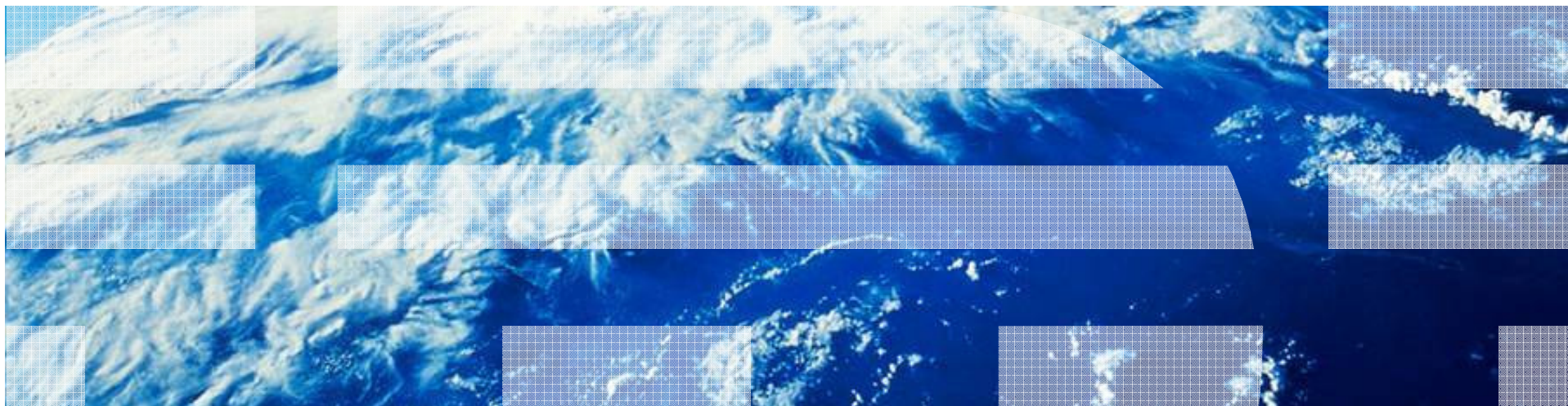


Cloud for Government

Mark Cleverley

Director, Strategy, IBM Global Government Industry



A normal person's view

“Computers were human.

Then they took the shape of metal boxes, filling entire rooms before becoming ever smaller and more widespread.

Now they are evaporating altogether and becoming accessible from anywhere.”

October, 2008

The
Economist

Thomas Watson (attributed)...

“I think there is
a world market
for maybe five
computers”



Maybe not so crazy?



But not everyone is enamored of cloud

<http://www.guardian.co.uk/technology/2008/sep/29/cloud.computing.richard.stallman>

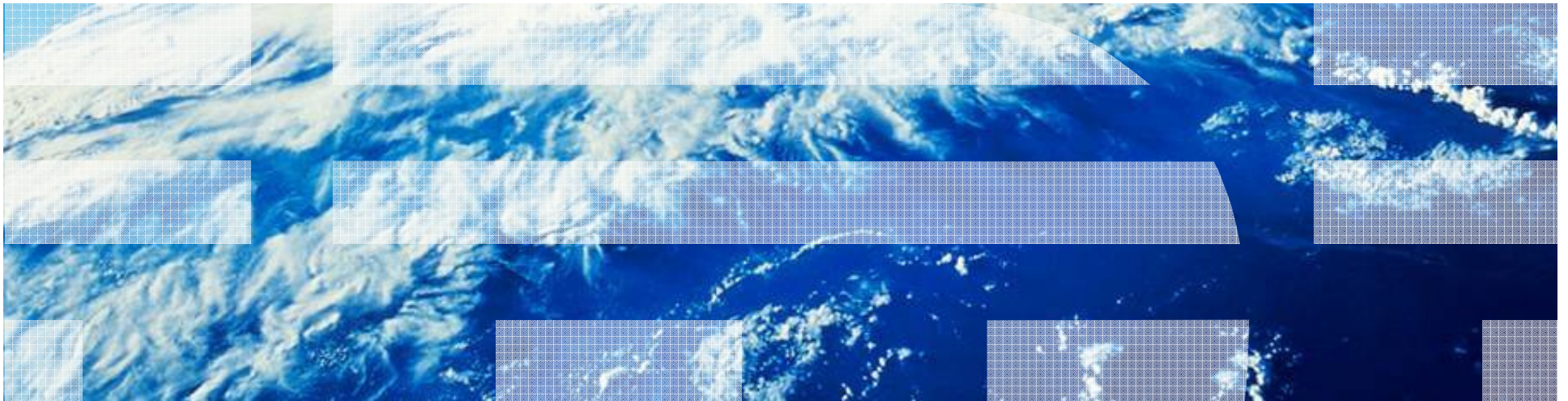


“The concept of using web-based programs like Google's Gmail is "worse than stupidity", according to a leading advocate of free software”.

“His comments echo those made last week by Larry Ellison, the founder of Oracle, who criticised the rash of cloud computing announcements as "fashion-driven" and "complete gibberish”.



Why is this happening?



Building a smarter planet...



INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of practically everything.



INTERCONNECTED

People, systems and objects can communicate and interact with each other in entirely new ways.

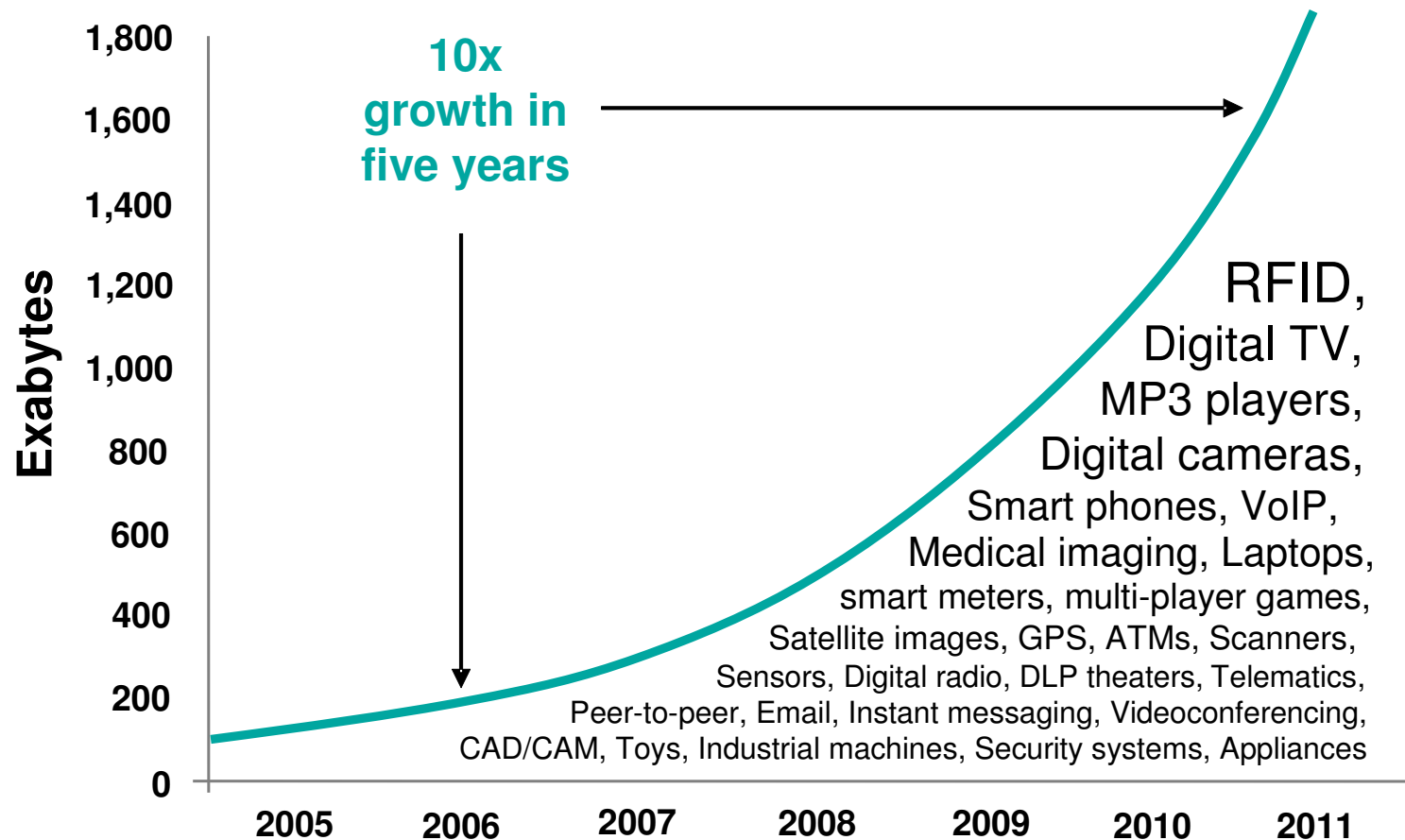


INTELLIGENT

We can respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.



Information and instrumentation explosion...

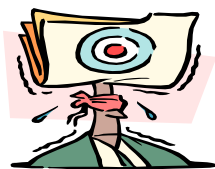


Approximately 70% of the digital universe is created by individuals, **but enterprises are responsible for 85% of the security, privacy, reliability, and compliance.**

Forces driving cloud

Data-intensive applications:

- Explosion of applications and user-generated content:
- Exabyte in 2006
- Zettabyte in 2010



Datacenter pressures:

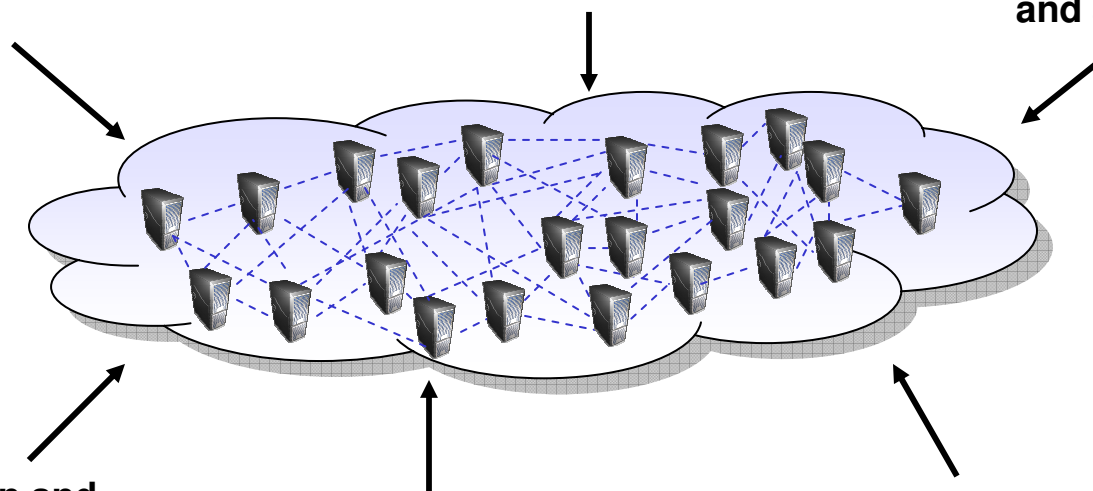
Growing operational complexity and cost from infrastructure and application sprawls



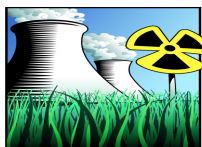
Increased network capacity and availability



Innovation and collaboration



Rising energy cost and environmental compliance



Shared services across lines of business



Infrastructure is stressed...



1.5x

Explosion of information driving 54% growth in storage shipments every year.

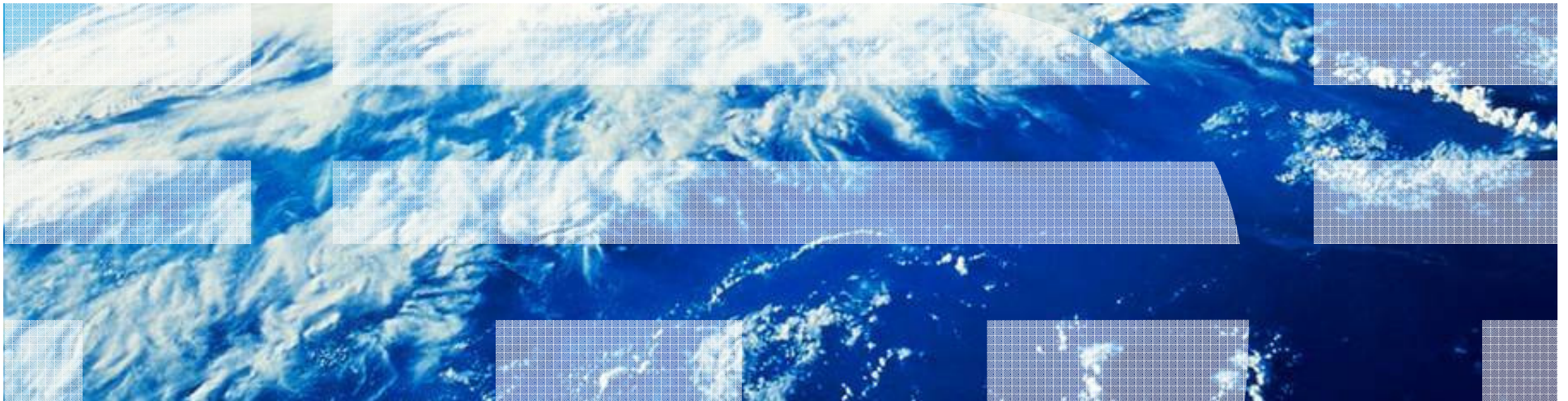
70¢ per \$1

70% on average is spent on maintaining current IT infrastructures versus adding new capabilities.

85% idle

In distributed computing environments, up to 75% of computing capacity sits idle.

What is happening?



Defining?

A new consumption and delivery model

inspired by consumer internet services and evolved from prior generations.

Create, store, share, query, manipulate... information and processes over the net – you don't care where – on a “cloud” of thousands of individual computers – you don't care how many – to do what you need.

Key characteristics:

- On-demand self-service**
- Ubiquitous network access**
- Location independent resource pooling**
- Rapid elasticity**
- Pay per use (or “free”)**



What the users see

A user experience and a business model

- Standardized offerings
- Rapidly provisioned
- Flexibly priced

An infrastructure management and services delivery method

- Virtualized resources
- Managed as a single large resource
- Delivering services with elastic scaling

Similar to banking ATMs and retail point of sale, cloud is driven by:

- Self-service
- Economies of scale
- Technology advancement

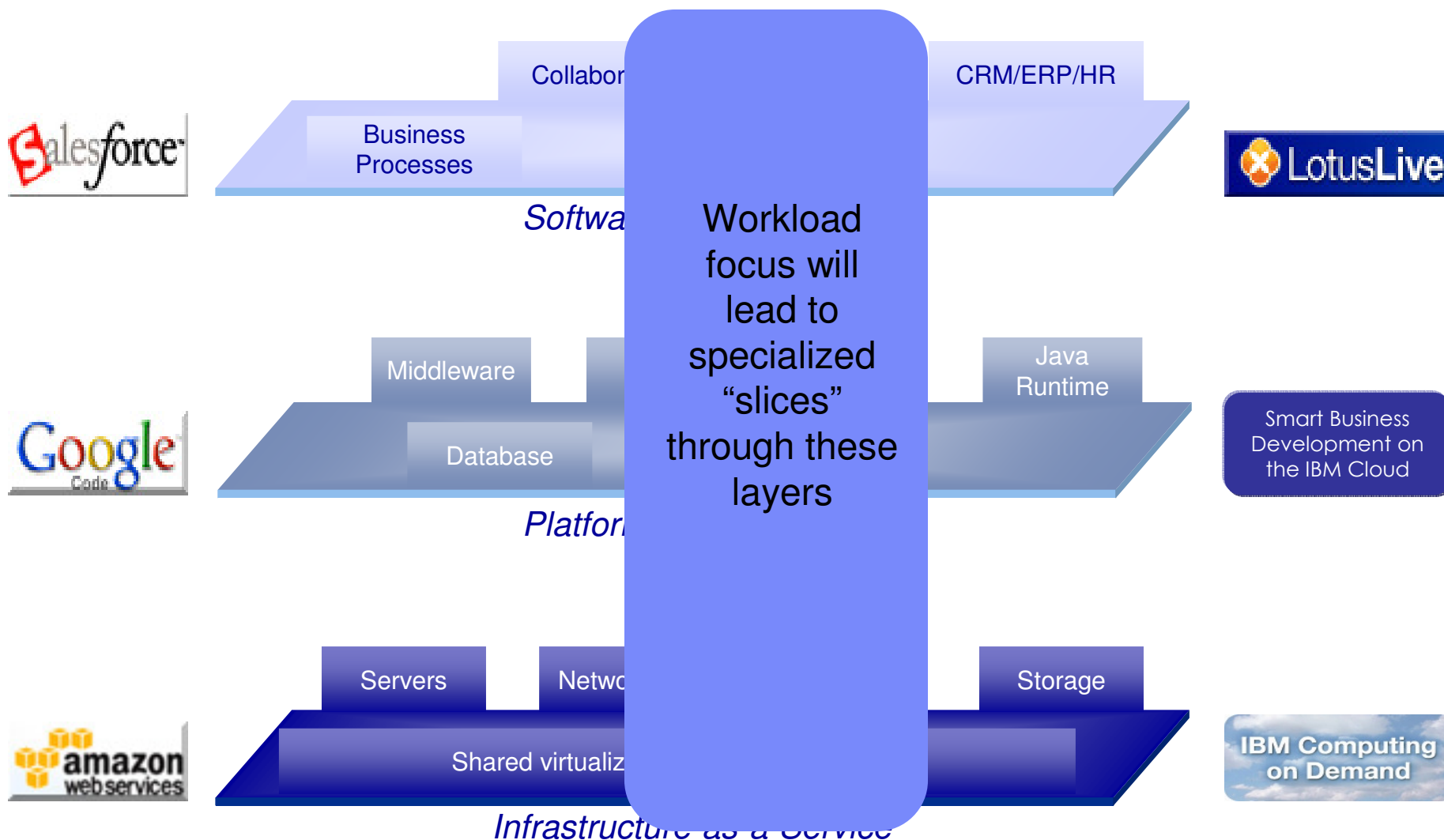
I only care about results, not how IT is implemented

I pay for what I use, like a utility

I can access service from anywhere, from any device

I can scale capacity up and down as needed

Three layers of cloud (NIST)



SOFTWARE Salesforce CRM

- CRM Products
- CRM Solutions
- Editions & Pricing
- Success Stories
- CRM Community
- Events
- AppExchange
- Media

Force.com Platform

Events & Community

Company

Services

A New Breed of Solution for the Public Sector

No Software to Install, No Hardware to Manage



Public Sector

The Time Has Come for Government On Demand

With no software to install and no hardware to maintain, Salesforce frees you from the expense and headaches of having to purchase, manage, and upgrade complex IT infrastructure. You can focus entirely on your core mission—which is why 3,500 government, nonprofit, and educational organizations are now using Salesforce to transform their operations, reduce risk, and better serve their constituents.

Test Drive our Newest Public Sector Solutions - FREE:

Salesforce Ideas for Government

Improve the services you provide, by sparking and quickly capturing ideas and feedback from employees, citizens, and businesses. Leverage the power of online communities with the same tool Dell and Starbucks use to drive innovation.

[FREE 30-Day Trial](#)

Salesforce for Economic Development

Transform your economic growth and development efforts the way Arlington, Virginia, the State of Wyoming, and the Province of Nova Scotia have, with no software to install and no hardware to manage and maintain.

[VIEW DEMO](#) | [FREE 30-Day Trial](#)

Salesforce for Human Services

Case Management transformed. Intake and assessment processes streamlined. Case workers freed from the shackles of paper and duplicate, siloed client data. All with no software to install and no hardware to manage.

[VIEW DEMO](#) | [FREE 30-Day Trial](#)

“By 2010, 25% of new business software will be delivered as SaaS.”

— Gartner (September 26, 2006)

Share Information and Applications

Our latest innovations, [Salesforce-to-Salesforce](#) and the [Government-to-Government AppExchange](#), enable you to realize the longstanding dream of collaborating and sharing information across organizational boundaries.

With point-and-click ease, Salesforce-to-Salesforce allows any two Salesforce-equipped organizations to set up trusted and secure data-sharing connections, with full control over which information is shared, when, and with whom.

The Government-to-Government AppExchange is an online community that government agencies can join in order to share their Salesforce-based applications, saving millions of dollars and avoiding years of redundant effort.

CONTACT ME

FREE TRIAL
Salesforce CRM Ideas for Government

FREE TRIAL
Salesforce CRM for Economic Development

FREE TRIAL
Salesforce CRM for Human Services

Force.com AppExchange

Salesforce for Political Campaigns

White Papers

On-Demand Politics
On-Demand Government

In The News

"The 2008 candidates are running 'e-election' campaigns," USA Today

"Salesforce.com gets into politics," ZDNet



Federal Cloud Computing Services

Cloud computing is a major feature of the President's initiative to modernize IT and can reduce the cost of IT infrastructure by utilizing commercially available technology. Cloud computing could improve data sharing and promote collaboration among government agencies, according to Federal CIO Vivek Kundra.

What is Cloud Computing?

Want to learn more?

Watch this brief video for an overview of Cloud Computing to gain a better understanding of what it is and its benefits.



Watch the video now »

What type of solution do you need?

Business Apps

Your agency or service is complex and requires state-of-the-art software to get business done.

GSA Cloud Business Apps has a solution!



Cloud IT Services

Need a better solution to reduce cost and implement projects faster?

GSA Cloud IT Services has the answer!



Productivity Apps

You need to get things done and GSA is there to help you do just that.

GSA Cloud Productivity Apps has the tools!



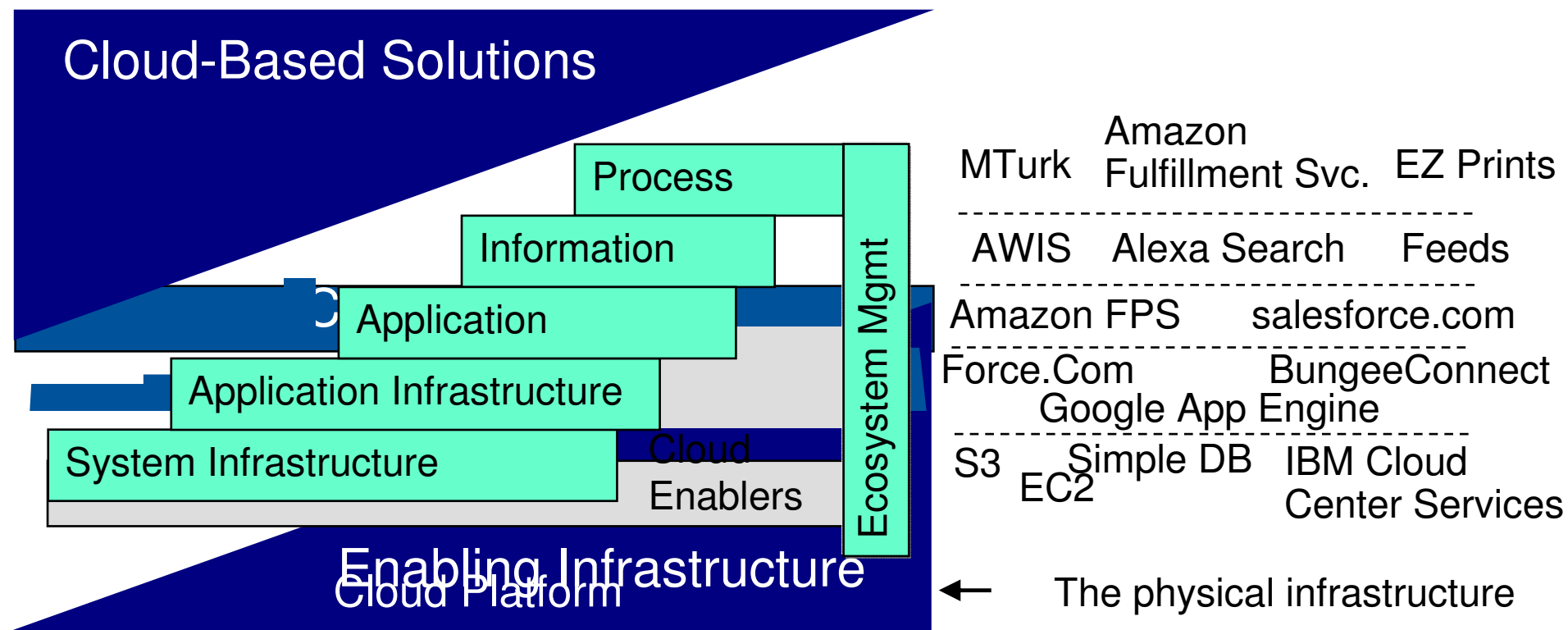
Social Media Apps

Social media tools make it easier to discuss the things we care about and help us get the job done.

GSA Social Media Apps can help you get the word out!



Public cloud is an emerging platform

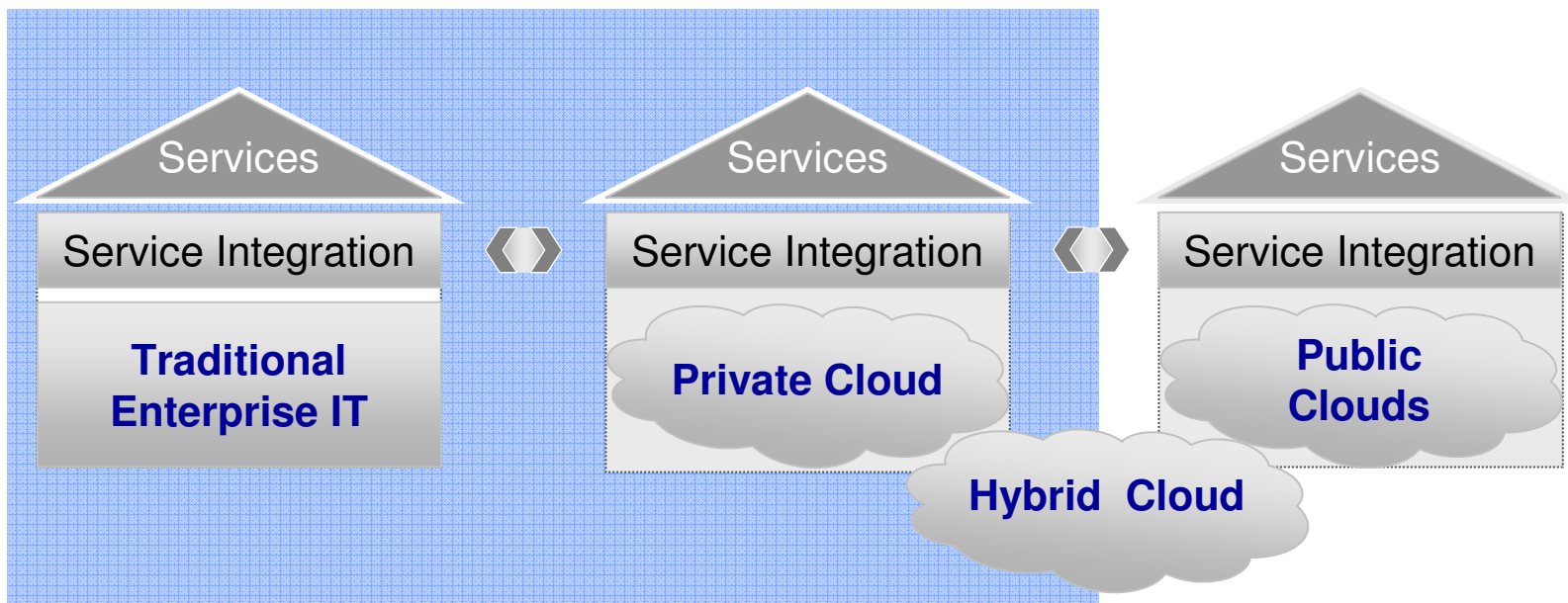


- Service providers optimize everything below their service boundary and hide underlying complexity from the consumer
- Consumers access, configure and/or programmatically extend the service and build everything needed above the service boundary

Characteristics

<i>Single point of access</i>	Self service with rich user experience
<i>Virtualization</i>	Increased system utilizations
<i>Automation</i>	Automated service request and fulfillment
<i>Agility</i>	Rapid service provisioning
<i>Flexibility</i>	Massive scaling of IT services as needed
<i>Usage accounting</i>	Utility based usage metrics
<i>Service management</i>	Modular services managed across infra/platform/application/business stacks.
<i>Security</i>	Shared services delivered across trusted domains
<i>Cost efficiency</i>	Reduced capital expenditure with minimal to no asset ownership

Public, private, and hybrid



Workloads?

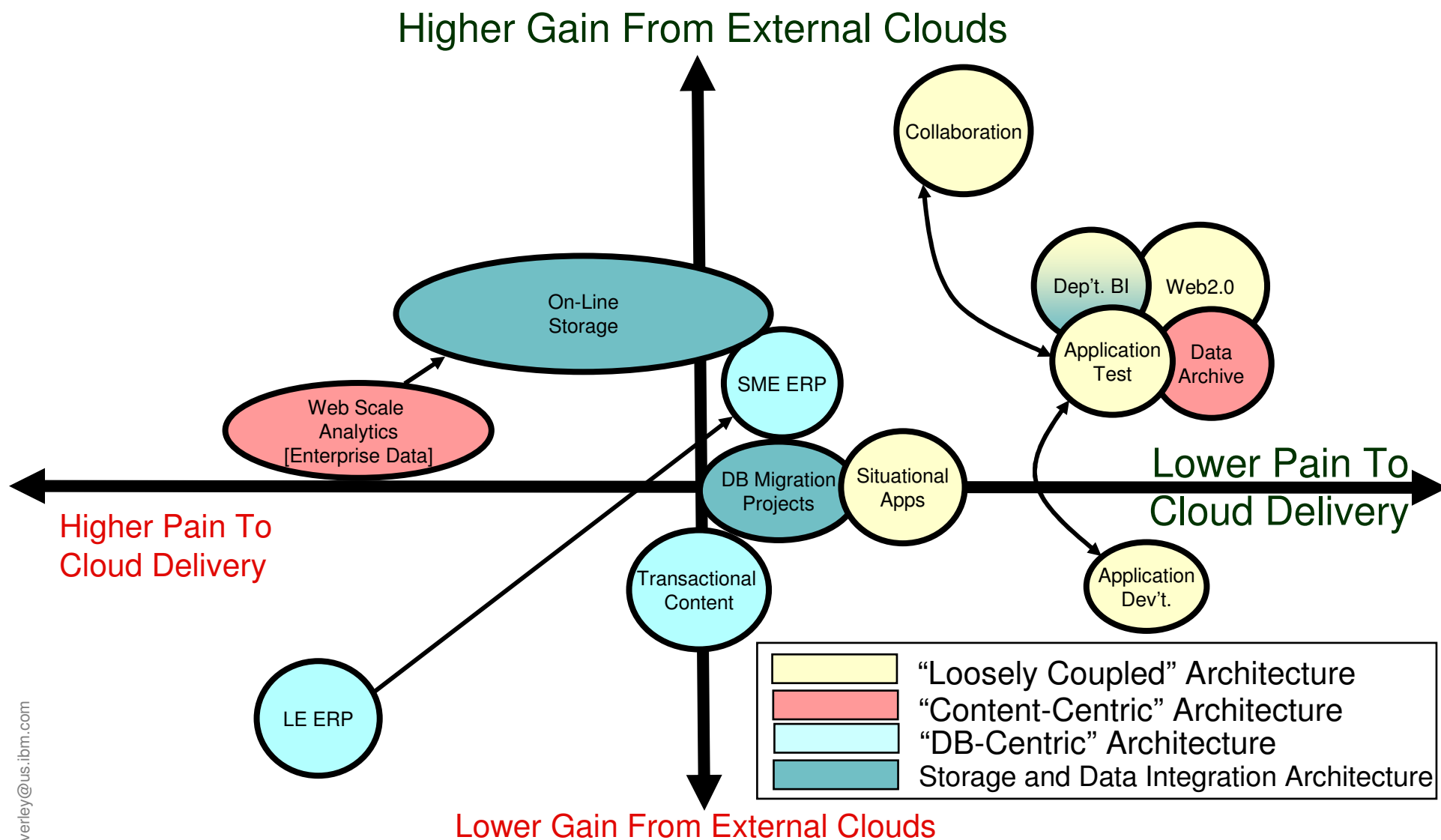
What workloads are we seeing move to cloud delivery?

- **Single virtual appliance workloads**
- **Test and pre-production systems**
- **Mature packaged offerings like email and collaboration**
- **Software development environments**
- **Batch processing jobs with limited security requirements**
- **Isolated workloads where latency between components is not an issue**
- **Storage solutions / storage as a service**
- **Backup solutions / backup and restore as a service**
- **Some data intensive workloads if the provider has a cloud storage offering tied to the cloud compute offering**

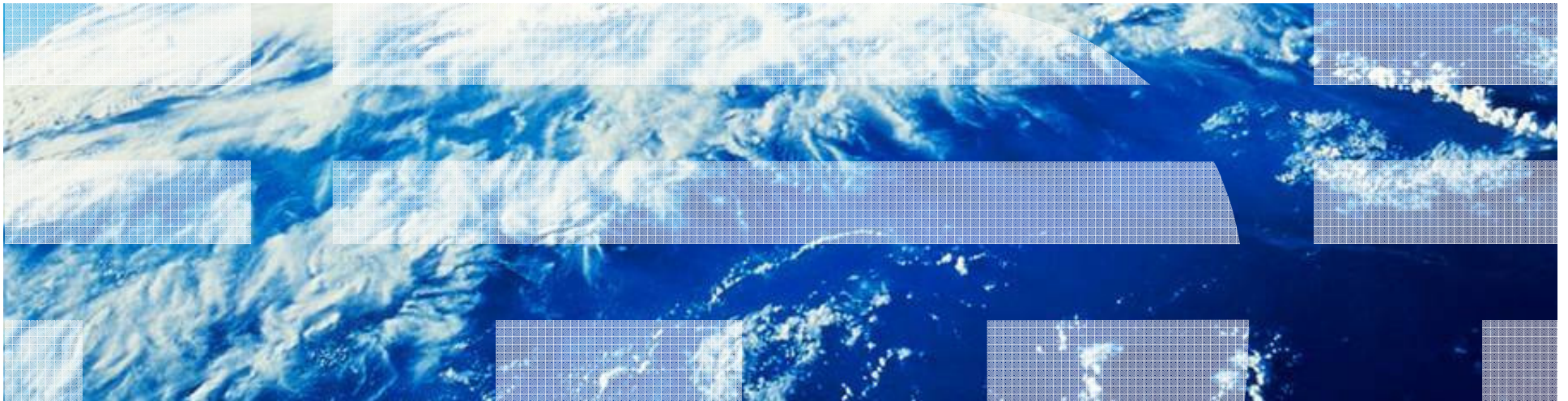
What workloads may not be ready for cloud delivery today?

- **Workloads which depend on sensitive data normally restricted to the enterprise**
 - e.g. employee information, health care records
- **Workloads composed of multiple, co-dependent services**
 - High throughput online transaction processing
- **Workloads requiring a high level of auditability, accountability**
 - e.g. workloads subject to Sarbanes-Oxley
- **Workloads based on software which does not have a virtualization or cloud aware licensing strategy**
- **Workloads requiring detailed chargeback or utilization measurement as required for capacity planning or departmental level billing**
- **Workloads requiring customization (e.g. customized SaaS)**

Mapping of workloads to architectural affinity



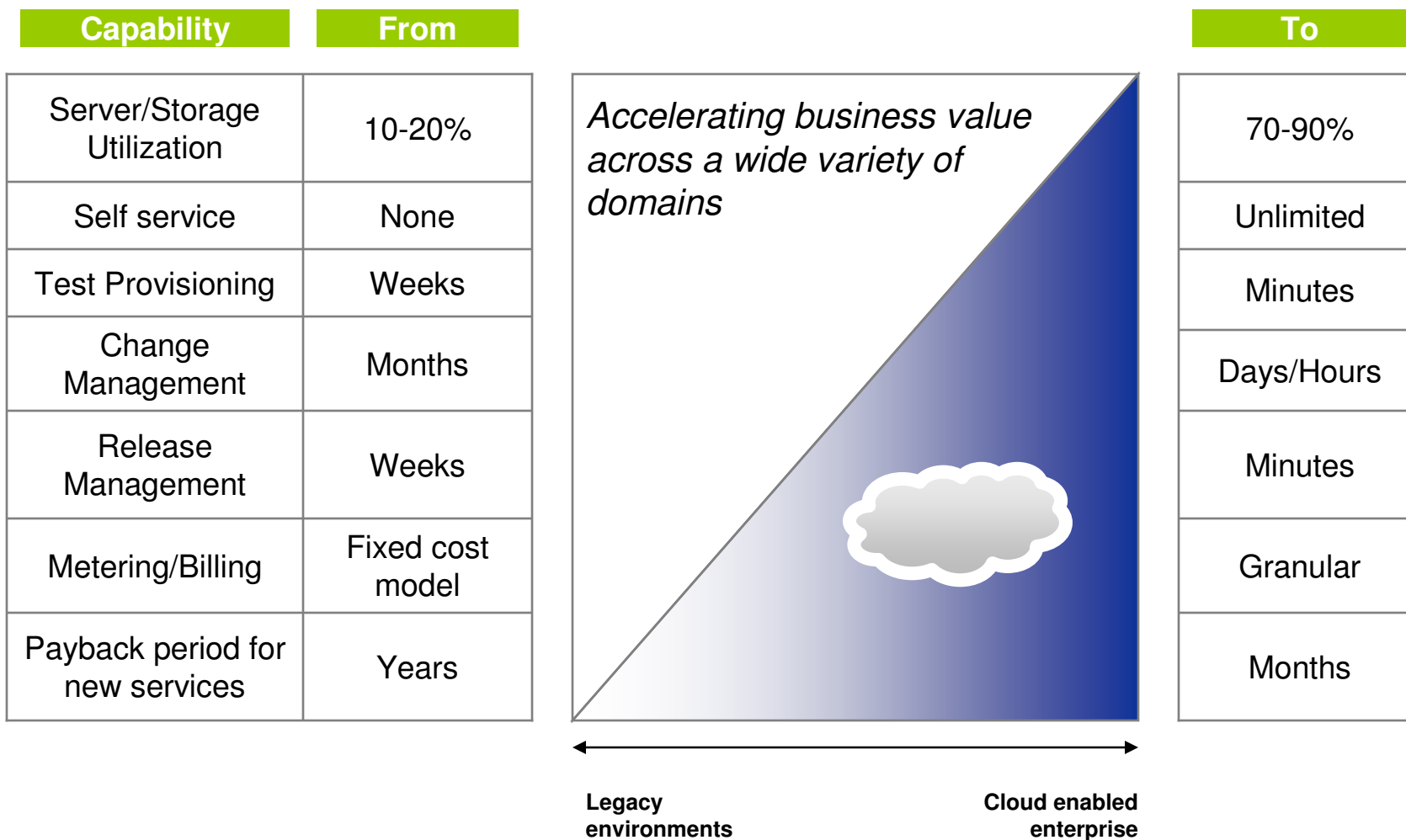
Where do we go next?



The key promises of cloud are **not confusing...**

- **For the user**, cloud provides a way of acquiring computing services without requiring understanding of the underlying technology.
- **For the government**, cloud computing delivers services for employee, citizen and business needs in a simplified way, providing more or less unbounded scale and potential improvements in quality of service and environmental posture.
- **For IT operations**, cloud is a new acquisition and delivery model for resources and, if properly used within an overall strategy, can help improve business performance and control the costs of delivering IT resources to the organization.
- Collaboration for economic development
- Shared services delivery
- Educational services
- New business models for multilaterals
- Shared back office for (e.g.) ITS
- Intellectual property analysis
- Investigation analytics
- Community engagement
- Water management
- Identity services for emerging nations
- Healthcare analytics
- Medical imaging
- ...

The IT promise



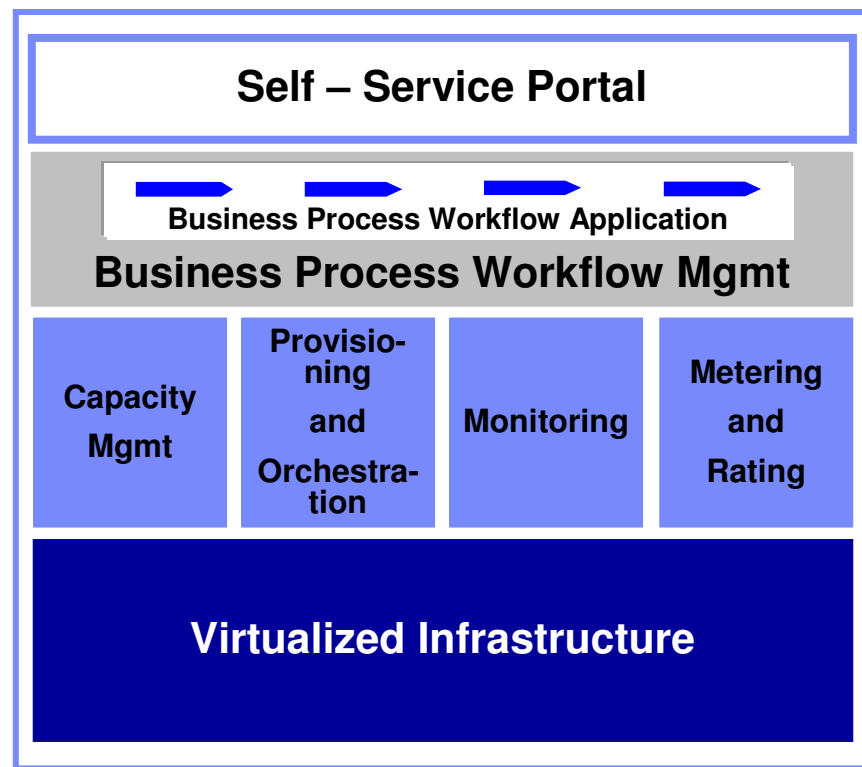
Some real benefits



- **Reduce IT labor cost by 50%** in configuration, operations, management and monitoring.
- **Improve capital utilization by 75%**, significantly reducing license costs.
- **Reduce provisioning cycle times** from weeks to minutes.
- **Improve quality**, eliminating 30% of software defects.
- **Reduce end user IT support costs** by up to 40%.

IBM Research Compute Cloud “Clear out the closets!”

- Establishing self-service, on demand IT delivery solution to serve 3,000 researchers across 8 countries
- Enabling automation of IT requests, provisioning, and management
- Simplifying IT environment; reducing IT deployment and management costs
- **Research requests now responded to in minutes - vs hours, days, even weeks**



Virtual Computing Lab

NC STATE UNIVERSITY Office of Information Technology OIT Units | Help Desk | Sysnews | Search OIT

VIRTUAL COMPUTING LAB
powered by Apache VCL

EAST CAROLINA UNIVERSITY

View site with SSL enabled
To see login form

Log in with NCSU WRAP
View all authentication options

Home SEARCH

- Reservation System
 - Make a Reservation
 - Current Reservations
- Help & Support
 - How Do I Get Started
 - Access Requirements
 - Frequently Asked Questions
 - Documentation
- The NC Education VCL Consortium
 - Academic Partners
 - Corporate Partners

Remote Access Service

NCSU provides a remote access service that allows you to reserve a computer with a desired set of applications for yourself, and remotely access it over the Internet. This service is powered by the [Apache Software Foundation's Virtual Computing Lab \(VCL\)](#) software.

You can use all your favorite applications such as Matlab, Maple, SAS, Solidworks, and many others. Linux, Solaris and numerous Windows environments are now available to all NC State students and faculty. Instructors that would like to request course access, please see [these instructions](#).

History

Development of The Virtual Computing Lab (VCL) started in 2004 as a joint venture of the [College of Engineering \(COE\)](#) and the [Office of Information Technology \(OIT\)](#) to efficiently use hardware investments and to provide remote access to a wide range of advanced compute requirements by both NCSU students, faculty, and researchers.

In November 2008, NCSU donated the VCL source code to the [Apache Software Foundation \(ASF\)](#) as part of on-going efforts to expand the VCL community and to foster open source development. NCSU continues to be heavily involved in the development of VCL through the open source community at ASF.

With the ongoing support from the College of Engineering, OIT, academic and corporate partners, the ASF VCL software installed at NCSU provides a service that successfully supports a wide range of users with diverse computing needs across the UNC system.

24 | 7 | 365

VCL @ NCSU is available **24 hours a day, 7 days a week**. You can access lab software any time you need it!
[Access Requirements](#).

VCL In Action

"One faculty member that spurned VCL until his first class in which students were required to bring in their own laptop with the course software installed. He discovered that the installs were not the same and some examples wouldn't run on some students laptops. Some had purchased the wrong version of the software, some had installed it incorrectly, some had installed additional software that overwrote the library files needed by his course software, etc. After two weeks he switched to VCL and these problems went away as he had complete version control for the software the students were using. He also didn't have to require the students to purchase the software."

VCL LOGIN

View site with SSL enabled
To see login form

Log in with NCSU WRAP
View all authentication options

PROVIDING SOLUTIONS FOR

Students
The applications you need, when you need them.

Faculty
Go from hours a day to hours a month of management.

University IT Departments
Reduce redundancies and increase efficiency.

VCL NEWS

NC State & IBM to host 3rd International Conference on the Virtual Computing Initiative - October 22-23, 2009

Duke Starts VCL Pilot

VCL part of National Science Foundation Grant

George Mason University & IBM host VCL Summit - July 13-14, 2009

Apache VCL at NCSU featured in IEEE Computer Magazine

Computer World Honors Program Recognizes NC State as a 2009 Laureate

See All News Items

VCL SYSTEM STATUS

VCL blades online: 593

VCL blades offline: 117

Active VCL Reservations: 88

VCL Usage Statistics

HPC blades online: 577

Active HPC jobs running: 1253

Total HPC jobs: 1444

VCL Sysnews

Solaris and Linux lab environments unavailable(9/20/09)

THE INFO CORNER

Open-Source Apache VCL project

History of VCL

How it Works

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

THE UNIVERSITY of NORTH CAROLINA GREENSBORO

East Carolina University

NORTH CAROLINA CENTRAL UNIVERSITY
FOUNDED 1910
Durham, North Carolina
James E. Shepard, Founder

Duke UNIVERSITY

NC STATE UNIVERSITY

DoI NBC



Cloud Computing is an emerging computing approach where data and services reside in scalable data centers and can be accessed in a variety of ways.

The NBC plans to bring the benefits of cloud computing to both NBC's business services clients and data center hosting clients alike through advancements to the highly efficient NBC shared infrastructure. To gain a better understanding of our Cloud Computing strategy & roadmap, please review the [NBC Cloud Computing Strategy](#).

For additional information on the NBC Cloud Computing strategy or offerings, please email cloud@nbc.gov.

- NBC Capabilities Currently Supported**

 - Human Resources Management Suite
 - Mainframe (Z-Linux) and storage virtualization

NBC Planned Offerings for Cloud Computing

 - Web 2.0
 - Software development and deployment platform
 - Automatic provisioning
 - X86 virtualization

For additional information on the NBC Cloud Computing strategy or offerings, please email cloud@nbc.gov.

Department of the Interior
National Business Center

Private cloud services on
top of existing shared
back office systems

Deep studies of the
business case – linux on
system z

But

Less Control

Many governments are **uncomfortable with or have policies which limit** the idea of their information located on **systems they do not control**. Providers must offer a high degree of security transparency to help put people at ease.

Compliance

Complying with SOX, HIPPA and other **regulations may prohibit** the use of clouds for some applications. Comprehensive auditing capabilities are essential.

Reliability

High availability will be a key concern. IT departments will worry about a **loss of service** should outages occur. Mission critical applications may not run in the cloud without strong availability guarantees.

Trust

Citizens place trust in government in ways they do not for retail, auction, personal, clouds. Allowing a cloud-b based service to answer a citizen's question might be appropriate – or it might not.

Readiness

Nowhere near all software is "cloud ready" and able, in the short term, to take advantage of cloud models either public or private.

Data Security

Migrating workloads to a **shared** network and compute **infrastructure** increases the potential for **unauthorized exposure**. Authentication and access technologies become increasingly important.

Security Management

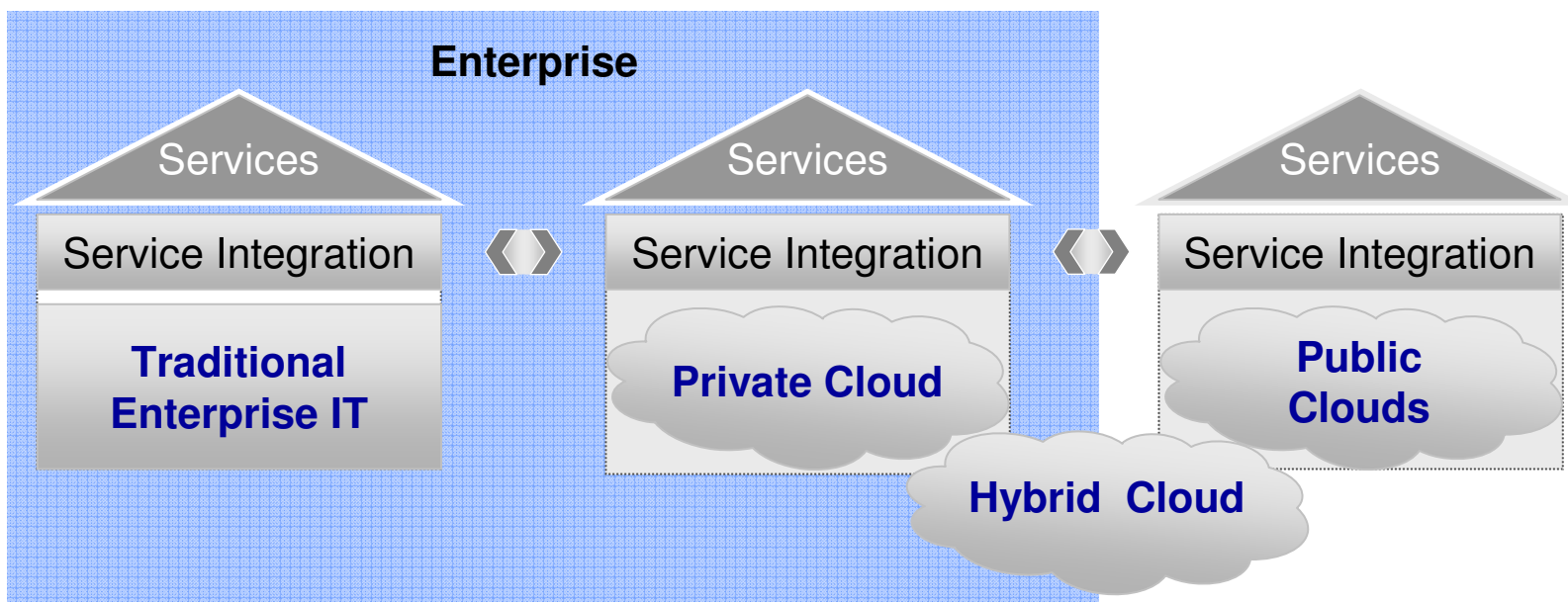
Providers must supply easy, visual controls to **manage firewall and security settings** for applications and runtime environments in the cloud.

“As the gap widens between enterprise and Web giant economics, it may get to the point that it no longer makes financial sense for many businesses to run their own servers.



When this happens, will you be a cloud or a cloud customer?”

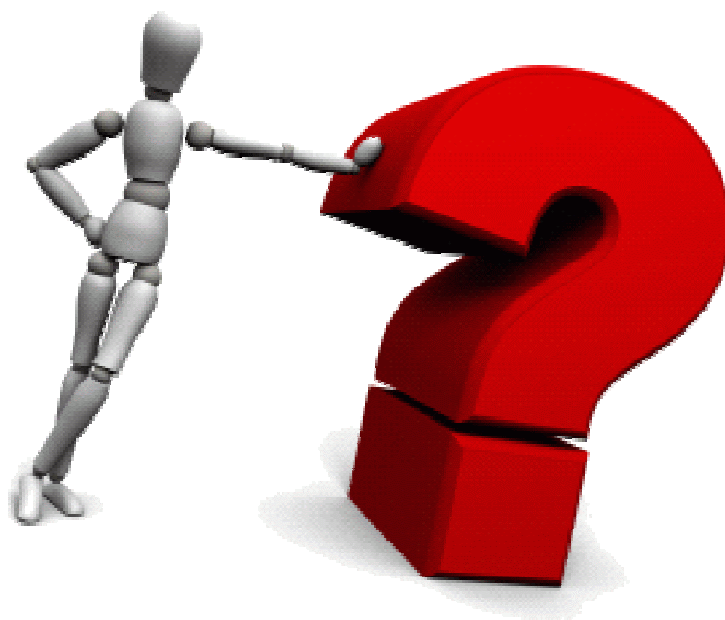
Probably both.
 Delivery models will co-exist



- Mission Critical
- Packaged Apps
- High Compliancy

- Test Systems
- Pre-production
- Developer Platform

- Variable Storage
- Software as a Service
- Web Hosting



Are you already doing something?

Can you assess your environment for readiness for cloud?

Do you have practices, policies or legislation that would support or inhibit adoption of cloud?

Have you educated your stakeholders on the potential impacts of cloud models?

Are your people already using cloud capabilities?

Do you have a strategy?

- **Without a strategy, cloud can be seen as a threat to “traditional” IT roles**
 - **Reduced control of IT services delivered over the Internet**
 - **Perceived cost gap between a cloud service and traditional IT**

- **With a strategy, cloud can be a huge opportunity for the IT team:**
 - **Lower costs, more responsive IT, optimized delivery**
 - **Greater range of services and capabilities**
 - **Greater visibility in billing / chargeback**
 - **Better control of the users’ systems, desktops, and services access**

1. IT Roadmap
2. Architecture
3. Workload Assessment
4. Enterprise / Cloud mix
5. Implementation



