Cloud Computing;

What is it,

How long has it been here,

and Where is it going?
Agenda – “The Cloud”

WHAT IS THE CLOUD?

How long has it been here?

Where is it going?
“THE CLOUD”

- OR -

A catch phrase that describes outsourcing, used by marketing folks around the world.

An IT phenomenon that will change the way businesses utilize Information Technology for years to come.

YOU DECIDE!
Where did the Cloud come from?

The Internet
Definitions of Cloud Computing

• Term used to describe any service available on the Internet. More specifically, cloud computing refers to a hosting environment that leverages pooled computing resources by way of **virtualization**.

• The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server. *(Google)*

• General term for anything that involves delivering hosted services over the Internet.

• In its simplest form, cloud computing is performing computing tasks via a network connection while remaining isolated from the complex computing hardware and networking infrastructure that supports it.
Definitions of Cloud Computing (continued)

- Updated version of utility computing: Virtual servers available over the Internet.
- Anything consumed outside the firewall, including conventional outsourcing.
- Computing used as a service rather than a product.
- Internet-based model for groups to become more efficient through sharing. *(BusinessInsider.com)*
- The Management and provision of applications, information, and data as a service. *(Independent.co.uk)*
- The delivery of computing and storage capacity as a service. *(Wikipedia)*
NIST Definition

• As defined by the National Institute of Standards and Technology (NIST) cloud computing is:

A model for enabling ubiquitous, 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.
The NIST cloud model is composed of five essential characteristics, three service models, and four deployment models.

**Characteristics**
1. On-demand self-service
2. Broad network access
3. Resource pooling
4. Rapid elasticity
5. Measured service

**Deployment Models**
1. Private cloud
2. Community cloud
3. Public cloud
4. Hybrid cloud

**Service Models**
1. Software as a Service (SaaS)
2. Platform as a Service (PaaS)
3. Infrastructure as a Service (IaaS)
Cloud Service Models

SaaS (Software as a Service) – Running an Application through the Internet
- User of a provider’s application running on a cloud infrastructure. Applications are accessible from various client devices such as web browsers.
- Examples include web-based e-mail and Internet-based payroll applications.
- Formally known as Application Service Providers.

IaaS (Infrastructure as a Service) – Getting IT Operations through an outside third party through the Internet
- Provides capability to provision servers, disk space and network devices rapidly when needed and scale back when not needed.
- Customer can load applications and other software devices needed on infrastructure. Cloud IaaS provider is just supplying hardware and related services.
- Examples include Amazon web services and Perimeter Technologies.

PaaS (Platform as a Service) – The Developer’s Cloud / Develop and deploy applications you created or acquired using the PaaS provider’s development tools
- Designed for developing use.
- Examples include Google App Engine, Salesforce.com, and Force.com.
Essential Characteristics of the Cloud

- **On-demand self-service** – Customer can use the service at anytime, however they wish.

- **Broad network access** – Service is network based, and accessible from anywhere, from any standardized platform.

- **Resource pooling** – Computing resources in the cloud are shared. This means numerous clients may be using the same set of resources at the same time.

- **Rapid elasticity** – Customer of a service can activate more resources on the fly.

- **Measured service** – CSP (Cloud Service Provider) acts like an electric utility measuring the amount of service provided and reacting accordingly.
# Cloud Deployment Models

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<tr>
<th>Deployment Method</th>
<th>Description</th>
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| Private Cloud       | • Operated solely for an enterprise  
• May be managed by the enterprise or a third party  
• May exist on or off premise |
| Public Cloud        | • Made available to the general public or a large industry group  
• Owned by an organization selling cloud services |
| Community Cloud     | • Shared by several enterprises  
• Supports a specific community that has a shared mission or interest  
• May be managed by the enterprises or a third party  
• May reside on or off premise |
| Hybrid Cloud        | • A composition of two or more clouds (private, community or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds) |
Why the Rush to the Cloud?

- Small & Medium Business need to establish resources to maintain an IT infrastructure that meets their business needs; these resources include money, time and expertise.
- **Save on up-front costs** with no Capital Expenditure. They are also able to substantially reduce the cost needed to maintain and upgrade hardware.
- **Reduce the costs** needed to maintain and upgrade hardware.
- **No need to install software**, upgrade hardware or maintain file servers and networks. Rent what you want as you want.
- **No need for in-house Computer Technicians** every time a computer or the network fails.
- **Outsource Enterprise level virus and intrusion protection**, well beyond the capabilities of any small business.
- **Outsource data loss or failed backups concerns**.
- **Scalable** so you can grow and contract your IT as the business needs.
Why the Rush to the Cloud?

- Optimizing Server Usage
- Cost Savings
- Smaller Data Centers
- Shortened Lifecycle
- Reduced Time for Implementation
- Outsourcing Non-core Competencies

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Old Cloud Companies

Old Clouds vs. New Clouds

New Cloud Companies
All this is great...however, I am an auditor. *How does the Cloud affect me?*
Cloud Statistics

- More than 8 in 10 companies currently use some form of cloud solution.
- By 2014, 1/3 of small businesses will use some form of IaaS.
- By 2015, spending on cloud services will be approximately 46% of all new IT spending.
Risks of Going Into the Cloud

- Where is my data?
- Who can see my data?
- Is my data secure?
- Is my data backed up properly?
- Can I switch providers easily?
- Who owns my data?
Cloud Concerns

• Data Location
• Co-mingled Data / multitenancy
• Cloud security policy/procedure transparency
• Cloud data ownership
• Lock-in with CSP’s proprietary API’s
• CSP business viability
• Record protection for forensics audits
• Identity and access management

• Penetration Detection
• Screening of other Cloud Computing clients
• Compliance Requirements
• Public cloud server owners’ due diligence
• Data erasure for current SaaS or PaaS applications
• Disaster Recovery

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Before Putting Data on Cloud

- Understand the public cloud computing environment offered by the cloud provider.

- Ensure that a cloud computing solution satisfies security and privacy requirements around your data.

- Ensure that the client-side computing environment meets organizational security and privacy requirements for cloud computing.

- Maintain accountability over the privacy and security of data and applications implemented and deployed in public cloud computing environments.

- Ask for a SSAE 16 from the Cloud Provider.

- Read the Contract!!!
Questions To Ask a Cloud Provider

- What will it take to migrate your systems and data back in house or to another Service Provider?
- How does the provider ensure that legal actions taken against other tenants will not affect access to your data?
- What will happen to your applications and data if the provider goes out of business? How can the provider ensure they won’t become the property of creditors?
- What visibility will the provider offer your organization into security processes and events affecting your data?
- What notice will the provider offer when it changes its data center locations or security practices?
Adaption of cloud technology and concepts will increase, but pace will be slow to noticeably impact back office business functions.

Concepts around IT as a Service will continue to grow. “Measured Services” concept will have big impact.

Ideas and changes around data storage will be most impacted first.

“The Cloud” will begin to fade and “As a Service” concepts will be increased in vernacular.

Applications on tablets and smartphones are already in development or are being used that incorporate or work with back-office applications.

Most of us are already in the clouds and don’t know it!
Questions?

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