

“Beyond The Hype Cycle”

***Cloud Computing
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The OCA

- UK based global ICT industry policy think tank, plus advocacy
 - Members are technology leaders in Asia Pacific economies
- Creating Dialogue on Technology Policy...
 - Open Innovation and Competition
 - *Open Standards*
 - *Cloud Computing* and Secure & Trusted IT
 - Energy efficient green IT
- ...to drive positive outcomes for all stakeholders, both public and private

My focus today

- Cloud computing uptake and forecasts
- The Economics of Cloud Computing
- The Cloud and innovation
- The Business opportunity for Cloud Computing
- Performance issues
- Conclusions

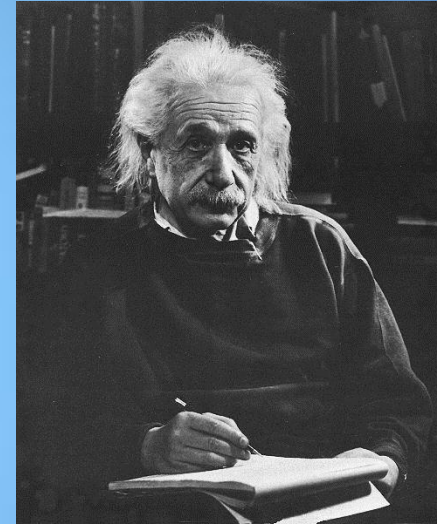
A question; who is the father of Cloud Computing?



Isaac Newton?



William Wilberforce?



Albert Einstein?

William Wilberforce - Who advocated the abolishment of slavery taking a CapEx to an OpEx!

NIST provides a working definition*

Cloud computing is a service 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.

- Private cloud - enterprise owned or leased
- Community cloud - shared infrastructure for a specific community
- Public cloud - sold to the public, mega-scale infrastructure
- Hybrid cloud - composition of two or more clouds

*Dr. Peter Mell, Dr. Tim Grance, NIST Information Technology Laboratory
10-7-2009 <http://www.nist.gov>

The Evolution of Cloud Computing



hotmail
First real cloud computing service



Microsoft Live and Bing, Google Search
eBay Auction as a Service
Facebook Social Networking as a Service
Twitter Micro-blogging as a Service
Wikipedia Knowledge as a Service



Amazon has excess capacity to meet seasonal buying needs

Amazon starts a business to rent idle infrastructure



First successful firm offering Infrastructure-as-a-Service for enterprise use



First successful firm offering Software-as-a-service for enterprise use

Cloud Computing

Office Web Apps

Microsoft Exchange Online

Live Meeting

Microsoft Office Communications Online

Online

Windows Server Active Directory

CRM Online

Windows Live ID

Azure™



Enterprise Wide-scale implementation of Business Productivity Online Applications

The Cloud is here now

- In terms of uptake in 2009, the global market size for the cloud was US\$60bn, this is predicted to rise to \$150bn in 2014*.
- The uptake of the cloud is growing at a CAGR of 25%*
- Over the next 5 years, enterprises and government will spend over US\$112b in cloud services – IaaS, PaaS and SaaS*
- What we are also seeing is a trend in cloud promotion to the CIO and the CEO/CFO

* Gartner Group 2010

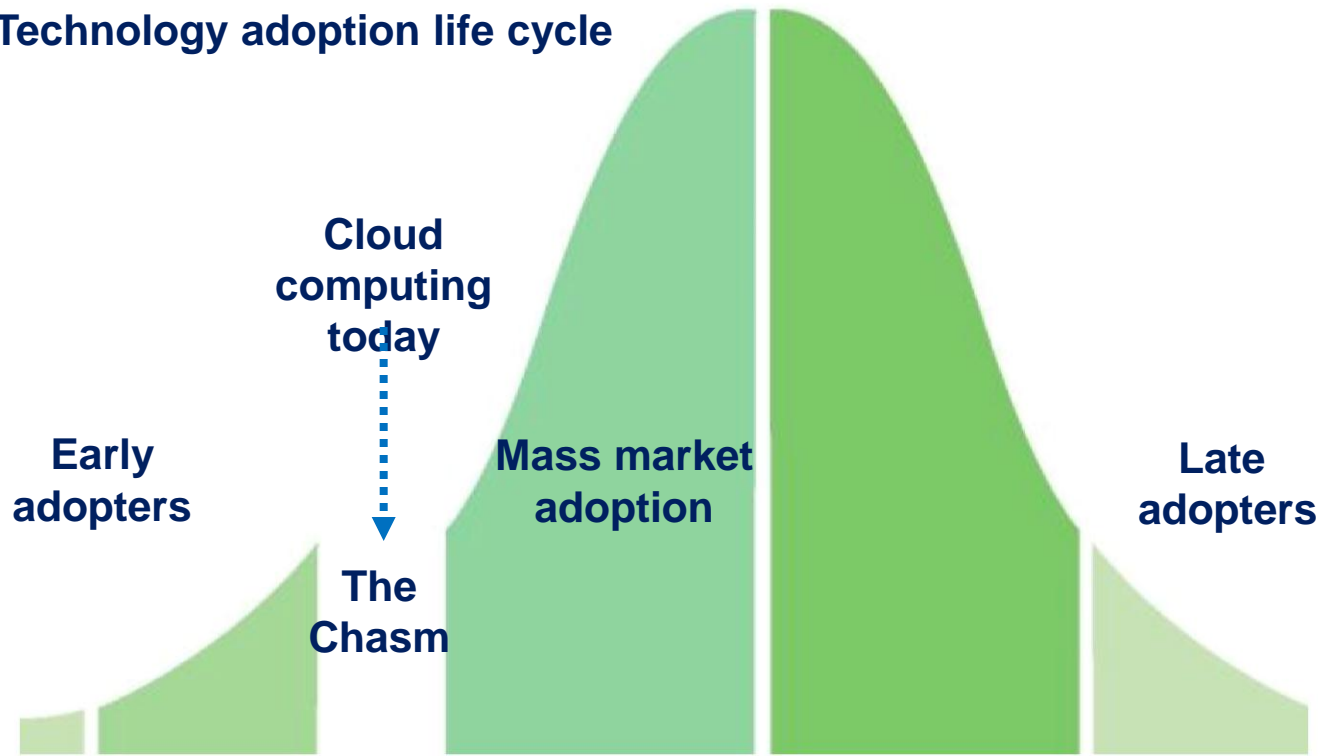
The US Govt is using the cloud

- The US CIO recently stated his case for the Cloud
- Recovery.gov, which provides data about government spending on the economic recovery.
- “Taking advantage of the cloud for consumer services allows us to abstract away from infrastructure investments”.
- “The cloud is suitable for a consumer facing Web site like Recovery.gov”.
- Using the Amazon cloud saved \$750,000 annually.
- Moving GSA.gov, which is also a consumer facing site, saved \$1.2 million a year.

Full Interview at: <http://nyti.ms/9W0296>

Enterprise adoption

Technology adoption life cycle



Visionaries

Technology
enthusiasts

Pragmatists

Conservatives

Sceptics

Initial Cloud Apps

- Testing/development
- Peak load support
- Employee portals
- Software-as-a-service
- Collaboration/Web 2.0
- Streaming media
- Hosting/back-up
- One-off projects
- Customer co-creation
- Small office support
- Telecommuters
- Conferencing
- Wikis, blogs
- Thin clients

Adapted from Geoffrey Moore's "Crossing the Chasm"

The Economics of Cloud Computing

- Economies of scale – standardised resources
- Automation of maintenance tasks
- Large centres have increased staff to server ratios
- Increased utilisation of resources at scale
- Lower carbon footprint
- Public and Private clouds do not scale the same way
- Private clouds will cost more but will have enhanced security

The numbers - by 2020 computing will process;

- 2 trillion financial transactions*
- 31 billion devices*
- 4 billion internet users*
- 25 million applications*
- 1.2 Zettabytes of storage₁

* Gartner Group 2010
1 Digital Universe 2010 EMC-IDC

Where will this come from?

- Sensors everywhere – from cows to cars
- Video everywhere – not just YouTube
- Growth in mobile smart devices – information everywhere all the time
- Half a million Apps for mobile devices
- Mobile devices specifically designed for the Cloud (IPad etc.)
- e-enabled healthcare – millions of records and images (and those sensors...)

IT Interdependencies

Client Applications

Open Office, Microsoft Office,
Adobe Photoshop, Online Docs
Firefox, Explorer, Opera, Chrome...

Server Applications

Jboss, BEA, Zope, WebSphere, Oracle, SAP,
Apache, Microsoft SharePoint, .NET,



Databases

IBM, MS, Oracle, etc.



redhat.



Operating Systems & Middleware

Apple, TIBCO IBM, MS, Sun/Oracle. etc



System Integrators/ Vendors

CSC, Cap Gemini, Fujitsu, IBM, Dell, etc.



Networking/Security Vendors

Cisco, Riverbed, Juniper, Blue Coat, etc.



Processors

X86-32, X86-64, Sparc, PPC, IA64



Storage

EMC, Dell, IBM, Hitachi, NetApp., etc..

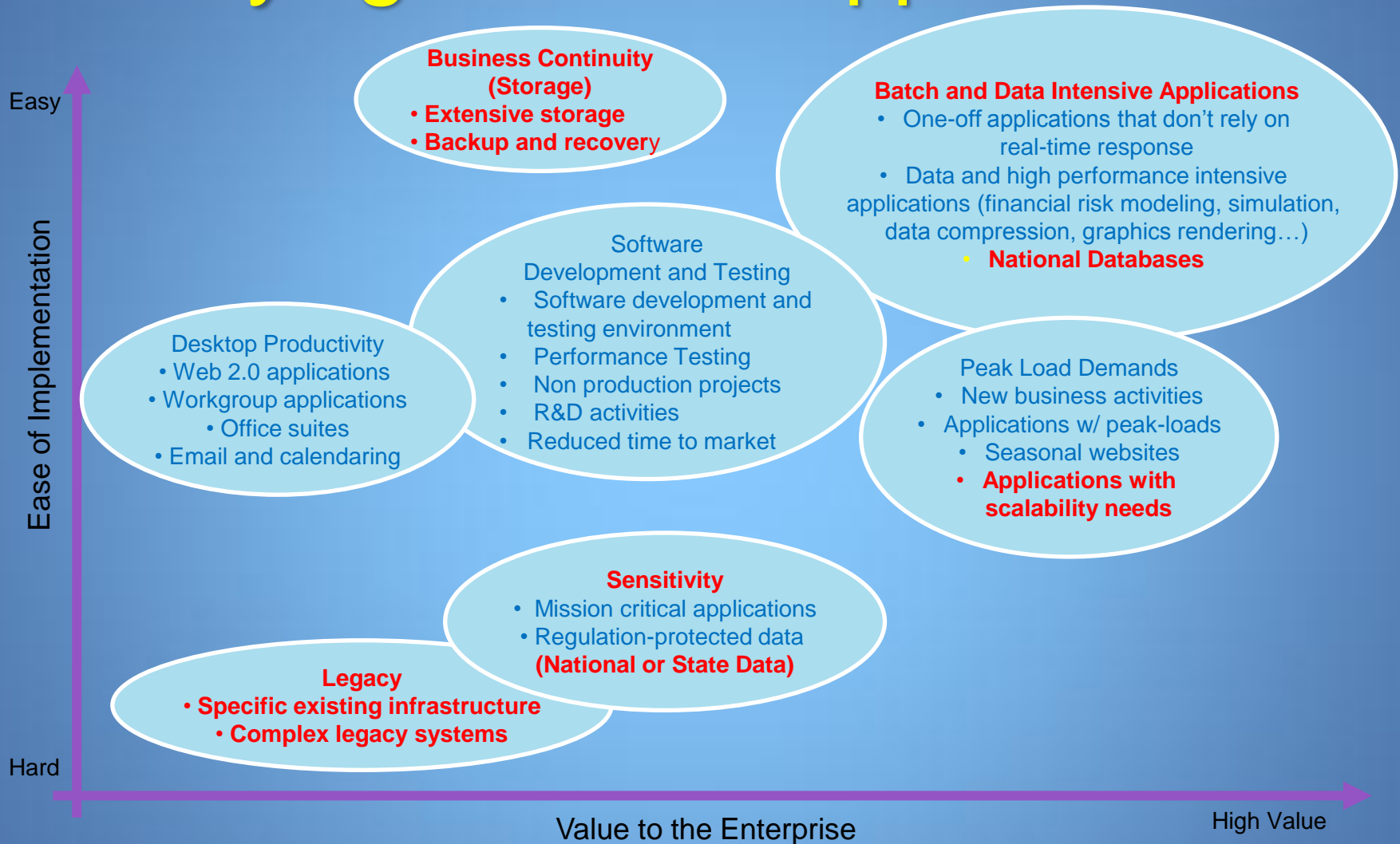


Trademarks are of the respective owners

The Cloud drives Open Innovation

- A platform to share – internally and externally
- infrastructure demands will mean relatively few providers
- Balanced by open competition in the SaaS layer
- Resulting in a greater number of players from more countries developing the applications that enterprises and consumers want
- Whole new businesses being created – Facebook, Google, Salesforce.com and many more
- Existing business changing and adapting - Amazon, Microsoft and Apple for example

Identifying business opportunities



Performance Issues

- Application performance management
- Orange in Europe recently polled 500 MNCs on their Cloud plans*
- Web conferencing, Video conferencing and Microsoft apps most likely candidates
- 68% plan to consolidate DC's and servers
- 70% will demand specific App SLA's on availability
- 56% for managed network SLA's
- 55% have WAN optimisation in place
- The solution is that data optimisation, compression and application accelerators are needed to enable on demand IT

*Source: Application Performance Management: maintaining performance, productivity and getting ready for the cloud. Orange Nov 2010

Bandwidth costs

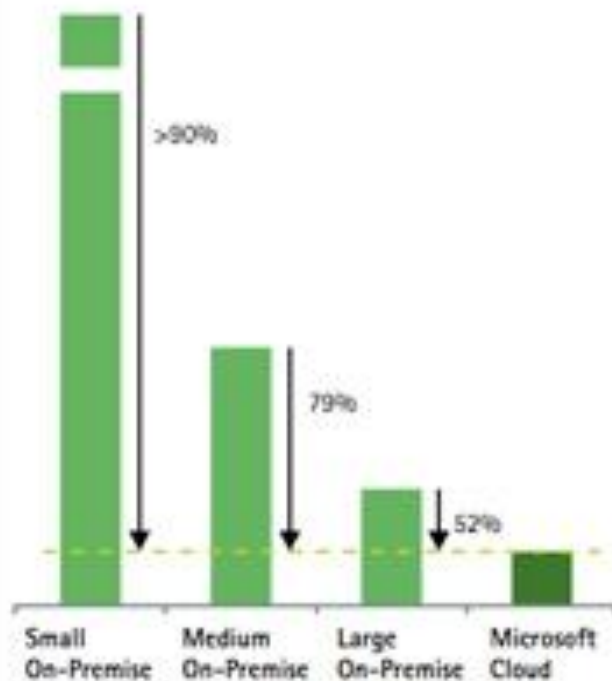
- Not all economies in particular in Asia have an affordable or competitive ISP market offering bandwidth that can support enterprise cloud models.
- Example; a 45mbps service in Hong Kong averages US\$1,504 per month compared to Malaysia where it is US\$11,059 or Vietnam US\$18,234!!*
- This is a problem looking for a regulatory solution to ensure widespread access for e-health e-govt and e-education for example.
- Data optimisation can reduce bandwidth needs by reducing what is sent over your network

The Cloud enables Green IT

Figure 1: Comparison of Carbon Emissions of Cloud-Based vs. On-Premise Delivery of Three Microsoft Applications

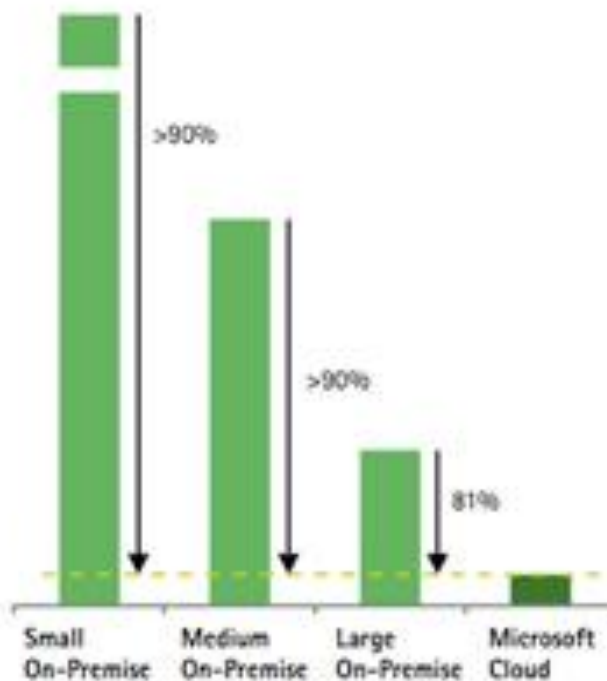
Microsoft Exchange

On-premise vs. Cloud Comparison, CO2e per user



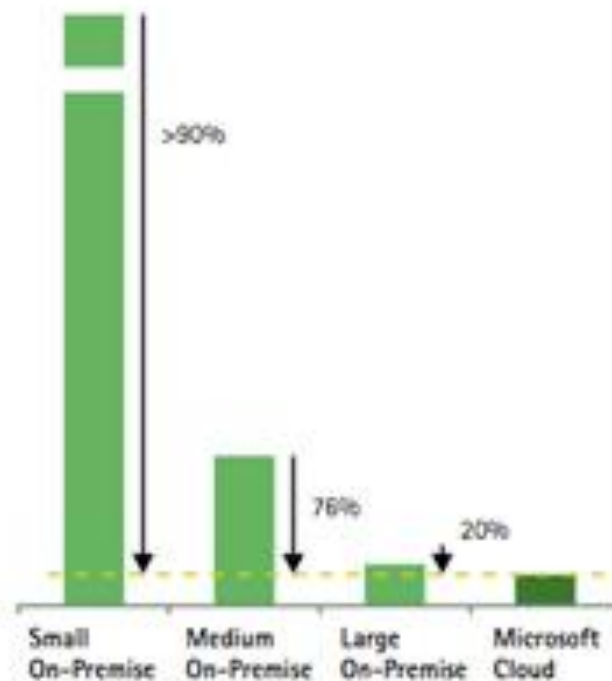
Microsoft Sharepoint

On-premise vs. Cloud Comparison, CO2e per user



Microsoft Dynamics CRM

On-premise vs. Cloud Comparison, CO2e per user



↓ = estimated decrease with Microsoft Cloud



In Conclusion

We are already beyond the hype and into the adoption cycle for cloud computing with hundreds of companies and thousands of developers delivering products now

The policy issues are being addressed by the forward looking global economies - in particular security for private clouds

The cloud takes advantage of the economies in internet delivered services to the next level in particular DR and BC as well as storage that will make a good business better and governments more efficient in service delivery.



Thank You Bill!

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