EXECUTIVE SUMMARY

Cloud-based as-a-service offerings present significant opportunities for government to benefit from scalable multi-tenanted environments, lower costs per-user, improved business processes and better value for money.

The NSW Government ICT Strategy recognises that improved government service delivery and better value ICT investment will be underpinned by a new, strategic approach to the sourcing and management of public sector ICT. This includes the adoption of cloud-based services where it is appropriate for agency business needs. The NSW Government Cloud Services Policy and Guidelines gives guidance to NSW Government agencies to assist in determining which cloud delivery model is best suited for their business needs.

The Cloud Pilot Project Final Report presents an analysis of cloud implementations by five NSW Government agencies (Cloud Pilot agencies), which were monitored over the course of a ten month period, from January to October 2013.

This report is based on observations captured at project team meetings and by conducting interviews with key project team members, stakeholders and vendors. The results of the Cloud Pilot Project are presented as lessons learned throughout the report. There are also seven key findings for the consideration of the NSW Government ICT Leadership Group and the ICT Board.

The objective of the Cloud Pilot Project was to test and understand the implications for the NSW public sector of transitioning to cloud-based as-a-service solutions. As such, observation of five Cloud Pilot agencies has demonstrated that as-a-service sourcing has the potential to deliver the following benefits:

- **Cost** – moving from customising and operating in-house ICT, to using the best available ‘off the shelf’ commodity solutions will reduce the total cost of ownership.

- **Agility** – on-demand, scalable and flexible services that can be implemented quickly provide agencies with the ability to respond to changing requirements and peak periods.

- **Efficiency** – improving the efficiency of internal business processes has long term benefits for the business, offers long term savings opportunities and enables uptake of other cloud-based service more easily.

- **Innovation** – innovation will be facilitated by economies of scale, as well as rapid and continuous system development and improvement.

- **Resilience** – a highly resilient environment reduces the potential for system failure.

Overall, certain factors that contributed to the successful implementation of cloud-based services by the Cloud Pilot agencies are:

- organisational readiness, including collaboration with divisions across the whole agency

- understanding and a clear articulation of the business objective(s)

- willingness to transform the business if required

- change management planning

- due diligence of the agency’s technical and business requirements.
THE FIVE CLOUD PILOT AGENCY PROJECTS

*Fire and Rescue NSW – email as-a-service*

Fire and Rescue NSW (FRNSW) trialled the migration of 7500 staff (at the time of writing 600 staff had been migrated, with the remaining staff migrated by Christmas) from Groupwise email managed in-house, to the Microsoft 365 email component hosted in the cloud. An archive of all emails continued to be managed in-house.

*NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) – ERP as-a-service*

DTIRIS partnered with SAP to consolidate its multiple existing finance, payroll and HR systems into a single cloud-based platform. SAP provided DTIRIS the ERP system as-a-service, with data stored offshore with the exception of payroll data, which is stored in a data centre located in NSW.

*BusinessLink – email as-a-service*

BusinessLink initiated a project to replace an internally built and managed email system, with cloud-based Microsoft 365 email. Businesslink is a shared service provider, and the plan was to use the software internally with Businesslink staff and then roll it out to its customers (other agencies within the family and community services cluster).

*The WorkCover Independent Review Office (WIRO) – infrastructure as-a-service*

WIRO implemented cloud-based infrastructure as-a-service to host its case management software. Data is hosted offshore by the vendor. As an office established to review decisions of its parent organisation, WorkCover, WIRO’s main business objective was to ensure independence from WorkCover, experience rapid implementation of the solution and minimise cost.

*ServiceFirst Proof of Concept – messaging as-a-service (two projects) and desktop as-a-service*

ServiceFirst trialled three separate proof of concept (POC) projects – Fronde (Google-based solution) and Unisys (Microsoft Exchange-based solution) provided messaging as-a-service solutions and HP provided a desktop as-a-service solution to a limited number of users over a period of three months.
1. **Business transformation**

The decision to implement a cloud-based solution is based on the ability of the solution to realise key business objectives. In order to derive the full benefits of implementing the cloud-based solutions, agencies need to clearly understand and articulate their business needs to the market.

2. **Organisational readiness**

Technical remediation is often required to implement a new ICT solution, regardless of the delivery model. However, the technical remediation required to move to a cloud-based solution may differ from that required to move to a new internal solution. Early assessment of required remediation will reduce the effort, time and cost involved in transitioning to a cloud-based solution. Internal remediation is an exercise that may only need to be performed once, after which agencies will be able to source additional cloud-based services more easily.

Strong enterprise architecture capabilities and other technical skills are required to successfully migrate from the existing internal technical environment to cloud-based services.

3. **Economies of scale**

Benefits of cloud-based solutions include the opportunity to leverage economies of scale through scalable offerings and multi-tenant architecture. Multi-tenant architecture refers to a vendor with a number of customers subscribing to a single, centrally-hosted software service. This enables the vendor to serve all of its customers in a consolidated environment. This represents a substantial potential saving over traditional software models.

4. **Economic and financial appraisal**

Undertaking a traditional cost/benefit analysis of implementing a cloud-based solution can be unhelpful as it may not be able to factor in the potential savings opportunities; the scope of savings of benefits of improving business processes; skills and capability requirements; and difficulties in quantifying of a move to the cloud-based service. There may also be difficulty associated with defining the scope of expenditure, which is likely to be organisation-wide, and which may only become apparent beyond the forward estimates.

Further work could be undertaken to provide guidance to agencies on what factors to consider when calculating whole-of-life or total cost of ownership of as-a-service solutions.

The adoption of as-a-service solutions may require upfront capital investment in setup and migration costs, but in the longer term will be maintained through recurrent funding. The funding and budget implications of shifting from capital to operating expenditure are largely unclear.

Agencies must ensure that appropriate consultation has been conducted with relevant business units and with NSW Treasury.

5. **Understanding the cloud market**

A sophisticated understanding of the cloud market is necessary to ensure that agencies engage the most appropriate vendor to meet their needs. This understanding includes differentiating between platform owners, service providers and niche consultants.
Agencies must be able to adequately define their requirements in order to select the appropriate vendor(s) to meet their business objectives.

6. **Ensuring appropriate procurement processes**

   It is essential that agencies clearly articulate their business objective requirements to the market when procuring cloud services.

   Agencies need to be mindful to ensure probity of the procurement process, especially when engaging a niche consultant to undertake an assessment of remediation or amendments to the internal architecture who may be a subsidiary division of a platform owner or service provider that may be bidding for the tender.

   Agencies need to understand the different market players that offer cloud services in order to identify the most appropriate vendor to suit their business needs.

7. **Organisational change**

   A thorough assessment of the organisational change implications of transitioning to an as-a-service model, particularly impacts on business processes and capability requirements, is undertaken prior to implementing a cloud-based solution.

   Change management planning is one of the first considerations of any cloud implementation. Taking full advantage of moving to an as-a-service model requires agencies to reconsider business process design, which can improve efficiency, increase service capability and place greater emphasis on strategic business objectives.

   Recognising that a move to cloud-based services is more than just a move to a new IT platform, and wide internal consultation across the agency (such as record-keeping, policy, finance, HR and IT) will stand agencies in good stead when addressing organisational change.

8. **Skills, capability and cultural change**

   Contract and vendor management capabilities will be required to manage solutions after migration. A thorough understanding of future skills and capability requirements is essential to realising the full benefits of adopting an as-a-service solution.

9. **Security, privacy and data location**

   Commercial cloud service providers with certified information security systems have robust security measures in place, which help to ensure the security of agency data. Agencies can enter into contractual arrangements with cloud service providers that, among other things, specify data storage location, in order to make an effective risk assessment of the service.

10. **Access to data and business continuity**

    Assurances regarding access to data are essential in maintaining business continuity.

    Contractual provisions will guarantee access to data in accordance with industry uptime standards and provide for regular reports on system outages, maintenance and downtime.

11. **Public access to government information**

    Retention policies, access guarantees and interoperability between cloud solutions and internal software and systems help to ensure that agencies can continue to meet legislative public access obligations.
12. Record keeping

Moving to an as-a-service model will not affect an agency’s ability to comply with legislative record keeping obligations provided robust information management practices are in place, including a document management system and related policies.

13. Bandwidth, WAN and LAN requirements

To maintain business continuity and ensure optimal service quality and performance, bandwidth, WAN and LAN requirements must be assessed prior to implementing a cloud-based solution.

14. Data and systems integration

Moving to a cloud environment requires an increasing emphasis on business design and architecture, particularly where cloud services will interface with or impact on existing business systems.

Prior to adopting a cloud-based solution, the impact on business processes should be considered, and the ability to integrate the cloud-based solution into existing enterprise infrastructure should be evaluated to ensure continuity of service and operations.

15. Mobility

The flexibility, mobility and high availability of services is often a key driver of the adoption of cloud-based services. Agencies need to be mindful of ensuring that these benefits are not limited to a particular technology or platform.

16. Licencing arrangements

Agencies need to give careful consideration to the licencing implications of transitioning to an as-a-service model.

Software licences and agreements often have limited or no mobility and cannot be transferred easily from one type to another or between holders. This may result in a situation where agencies are liable to maintain expensive legacy licences even after migrating to a cloud-based solution.

17. Migration in

Migrating data from an internal environment to a cloud environment via the internet can be a time consuming process and may put significant strain on an agency’s network infrastructure and internet bandwidth.

Additional challenges may arise as a result of coexistence of the existing and new solutions during the migration phase of a cloud implementation. A comprehensive understanding of migration challenges will help agencies minimise disruptions to services. Agencies need to be prepared for surprises, to learn from doing and adapt accordingly to changes as required.

18. Migration out

On termination of an agreement for cloud-based services, agencies must be able to ensure that data will be migrated securely to a new solution while maintaining business continuity, and that data will be removed entirely and permanently from the provider’s infrastructure.

19. Avoiding vendor lock-in

Agencies will be cognisant of avoiding vendor lock-in at the point of engagement with cloud service providers. Industry interoperability and data portability standards will help to minimise the risk of vendor lock-in. Additionally, government data and information standards will facilitate the adoption of cloud-based services and increase collaboration and information sharing between agencies.
KEY FINDINGS

1. Guidance is needed on the change management implications of transitioning to an as-a-service model, including skills and capability requirements and cultural change dimensions.

   Further guidance on change management implications could be included in an update to the Cloud Policy and Guidelines.

2. A mechanism for sharing agency experiences in procuring and using cloud services would assist agencies to navigate through the process of implementing cloud services.

   The Community of ICT Professionals is one mechanism where agencies can share information. The ratings system in the ICT Services Catalogue and the publication of this report will also support this finding.

3. Guidance is needed on the implications of cloud-based services for agency information and records management.

   State Records Authority has published some guidance material on its website. Further guidance could also be included in an update to the Cloud Policy and Guidelines.

4. Standard terms for contracting for as-a-service would assist inexperienced or smaller agencies and guidance is needed on the associated procurement processes.

   The ProcureIT “as-a-service” module was published in August 2013, and provides standard terms for contracting for as-a-service offerings. Guidance on associated procurement processes could be developed by NSW Procurement specifically for as-a-service offerings.

5. Recognising that implementing commercial off the shelf products better enable information sharing and access to cost savings from multi-tenant environments, a mechanism for limiting vendors from providing customised solutions would assist agencies to realise the benefits of cloud-services.

   DFS is currently undertaking a program of work to develop technical standards and frameworks to assist agencies implement technical projects. This program of work will include cloud-services.

6. Guidance is needed on undertaking a total cost of ownership and whole of life analysis of cloud-based services as well as what “value for money” is for as-a-service solutions.

7. Guidance is needed to assist agencies to understand the implications of the shift from capital to operating expenditure associated with the adoption of an as-a-service model.