

Cloud Computing:

BY

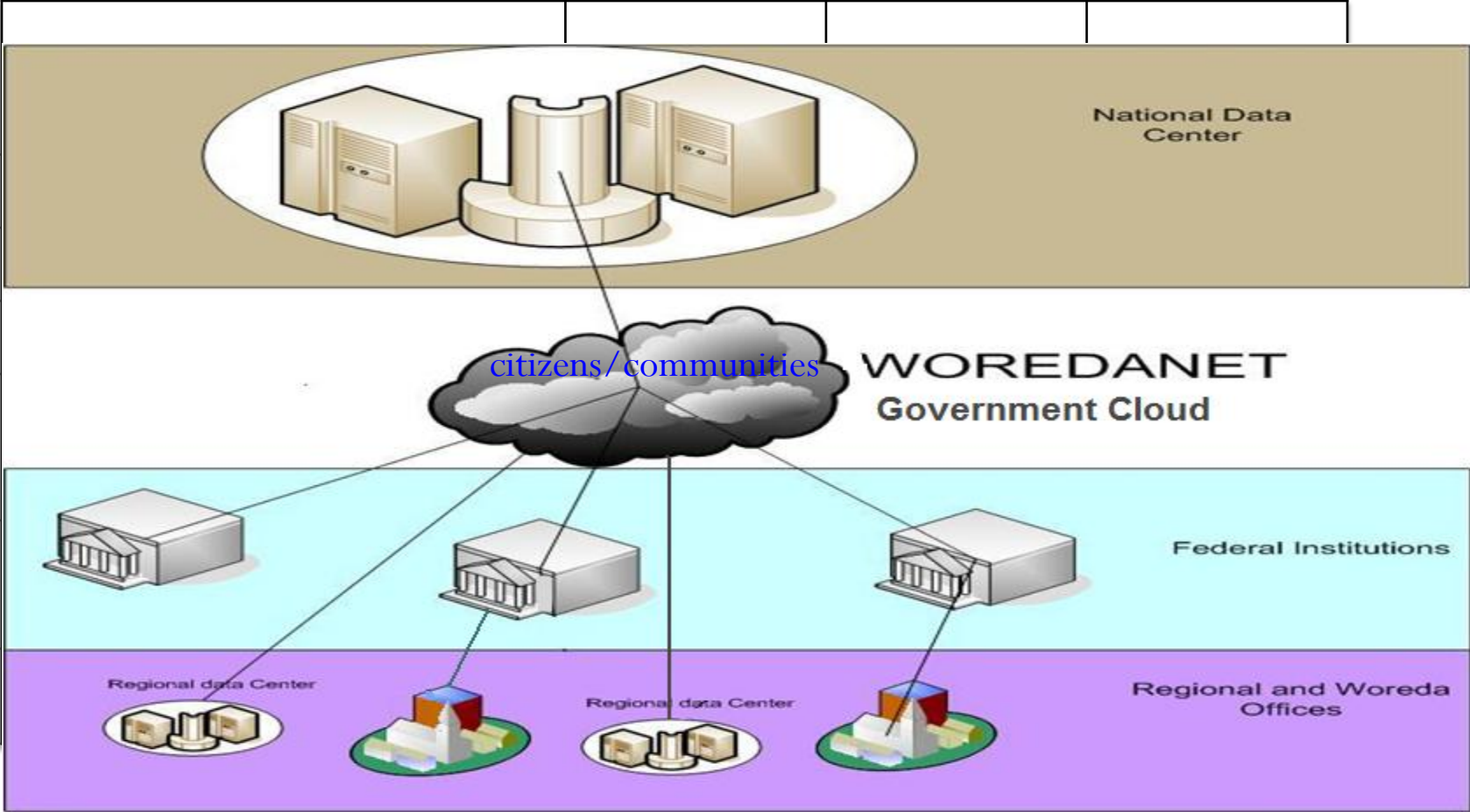
Mesay Hailemariam Moreda,

Team Leader, government Applications and electronic Services,

MCIT, Ethiopia

June, 2012

Infrastructure...



Available infrastructure...

- *Infrastructure,*
- *Applications,*
- *Service delivery Centers:*
- *Standards & Guidelines*
- *HRD*

Infrastructure...

Services	Number of Users (Oct. 2011)	Capacity in 5 years	Users per 100 inhabitants
Landline Telephone (Fixed line)	836,543	8.5 Million	10
Mobile Telephone	12,142,316	40 Million	50
Internet & Data Users	166,813	7.17 Million	8.5
Rural Connectivity (in 5KM radius in %)	49.3%	90%	-
Wireless coverage of the country	<50%	90%	
International Link Gb/s	3.2	20	

Source:- GTP Plan of Ethiopia, Dr. Mesfin Belachew

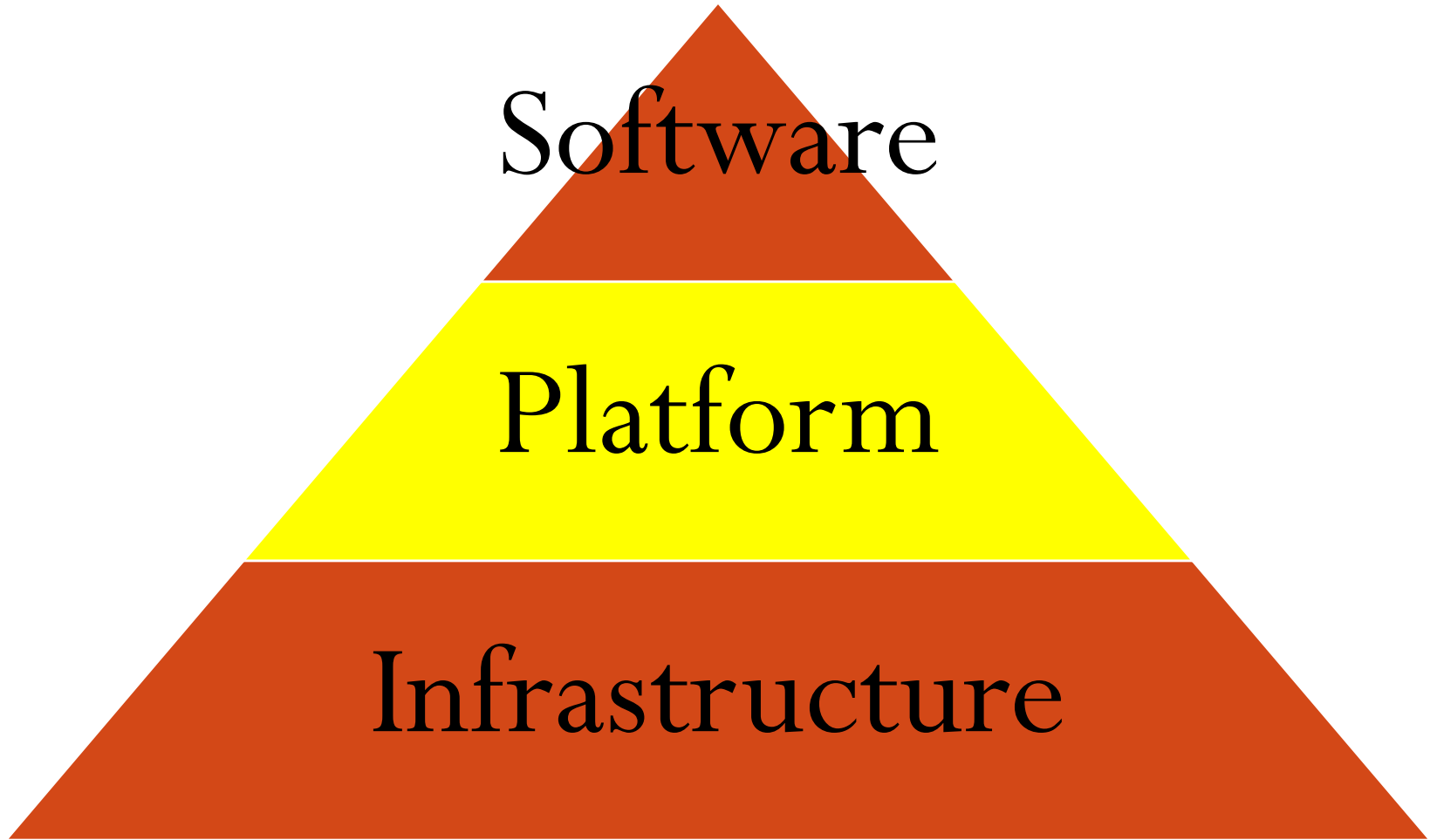
What is cloud computing



Definition

- *A model for enabling a convenient, on-demand and network access to a shared pool of configurable computing resources, (networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimum management effort or service provider interaction (NISTcan Definition)*

Delivery Models

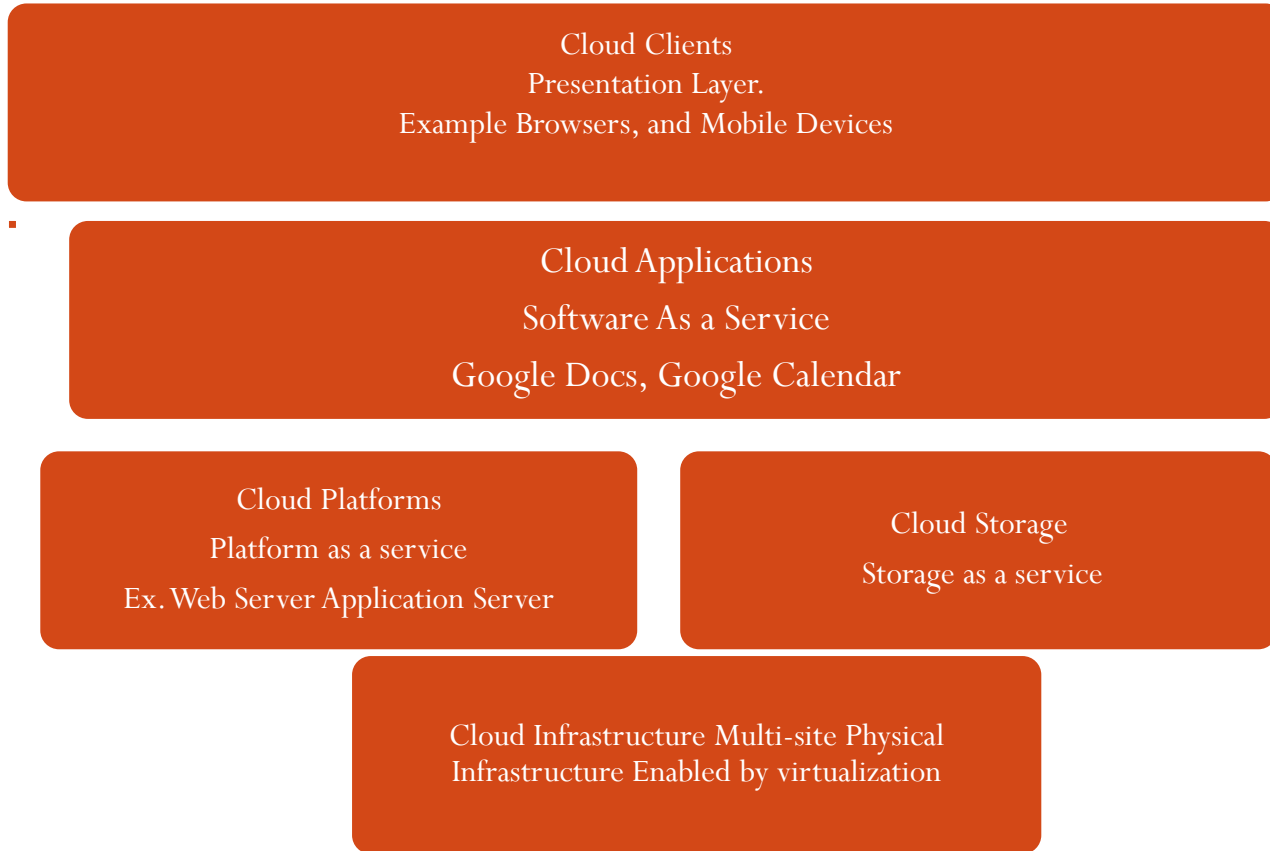


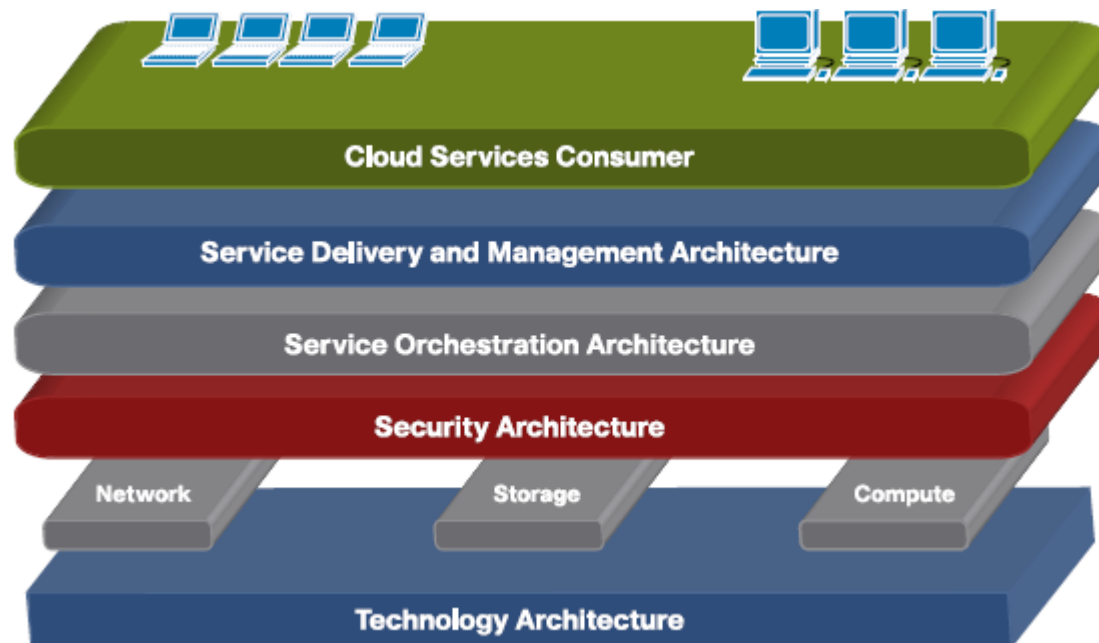
Software

Platform

Infrastructure

Layers of cloud computing





Value proposition in cloud...

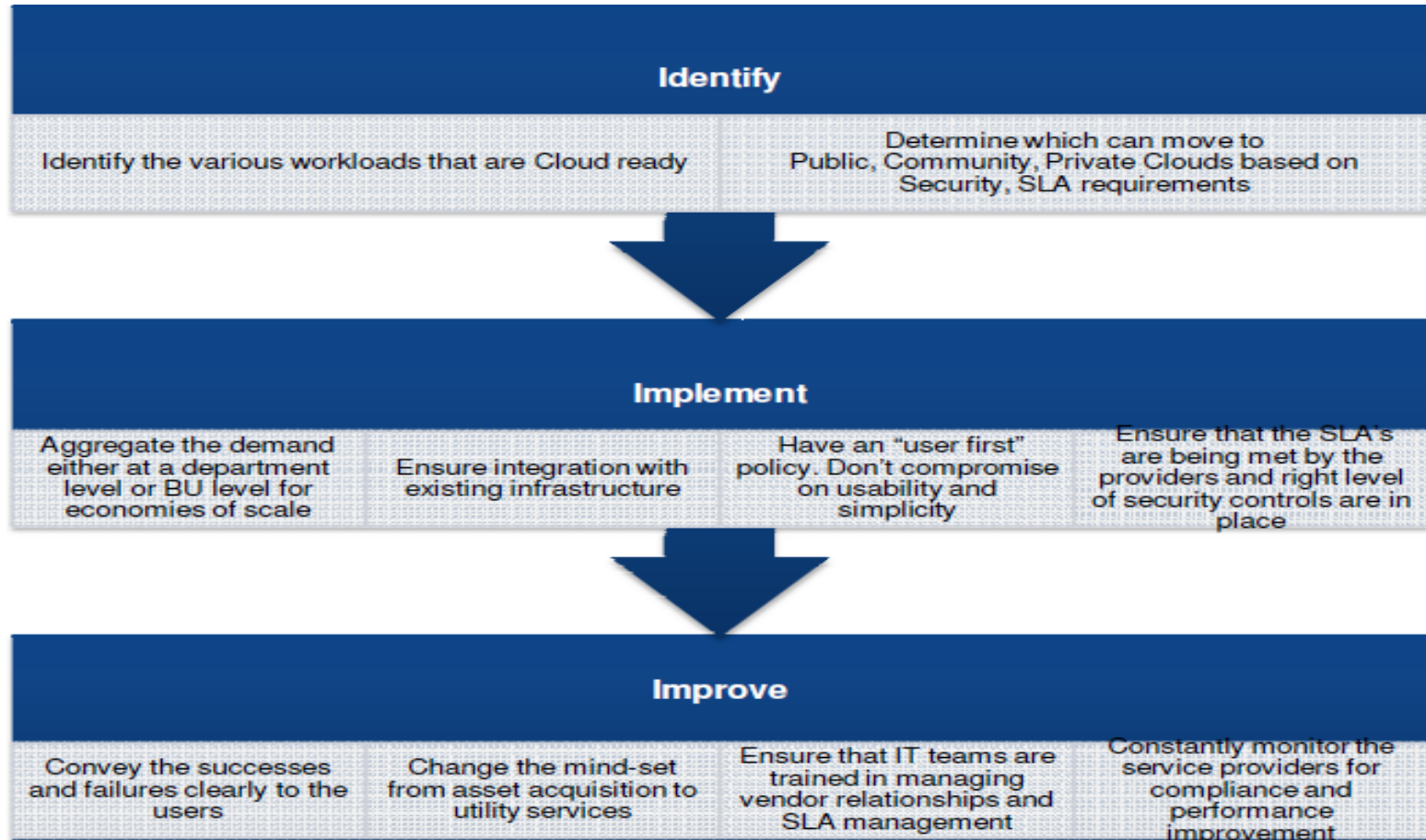
Reduction in ICT Spending	<p>By adopting cloud computing, government agencies can create a central pool of shared resources – software and infrastructure. The consolidation of resources and the fact that cloud computing is more cost effective, leads to reduction in ICT spending.</p>
Agility	<p>Governments operate in a strict hierarchical manner and the process for approvals and purchase orders is a time consuming activity. Cloud computing provides the capability to eliminate these time consuming activities and provision resources on the fly.</p>
Access to Most Updated Technology	<p>Cloud computing offers the government the ability to constantly have access to the most updated software and hardware. The onus of upgrading technology is on the service provider in this delivery model who ensures access to the most up-to-date solutions.</p>
Elimination of Procurement & Maintenance	<p>Another key advantage is the elimination for the need to procure, monitor, and maintain IT resources. This too is the responsibility of the service provider under the delivery model. Apart from reducing the workload, this reduces the need for IT staff and allows the government/agencies to focus on their core areas of work.</p>
Universal Resource Access	<p>Cloud computing is delivered through the Internet enabling universal access to resources. Furthermore, it helps the government in establishing a common platform for all its eGovernance initiatives, one that is easily accessible by the citizens as well.</p>

Source: Frost & Sullivan

Risks....

- Security
- Business Continuity
- Attack
 - Malware
 - Side channel attack
 - Brute force attack
 - Rogue clouds
 - bbn

Adoption frame work



Example government clouds

- www.apps.gov



Apps. Gov. htm



Cloud Computing for UK Government. htm

Characteristics of Cloud Computing

The five characteristics of cloud computing are

1. On-demand self services:

- A consumer can unilaterally provision computing capabilities such as server time, and Network storage as needed automatically without requiring human interaction with each service provider*

2. Broad network access:

- Capabilities are available over the network and accessed through standard mechanisms that promotes heterogeneous thin or thick clients (mobile phones, laptops, and PDAs)*

3. Resource pooling:

- Resources are Storage, Processing, memory, network bandwidth, and virtual machines,*
- provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to the customers demand. There is a sense of location independence in that the customer has no control or knowledge over the exact location of the provided resources but may be able to specify location at higher level of abstraction (eg. Country, Regional government , or datacenter).*

4. Rapid elasticity:

- Resources are rapidly and elastically provisioned, in some cases automatically to quickly scale up and rapidly released to quickly scale down. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at anytime.*

5. And measured service:

- Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service. (e.g storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service.*

Cloud 4G...

- *Commercial service providers are expanding their valuable cloud offerings to include the entire traditional IT stack*
 - *Software / hardware infrastructures*
 - *Middleware platforms*
 - *Application system components*
 - *Software services*
 - *Turnkey applications*

C4G...

- *The private sector has already taken advantage of these technologies to*
 - *improve resource utilizations*
 - *Increase service responsiveness*
 - *Accrue meaningful benefits in efficiency, agility, and innovation*

Cloud for the government

Chart 2: Modes of Cost Savings

Datacenter Consolidation

- With most Governments taking a pro-active role in datacenter consolidation and virtualization to enable cloud computing, the cost of running a server will drastically decrease.
- Datacenter consolidation will also result in lower power consumption and easier administration – both of which will reduce operating costs.

Aggregation of Demand:

- Demand aggregation would result in efficient usage of existing infrastructure and optimize procurement of new resources. The existing silo based procurement system, which has resulted in gross inefficiencies, will yield to models that treat IT services as a utility. It is extremely important to create an ecosystem that encourages demand aggregation so as to not lose out on the potential cost savings.

Multi-tenancy

- The reduction in number of physical infrastructure, pooling of licensing and self-service nature of provisioning will result in lower spending on software, hardware and services.

Best country experience ... UK

- *Key measures of the Government ICT Strategy:*
 - *Establishing a Government Cloud or "G-Cloud". The government cloud infrastructure will enable public sector bodies to select and host ICT services from one secure shared network.*
 - *Reducing the number of data centres. Consolidating hundreds of computer data centres, which hold all the digital information for government, to approximately ten to 12 secure, reflexible centres.*
 - *Creating a government applications store. The application store will be a marketplace for sharing and reusing online computer programmes (like standard office applications such as word processing and email) on a pay by use basis. It will speed up procurement and deliver savings of approximately £500m per year.*
 - *Implementing a common desktop strategy. A new set of common designs for desktop computers across the public sector. Historically each organisation has separately specified, built and designed its desktop computers. Creating one set of designs will lead to savings of £400m per year.*

Con...

- *Easier maintenance*
 - *Imagine the headache of maintaining 30+ datacenters and compare it to maintaining only 4*
- *Increased reliability and back-up (if done right!)*
- *More rapid development*
- *Surge capacity*
 - *Regional governments could also save money because longer requires to provide the “care and feeding” of an IT infrastructure all over the nation. They could gradually*
 - *When you move to the cloud, a whole bunch of problems is put onto the professionals and the body that are the service providers, You no longer manage by program but manage by service, and you suddenly focus on your mission instead of upkeep. Hence experience a big surge in capacity*
- *Collaboration*

Cloud 4 Federal Governemnt

- *Possible advantages for Federal Government*
 - *Increases operations efficiency*
 - *Responding faster*
 - *Shared Infrastructure*
 - *Economic of scale*
 - *organizations measure and pay for only the IT resources they consume,*
 - *increase or decrease their usage to match requirements and budgets*

- *Leverage the underlying capacity of IT resources via a network*
- *Resources needed to support mission critical capabilities could be provisioned more rapidly with minimal overhead*
- *Offers the government an opportunity to be more efficient, agile, and innovative through effective use of IT investment*
- *If organizations need to launch a new innovative program, it can quickly do so by leveraging cloud infrastructure without having to acquire significant hardware lowering both time and cost barriers to deployment .*
- *Thus, the government must*

Role of Government for the gov

- *Articulate the benefits, considerations, and trade-offs of cloud computing*
- *Provide decision framework and case examples to support regional governments, ministries, and agencies in migrating towards cloud computing*
- *Highlight cloud computing implementation resources (data centers, storages, platforms, applications,)...mentioned as blessing*
- *Identify government activities and roles and responsibilities for catalyzing cloud adoption*
- *Identify and resolve cloud related issues (policy, standards, services, ...)*
- *Set up proper cloud governance for standards and certification and accreditation,*

Continued...

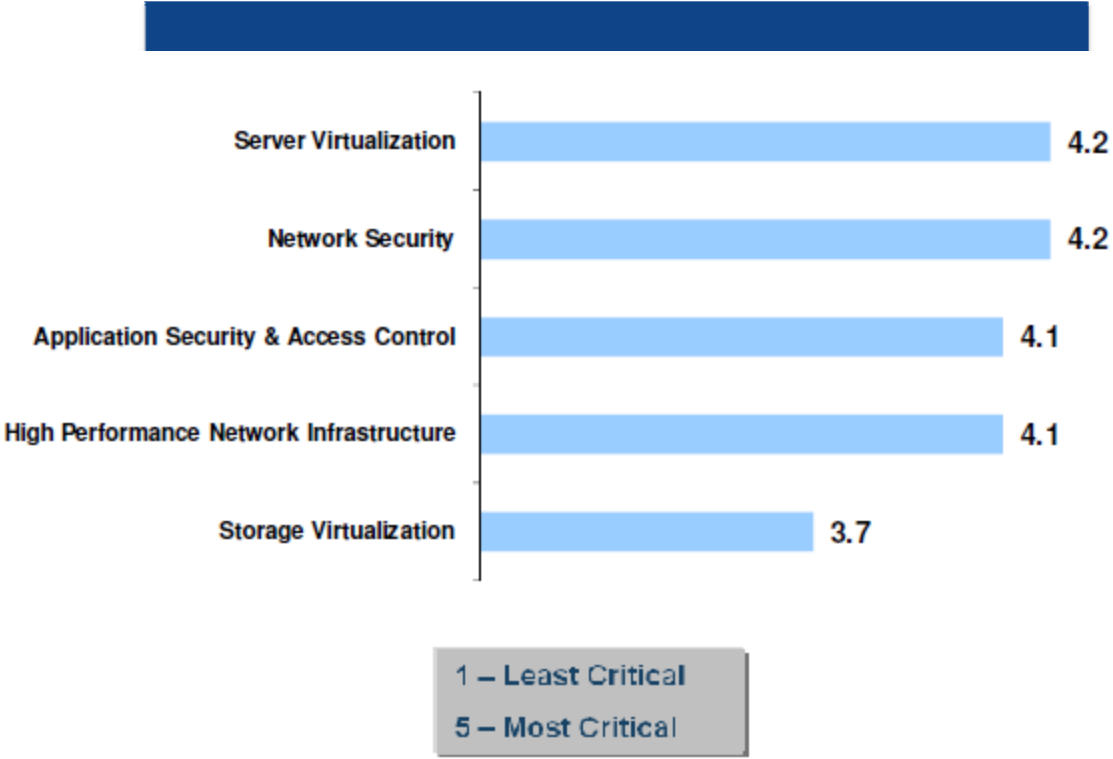
- *Ensures Security, interoperability, portability among cloud service providers*
- *Provide cloud computing capabilities (IaaS, PaaS, SaaS) and mitigate threats (Security.... Put all your eggs*
- *Establish government -wide procurement (IT like utility...)*
- *Lead the overall migration towards cloud computing*

Role of Government... continued

- *Re-evaluate its technology sourcing strategy to include considerations and application of cloud computing solutions as part of budget process*
- *“IT services as utilities”*
- *Consistent with the cloud policy*
- *Agencies and ministries will modify their IT portfolios to fully take advantage of the benefits of cloud computing in order to maximize capacity utilization, improve IT flexibility and responsiveness, and minimize cost*
- *harness the potential of cloud computing we must*

- *st to increase the pace at which the government realize the value of cloud computing by requiring agencies to evaluate safe, secure cloud computing options before making any new investments*

Critical activities (asia pacific expe)



The Message

We can build datacenters forever... we can not keep on dealing with Datacenter issues indefinitely, We should transform our attitudes ... from Asset Management to Service management ... and through this to transformation of government services

- *Cloud computing is a manifestation and core **enabler of transformation.***

egov Plan

Government responsibility

To achieve the significant cost, agility, and innovation benefit of cloud computing as quickly as possible.

- *Design the strategy (data center, security, application)and actions (server virtualization, Network security, Application security, ...) to get started immediately*
- *Assess the cloud Resources of MCIT (Storage, Network, Standards, certifications, Capacity building plan, Service delivery and management)*
- *Adopt a **Cloud for Transformation** Policy ,*
- *Develop cloud adoption framework (catch the cloud wisely...)*
- *Identify stakeholders to make sure that the cloud options are fully considered*
- *promote a change in the prevalent mindset of Asset management to Service management (Horn counting...)*