
Nov 2017

# Agenda

- Defining Cloud Computing
- Compare and Contrast Cloud Computing with traditional model
- Public, Private and Hybrid
- SaaS,PaaS and IaaS
- Use Cases for using Cloud

# Poll

- How many of you have **heard** of **Cloud Computing ?**
- How many of you know **what Cloud Computing** is ?
- How many of you **are actually using Cloud** ?
- How many of you are **using Gmail , Yahoo, Facebook , DropBox , Whatsapp** ?

# What is Cloud Computing ?

# Is this Cloud Computing ?


Google's "Project Loon"

# Who said What ?

"The interesting thing about cloud computing is that we've **redefined cloud computing to include everything that we already do**. **I can't think of anything that isn't cloud** computing….Maybe I'm an **idiot**, but I have no idea what anyone is talking about. What is it? It's complete gibberish. It's insane. When is this idiocy going to stop?"

– Larry Ellison, chairman, Oracle

"I don't need a hard disk in my computer if I can get to the server faster… carrying around these non-connected computers is byzantine by comparison."

# What people think ?

There’s no way that company exists in a year,” he said in the spring of 2001.

Salesforce went public three years later; Siebel Systems got swallowed by Oracle in 2005.

**Tom Siebel**

The cloud services companies of all sizes…

The cloud is for everyone.

The cloud is a democracy.

**Marc Benioff** *–SalesForce.com*

# Cloud + Computing

## Computing over Internet


Traditionally **Internet is represented as a Cloud**

**Cloud computing is use of computing resources (software) which are delivered over the Internet**

# Accessed over Internet



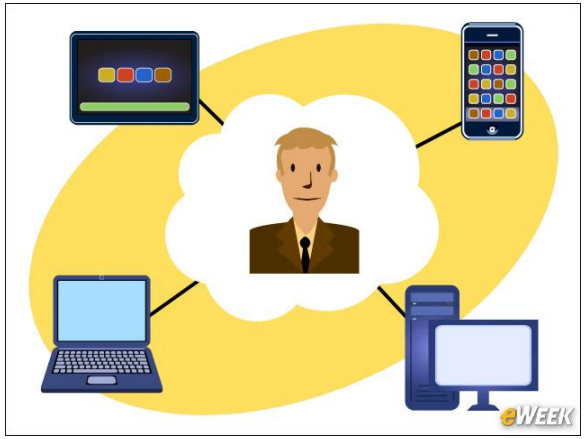






# Ubiquitous Access

- 24x7 access
- Centralized data access
- Multiple users can work on the same data set
- Use Mobile Devices – iPAD, Mobile Phones, Tabs etc.



# Agility

• Reduces turn around time from request being initiated to services being provisioned

• **No need** to purchase and **setup hardware**

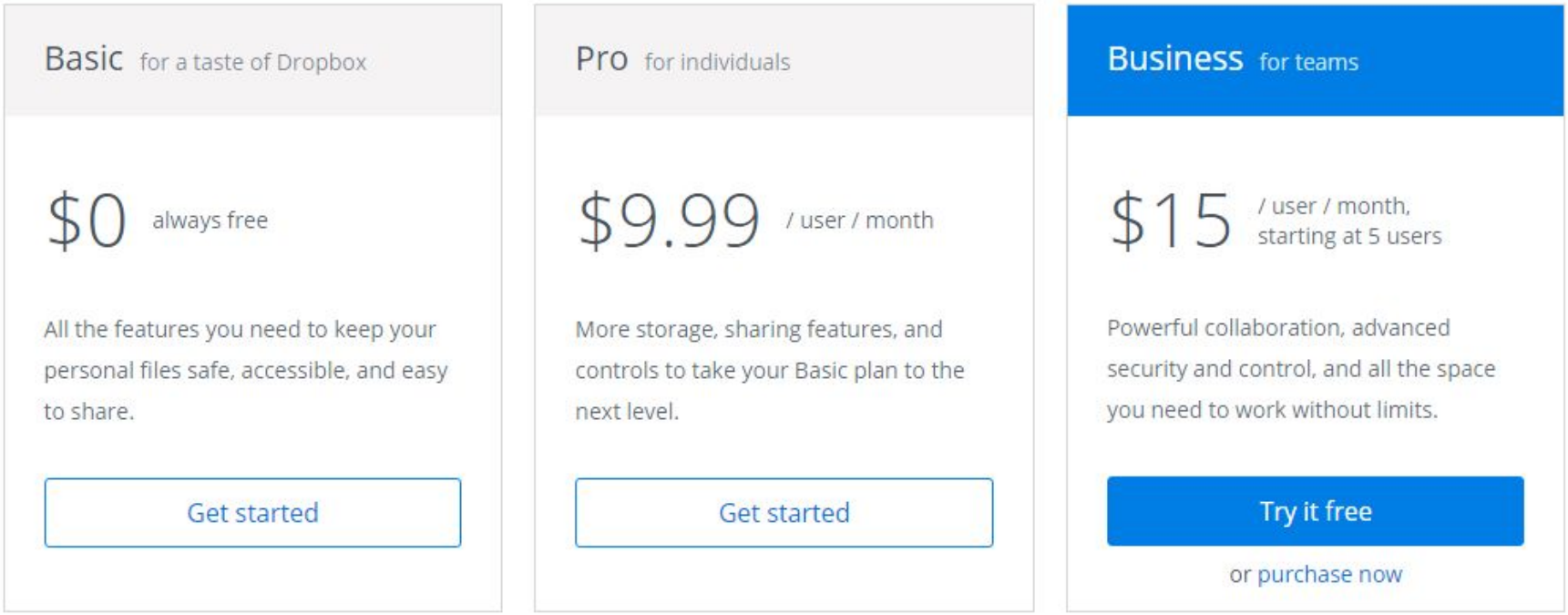
• **No need to purchase** and **setup software**

• Get going in minutes

e.g. Register on Facebook and start using it immediately
e.g. Register on Gmail and start using it immediately

# Pay as You go

- Pay for what you use  ( No more  or no less)
- No Upfront Investment



# Users are interested in only Service

- User is not concerned about how the service is implemented
- Users are **interested in service** (sending email, receiving emails..) – i.e. Service Level Agreement (SLA)

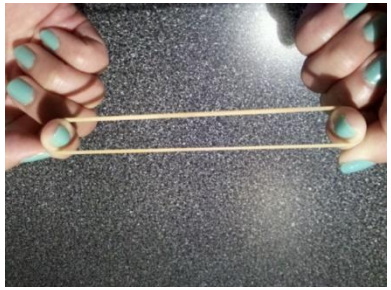
# Ownership

- Service Provider is the owner
- User is not the owner but just uses the service
- User pays for the service

# No Lock In

- No lock in
- Stop using service or terminate it at any time
- Provides flexibility in choosing different service providers based on their service

# Elastic



- Users are perceived with ability to have significantly large capacity in their hand
- Large no. of photos , videos , no. of comments on the Facebook
- Large no. of emails sent, Large no. of files stored in Google Drive
- Capacity feels unlimited
- Grow - Scale Up as well as
- Shrink - Scale In / Scale Down

# Cloud Computing Service Model


**S**oftware **a**s **a** **S**ervice Model – **SaaS**

# Why to Limit Cloud Based Service Model to Software ?

# Extending model to Computing Resources ?

- Having servers in the Cloud ?
- Launching Windows Machine  in Cloud ?
- Getting Linux machine in the Cloud ?
- Having hard disk (storage) in the Cloud ?
- Having network in the Cloud ?


**I**nfrastructure **a**s **a** **S**ervice **Model**  - **IaaS**

# Defining Cloud Computing

# Some Cloud Definitions

## Layman's definition

Cloud computing is **use of computing resources** (hardware and software) that are **delivered as a service over a network** (typically the **Internet**)

- Mail Services ( Gmail , Yahoo, outloolk.com ,…)
- Social Networking (Facebook, Orkut, Google+ ,…)
- Applications (Google Docs, Drop Box, CRM , Project Management , JIRA , Office 365 ,….)

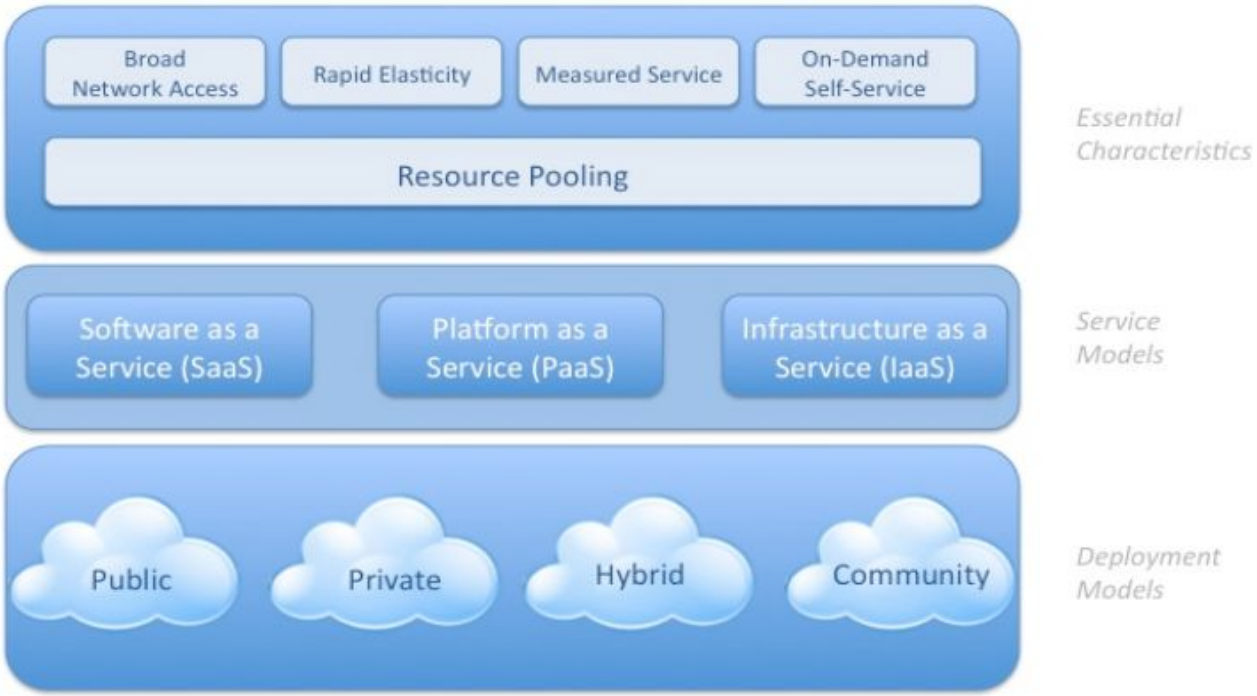
## Gartner's Definition

***Style of computing*** *in which* ***scalable*** *and* ***elastic IT-enabled capabilities*** *are* ***delivered as a service*** *to external customers* ***using Internet technologies***

# NIST Definition

**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**

Visual Model Of NIST Working Definition Of Cloud Computing
*http://www.csrc.nist.gov/groups/SNS/cloud-computing/index.html*

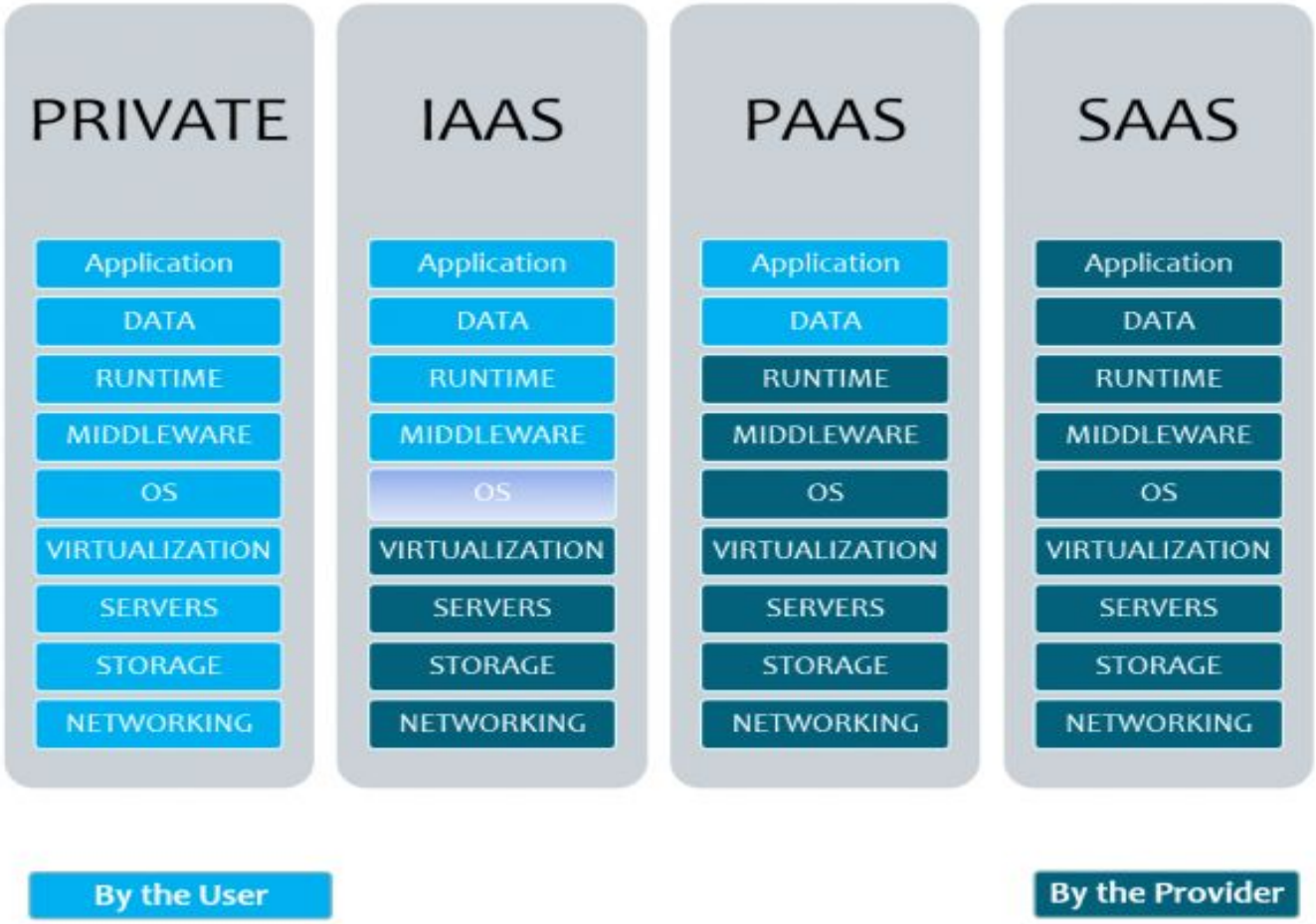


# Essential Characteristics

| | |
|---|---|
| 1. On demand self service | A consumer can provision resources ( computing storage , memory ) without requiring human interaction with each service provider |
| 2. Resource Pooling | Computing resources are pooled to serve multiple consumers using a multi-tenant model |
| 3. Broad network access | Capabilities are available over the network typically over Internet |
| 4. Measured Service | Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service |
| 5. Rapid Elasticity | Scale out (expand) and Scale in (shrink) quickly |

# Cloud Computing Service Models

# Service Models - Similarities and Differences

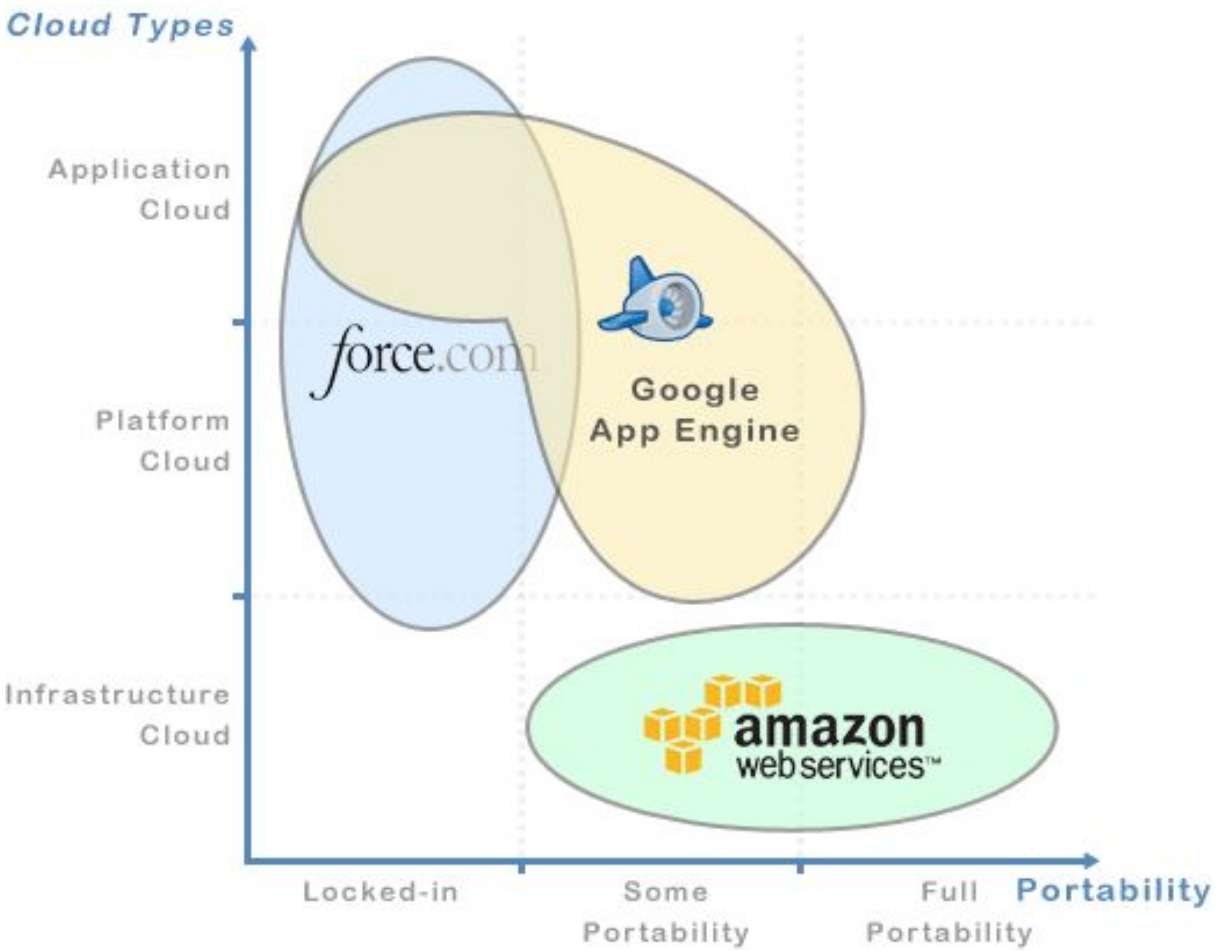


# Degree of User Control in Service Models

| Parameter | Software as a Service (SaaS) | Platform as a Service (PaaS) | Infrastructure as a Service (IaaS) |
|---|---|---|---|
| **Control of Application** | No | Yes | Yes |
| **Control of Operating System** | No | No | Yes |
| **Networking Control** | No | No | Yes |
| **Control of Hardware** | No | No | No |
| **Programming Building Blocks** | No | Yes | No (Typically) but varies from provider to provider |

# One Word Difference in Service Model

# Service Models and Portability




Source : http://www.bitsandbuzz.com/article/cloud-portability-force-com-vs-google-app-engine-vs-amazon/

# Cloud Deployment Models

# Public Cloud

- **Owned by third party service provider**
- Available to clients from a service provider via the Internet
- Public **does not necessarily mean free**
- Could be **free** or **fairly inexpensive** to use
- Does **not mean that user's data is publicly available**
- On boarding of a user  is easy and typically done in minutes

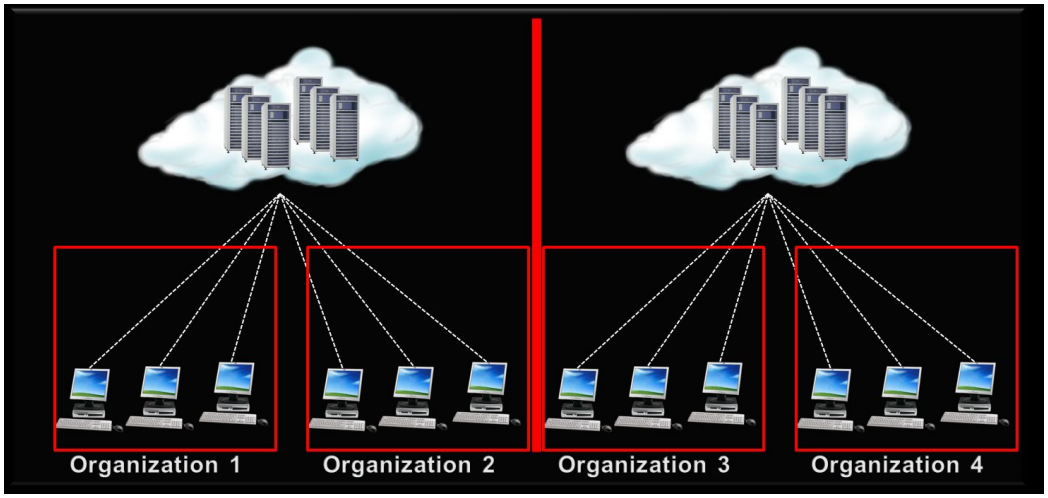
# Private Cloud

- Cloud is owned by a particular organization
- Managed by Organization or could be outsourced to third party
- Offers greater control of the Cloud Infrastructure , improving security and resiliency because of controlled nature

# Community Cloud

• Controlled and used by a group of organizations that have **shared interests s**uch as specific security requirements or a common mission

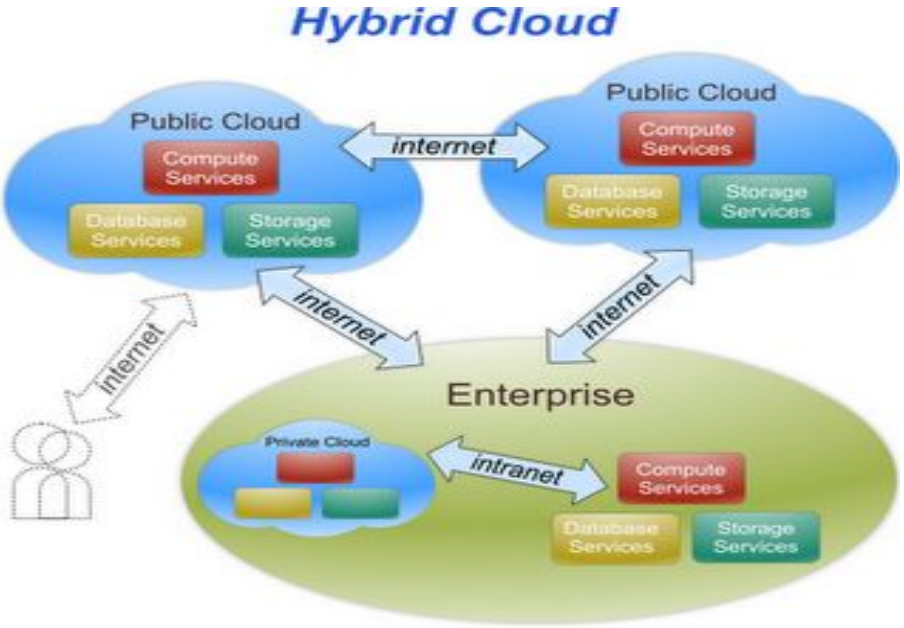
• Members of the community share access to the data and applications in a cloud



# Hybrid Cloud

- Combination of public and private cloud

- Typically outsource non-business-critical information and processing to the public cloud while keeping business-critical services and data in their control



# Why adoption of Cloud Computing ?

# Pay for Actual Usage


- Pay for what you use
- No more  or no less

# Agility

• Reduces the turnaround time from request being initiated to services being provisioned

• **No need** to purchase and **setup hardware**

• **No need to purchase** and **setup software**

• **No need to have large implementation cycles**

• Get going in minutes

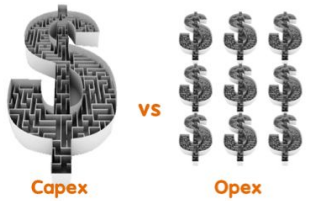
e.g. Subscribe to CRM Application in minutes (SaaS)

e.g. Launch Linux or Windows Server in minutes (IaaS)

e.g. Getting applications to market very quickly, by using the most appropriate building blocks necessary for deployment (PaaS)

# Significantly Reduced Capex

• **Avoid large** amount of **capital** on **purchasing and installing IT infrastructure**




• Use saved Capital for other critical business investments

• Offers simple **operational expenses** that is easier to budget for month-by-month

• **Save money** on depreciating assets

• **No need to pay for excess resouce capacity**

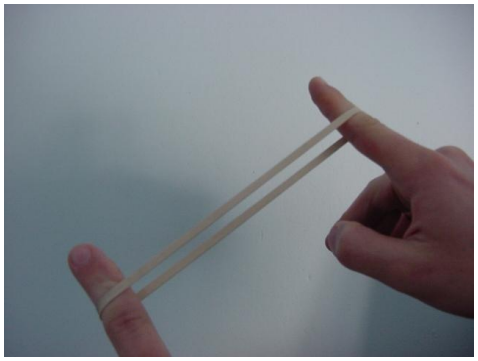
• Infrastructure including hardware and software is not purchased thus lowering captial expenditure and **lowering maintenance**

# Reduced Administrative Costs

- **Quick deployment time** due to automation
- Patch management , upgrades are **done by Cloud Service Provider**
- **Reduced burden** on IT staff
- **Recurring training costs** on internal IT staff is **drastically reduced**

# Reduced Burden on IT personnel

# Scalability on Demand - Elasticity



• **Scale up or down** quickly based on demand

• Enables you to **respond to real requirements** rather than projected requirements

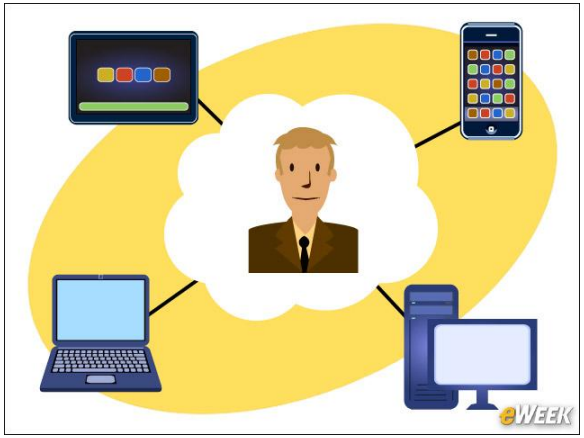
• Sudden workload spikes are also managed effectively & efficiently, since the cloud can scale dynamically

**e.g.** Need to increase the fleet of servers from 2 to 20 in less than few hours

**e.g.** Need to add additional users so that access can be provided to additional users for CRM system

# Ubiquitous Access

- Accessed over **Internet**
- 24x7 access
- Centralized data access




- Multiple users can work on the same data set
- Use Mobile Devices – iPAD, Mobile Phones, Tabs etc.

# Cloud Usage Scenarios

# Use Case – Storage & Backup

## Typical Approach

- Backup on Tapes
- Tapes kept physically at secure place
- Recovery in days or weeks
- Complexity increases when multiple offices are operational
- No built in redundancy

## Cloud Embracing Approach

- Backup on **Cloud Storage Service**
- **No physical transmission of data**
- Recovery in **minutes**
- Complexity is managed with the help of software systems
- **Highly Available and Reliable**
- **Stores multiple copies** of the data across data centers

# Case Study – Storage & Backup

**Challenge**

BMC Software needed to find an easily-accessible storage solution for **over 13,000 VMware images, in addition to a convenient backup and disaster recovery system** for its remote sales offices.

**Solution**

The company presented these challenges to Enterprise Cloud Storage providers StorSimple, which satisfied both requests by integrating its own storage appliance with Amazon Simple Storage Service (Amazon S3)

**Benefits**

- **Freed up portions of BMC's existing infrastructure to host new applications**
- **Avoided cost of additional hardware**

(**Source** : http://aws.amazon.com)

# Use Case - On-Demand Infrastructure

- Need resources (computing/storage) without Capital Expenditure
- Need resources within minutes and not days/weeks
- Need resources only when users are connected (e.g. 9:00 a.m. to 9:00 p.m.)
- Application Areas
  - Training Infrastructure
  - Testing Infrastructure
    - (e.g. Dev-Test, Test 1, Test 2,…)
  - R & D Infrastructure
  - Demo Infrastructure

# Case Study – On-Demand Infrastructure

**Challenge**

Northgate UK ‘s – GEM program requires multiple environments for demonstration purpose. The environment has **33 machines** spread across 5 environments. Secondly the **usage is expected to be only during UK business hours**. GEM program required cost effective solution to manage such as large no. of servers with lesser administrative overheads.

**Solution**

Northgate decided to use **Fujitsu Global Cloud platform** for creating multiple environments. The **automation is introduced to start /stop the virtual machines during UK business hours.**

**Benefits**

- **Avoided cost of additional hardware**

- **Reduced** total **cost by 50%** from 1900 GBP for 33 Virtual machines to GBP 950 on month on month basis by auto start /stop of virtual machine

- **Significantly improved the agility** to provision servers

# Use Case – Do Away with Installation & Configuration Costs

**Requirement**

**Installation** of same set of software and **configuration** is required **on 20 machines for a training** to be conducted.

**Typical Approach**

- Install and configure required software on 20 machines 20 times

**Cloud Embracing Approach**

• Build an image with 'Common' infrastructure

• Reuse it for launching new machines using image

• **Saves resources** and **effort** on getting the server, installing and configuring it

# Use Case - Web/Mobile /Social App Hosting

**Requirements**

- Ubiquitous access , Fast, Able to handle large user base ,24x7
- **Viral nature of Social Applications demand ability to rapidly scale**
- Ability to store and server structured /unstructured content such as photo,video,audio etc.

**Case Study**


- Photo sharing site have added **more than 10 terabytes of new images each month.**
- The company has **saved roughly $500,000** in storage expenditures and cut its disk storage array costs in half—all with **zero increase in staff or datacenter space.**
- 1 programmer and 15 employees

# Use Case - Content Delivery

**Requirement**

Need to store massive content such as audio, video at the same time achieve performance by keeping content closer to user location to provide data at faster speeds

**Case Study**

- Internet Movie Database (www.imdb.com) is one of the world's most popular and authoritative sources for movie, TV and celebrity content

- More than 100 million unique visitors per month

- IMDb uses Amazon CloudFront (CDN ) to host search data for the IMDb magic search feature, finding the movie or person you're looking for in just a few key presses

# Use Case – High Performance Computing

Gain from a large pool of high end servers to do the job instead of buying infrastructure on your own

**Case Study**

• Scribd allows users to turn PDF, Microsoft Office Word and Microsoft Office PowerPoint files into Web documents using a solution built on Amazon EC2 and Amazon S3.

• Scribd used Amazon EC2 spot instances for a recent batch conversion job, saving 63%, or $10,500, compared to what it would have spent on on-demand instances for the same job.

Source : http://aws.amazon.com

# Summarizing

# So Cloud Computing is…

- Way of Computing
- Typically Internet is the essential element
- Evolved over the years
- Easy to use
- Works on pay as you go model
- Elastic (Scalable on demand)
- Combination of multiple technologies
- Works on the concepts of Virtualization
- Has got significant acceptance over last 2-3 years
- Part of Strategy for any IT company , IT enabled business , IT enabled function

# Cloud Computing is NOT …

- Technology
- Not going to completely wipe out traditional computing
- Not Replacement of existing set of technologies

# Summarizing – Cloud Computing

- Service Models - **IaaS , SaaS , PaaS** but moving towards continuum
- Deployment Models - **Public, Private, Hybrid, Community…**
- Benefits of Cloud Computing
  - **Ease of use, significantly reduced capex, pay-as-you-go**
  - **Ubiquitous access …**
- Follow the Guiding Principles for Cloud Adoption
  - Know what you want from cloud
  - **Start small**
  - Measure your progress
  - **Enjoy the benefits**

# Thank You

Q & A