

Week 7

Government use of Cloud Computing

Outline

- Why Cloud Computing for Government
- G-Cloud in Singapore
- Government Use of Public Clouds
- Guest speaker: Mr. Lee Kee Siang (Director, Infocomm, National Library Board)



NIST definition

Cloud computing is a computing model where IT capabilities are delivered as a service over the Internet to many users

Benefits of Cloud Computing

- Reduced Cost
 - Typically paid incrementally, saving organizations money
- Increased Storage
 - Can store more data than on private systems
- Highly Automated
 - IT personnel need to worry about keeping software up to date
- Flexibility
 - Offers much more flexibility than past computing methods
- More Mobility
 - Access info wherever staff are, rather than having to remain at their desks
- Allows IT to Shift Focus
 - No worry about constant server updates & other computing issues
 - Free to concentrate on innovation.

Why Cloud Computing for Government



Vivek Kundra
(former) US Federal CIO
Author of Cloud-First policy

The federal government spends over \$75B annually on IT. This technology supports every mission our government performs— from defending our borders to protecting the environment [...]. However, federal agencies and departments encounter many difficulties in deploying new IT services and products. Procurement processes can be confusing and time-consuming. Security procedures are complex, costly, lengthy and duplicative across agencies. Our policies lag behind new trends, causing unnecessary restrictions on the use of new technology. Past practices too often resulted in inefficient use of purchased IT capabilities across the federal government. We are dedicated to addressing these barriers and to improving the way government leverages new technology.

Benefits to Government (1)

Costs saving

- US federal government spends \$75B a year on IT products - \$20B for computer hardware
- Agencies that have "moved to the cloud" generally enjoyed 25% to 50% savings on their IT costs

"For the federal government as a whole, this translates into billions in cost savings, depending on the scope of the transition."

Darrell West

VP & Director of Government Studies
Brookings Institution

Benefits to Government (2)

Agility

- "In the government, it can take years to procure, configure and deploy technology solutions. By using cloud services, the federal government will gain access to powerful technology resources faster and at lower costs. This frees us to focus on mission-critical tasks instead of purchasing, configuring and maintaining redundant infrastructure."

Vivek Kundra
(former) US Federal CIO

“Cloud First” Policy

"When evaluating options for new IT deployments, the Office of Management and Budget will require that agencies default to cloud-based solutions whenever a secure, reliable, cost-effective cloud option exists. To facilitate this shift, we will be standing up secure government-wide cloud computing platforms."

Vivek Kundra
(former) Federal CIO

Benefits to Citizens

- Lowers threshold for entry to those who have previously lacked means to purchase PC solutions
- Cloud computing plus next generation broadband networks go a long way to address 'digital divide' by making computers easier to use & improving functionality

G-Cloud in Singapore

Cloud Computing for Government

Objective

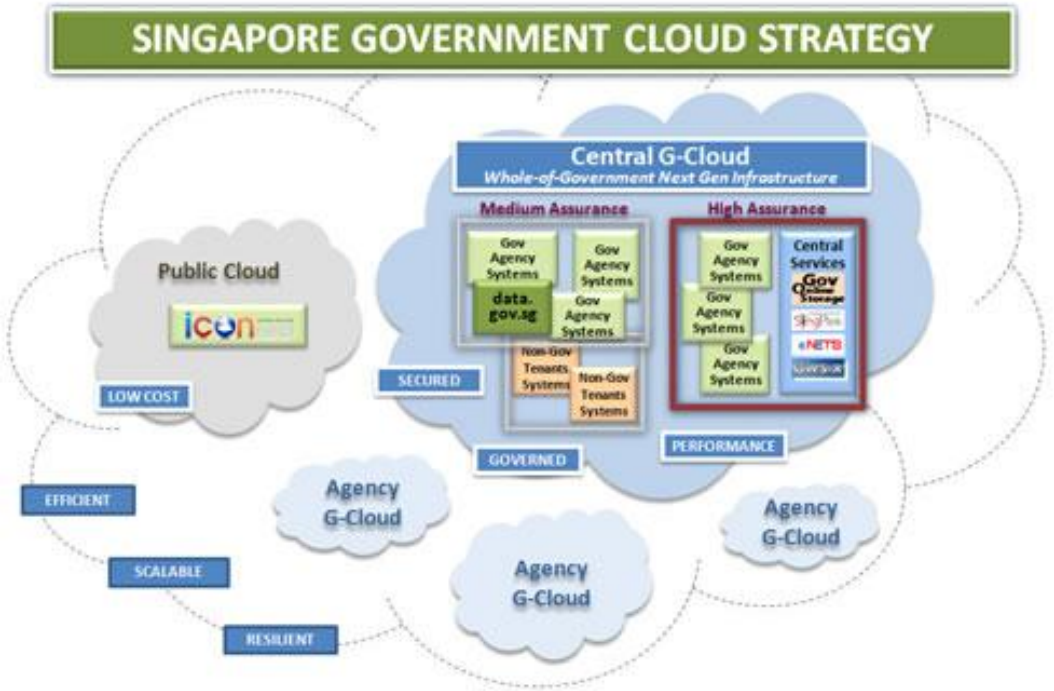
Provides a resilient & secure ICT shared environment that allows govt agencies to procure computing resources on-demand, with greater ease & speed



- Acknowledges that each cloud computing model provides its own level of assurance & benefits
- Cloud strategy aims to leverage appropriate cloud for appropriate need by adopting a multi-prong approach to cloud computing
 - Leverage public CSPs for appropriate needs so as to benefit from lower cost of computing resources
 - Implement a private govt cloud (Central G-Cloud) for WOG use where security & governance requirements cannot be met by public clouds
 - Enable interoperability between Central G-Cloud and Agency G-Clouds through a set of internal G-Cloud standards

Central G-Cloud

- Will provide efficient, scalable & resilient cloud computing resources
- Will be designed to meet 2 levels of security & governance requirements:
 - High Assurance Zone – a physically dedicated computing resource pool which will only be used by Govt to serve its high assurance needs
 - Medium Assurance Zone – a computing resource pool which will be shared with non-govt cloud users to lower cost computing resources for Govt



- Will provide central services
 - govt web service exchange
 - gateways to SingPass & e-Payment services
- Will identify & provide common services, such as CRM & web content management, as SaaS offerings on G-Cloud
- Enables standardisation, & sharing of computing resources & apps at WOG level

Government Use of Private Clouds

National Institute of Education (NIE)

- Objective
 - Create a private cloud for institute's 460 lecturers to enable faster access to computing resources for their research (e.g. conduct surveys, research on subjects like adopting mobile computing or social media technology for teaching or learning)
- Capacity
 - Some 110 or so computer servers consolidated into ~ 50
 - Cloud storage capacity to grow ~40 TB to 100 TB by 2013
 - Current 30 projects a year to grow ~ 80 - 100 annually over next 2 years
 - Vendors: Fujitsu, EMC, VMware
- Will achieve savings of \$60K a year on electricity charges alone
 - Excludes savings from floor space & manpower
- NIE plans to move its e-learning portal & enterprise administration system to a cloud by 2014

[Source: Digital Life, 10 August 2011]

YOG IT Systems & Applications



Include Game Management System, Information Diffusion System and Internet, Digital & Media that convey Games-time data such as results, athletes & weather information to officials, sponsors, media & members of Olympic Family.

Government Use of Public Clouds

YOG Virtual World - Odyssey



NLB tackles Web Archiving

- Web Archive Singapore
 - Aim:
 - Crawl all .sg websites to capture materials of national & historical significance
 - Index all retrieved web contents
 - Challenge: Requires extensive use of IT resources
- Solution
 - Makes use of cloud services from nGrid, a local CSP
- Benefits
 - Cost savings
 - Scalability
 - Time savings



Photo courtesy of National Library Board Singapore

NLB's mission is to provide a trusted, accessible and globally-connected library and information service.

MOE uses public cloud

- First in Asia to provide Web 2.0 communication & collaboration tools to 30,000 teachers & staff in over 350 schools
- Goal is to adopt innovative technologies within education profession to drive next-generation learning & communications
- Google Apps replace existing e-mail system & might replace existing word processing software in future
- Use of Google apps was estimated to save ~ \$360,000 a year
- Applications also promote interactive teaching & learning

Business Times - 23 September 2009

MOE takes big leap to Google platform

By **ONG BOON KIAT**

IN a landmark move and nod to the rise of the Web 2.0 phenomenon, the Ministry of Education (MOE) will be adopting a suite of Web-based software from US search giant Google.

By year-end, over 30,000 teachers and staff in over 350 schools will get the software, called Google Apps. It includes popular electronic messaging application Gmail, as well as office applications like word processor and spreadsheet.

The tender is worth about \$650,000 per year, for two years, MOE said yesterday.

The move is "part of MOE's goals to adopt innovative technologies such as Web 2.0 within the education profession to drive next-generation learning and communications", according to a joint statement by the three parties involved - MOE, NCS and Google.

It makes MOE the first in Asia to provide Web 2.0 communication and collaboration tools to all teachers in the public school system, the statement added. Web 2.0 is commonly associated

with the social networking trend and Internet software that promotes collaboration among users.

"This is a key project for MOE as it will facilitate collaborations and sharing among our teachers and help enhance their teaching practices," Chan Tee Miang, MOE's chief information officer said.

It will also transform the way educators work with their peers and Gen-Y students, added NCS chief executive Lim Eng. IT services provider NCS is implementing this project.

But MOE's move could come as a surprise to some industry watchers due to its timing - before the roll-out of MOE's mega computer project, dubbed the Standard ICT Operating Environment (SOE) for Schools. An MOE spokesman told BT that with the adoption of Google Apps, an e-mail system "will no longer be one of the base services" required of SOE for Schools.

SOE for Schools, which has a contract sum of around \$620 million and covers over 60,000 seats in schools, is slated to be rolled out from end-2010 over two years.

MOE had decided to escalate the implementation of a new e-mail system ahead of SOE for Schools because of limitations of the current system, which is also not able to keep up with rising e-mail usage, the spokesman said.

Google Apps will replace MOE's existing e-mail system, but not - for now - the Microsoft Office software suite which MOE teachers are using for word processing.

Google Apps is available in both paid and free versions, including a free Education Edition - the version MOE is getting.

MOE will be paying NCS for project implementation, service and support.

A notable appeal of Google Apps is its cloud computing model. This refers to a platform that lets companies use applications over a network, such as the Internet, without owning the systems needed to run them, hence saving money. Cloud computing systems run software and store data in remote machines.

Yesterday's joint statement said MOE will become the first ministry in Singapore to adopt a public cloud computing platform.

FutureSchools Moving to Cloud

- Current
 - Infrastructure located in schools & external data centres
 - More than >90% of solutions are web-based
- IDA has been working with partners to
 - Create web-based applications of existing client-based modules
 - Adopt cloud-based infrastructure to enable scaling on-the-go
 - Provide services-as-a-subscription pricing model



End goal is to provide solutions as a utility
on a pay-as-you-go model

LMS providers tap on cloud for scalable LMS solutions for schools

- Currently, LMS providers can support 10 – 15% of concurrent access based on normal usage
- During emergency school closures, LMS providers are required to support up to 50% concurrent access within 48 hours
- IDA has been working with LMS providers to
 - Adopt cloud-based infrastructure to enable scaling on-demand for bandwidth and computing resources (e.g. storage) required



End goal is to provide solutions to support home-based learning during emergency school closures



- Over 200K NUS alumni access email on a cloud-based service
- Immediate savings ~ \$14K per year
 - Manpower, network & servers
- Also exploring cloud services like CRM, knowledge management, & virtual desktops
- NUS has deployed MS live@edu, cloud-based solution tailored for education sector
 - Solution saves NUS up to \$60K per year

NUS navigating to the cloud to cut costs

Up to 200,000 NUS alumni access their e-mail on a cloud-based service

By RAJU CHELLAM

THE education sector seems to be steering towards cloud computing faster than other sectors. The National University of Singapore (NUS) is the latest major educational institution in Singapore to seek the saviour of the cloud in an attempt to save costs and boost operational efficiency.

The Ministry of Education (MoE) was the first and put 30,000 teachers in 350 schools on a Google cloud in September 2009.

A year later, Singapore's largest private tertiary institution - SIM University (UniSIM) - put its archival data on a public cloud. And now, NUS has joined the so-called cloudwagon.

"NUS began migrating its lifelong e-mail service for alumni to the cloud from November 2009," Tommy Hor, director of NUS' Computer Centre, told *BITT*.

"It is a full-fledged implementation for more than 200,000 alumni members. NUS is also working on virtual server provisioning to reduce both DC (data centre) usage of energy as well as physical space."

NUS has about 8,000 faculty and staff members, some 32,000 students and 202,000 alumni.

"Currently, only the alumni e-mail has been moved to the cloud," Mr Hor said. "We estimate immediate savings on manpower, network and servers to be about \$14,000 a year. The cloud model also helps us avoid costs, which could amount to a few hundred thousand dollars if we

had to increase mailbox size for storage and upgrade the servers for all the alumni."

NUS is also exploring other cloud services such as CRM (customer relationship management), knowledge management and virtual desktops.

"We encounter peak periods, such as during course selection by students, when the servers need to run high data loads," Mr Hor said. "It is thus more cost effective to implement a cloud solution to address such peak periods."

NUS worked with storage giant EMC Corp to implement a continuous storage system called EMC VMAX.

"That's a private cloud solution that enables on-demand data storage provisioning," Mr Hor said. "The hardware and professional services are provisioned on-premise and support the enterprise database, e-mail and other mission-critical apps."

EMC Singapore's country manager Joe Ong said EMC has been working closely with NUS to provide on-demand provisioning and support during periods of high data traffic. "EMC's infrastructure will help NUS achieve its vision of becoming a global knowledge enterprise," Mr Ong said.

NUS has deployed Microsoft's Live@edu, a cloud-based solution tailored for the education sector. The web-conferencing solution is from Cisco WebEx, which saves NUS up to \$60,000 a year.

"One big benefit of the cloud for NUS is the significant reduction in deployment time," Mr Hor said. "Previously we had to go through an extensive process of exploration, testing, solution architecture, pro-



Mr Hor: Immediate savings on manpower, network and servers estimated at about \$14,000 a year

urement, implementation, testing and commissioning before any solution could be deployed for production. Cloud computing cuts deployment time for new systems from 12-24 months to one to two months."

In September last year, the MoE announced its decision to leverage on Google Apps to provide e-mail, Web 2.0 communication and collaboration tools to more than 30,000 teachers and staff in 350 schools in Singapore. The goal was to adopt innovation technologies within the education profession to drive next-generation learning and communications, the MoE said.

UniSIM opted for a cloud-based service called SaaS (Storage as a Service) and found that it cuts costs by a factor of 20.

"If we had decided to buy all the information sources ourselves, it would have cost us about \$146,400," said Gary Teo, director of UniSIM's campus IT services. "By opting for a SaaS model, our total cost was only \$7,200. That's 20 times lower than if we had done it all ourselves."

According to research house International Data Corp, the global market for SaaS is expected to cross the US\$3 billion mark by 2012, with a compound annual growth rate of 30 per cent between 2007 and 2012.

StaaS for UniSIM

- SIM University
 - Singapore's largest private tertiary institution
 - Founded in 1964 as a membership society under EDB
 - Has 33,000 corporate & individual members
- Puts archival data on a public cloud (storage-as-a-service)
 - Course materials are not available on cloud
 - Plans to make it available in future
 - Benefits include increased efficiency & cost effectiveness
 - All data is encrypted at source before it is stored



Cloud costings

Cost comparison between in-house and cloud based models

COST COMPONENTS	BUY OWN RESOURCES (\$\$)	BUY GRID SERVICES (\$\$)	REMARKS
Hardware	12,000	—	Purchase of two servers + operating system + maintenance
Software	70,000	—	Purchase of software
Storage	14,000	—	Storage & maintenance fee
Co-location & power	7,200	—	Co-location & power cost for two servers
Technical support	43,200	—	Manpower for technical setup + support
Grid services (SaaS)	—	7,200	Storage + Singaren shared bandwidth
Total	146,400	7,200	Savings of \$139,200

Source: National Grid Office + UniSIM + PDC Systems

“If we had decided to buy all the infocomm resources ourselves, it would have cost us about \$146,400. By opting for a SaaS model, our total cost was only \$7,200. That’s 20 times lower than if we had done it all ourselves.”

Gary Teo,
director of UniSIM campus IT services



In SGD over 3 years

Bulk Tender – Public Cloud Services

- Intended for Government ministries, statutory boards & participating entities (viz, NUS, NTU, CAG) so as to ease their procurement of Cloud Services
 - Offered on a utility model for apps in Unclassified category
 - Customers will be charged only on actual usage
- Services include:
 - Infrastructure Services
 - Compute Services
 - Storage Services
 - Bandwidth Services
 - Platform Services
 - Operating System & System Services
 - Application/Web Hosting Services
 - Storage Backup Services
 - Optional Services
 - Software-as-a-Service
 - Software License Hosting Services
 - Professional Services

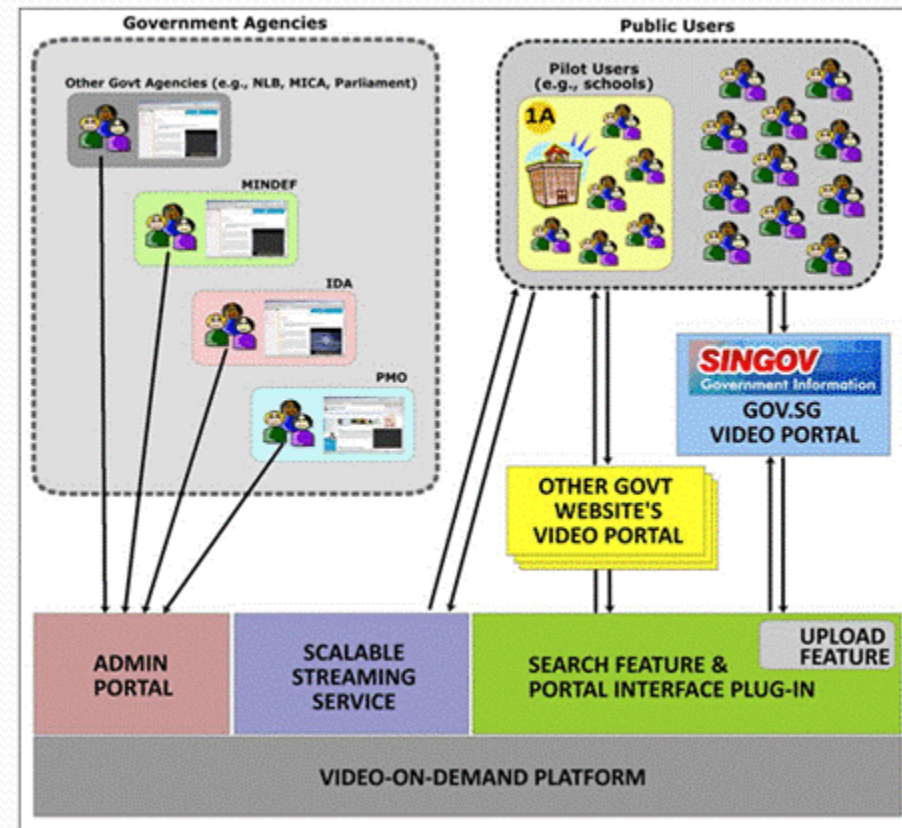
Awardees

- SingTel/Alatum
- NCS/Alatum
- nGrid
- PTC

Being refreshed in
Q1 2012

Bulk Tender – Video Hosting & Streaming

- To provide a suite of video hosting & streaming services on a utility model
 - For Government ministries, statutory boards & participating entities (e.g. NUS, NTU, CAG)
- Services enabled via scalable platforms (e.g., cloud providers) to meet demands of video streaming catering to
 - Large no. of concurrent users
 - Widely varying compute, storage & bandwidth needs
- Allows agencies to upload / manage videos, & hyperlink to these videos via a thumbnail in their own websites
- Govt users include
 - MINDEF, MOT, PSD, IDA, SNGS, IE Singapore, MAS, Civil Service College, ...



Awardees

- EvvoMedia/Alatum
- ServTouch/nGrid

CLOUD BENEFICIARY 1

Govt creates its own YouTube

It used Cloud to develop its own video-hosting service, saving money on servers and avoiding ownership issues

Government agencies like the Ministry of Transport (www.mot.gov.sg) are using short video clips on their websites to better explain policies to citizens.

The videos are hosted on the cloud but popular video hosting site YouTube has nothing to do with it.

Khoong Hock Yun, assistant chief executive officer of the Infocomm Development Authority (IDA), said: "YouTube has made videos popular. But government agencies hesitate to use it because any video posted on YouTube belongs to the website. If there is a court case, it must be heard in the United States. There is also a discomfort knowing that our videos on National Day parades, for example, can be spoofed."

The IDA came up with a video-hosting service last March which any government agency can use to put up videos on their websites. Instead of building its own hardware to host the videos, the IDA is making use of the cloud to host and stream the videos.

Dubbed Envision, the video-hosting service was awarded to two local consortia Evvo Media and ServTouch through a public tender earlier this year.



PHOTO: WWW.MOT.GOV.SG
In this screen shot, Transport Minister Raymond Lim explains his ministry's land transport policy in a video embedded in the Ministry of Transport website.

There are three key benefits to Envision, said Khoong.

By using a shared resource, each agency pays only when they use the service and save on high capital expenditure on servers and networks.

There are two different service levels to ensure smooth video streaming experience. One is on a best effort basis where some lag during video streaming is acceptable. Said Khoong: "Agencies will use this for

promotional videos."

The other is a guaranteed level of service where a large number of people can sign in simultaneously and the high Internet bandwidth assigned for this service will ensure that the videos will play without lag or stalling.

Copyright and ownership issues form the third benefit for users. There is no worry over who owns the videos hosted by the service providers.

Explaining why IDA went for a cloud service, Khoong said: "It's difficult to know how much storage capacity and bandwidth to plan for. If we over-provide, it's a waste. If we under-provide, we can't scale easily when demand increases."

With Envision, the savings can be substantial. A 10-minute video, made available for one month and in which 150 concurrent users could tune in, could save an agency about \$5,000 a month by using the cloud service compared to paying \$10,000 to a dedicated video-on-demand provider. The Ministry of Transport, Mindel, the Public Service Division and IDA are the initial agencies interested in Envision services.

A video search in the www.gov.sg website will be rolled out soon, which will let people search online for all videos created by the Government.

In phase two of the project next year, Envision will be rolled out to schools where teachers and students can access videos and other interactive digital material for learning and teaching.

chngkeg@sph.com.sg

SNGS Video Hosting & Streaming



<http://www.ngp.org.sg/EnVision>



Most Popular Videos



[2W - Gym Presentation \(PE\)](#)

2010-08-12 14:33:46
72 views



[2H - Gym Presentation \(PE\)](#)

2010-08-12 14:29:37
38 views



[demo video 2](#)

2010-07-29 15:21:57
13 views



[40th Sports Carnival Video](#)

2010-08-05 16:43:34
13 views



[SNGS Marketing Video](#)

2010-08-11 08:41:58
11 views



RGS COMMUNITY VIDEO-SHARING PORTAL



LATEST VIDEOS



Year 4 English Drama
2011-Part 2
2011-11-01 15:45:50
8 views



Year 4 English Drama
2011-Part 1
2011-11-01 15:40:25
7 views



C.S.E. - RGS
2011-10-17 15:50:41
16 views



Gotta Catch 'em All - CSI
2011-10-12 00:19:51
21 views



CSI Video (Project: Mr.
Mum (Part 2/3))
2011-10-12 23:35:21
17 views



CSI Video (Project: Mr.
Mum (Part 3/3))
2011-10-12 23:33:22
20 views

POPULAR VIDEOS



Nurture @ Kebun Baru
Community Club
2011-10-10 09:15:22
119 views



Blood Spatter Analysis
2011-05-11 05:51:07
107 views



Mistaken
2011-05-15 21:23:59
21 views

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enter your keywords below here

search by category

Submit





St Joseph's Institution
Founded in 1852

Nurturing Men of Integrity and Men for Others

Si

Home

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Watch

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Community

My Profile | My Videos | My Favorites | My Playlist | My Group

Search Videos

Search

Watch



Better than TV! Watch what you want, when you want!

Upload



Quickly upload and tag videos in almost any video format

Share



Easily share your videos with everyone, public or private

Log In

Username:

Password:

Forgot your password?

Login

Statistics



Public Videos: 17



Private Videos: 51



Members: 24



Watched Videos: 5,593



Online Visitors: 0

Popular Tags

Recently Viewed



Volume



The Fullerton - S ...



AYG 2009 Torch



Outward Bound Sab

How schools can use EnVision...

- Corporate videos
- Videos on students' achievements
- Videos on co-curriculum activities, outings, study experiences, etc
- Videos on celebrations, e.g. national day, sports day, teachers' day, children's day
- Videos that teach students school values, songs or dances



Selected Government Users (of SaaS)

- Vsee (Ministry of Defense)
- Community Care Management Solution (Singapore General Hospital)
- Jusfeedback (Ministry of Health, Ministry of Manpower, IDA, Land Transport Authority, Universities, Schools)
- Salesforce (Ministry of Education, National Library Board, Singapore Tourist Board)
- I-magination (National Environment Agency)

Selected R&D Users (of IaaS)

- Multi-way Join Processing under MapReduce Framework (School of Computing, NUS)
- Fighting Vandalism on Wikipedia (School of Computing, NUS)
- Distributed Check-pointing on Federated Clouds (School of Computing, NUS)
- Climate Change Analysis (Tropical Marine Science Institute, NUS)
- Bioinformatics on Hadoop (School of Info Systems, SMU)
- Optimizing Model Training for Speech Recognition (School of Computer Engineering, NTU)
- iTwin (Institute of Infocomm Research, A*STAR)

Cloud Landscape in Singapore

Cloud Readiness Index 2011



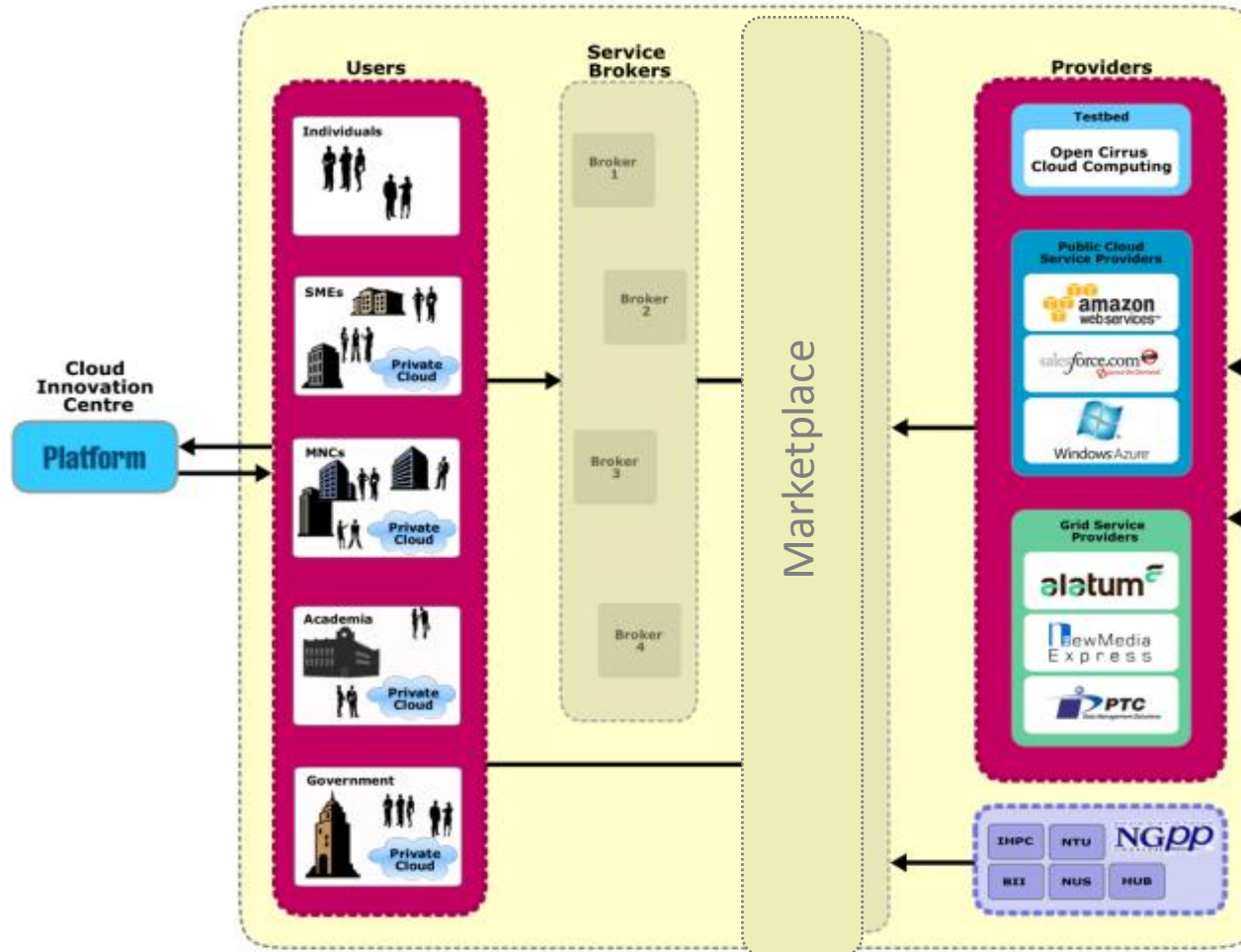
	INDEX SCORE	RANK		Regulatory Conditions	International Connectivity	Data Protection Policy	Broadband Quality	Government Prioritization	Power Grid Quality	Internet Filtering	Business Efficiency Index	Global Risk	ICT Development
TOP SCORE				10.0	9.0	10.0	9.0	9.4	9.2	10.0	9.3	8.0	8.8
Japan	85	1		8.7	9.0	10.0	8.0	8.2	9.0*	10.0	6.8	6.5	8.4
Hong Kong	83	2		7.5	9.0	10.0	6.4	8.4	9.2	10.0	9.3	5.0	8.4
Korea	82	3		8.7	7.0	10.0	9.0	8.6	8.4	7.5	6.4	8.0	8.8
Singapore	82	3		10.0	9.0	6.0	5.6	9.4	8.9	7.5	8.9	8.0	8.3
Australia	78	4		10.0	6.0	8.0	5.3	6.6	8.0	10.0	8.1	8.0	7.7
Taiwan	76	5		6.2	8.0	10.0	5.4	7.3	8.2	10.0	7.8	5.0	7.7
New Zealand	73	6		7.5	4.0	10.0	5.3	8.7	6.9	8.7	7.5	6.5	8.2
Malaysia	68	7		7.5	6.0	6.0	4.7	8.8	7.6	10.0	6.5	5.0	6.3
China	60	8		8.7	9.0	2.0	4.9	5.2	7.0	6.2	6.3	5.0	5.7
India	53	9		6.2	6.0	6.0	4.7	6.6	4.1	7.5	5.9	2.0	4.2
Thailand	51	10		5.0	5.0	2.0	5.0	4.1	7.6	7.5	6.6	2.0	5.7
Indonesia	50	11		7.5	4.0	6.0	4.6	4.3	4.8	8.7	3.3	2.0	5.0
Vietnam	48	12		7.5	5.0	4.0	4.5	3.5	4.8	3.7	5.0	5.0	5.5
Philippines	45	13		5.0	5.0	2.0	4.6	3.7	4.5	7.5	5.1	2.0	5.4

* Japan's power grid quality score is pre-earthquake based.

Cloud Ecosystem in Singapore



Cloud Ecosystem - CSPs



Selected Enterprise Users



- Problem statement

- Need to scale quickly in response to varying transaction load on its online order web site running on a hosted server with a pre-determined configuration

- Solution

- Cloud service offer a pool of readily available & elasticity on a 'pay-per-use' model
- Able to handle peaks without any reduction in performance

- Benefits

- Greater flexibility
- Significant cost saving (up to 90%)
- Enhanced performance leading to improved customer experiences



HSR property agents jump on Google cloud

By VICTORIA HO

FACING a mammoth task of helping its agents maintain correspondence records for three-year stretches, HSR Property Group decided to jump on the Google cloud this month.

HSR CEO Patrick Liew told reporters at a media briefing that this decision was prompted by a new regulation from the Council of Estate Agencies (CEA) mandating estate agents keep their records for at least three years. This includes documents and e-mail correspondence.

Within a month, the real estate group's 2,700 brokers were migrated over to Google Apps, the search giant's business-focused Web app suite.

Mr Liew said the cloud would provide a fuss-free way of maintaining the data, without building a large data centre.

He also spoke of the pain of ensuring clean and reliable backups, saying that the software-as-a-service (SaaS) route allowed

ment and agents, said Mr Liew.

Mr Liew echoed this, saying the Google suite's collaboration offerings such as video and document sharing are expected to help HSR disseminate information to agents more easily.

He also hopes agents will take to some of Google's other offerings such as Google Earth, which can be used to showcase property locations. He is confident of users jumping onboard the Web apps suite.

With the popularity of smart phones, the company expects the bulk of its agents to access their mail and documents via mobile phones and tablets.

Migration has been going smoothly, and all of its agents will have been taken through the system by next week. "The clarion call has been sounded that technology is the way forward," said Mr Liew.

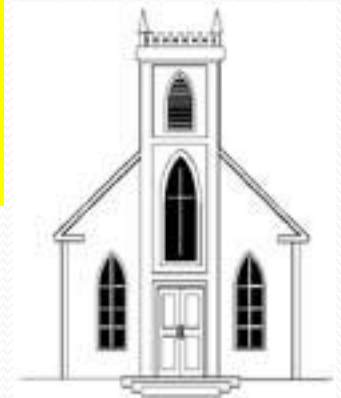
Google's Asia-Pacific Enterprise managing director, Doug Farber, said the company has been seeing a 188 per cent year-on-year



- Prompted by a new regulation from Council of Estate Agencies mandating estate agents keep their records (including documents & correspondence) for at least 3 years
- SaaS allows HSR to avoid maintaining necessary IT expertise in-house & pain of clean & reliable backups
- Google suite's collaboration offerings such as video and document sharing are expected to help HSR disseminate information to agents more easily
- With popularity of smart phones, HSR expects bulk of its agents to access their mail & documents via mobile phones & tablets

Religious Organizations Using SaaS

- Association of Muslim Professionals
- Islamic Fellowship Association
- Bethesda Cathedral
- Church of Our Saviour
- Covenant Evangelical Free Church
- Seventh Day Adventist Community Church



Associations / Societies Using SaaS

- Association of Singapore Philatelists
- Credit Counselling of Singapore
- Singapore Chinese Chamber of Commerce
- Singapore Association of the Visually Handicapped
- Singapore Anti-Tuberculosis Association (IaaS)
- Wei Jin Dragon & Lion Dance Association



Examples of Sports-related Companies using SaaS

- Adidas Korea Ltd
- Adidas Sports (China) Ltd
- Aramis Fencing Equipe Pte Ltd
- Bollywood Dance Pte Ltd
- Cricket Event & Entertainment
- Golf Parivaar Pte Ltd
- Kungfu Republic
- Softball Academy
- Wiz Golf Pte Ltd
- Z Fencing Pte Ltd
- Z Sports Pte Ltd

People's Association related Orgs. using Cloud

- Geylang Serai Community Centre
- Nee Soon East Citizen's Consultative Committee
- People's Association



Educational Institutions Using SaaS

Public Schools

- East View Primary School
- Rulang Primary School
- Yishun Secondary School
- Greenridge Primary School
- Kuo Chuan Presbyterian Primary School

Private Schools

- Agape School of Education Pte Ltd
- Avantus Training Pte Ltd
- The Playground Preschool Pte Ltd
- The School of Applied Studies Pte Ltd
- Cherrybrook Kindergarten



Schools



Guest speaker

Mr. Lee Kee Siang

Director, Infocomm, National Library Board