartners.org/) The NSCCC has been an invaluable way for government and industry to consider the issues impacting on cloud computing in Australia.

The government will develop a stocktake of existing regulatory measures and how they apply to cloud services. The stocktake will allow the government to explore at a high level what levers are available in the international cloud market place to address systemic market inefficiencies or failures, if they arise. At this stage the government considers that cloud services do not require specific regulation as they are covered by existing legal frameworks. However, if market failure does occur, all parties benefit from knowing how, and through what mechanism, government will intervene. A stocktake would outline how shortcomings would be identified, the types of market failure that would trigger a government response and the kind of regulatory action which would be considered by government.

	Action	Implementation
2.4	The government will establish a consumer cloud working group to bring together industry and consumer groups to examine emerging consumer cloud computing issues.	DBCDE, ACMA, ACCC and Industry (including the NSCCC): to establish the proposed working group in 2014.

	Action	Implementation
2.5	The information technology industry, in consultation with government will develop a voluntary Cloud Consumer Protocol, to encourage information disclosure by cloud providers and support consumers of cloud services in being well informed.	The Australian Computer Society: to engage with industry and government through the NSCCC, and the Australian Information Industry Association on development of a protocol by the end of 2013 with a review in 18 months.
2.6	The government will develop a cloud regulatory stock take in consultation with industry, regulators and consumer groups.	DBCDE: to consult with key stakeholders including the NSCCC and develop the cloud regulatory stock take by end of 2013.

3. Enhancing existing successes

The government has a series of digital engagement programs currently targeted at small business and not-for-profits. These programs include:

- the Digital Enterprise Program, which provides free group training for small businesses and not-for-profits to take full advantage of the NBN.
- the Enterprise Connect Program, which has developed quick guides for small business to provide information on key issues involved in the identification, selection, purchasing and implementation of cloud solutions to improve their business.
- the Technology and Knowledge Connect program, which utilises a direct engagement model to provide Enterprise Connect clients with information and advice about key issues in their consideration of cloud services.
- the Digital Local Government program, which provides funding to local governments in NBN rollout areas to develop online services that are replicable and scalable, and that other local governments across Australia can adapt and use.
- the Small Business Advisory Service program, which provides low-cost business advisory services provided and managed by non-profit organisations. Advice is delivered through mechanisms such as one-on-one mentoring, workshops and group advisory sessions.

Already there? A range of universities across the tertiary sector have already adopted cloud services to some degree. For example, Adelaide, Macquarie, Monash and RMIT all utilise a popular public cloud software-as-a-service product for word processing and other office productivity tasks.

Many of these programs can be used to further enhance the knowledge and confidence that small businesses and not-for-profit organisations have in acquiring cloud services. Over time, there is a need to measure whether these successes are continuing and to inform future government initiatives.

	Action	Implementation
2.7	The government will continue to provide small businesses with access to technology experts to provide advice and recommendations about using cloud services through the Technology and Knowledge Connect service.	DIICCSRTE: delivered as part of existing program
2.8	The government will help small businesses understand the benefits of cloud computing as an enabler of business productivity through the Enterprise Connect service.	DIICCSRTE: delivered as part of existing program
2.9	The government will promote the benefits of cloud services to small business and not-for-profits through the Digital Enterprise Program.	DBCDE: delivered as part of existing program
2.10	The government will provide focused and practical advice about how cloud computing services can help small businesses through the Small Business Advisory Service Program.	DIICCSRTE: delivered as part of existing program
2.11	The government will regularly measure and report on take-up and use of cloud services in small business and not-for-profits.	DBCDE: to commission research and report every two years

Case study: Innovation in the cloud

Why Cloud?

Xero is an innovative cloud services firm that provides accounting, banking, reconciliation and payroll services. Established in 2006, it now services over 157,000 customers worldwide with 50,000 customers in Australia.

A key innovation in the Xero cloud services model is that it allows firms and their accountants to run a single shared view of the ledger which in turn enables accountants to advise clients in real time, rather than work through large blocks of information at the end of each quarter. This adds value by helping accountants be more efficient in managing compliance activities, which frees up their time to provide higher value advice in areas such as budgeting and cash flow.

Benefits so far

Growthwise, a client of Xero has reported savings of over $60,000 a year by using Xero services to reduce IT overheads. The availability of Xero services on mobile platforms and smartphone applications also highlights the value of mobility and flexibility in supporting businesses to run their operations while being out of the office.

Take away message

New internet businesses models continue to disrupt traditional service sectors with innovative companies creating new and specialised cloud services which can be scaled and delivered to customers from all around the globe.

Supporting a vibrant cloud services sector

Over the past 40 years Australia has experienced several periods of high productivity growth linked to the dissemination and consumption of productivity enhancing technologies.

A vibrant cloud sector with competition in services and a highly skilled and capable ICT workforce will ensure Australia is well placed to increase productivity growth through the supply and consumption of world-class cloud services.

Goal: Australia will have a vibrant cloud sector supported by:

- a skilled and cloud-aware ICT workforce, able to create as well as adopt cloud services
- effective competition in cloud services
- regulatory settings that support growth, foster innovation and protect users.

1. ICT skills and capacity

A workforce of skilled ICT workers is essential to support a vibrant cloud sector. Major projects such as the NBN, and the growth in the digital economy generally, are expected to generate increased demand for human capital and skilled employees[xv]. A cloud services industry that continues to grow in size and sophistication is also expected to generate demand for new skills within the broader ICT workforce.

Both government and private sector organisations must plan effectively to ensure that training is available for existing ICT workers to develop new skills and knowledge about cloud services. More importantly, training must be effective in developing the skills needed to support practical problem-solving capabilities in using cloud services to meet business needs and boost organisational productivity.

Tertiary institutions have an important role to play in fostering the development of the next wave of cloud-skilled entrants into the workforce. Tertiary planning within the broader ICT curriculum framework will need to give cloud computing additional emphasis to reflect its growing importance in organisations and to ensure new entrants have the qualifications and skills to contribute to the cloud sector's growth. Aside from workers with purely technical qualifications, there is also a need to ensure that workers have the training to turn promising research developments into commercial realities.

Ongoing collaboration and dialogue between government, industry and the tertiary sector will be essential in supporting a vibrant cloud sector through a strong and sustainable skill base.

	Action	Implementation
3.1	The government will encourage discussion between tertiary education stakeholders to consider strategies to ensure graduates have the right skill sets. Cloud computing would form an important part of this, to ensure that Australian ICT workers have the skills that they need to succeed in the cloud services industry.	Further details to be released in 2013
3.2	Further examination of the current and future skill needs of the ICT industry will be undertaken by the Australian workforce and Productivity Agency (AWPA)	AWPA: Further details to be released in 2013

2. Promoting competition, growth and foreign investment

Historically the important contributions of ICT to Australian economic growth have been achieved through policy that fosters the use of ICT rather than its product[xvi].

The key to increasing economic growth through new technology lies in:

> maximising the consumption of productivity-enhancing technology

> minimising barriers to adoption.

A competitive cloud services market will drive efficiency and innovation, which benefits consumers through increased choice, better quality services and lower prices. This will in turn create export opportunities. Australia must also continue to promote its competitive strengths, including stable government, firm rule of law, transparent institutions and energy security to help grow domestic cloud exports and also to attract foreign investment and the best technology from abroad. Australian companies have already created world-class cloud services used around the world (see for example the Yuruware Monitor in the case study at the end of this chapter). The government will be looking at the ways in which it can maximise these advantages and create the conditions that could help encourage Australian firms to produce and export world class cloud services.

The government is pursuing an ambitious and forward-looking trade agenda to help businesses take full advantage of these competitive strengths. This includes negotiation of trade agreements and involvement in international forums such as the World Trade Organization, the Asia-Pacific Economic Community forum and the International Telecommunication Union.

In negotiating international agreements relating to cloud computing and the digital economy, the government seeks to balance the benefits of an open, innovative and dynamic online environment with Australia's interests in providing a safe and secure operating environment that reflects Australian priorities and values.

Naturally cloudy? The Commonwealth Bank of Australia (CBA) has noted that enhancements to the Australian cloud market could build on some of Australia's inherent advantages, including its:

> socio-political and economic stability

> growing economy

> strong services sector

> advanced ICT development.

The CBA argues that these attributes, coupled with the right regulatory settings (in particular, in regard to data sovereignty) and world-class security, could make Australia an attractive location from which to host regional and international cloud services.

An important element in promoting a competitive cloud services market is the development of common standards across industry. In the long term, interoperable and seamless federation across secure clouds will be an outcome of the development of global standards. Appropriate standards can lower barriers to entry, reduce switching costs for consumers and reduce the likelihood of vendor lock-in. There are a number of standard-setting bodies already in the process of developing standards relevant to cloud services.

For example, the government (through DBCDE and AGIMO) collaborates with private sector participants on the Standards Australia Committee on Distributed Application Platform and Services (known as the JTC1/SC38 Mirror Group). This collaboration between government and Australian private sector organisations feeds into the relevant bodies of the International Organisation for Standardization and the International Electrotechnical Commission. The government will continue to remain active internationally in cloud computing related standards-setting processes, and will continue to encourage Australian private sector organisations to participate in the standards-making process.

A number of stakeholders have highlighted a range of key regulatory settings (including data protection, data privacy, energy security and infrastructure) as being key contributors to a nation's cloud computing 'readiness' and attractiveness to foreign investment. The government acknowledges these comments, and will work with industry to maximise the attractiveness of Australia for foreign investment by cloud service providers, to the extent possible by national security and other public policy considerations.

As noted throughout this strategy, cloud computing is an evolving service delivery platform. This strategy itself will need to be updated as technology and the cloud services market evolves. The NSCCC has proven to be an effective consultation mechanism. The government will continue to utilise this body to examine cloud computing issues, opportunities and challenges.

	Action	Implementation
3.3	The government will strengthen Australian engagement with regional and international standards institutions and technical committees, and strongly encourage involvement by the private sector.	DBCDE, AGIMO and the Defence Signals Directorate: ongoing.
3.4	The government will collaborate with industry to promote Australia as a trusted hub for data storage and processing, while encouraging foreign investment and participation.	AusTrade: to lead engagement with industry, beginning in 2013.
3.5	The government will continue to engage through the NSCCC to examine cloud computing issues, opportunities and challenges.	DBCDE and AGIMO: to lead engagement with the NSCCC throughout 2013.

3. Supporting research and development

It is important to identify any gaps in the development of cloud technology and where the barriers to takeup of cloud services exist. Strong linkage across the research, vendor and end-user communities is needed to ensure these gaps and barriers are identified. Consultations in the development of this strategy have suggested that the areas of privacy, security interoperability, portability and the use of cloud services for data analysis could be promising areas of research focus for the private sector or government.

Consideration of whether further government-funded research and development should be undertaken must take into account existing initiatives in cloud research and development. This includes work undertaken through National ICT Australia (NICTA), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), universities and through collaborative mechanisms such as the Cooperative Research Centres[xvii].

Any further government-funded research and development in cloud computing should aim to build on rather than duplicate existing or past developments. The National Research Investment Plan[xviii] (the Investment Plan) provides a framework that could be used to analyse the research and associated capability needs. The process outlined in the Investment Plan enables a coordinated and strategic approach to research investment, taking into account existing research capacity, theavailability of research workforce and infrastructure.

Clever cloud: The National eResearch Collaboration Tools and Resources (or NeCTAR) is partnering with Australian institutions and research organisations to create, for the first time, a national research cloud for Australian researchers. The University of Melbourne has built the first node of the research cloud, operational now, and further nodes will be commissioned by other research institutions throughout 2013. See www.nectar.org.au/research-cloud for more info.

The government is carefully considering the growth of cloud computing and how this phenomenon should be incorporated into the existing national research framework. It may be that new investments in this area are warranted, and should be considered through the relevant government processes.

	Action	Implementation
3.6	The government will work collaboratively with industry and research institutes though existing mechanisms to identify research needs for cloud computing.	DIICCSRTE, DBCDE, CSIRO and NICTA: to consider in 2014.
3.7	The government will consider the creation of a community of interest, to discuss whether additional cloud research is needed and how to apply or enhance existing research efforts in this space.	DBCDE: to explore interest with key stakeholders in 2014.

Case study: Australian cloud innovation

Why cloud?

Small businesses moving to cloud can get cost, performance and time-saving benefits. However, where a small business has made a successful move to cloud services, it can still be a challenge to monitor the performance and to assure resilience for their chosen cloud service.

In 2012, two Australian companies teamed up to solve the problem. Yuruware is a start-up company, based on NICTA research. Yuruware's 'Monitor' and 'Bolt' services provide simple-to-use migration and disaster recovery solutions for use in conjunction with cloud services.

Senath is a cloud services provider that uses Yuruware's services to enhance its offering to its customers. In combination this has allowed small businesses to take advantage of cloud services while reducing any potential risk.

Benefits so far

The adoption of Yuruware services by Senath has:

- Given Senath and its small business customers access to granular data about their cloud services
- Given Senath's customers better control, traceability and management of their assets
- Provided the developer community using Senath's cloud platform withadditional features to incorporate into their applications
- Provided a foundation for cloud-based disaster recovery.

Take away message

The collaboration between Senath and Yuruware illustrates how ICT research that is relevant to the market can create a globally-focused cloud services company like Yuruware, which can then provide services to Australian based cloud providers, who in turn can provide dynamic and innovative services to end users all over the world.

Attachment: List of goals and actions

Maximising the value of cloud computing in government:

The Australian Government will be a leader in the use of cloud services to achieve greater efficiency, generate greater value from ICT investment, deliver better services and support a more agile public sector.

	Action	Implementation
1.1	The government will: > identify training and skills development opportunities available to agencies on how to evaluate the benefits of cloud services and how to procure and manage them. > clarify obligations on agencies in relation to risk management, data security, privacy and the storage and processing of data offshore.	AGIMO, with input from DBCDE, OAIC and AGD: to complete in 2014
1.2	The government will identify opportunities for cloud services trials in agencies and establish information sharing initiatives to facilitate continual learning and establish a repository of case studies, better practice risk approaches and practical lessons learned. Interested State and Territory government organisations will be invited to participate.	AGIMO: ongoing, with work beginning in 2013 through the Chief Information Officer Committee.
1.3	The government will publish and report on the use of cloud services in the public sector. Using this information, the government will consider whether additional tools are necessary to assist agencies to self-assess their own cloud computing needs, and investigate whether current ICT funding models are suitable to encouraging adoption of cloud services in government.	DBCDE with support feom AGIMO: to report annually beginning in early 2014
1.4	The government will explore the feasibility of a community government-Cloud.	AGIMO: to report by early 2014
1.5	The government will review the current cloud strategic directions paper, and issue an updated version shortly after the release of the National Cloud Computing Strategy.	AGIMO: by mid-2013
1.6	Government agencies will be required to consider cloud services (including public cloud services) for new ICT procurements. Government agencies will choose cloud services, where the service represents the best value for money and adequate management of risk, compared to other available options.	DOFD/AGIMO: to release guidance by end of 2013.
1.7	The government will: > consider the ways that the early successes of Data Centre as a Service Multi Use List can be built upon. > refresh the Data Centre Facilities Panel.	DOFD: to refresh The Panel in 2013 and to review the DCaaS MUL in 2014.
1.8	Government agencies will migrate public facing websites to cloud hosting at natural ICT refresh points, where those cloud services demonstrate the best value for money and is fit for purpose. Agencies will also adopt public cloud services for their testing and development needs, as appropriate and where the service represents best value for money and is fit for purpose.	AGIMO: to publish guidance for agencies in 2013. Agencies: to implement at natural ICT refresh points.
1.9	The government will investigate how the use of cloud services can be promoted to NGOs that receive government funding, and consider what assistance could be provided to NGOs in procuring cloud services.	DBCDE: to conduct initial investigations by the end of 2013.

Promoting cloud computing to small businesses, not-for-profits and consumers:

Australian small businesses, not-for-profit organisations and consumers will have the protection and tools they need to acquire cloud services with confidence.

	Action	Implementation
2.1	The government will enhance the online information resources about cloud computing through digitalbusiness.gov.au and other online information portals.	DBCDE and DIICCSRTE: beginning in 2013.
2.2	The government will work with intermediaries and members of peak body associations to: > promote informed decision-making about cloud computing, particularly in relation to the productivity and security benefits > develop information tailored to the needs of particular industry segments.	DIICCSRTE and DBCDE: beginning in 2013.
2.3	The government will publish guidance targeted towards industry and users on how existing privacy legislation fits with cloud computing.	DBCDE and OAIC to publish guidance by mid-2014.
2.4	The government will establish a consumer cloud working group to bring together industry and consumer groups to examine emerging consumer cloud computing issues.	DBCDE, ACMA, ACCC and Industry (including the NSCCC): to establish the proposed working group in 2014.
2.5	The information technology industry, in consultation with government will work to develop a voluntary Cloud Consumer Protocol, to encourage information disclosure by cloud providers and support consumers of cloud services in being well informed.	The Australian Computer Society: to engage with industry and government through the NSCCC, and the Australian Information Industry Association on development of a protocol by the end of 2013 with a review in 18 months.
2.6	The government will develop a cloud regulatory stocktake in consultation with industry, regulators and consumer groups.	DBCDE: to consult with key stakeholders including the NSCCC and develop the cloud regulatory stocktake by end of 2013.
2.7	The government will continue to provide small businesses with access to technology experts to provide advice and recommendations about using cloud services through the Technology and Knowledge Connect service.	DIICCSRTE: delivered as part of existing program
2.8	The government will help small businesses understand the benefits of cloud computing as an enabler of business productivity through the Enterprise Connect service.	DIICCSRTE: delivered as part of existing program

	Action	Implementation
2.9	The government will promote the benefits of cloud services to small business and not-for-profits through the Digital Enterprise Program.	DBCDE: delivered as part of existing program
2.10	The government will provide focused and practical advice about how cloud computing services can help small businesses through the Small Business Advisory Service Program.	DIICCSRTE: delivered as part of existing program
2.11	The government will regularly measure and report on take-up and use of cloud services in small business and not-for-profits.	DBCDE: to commission research and report every two years

Supporting a vibrant cloud services sector:

Australia will have a vibrant cloud sector supported by:

> a skilled and cloud computing aware ICT workforce, able to create as well as adopt cloud services

> effective competition in cloud services

> regulatory settings that support growth, foster innovation and protect users.

	Action	Implementation
3.1	The government will encourage discussion between tertiary education stakeholders to consider strategies to ensure graduates have the right skill sets. Cloud computing would form an important part of this, to ensure that Australian ICT workers have the skills that they need to succeed in the cloud services industry.	Further details to be released in 2013
3.2	Further examination of the current and future skill needs of the ICT industry will be undertaken by the Australian Workforce and Productivity Agency (AWPA)	AWPA: Further details to be released in 2013
3.3	The government will strengthen Australian engagement with regional and international standards institutions and technical committees, and strongly encourage involvement by the private sector.	DBCDE, AGIMO and the Defence Signals Directorate: ongoing.
3.4	The government will collaborate with industry to promote Australia as a trusted hub for data storage and processing, while encouraging foreign investment and participation.	AusTrade: to lead engagement with industry, beginning in 2013.
3.5	The government will continue to engage through the NSCCC to examine cloud computing issues, opportunities and challenges.	DBCDE and AGIMO: to lead engagement with the NSCCC throughout 2013.
3.6	The government will work collaboratively with industry and research institutes though existing mechanisms to identify research needs for cloud computing.	DIICCSRTE, DBCDE, CSIRO and NICTA: to consider in 2014.
3.7	The government will consider the creation of a community of interest, to discuss whether additional cloud research is needed and how to apply or enhance existing research efforts in this space.	DBCDE: to explore interest with key stakeholders in 2014.

ATTACHMENT: List of goals and actions

i This diagram is a simplification of the National Institute of Standards and Technology definition of Cloud computing.

ii Microsoft, *AMI Partners 2010-2011 Worldwide SMB Cloud Service Study*,

iii European Commission, Unleashing the Potential of Cloud Computing in Europe, http://ec.europa.eu/information_society/activities/cloudcomputing/docs/com/com_cloud.pdf, September 2012

iv MYOB, Small Business Survey—*Australian SMEs and Cloud Computing*, July 2012

v ARC Centre of Excellence in Policy and Security and the Australian Institute of Criminology, *Cloud Computing Threat Assessment for Small Business*, October 2012.

vi KPMG, *Modelling the Economic Impact of Cloud Computing*, www.kpmg.com/au/en/issuesandinsights/articlespublications/pages/modelling-economic-impact-cloud-computing.aspx, May 2012

vii IDC, *Quantitative Estimates of the Demand for Cloud Computing in Europe and the Likely Barriers to Up-take*, http://ec.europa.eu/information_society/activities/cloudcomputing/docs/quantitative_estimates.pdf, July 2012

viii Journal of International Commerce and Economics, *Policy challenges of cross border cloud computing*, May 2012

ix ITU Broadband Commission, *The Broadband Bridge—Linking ICT with Climate Action for a Low-Carbon Economy*, www.broadbandcommission.org/net/broadband/Documents/bbcomm-climate-full-report-embargo.pdf, March 2012

x OECD, *Science Technology and Industry Scoreboard 2011*, www.oecd-ilibrary.org/sites/sti_scoreboard-2011-en/02/08/index.html?contentType=/ns/Chapter,/ns/StatisticalPublication&itemId=/content/chapter/sti_scoreboard-2011-19-en&containerItemId=/content/serial/20725345&accessItemIds=&mimeType=text/html

xi Source: Boston Consulting Group

xii Australian Bureau of Statistics 2011

xiii Microsoft, *AMI Partners 2010-2011 Worldwide SMB Cloud Service Study*,

xiv Optus, *Digital Ready*, www.optus.com.au/aboutoptus/About+Optus/Media+Centre/Media+Releases/2011/Australian+SMBs+must+keep+pace+with+consumers+in+digital+world, October 2011

xvi Treasury, *Speech: Measuring the impact of the global economy on Australian business*, June 2001

xvii There are three Cooperative Research Centres (CRCs) that undertake research that relates to cloud computing technologies and services. These include the Smart Services CRC, the CRC for Infrastructure and Engineering Asset Management, and the Capital Markets CRC.

xviii Department of Industry, Innovation, Science, Research and Tertiary Education, National Research Investment Plan, http://www.innovation.gov.au/Research/Pages/NationalResearchInvestmentPlan.aspx, November 2012

Australian Government

Department of Broadband,
Communications and the Digital Economy