Cloud computing and shared ICT in the Public Sector

Case Studies

2013
Contents

- Shared ICT services & cloud computing trends
- New Zealand case study
- Singapore case study
- UK case study
- US case study
- Case study evaluations & implications
Governments globally have been standardising and centralising infrastructure for many years

Global Government Shared Services Examples

- **United Kingdom**
  - Opt-in shared service model of the British Department of Health that works for over 160 member organisations (hospitals and public bodies)

- **British Columbia, Canada**
  - Shared IT infrastructure support across all 13 government ministries

- **Canada**
  - Consolidating 100+ different email systems, 300+ data centers etc. across whole of Canadian government

- **Singapore**
  - Shared IT infrastructure services for over 100 agencies

- **North Ireland**
  - Shared IT service provider for 11 government departments and 30 other public bodies

- **Colorado, USA**
  - Share services across state agencies set up with legislative support to enforce agency compliance

- **Kenya**
  - Share services program initiated to consolidate IT infrastructure across 42 ministries

Source: National ICT Government websites, Newspress, Frost & Sullivan, Ovum, Gartner
Shared infrastructure services are now evolving and migrating to the cloud globally

Global Government Cloud Examples

<table>
<thead>
<tr>
<th>Infrastructure-based broker models</th>
<th>Web-store based models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Zealand</strong></td>
<td><strong>United States</strong></td>
</tr>
<tr>
<td>• ~50 agencies (~33% of all agencies) using IaaS since 2012</td>
<td></td>
</tr>
<tr>
<td>• Targeting NZ$50-250M in total savings over the total life of the deal (10 years)</td>
<td></td>
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<tr>
<td>• Currently tendering for DaaS¹ and OPaaS¹</td>
<td></td>
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<tr>
<td><strong>Singapore</strong></td>
<td><strong>United Kingdom</strong></td>
</tr>
<tr>
<td>• Private and public cloud IaaS services launched in July 2013 for government shared services</td>
<td></td>
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<tr>
<td>• Vendors provides transition services for government agencies as part of standard pricing</td>
<td></td>
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<tr>
<td>• ~50 agencies (50%) have signed-up</td>
<td></td>
</tr>
<tr>
<td><strong>France</strong></td>
<td><strong>United Kingdom</strong></td>
</tr>
<tr>
<td>• Developing a domestically located private IaaS cloud (G-Cloud) platform in partnership with orange Telecom and Thales in 2012</td>
<td></td>
</tr>
<tr>
<td>• Objective is to provide French citizens fast and reliable access to French public services</td>
<td></td>
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<tr>
<td><strong>Hong Kong</strong></td>
<td><strong>United Kingdom</strong></td>
</tr>
<tr>
<td>• Awarded $127M contract (in March) for cloud services (IaaS, PaaS, SaaS) for the next 7 years to Atos IT Hong Kong</td>
<td></td>
</tr>
<tr>
<td>• 30 departments (~25-30% of all agencies) committed to using the services</td>
<td></td>
</tr>
<tr>
<td><strong>Singapore</strong></td>
<td><strong>United Kingdom</strong></td>
</tr>
<tr>
<td>• Cloud First policy for government agencies - targeting 25% of ICT spend through the cloud</td>
<td></td>
</tr>
<tr>
<td>• Provides various IaaS, EaaS¹ and SaaS through online store</td>
<td></td>
</tr>
<tr>
<td>• 50% of agencies of have adopted some form of cloud services</td>
<td></td>
</tr>
</tbody>
</table>

1. DaaS – Desktop-as-a-Service; OPaaS – Office-Productivity-as-a-Service; EaaS – Email-as-a-Service
Source: National ICT Government websites, Newspress, Frost & Sullivan, Ovum, Gartner

Not Exhaustive
Australian government agencies have been leveraging cloud based technologies for some time

### Australian Government Cloud Examples

<table>
<thead>
<tr>
<th>Federal Agency Examples</th>
<th>State Entity Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West Australian Health</strong> has adopted for a private cloud for the IaaS deployment</td>
<td><strong>University of Western Australia</strong> are transitioning data centres to externally hosted private cloud IaaS arrangements</td>
</tr>
<tr>
<td><strong>Australian Bureau of Statistics</strong> has implemented a virtualisation solution to enable transition to a private cloud environment</td>
<td><strong>Local Government Association</strong> of Queensland has created GovCloud, a community cloud services portal for councils</td>
</tr>
<tr>
<td><strong>Australian Maritime Safety Authority</strong> has implemented a Public Cloud for SaaS and PaaS deployments from Salesforce.com</td>
<td><strong>Monash University</strong> use public cloud services like Gmail for both students and staff</td>
</tr>
<tr>
<td><strong>Department of Immigration and Citizenship</strong> has implemented a Hybrid Cloud(^1) for IaaS as a proof of concept</td>
<td><strong>NSW’s Department of Finance and Services</strong> are consolidating delivery of state government web solutions through the use of private cloud Content Management System SaaS solution</td>
</tr>
<tr>
<td><strong>Treasury / ATO</strong> has migrated Standard Business Reporting and Business Names projects into the cloud</td>
<td></td>
</tr>
<tr>
<td><strong>Department of Immigration and Citizenship</strong> initiated a proof of concept for the provisioning of an end-to-end online client lodgement process on a cloud platform</td>
<td></td>
</tr>
<tr>
<td><strong>Australian Taxation Office</strong> has moved eTax, Electronic Lodgement System and Tax Agent Board administrative support systems into the cloud</td>
<td></td>
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1. Hybrid Cloud – Cloud based services that are a mix of private and public cloud services

*Source: Frost & Sullivan, Ovum*
Government agencies are extracting four primary sources of value from these offerings

Sources of Value for Government Cloud Initiatives

- **Drive automation and self-service**
  - Whole of government contracts allowing agencies the flexibility to purchase computing infrastructure 'on demand' on a 'pay-per-use' basis

- **Improves access to innovation**
  - Leverages vendor’s global commercial experience for innovation (e.g. brings benefits of efficient cloud computing to the public sector)

- **Reduces the total cost of infrastructure**
  - Agencies purchase computing infrastructure directly from host vendors, not required to purchase or maintain separate infrastructure
  - One single contract centrally managed on behalf of all departments
  - Improved demand aggregation and leverage improves economics

- **Universal resource access**
  - Enables government to establish common platforms for eGovernment initiatives
  - Services are delivered through the internet allowing universal access to resources – allowing both staff and citizens to access data if desired
Cloud computing also brings implementation challenges that governments need to address

### Cloud Computing Services Challenges

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Description</th>
<th>Strategies to Address</th>
</tr>
</thead>
</table>
| **Security & Privacy**      | • Data is not longer stored on government owned infrastructure, instead it is stored on vendor owned infrastructure  
                             • Greater perceptions of risk in citizen data and homeland security due to the loss of control over infrastructure  | • Development of private cloud data centers located in homeland countries  
                             • Appointment of leading cloud providers as cloud providers in order to utilise latest security offerings |
| **Migration of legacy architecture** | • Most existing agency infrastructure is old and custom built for specific purposes  
                             • Agencies will need to migrate their legacy architecture to standardised offerings that do not allow customisation thereby increasing migration complexity  | • Development of transition support teams on both government and vendor sides to support transition |
| **Reliability**             | • Greater perceptions of reduced system reliability and up-time due to the loss of control over infrastructure  | • Appointment of leading cloud providers with strong reliability reputations |
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The NZ operating model utilises 3rd Party Service Providers to build scale and reduce unit prices

**NZ Operating Model**

**Services Establishment**

- Lead agency acts as broker of ICT services and takes a mgmt. fee
- Service agreements are standardised with minimal room to customise
- Agencies sign a Memorandum of Understanding (MoU) with Lead agency that enables agencies to access negotiated services
- Agencies are only permitted to source directly from vendors if service is not supplied in standardised agreements
- 3rd Party platform and software providers are encouraged to utilise brokered IaaS deal to improve scale and pricing
- Lead agency only gets involved in vendor mgmt. if there are significant systematic issues

**Agency Procurement & Vendor Mgmt**

- Agencies sign a Participating Agency Agreement (PAA) with a selected vendor – standard IaaS deal – day-to-day service agreement as brokered by DIA between the agency and vendor
- Agencies manage vendors on a day-to-day basis
- Agreements are standardised and have standard sets of SLA’s and pricing structures
- Prices drop for all participants as demand thresholds increase – this includes 3rd party service providers
- Not much room for customisation in services – ability to request additional services for consideration in the DIA’s next round of negotiations (every 6-12 months)

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1. OPaaS and DaaS deals are currently being negotiated and vendor panels are expected to be finalised by late 2013

Source: National ICT Government websites, Government Lead Agency Employees
Core management of the IaaS deal resides in the DIA’s Operations department

Department of Internal Affairs ICT Org Chart

Total FTE’s ~130-140

- **Strategy**
  - Strategy Managers
  - Execution of NZ government’s ICT Strategy and Action Plan to 2017
  - Routinely assess the market and vendor landscape for changes and trends

- **Sourcing**
  - Sourcing Managers
  - Develops EOI’s, RFI’s and operates RFP process for new service contracts
  - Negotiates contracts and the addition of new services in existing contracts

- **Operations**
  - Common Capabilities Manager
  - Demand Managers
  - Agency Change Manager
  - Ongoing vendor management of common NZ govt ICT contracts
  - Works with agencies to identify demand and challenges
  - Identify the need for new services and initiates procurement process to obtain new services
  - Monitors technological changes and how they will impact agencies and services

- **ICT Assurance**
  - Account Manager
  - Provides advice on the IT systems security and reliability to the DIA and to agencies

- **GCIO Office**
  - Colin MacDonald
  - GCIO, CE & Secretary of DIA
  - Development of overall NZ govt. ICT Strategy and Action Plan to 2017
  - Sets targets for online government transactions
  - Oversees all Government ICT activities

1. Department is currently undergoing restructuring – presented structure may have changed since development of slide

Source: National ICT Government websites, Government Lead Agency Employees
The NZ model

NZ Government Services Model

Legend
- Service provided
- To be confirmed
- Service not provided

Source: National ICT Government websites, Government Lead Agency Employees
The NZ model is seeing success with ~50 agencies signed up in the first two years

NZ Operating Model Case Study Detail

<table>
<thead>
<tr>
<th>Background &amp; Challenges</th>
<th>Critical Success Factors</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td><strong>Ministerial mandate</strong></td>
<td>~50 agencies have signed up to the IaaS deal within two years</td>
</tr>
<tr>
<td>– 150+ government agencies with no existing share services model in place</td>
<td>– All-of-government approach to cloud computing announced by the Minister of Internal Affairs</td>
<td>Agencies are distributed equally between 2 of the 3 vendors</td>
</tr>
<tr>
<td>– Historically, agency ICT services were either managed inhouse or outsourced to a variety of vendors (e.g. Datacom, Revera, IBM, HP, Unisys etc.)</td>
<td>– All new services and expiring contracts need to adopt cloud services</td>
<td>Savings greater than NZ$12M already realised with NZ$50-250M expected over the first 10 years of the IaaS deal</td>
</tr>
<tr>
<td>– Some agencies were on syndicated arrangements, but this was not prevalent</td>
<td>– Justification required to not adopt cloud services</td>
<td>Continually extending services as agencies are increasingly demanding more services</td>
</tr>
<tr>
<td>– On Oct 2011 NZ govt. signed a deal with Revera, IBM and Datacom to provide IaaS to the whole of NZ govt.</td>
<td>– Encouraged agencies to sign-up on IaaS deal</td>
<td>Running tenders for OPaaS and DaaS due to success of IaaS deal</td>
</tr>
<tr>
<td><strong>Key challenges</strong></td>
<td><strong>Add scale through 3rd parties</strong></td>
<td>GCIO team within DIA of ~130-140FTE’s that is responsible for carrying out the NZ govt’s ICT Strategy and Action Plan to 2017</td>
</tr>
<tr>
<td>– Migrating legacy architecture</td>
<td>– 3rd party suppliers on platform or software layers are encouraged to utilise IaaS deal as backbone for infrastructure services</td>
<td></td>
</tr>
<tr>
<td>– Developing an offer that would encourage agencies to sign-up on the IaaS deal</td>
<td><strong>Agency transition assistance</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Dedicated agency transition teams in DIA who are able to discuss technical issues and work with vendors to identify solutions</td>
<td></td>
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Source: National ICT Government websites, Government Lead Agency Employees
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- Case study evaluations & implications
The new Singaporean operating model brokers improved IaaS offerings to agencies

Singapore Operating Model

Previous Model

- Infocomm Development Authority (IDA) acts as a lead agency and broker for shared services contract with NCS
- Focus of SHINE was to enable agencies to host web sites, deploy e-Services and applications
- Shared services platform providing basic hosting and storage services provided for whole government use
- No networking services provided
- Agencies are not mandated to utilise SHINE service – agencies are allowed to procure services from other vendors or utilise in-house capabilities
- Over 100 government agencies were utilising SHINE platform

New Model

- Infocomm Development Authority (IDA) acts as a lead agency and broker for shared services contract with Singtel & HP JV
- G-Cloud is an enhancement of service offering from SHINE platform
- G-Cloud's IaaS offering serves as a platform that enables PaaS and SaaS to be procured by agencies if so desired
- Agencies are still not mandated to utilise G-Cloud service
- SingTel/HP provides training to government agencies on G-Cloud functioning and helps them transition to G-Cloud from SHINE

Source: National ICT Government websites, Gartner analysts
The Singapore IaaS deal is limited to processing and storage services

Singapore Government Services Model

Legend
- Service provided
- To be confirmed
- Service not provided

Source: National ICT Government websites, Gartner analysts
The Singapore model is already has 50% of agencies participating

**Singapore Operating Model Case Study Detail**

<table>
<thead>
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<th>Critical Success Factors</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td><strong>Agency transition assistance</strong></td>
<td>~50 agencies (50%) have signed-up to transition from SHINE to G-Cloud despite G-Cloud only being available since June 2013</td>
</tr>
<tr>
<td>– 100+ government agencies on the existing shared services model in place (SHINE)</td>
<td>– SingTel/HP provide comprehensive transition/migration assistance to agencies</td>
<td><strong>Agency quote:</strong> “...With G-Cloud, we can now anticipate faster speed and greater scalability for our on-demand computing needs to enhance a robust administrative and learning environment…” said Mr Lim Teck Soon, IT Director, Ministry of Education.</td>
</tr>
<tr>
<td>– Historically, agency ICT services were either managed inhouse or outsourced to a variety of vendors</td>
<td>– Detailed approach that considers onboarding and ongoing management of migration</td>
<td></td>
</tr>
<tr>
<td>– On May 2012 IDA signed a deal with Singtel to provide cloud IaaS to the whole of government</td>
<td>– SingTel/HP spend 2 weeks with each agency to understand migration support requirements and develop a roadmap to transition for each agency</td>
<td></td>
</tr>
<tr>
<td>– Ensuring competitiveness of pricing offered by SingTel</td>
<td>– Service is a value-added bonus that is not included in pricing and is not charged separately</td>
<td></td>
</tr>
<tr>
<td><strong>Key challenges</strong></td>
<td><strong>Simplicity in offerings</strong></td>
<td></td>
</tr>
<tr>
<td>– Migrating from SHINE shared services platform to SingTel’s G-Cloud</td>
<td>– Single vendor with standard set of services at single unit pricing</td>
<td></td>
</tr>
<tr>
<td>– Encouraging enough of the major agencies to migrate to G-Cloud</td>
<td>– Simplicity makes it easy to shop for services and improves likelihood of uptake</td>
<td></td>
</tr>
</tbody>
</table>

Source: National ICT Government websites, Gartner analysts
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- Case study evaluations & implications
The UK govt. has concurrently moved to a shared services model while utilising cloud services

**UK Operating Model**

### Previous Model

- Agencies procured ICT services individually or in syndicated groups – no WoG shared services model
- Mix of agencies procuring all, some or no services varied throughout UK government
- Agency ICT solutions were often bespoke, complex, expensive and underutilised – server utilisation was as low as 10% in some cases

### New Model

- Lead agency procures a large collection of ICT services spanning IaaS, PaaS, SaaS and specialist cloud services across a large number of vendors
- Services are placed on an online platform called G-Cloudstore for agencies to shop for services and vendors
- High degree in transparency with all agreed deals and their pricing available to be viewed on the G-Cloudstore website
- Service agreements are standardised with little room for customisation
- Agencies go into individual contracts called ‘Call-offs’ with vendors and are expected to manage vendors on a day-to-day basis
- Service reviews are conducted yearly based on agency feedback
- Access to SME’s as well as large corporates

Source: National ICT Government websites
The UK govt. services model is focused on desktop, processing and storage services

**UK Government Services Model**

![Diagram of UK Government Services Model]

Legend:
- Service provided
- To be confirmed
- Service not provided

Source: National ICT Government websites
The UK govt. has facilitated £45M in deals, but a majority of deals relate to consultancy and labour

UK Operating Model Case Study Detail

**Background**
- 30k government agencies and councils utilising a mix of inhouse and outsourced ICT services – some syndicated groups, but no WoG shared services model
- Existing WoG ICT spend ~ £16B p.a.
- In 2011 the UK govt. developed the G-Cloudstore and offered Cloud based ICT services to the entire UK Public Sector
- In May 2013 a new mandate was released, instructing all IT purchases to go through G-Cloud
- G-Cloud initially was targeting savings of over ~£340M by 2015
- G-Cloud and it’s web-store is operated by only ~10FTE

**Key Challenges**
- **Agency change management and buy-in/ support**
  - Slow up take from agencies as the UK govt. has consciously focused on launching the G-Cloud store first and then change mgmt. second
- **Transitioning support**
  - No support from govt. to support transition from legacy architecture to cloud systems
  - Vendors are often SME’s who may not have scale to provide adequate transition support
- **Vendor security accreditation**
  - Vendors are not automatically approved for Pan Government Accreditation (PGA) – this can take up to 9 months
  - Agencies take on risk if procured services are not PGA accredited which is deterring uptake of services

**Results**
- As of August 2013:
  - £45M of sales through G-Cloudstore since inception
  - 64% of sales (by value) have been through Central Government and the rest through the Wider Public Sector
  - Only $2M has been for IaaS, $11M for SaaS
  - Specialist Cloud Services account for $32M of spend
- Use of G-Cloud has not been on core cloud offerings, rather it has been on various IT consultancy and labour hire services as provided in Specialist Cloud Services offerings

Source: National ICT Government websites
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The US federal govt. has developed a web-store to help facilitate their Cloud-First policy

US Operating Model

### Previous Model

- Federal agencies procured ICT services individually or in syndicated groups – no WoG shared services model
- Mix of agencies procuring all, some or no services was varied throughout US government
- Agency ICT solutions were often bespoke, complex, expensive and underutilised – as low as 7% utilisation in some cases

### New Model

- Lead agency procures standard IaaS, EaaS and SaaS purchase agreements for federal agency use
- Lead agency role in brokering services is limited as services offered in standard purchase agreements are generally limited
- Agencies are open to procure cloud services (IaaS, PaaS, SaaS) outside of standard purchase agreements
- Services are transitioning from an online platform called Apps.gov to a yet to be named web-store platform
- Service agreements are standardised with little room for customisation
- Separate security authorisation body (‘FedRAMP’) which accredits cloud vendor services that are outside standardised agreements for WoG use

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1. Federal government closed Apps.gov web-store in Dec 2012 and is developing a new web-based store for cloud services

Source: National ICT Government websites
The US’s standard agreements focus on processing and storage services

US Government Services Model

Legend

<table>
<thead>
<tr>
<th>Service provided</th>
<th>To be confirmed</th>
<th>Service not provided</th>
</tr>
</thead>
</table>

Source: National ICT Government websites
The US’s success to date is underpinned by a strong mandate with firm cloud migration targets

## US Operating Model Case Study Detail

### Background

- **Background**
  - 1000+ federal government agencies utilising a mix of inhouse and outsourced ICT services – some syndicated groups, but no WoG shared services model
  - Existing WoG ICT spend ~ US$75-80B p.a.

- **Key adoption challenges**
  - Agency concerns around security of cloud services
  - Future technical migration concerns – agencies are avoiding vendor platforms and technology that “lock-in” customers
  - Lack of adequate knowledge of cloud services within agencies making difficult to transition

### Critical Success Factors

- **Cloud first mandate**
  - All federal agencies required to adopt cloud technologies where feasible
  - Stipulates that all agencies need to identify three services to migrate with one fully migrated within 12 months and all three within 18 months

- **Data center consolidation mandate**
  - In 2010, mandate issued to close consolidate federal data centers
  - Targeting to close ~50% of all federal DC’s by 2015

- **Vendor security accreditation**
  - Accreditation body FedRAMP provides a standardised and centralised approach to assessing and authorising cloud computing services

### Results

- More than 50% of agencies have adopted cloud services
- IaaS is the most adopted service with 49% of agencies with SaaS at 25% and PaaS at 19%
- More than 450 DC’s (~25%) have been closed/consolidated
- Federal cloud spending is expected to reach US$1.7B in 2014 and US$7.7B by 2017

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Source: National ICT Government websites, Newspress
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The NZ model builds scale through 3rd party vendors whereas SG focuses on migration support

Global Government Cloud Based ICT Operating Models

Pros:
- Effectively builds scale through mandating agencies to participate and involving 3rd party providers
- Standardised agreements force migration to standardised infrastructure and improves systems compatibility between agencies

Cons:
- Current IaaS offering does not cover a wide variety of services – having trouble keeping up with agency demand for additional services

1. OPaaS and DaaS deals are currently being negotiated and vendor panels are expected to be finalised by late 2013
Source: National ICT Government websites, Government Lead Agency Employees
The UK offers a wider variety of services, but the US has a stronger security accreditation process.

Global Government Cloud Based ICT Operating Models

**Pros**
- Wide variety of services and vendors
- Competitive tension ensures competitive pricing
- Transparency of deals develops trust in pricing and services for agencies
- Access to SME’s as well as large corporates

**Cons**
- Overly complex number of services and vendors making it difficult to procure
- Inadequate agency transition assistance and change mgmt. to agencies

1. Federal government closed Apps.gov web-store in Dec 2012 and is developing a new web-based store for cloud services
   Source: National ICT Government websites
Key learning's are to focus on agency buy-in and transition support

Case Study Implications

**Agency change management**
- Involve agencies/ departments throughout the IaaS tendering process to develop a solution that to gather buy-in early
- Focus change efforts on the top 5-10 agencies

**Agency transition support**
- Develop significant transition support (e.g. onboarding, gap analysis, migration paths etc.) for agencies to make it as easy as possible for agencies to transition
- Identify transition support capabilities in vendors during RFP phase and make this a key evaluation criteria

**Mandate required to encourage uptake**
- Obtain ministerial support and issue a mandate to encourage maximum buy-in from customers and other Government departments

**Incentivise agencies to advocate**
- Structured deal to provide volume based incentives that reduce pricing for all participants as certain volume thresholds are reached
- Such a mechanism can incentivise agencies to encourage other agencies to sign-up

**Build scale through 3rd Party Service Providers**
- Encourage 3rd Party Service Providers to utilise brokered IaaS deals in order to help build scale and improve pricing - making the deal more attractive for whole of government