



Next-gen Technologies & Cloud Computing

The Trade Agenda

Peter Lovelock

Director, TRPC

Washington, D.C.

March 2011

How to Define a Cloud?

1. “... an on-demand service model for IT provision, often based on virtualization and distributed computing technologies... a new way of delivering computing resources, not a *new* technology”.
– ***European Network and Information Security Agency***
2. “... a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”.
– ***US National Institute of Standards & Technology***
3. *A computing paradigm where services and data reside in shared resources in scalable data centers, and those services and data are accessible by any authenticated device over the Internet*

Cloud Computing: Key Attributes

Key attributes that distinguish cloud computing from conventional computing

- Abstracted and offered as a service
- Built on a massively scalable infrastructure
- Based on dynamic, elastic, flexibly configurable resources that enables rapid provisioning
- Shared and multi-tenanted resources (hardware, memory, database)
- Easily purchased and billed by consumption
- Self-service based usage model
- Accessible over the Internet by any device

Cloud Computing – Why Now?

- **Bandwidth**
 - Increased availability of high-speed broadband (wireless and fixed)
- **Access**
 - Improved mobility & capability of devices
 - Laptops and Netbooks
 - Mobiles, Smartphones, Tablets
- **Storage**
 - Costs of storage capacity have fallen exponentially over the last decade, enabling the new business opportunities/models

Cloud Computing: Benefits

Microeconomic

- *Choice and Flexibility*
- *Cost Savings and Efficiencies*
- *Greater Computing Power and Latest Technologies*
- *New Platforms for Innovation*

Macroeconomic

- *Wealth Creation*
- *Innovation*
- *Jobs*
- *Address societal challenges*

Some Examples

Software as a Service (SaaS)

Software offered by third parties deployed as a hosted service and accessed over the Internet

1. HR ('Salesforce')
2. Email ('Hotmail')
3. Google ('Apps')

Platform as a Service (PaaS)

Platforms that can be used to deploy applications provided by customers or partners of the PaaS provider.

1. 'Azure'
→ MyTampines
→ Health Provisioning

Infrastructure as a Service (IaaS)

Computing infrastructure, such as servers, storage and network, delivered as a cloud service, typically through virtualization.

1. Amazon ('EC2')
→ Tax Collection

Key Policy & Regulatory Issues

Infrastructure & Access: *APEC already focused quite well*

Interoperability & Standards: *rules for the info ecosystem*

Data portability: *rules between providers, apps & systems*

- Time/ cost involved? Potential data loss?
- Can vendors provide sufficient openness to gain trust? Is there common accountability?

Data security: *how safe is the data/information*

- Very real possibility that the owner's data could reside on the same resources as a competitor's application and data

Key Policy & Regulatory Issues

Privacy: *who can access what & when*

Identity Management: *enhancing authentication*

Data Sovereignty: *who can access what & when*

- Where is data stored/ processed?
- Who and where are my service/ app providers?
- Legislation: levels of enforcement, company compliance, etc.

IPR & Piracy

We need coordinated action about how data will move *to* the cloud, *in* the cloud, and *between* the clouds

The key question for governments is not, how to build and deploy technology – this is essentially a ‘known’ – but how to build *trust and confidence* in the system to maximize the benefits

Policy Interoperability

- Internet has enjoyed ‘light touch’ regulation
- Data is becoming ‘stateless’:
 - Cross platforms
 - Cross providers
 - Cross borders
- Increasing ‘control’ over data means more clarity is needed:
 - Developers need certainty to build globally relevant applications
 - Customers need confidence that their data – and identity – is protected
 - Service providers need clarity to build the platform & infra for the cloud

New Regime Suggestions for Cloud

1. Better legal certainty for companies providing cloud services.
 - Today, there is little legal certainty two reasons: (i) laws have become outdated; (ii) **it's often unclear *whose law applies at any given moment.***
2. New generation of regulations focused on *outcomes* rather than the means by which those outcomes are to be achieved.
3. Enhance the ability for data to cross borders.
 - Place the accountability on cloud service providers within consistent frameworks (“an accountability principle”).