DAY - 1
OVERVIEW
CLOUD COMPUTING

AWS Architecture and Design

1. **Day 1 Overview of Cloud Computing**
2. Day 2 Overview of AWS
3. Day 3 Amazon EC2*
4. Day 4 Amazon EBS *
5. Day 5 Amazon CloudWatch *
6. Day 6 Amazon S3*
7. Day 7 Amazon Elastic Load Balancer *
8. Day 8 Amazon Auto Scaling *
9. Day 9 Amazon VPC *
10. Day 10 Amazon IAM *
11. Day 11 Amazon RDS
12. Day 12 Amazon Route 53 *
13. Day 13 Amazon DynamoDB* & Glacier
14. Day 14 Amazon Cloudfront* & Import Export & Amazon SES *
15. Day 15 Amazon ElasticBeanStalk & Amazon Cloudformation & Amazon OpsWorks
16. Day 16 AWS Economics & AWS Account Overview *
17. Day 17 AWS Architecture
18. Day 18 AWS Certification Preparation

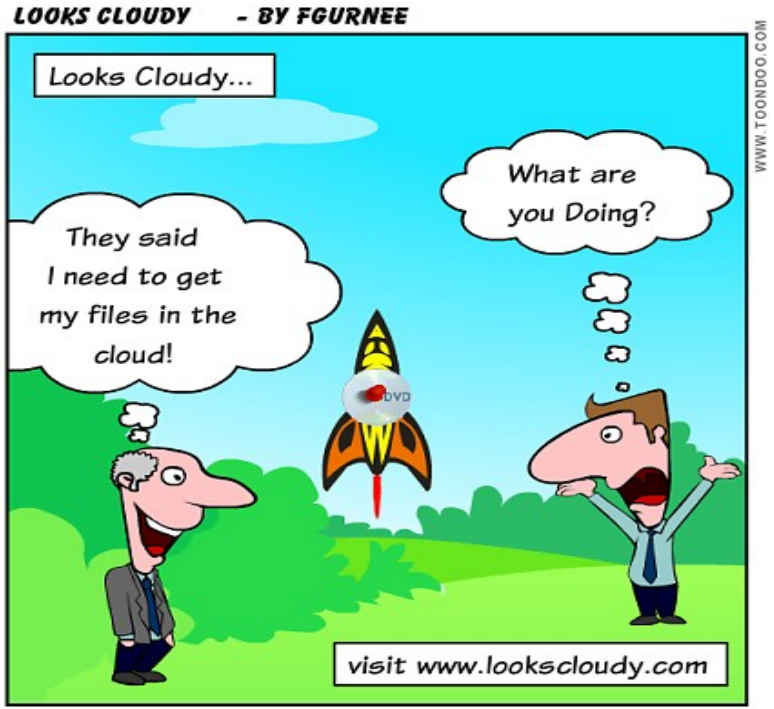
[With Hands on Demo]

Agenda

Overview Cloud Computing

- » What is Cloud Computing?
- » Cloud Models
- » Why Cloud Computing?

Cloud Time



Buzz about Cloud Computing

"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"

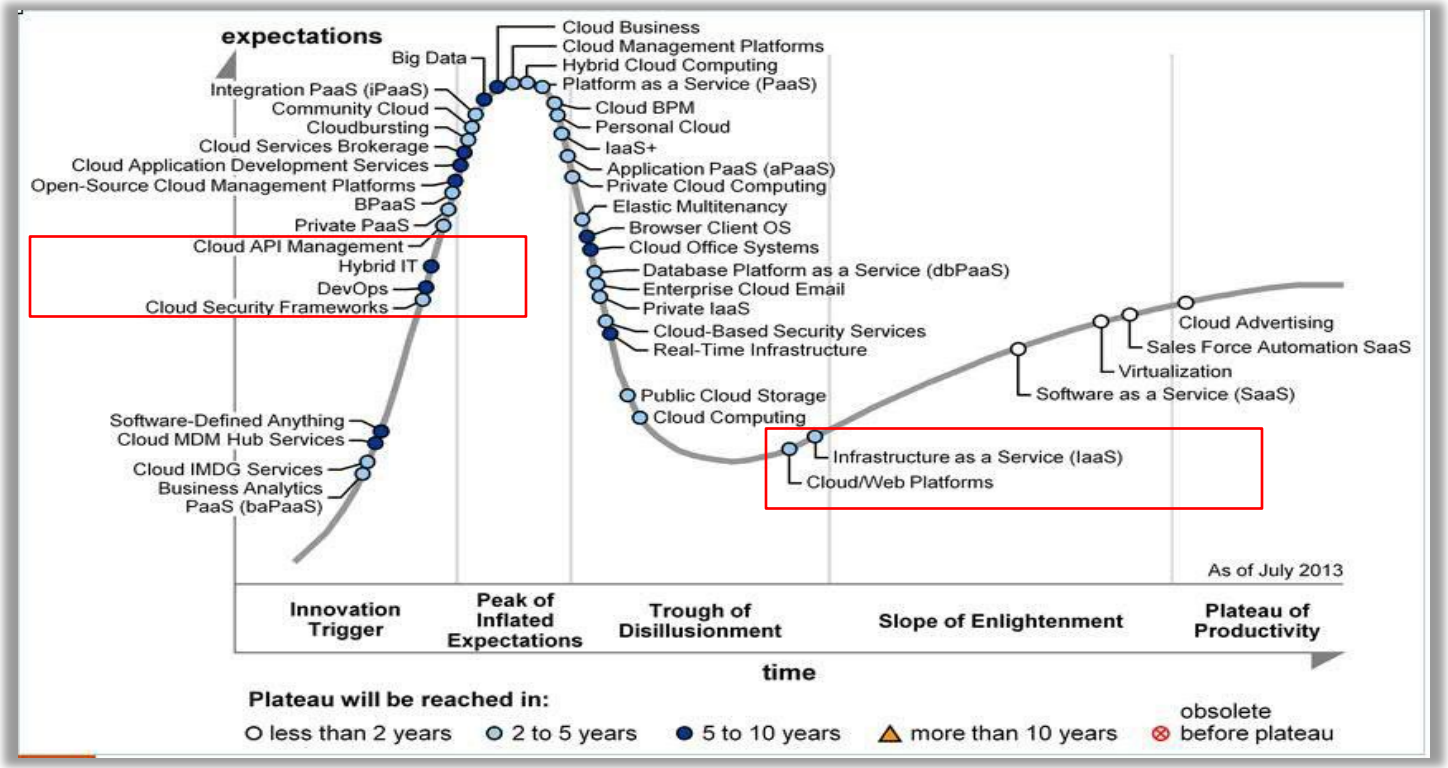
– Steve Jobs, late chairman of Apple (1997)

"We believe we're moving out of the Ice Age, the Iron Age, the Industrial Age, the Information Age, to the participation age. You are participating on the Internet, not just viewing stuff. We build the infrastructure that goes in the data center that facilitates the participation age. You IM (instant message), you blog, you take pictures, you publish, you podcast, you transact, you distance learn, you telemedicine. You are participating on the Internet, not just viewing stuff. We build the infrastructure that goes in the data center that facilitates the participation age"

– Scott McNealy, former CEO, Sun Microsystems

http://www.forbes.com/sites/joemckendrick/2013/03/24/10-quotes-on-cloud-computing-that-really-say-it-all/

Gartner Hype Cycle



Gartner Hype Cycle

Cloud Computing is a Reality

What is Cloud Computing?

“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 with all of these announcements. The computer industry is the only industry that is more fashion-driven than women’s fashion. 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?”

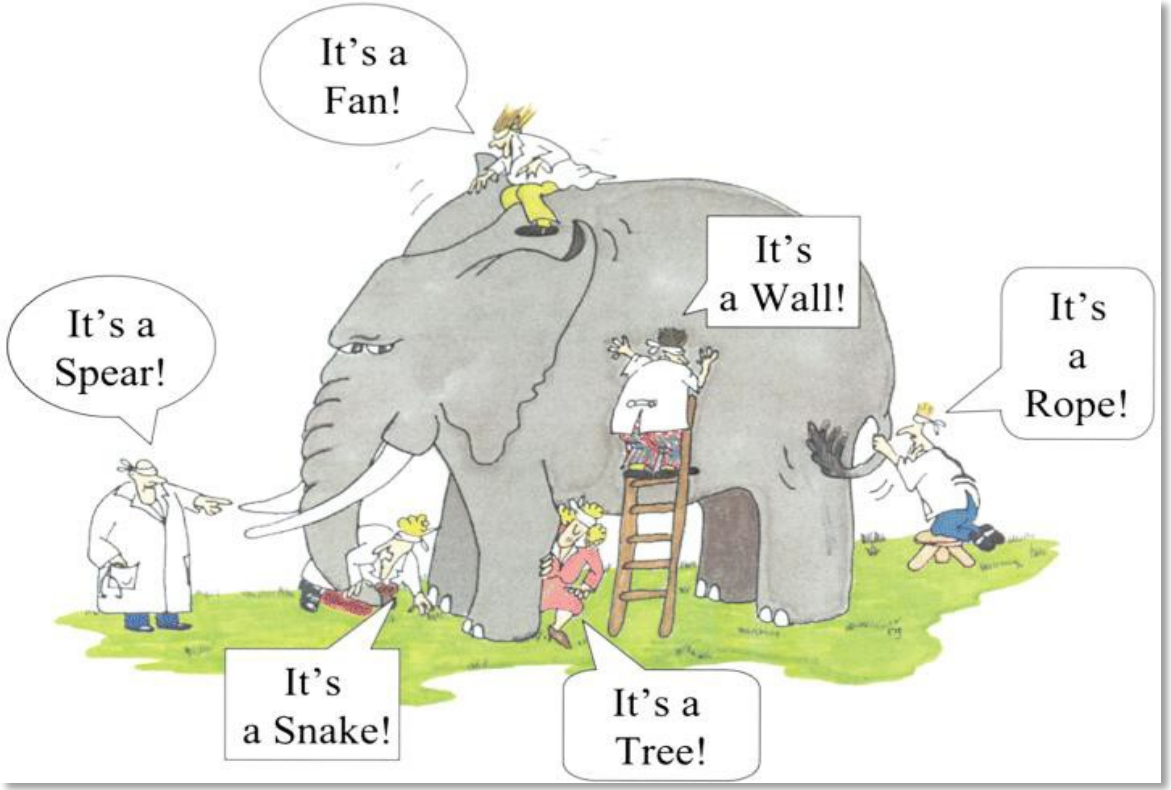
– Larry Ellison, chairman, Oracle

"This year's survey confirms what we hear from our MSP users every day - delivering new cloud services is overly complex and costly - which ultimately impact SLA's. To help accelerate adoption of new cloud based applications to enhance both business agility and resiliency, it's clear providers need to adopt solutions that prevent vendor lock-in, while maximizing interoperability, reliability and simplicity.“

– Ash Ashutosh, Founder and CEO

http://www.forbes.com/sites/joemckendrick/2013/03/24/10-quotes-on-cloud-computing-that-really-say-it-all/

What is Cloud Computing? (Contd.)



Cloud Introduction

→ According to Forrester, Cloud Computing is:

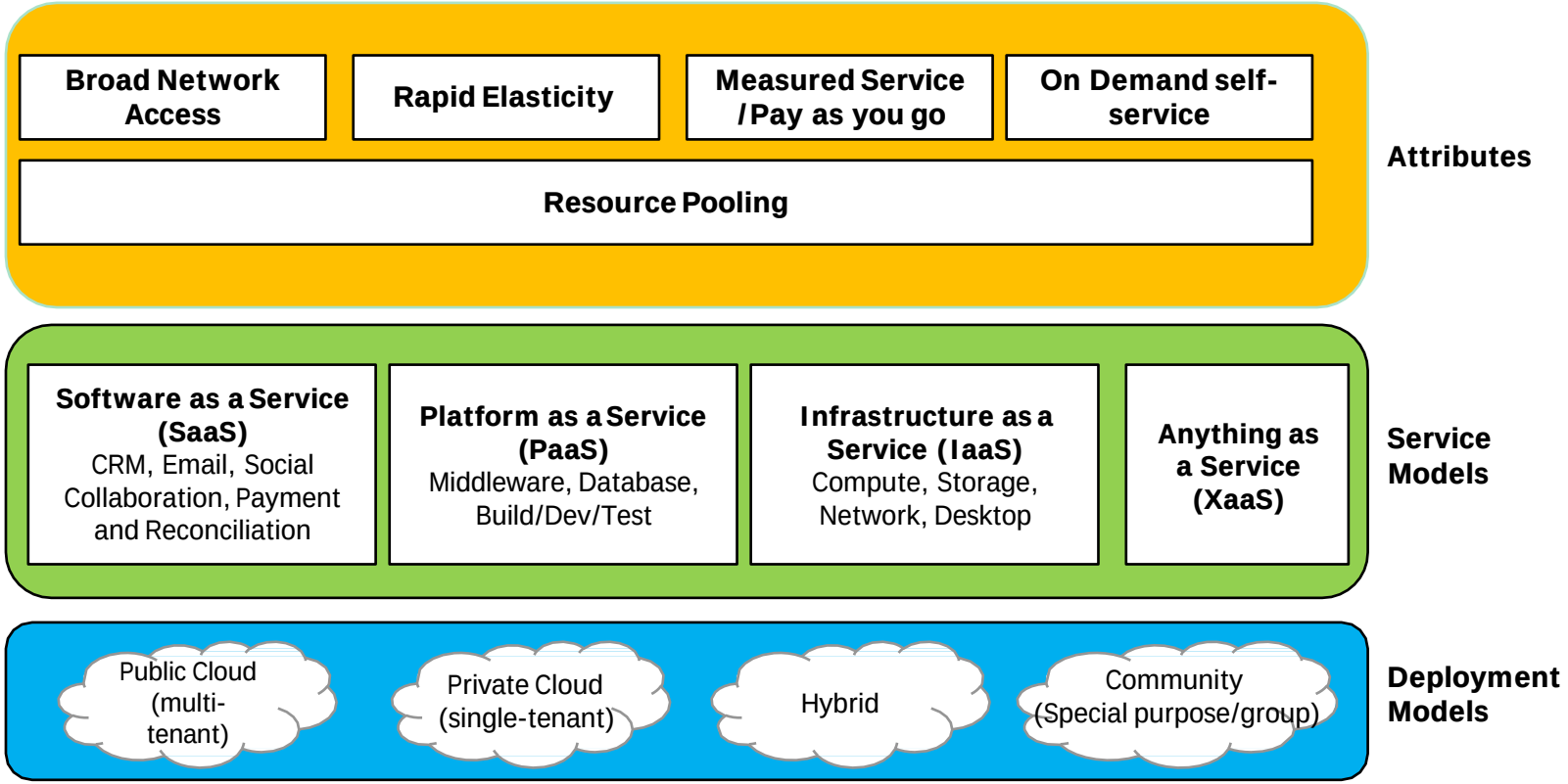
"A form of standardized IT-based capability — such as Internet-based services, software, or IT infrastructure — offered by a service provider that is accessible via Internet protocols from any computer, is always available and scales automatically to adjust to demand, is either pay-per-use or advertising-based, has Web- or programmatic-based control interfaces, and enables full customer self-service."

Cloud Introduction

→ **According to NIST, Cloud Computing is:**

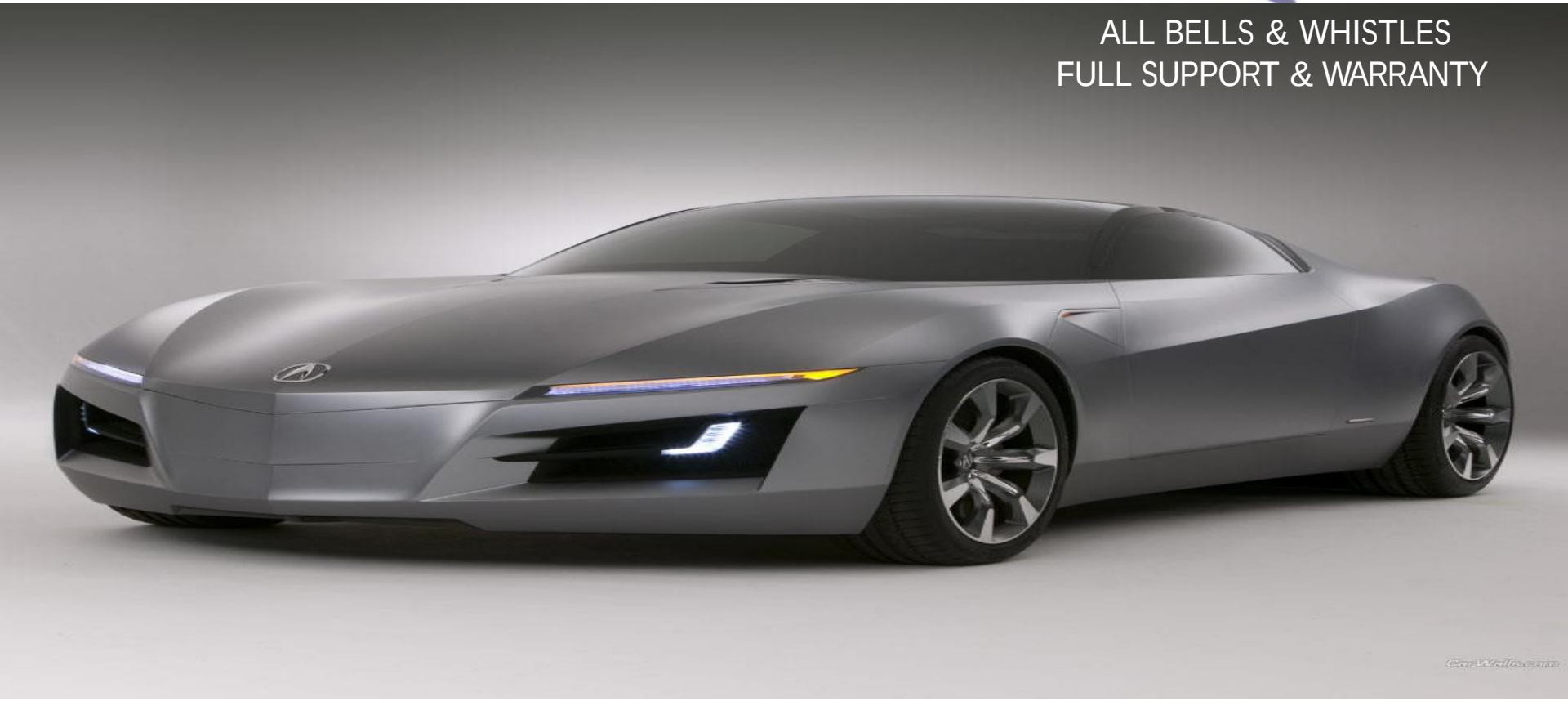
"Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models." - (NIST)

Cloud Introduction



http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf

TRADITIONAL HARDWARE/SOFTWARE



LEASED HARDWARE/SOFTWARE

NO MAJOR ALTERATIONS ALLOWED
MONTHLY PAYMENT
LIMITED SUPPORT

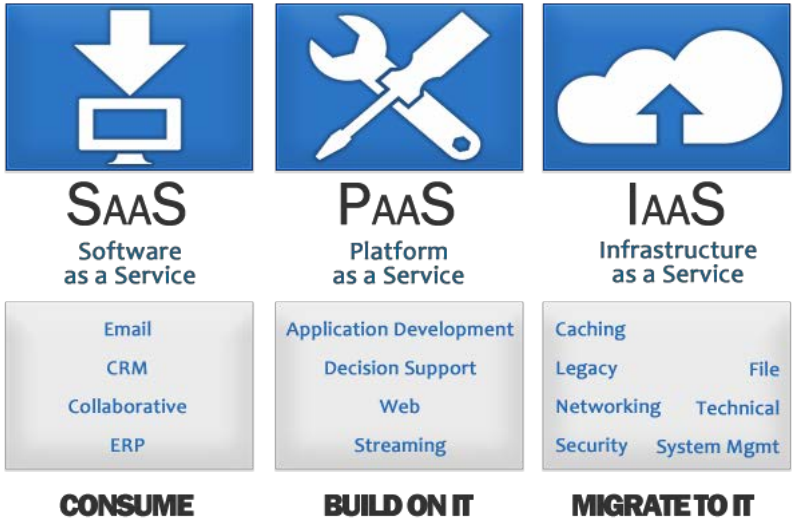
ON-DEMAND HARDWARE/SOFTWARE

Cloud Models

http://blogs.southworks.net/mwoloski

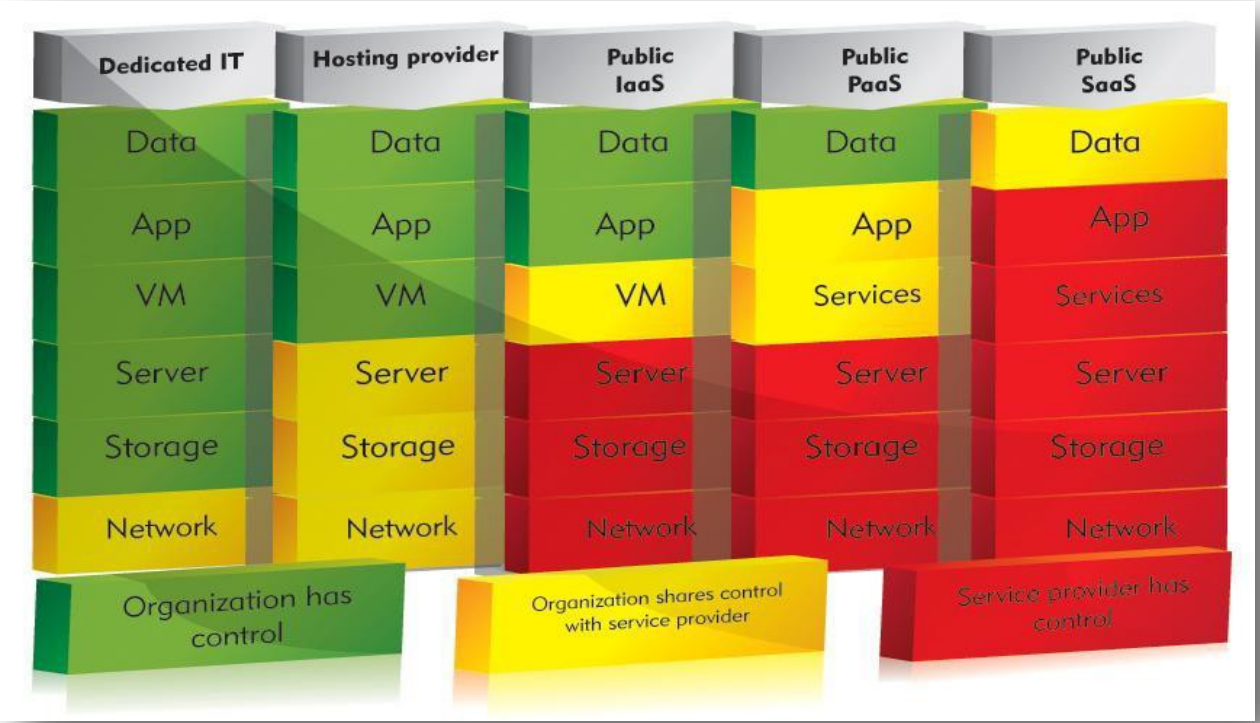
Cloud Delivery Models

- → Software as a Service (SaaS):
  - » The application is hosted centrally
  - » Software testing takes place at a faster rate
  - » Reduction in IT operational costs
  - » No need to install new software to release updates
- → Platform as a Service (PaaS):
  - » Facilitation of hosting capabilities
  - » Designing and developing the application
  - » Integrating web services and databases
  - » Providing security, scalability and storage
- → Infrastructure as a Service (IaaS):
  - » Virtualization of Desktop
  - » Internet availability
  - » Use of billing model
  - » Computerized administrative tasks

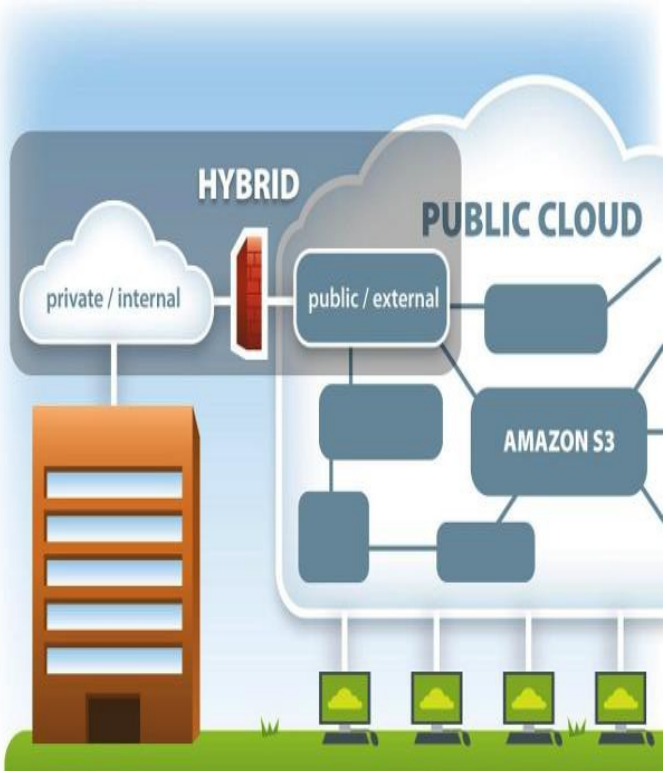


http://softwizz.in/wp-content/uploads/2015/11/cloudcomputing.png

Distribution of Control between Service Models



Cloud Computing Deployment Models



https://dzone.com/storage/temp/381297-hybrid-cloud-diagram.png

Public Cloud

- Mega-scale Infrastructure and Services
- Sold publically
- Pay-Per-Use
- Multitenant applications and services
- Access virtually unlimited resources

Private Cloud

- Finite Infrastructure and Services
- Enterprise owned or leased
- Charge-back to LOBs or Users
- Cloud Computing model in a company's own datacenter or providers
- Access limited resources that must be managed by LOBs or Central IT

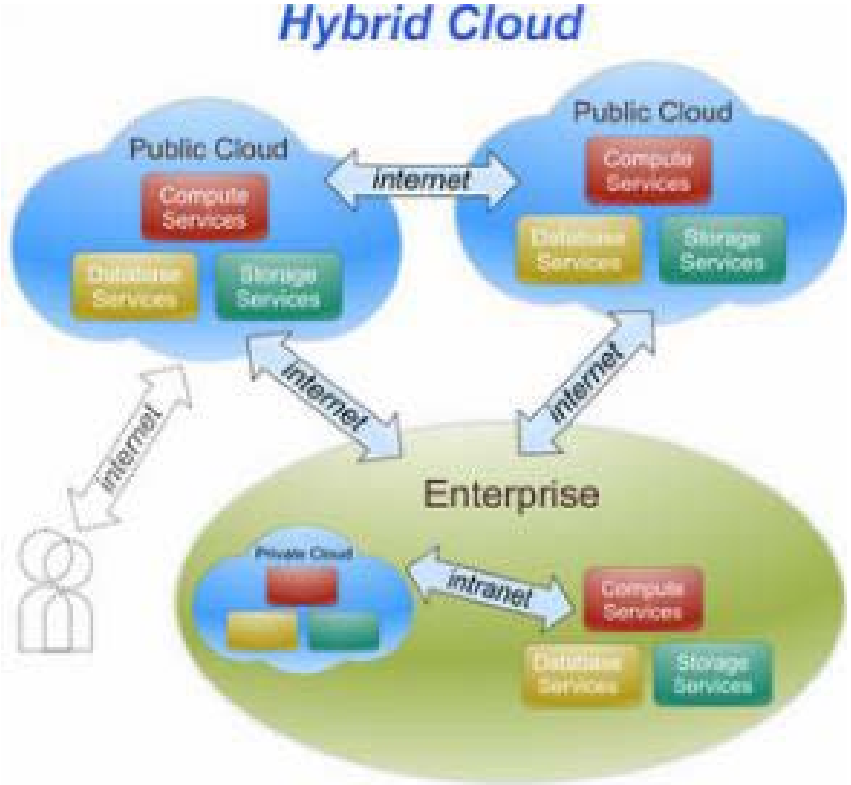
Hybrid Cloud

- Composition of two or more clouds
- Mixed usage of both public and private clouds
- Enables application components to be spread between multiple public and/or private clouds

Hybrid Cloud

→ Hybrid Cloud consisting of multiple internal and/or external providers will be typical for most of the enterprises

→ Example : VMWare, Amazon VPC, Microsoft Azure etc



Sample Benefits and Risks for Cloud Models

Delivery Model	Benefits	Risks	✓Best Fit
Public	→ Costs → Time-to-Market → Elasticity → Self-Service → Simplicity	→ Lack of Control → Security → Regulatory & Compliance → Data Migration → Application Development → Software Licensing → Vendor Lock-In → Limitations	→ Applications and Data that can be publicly hosted → Applications that can be easily moved or ported to commodity virtual platforms
Private	→ Control → Security → Compliance	→ Scale → Management Tools → Charge-back → Adoption → ROI	→ Applications and data that can not be hosted publicly for security or compliance reasons → Applications and data the require a high-level of control
Hybrid	→ Flexibility → Security → Efficiencies	→ Multiple Points of Failure → Same risks as public and private clouds	→ When it is required to separate applications and data between private and public clouds → When public clouds can not accommodate requirements → When public cloud resources are only required temporarily and workloads can be migrated between clouds

Key Characteristics

→ Agility :

» Improves with users able to rapidly and inexpensively re-provision technological infrastructure resources

→ Cost (Pay as You Go) :

» Cost is greatly reduced and capital expenditure is converted to operational expenditure . Also you can convert fixed cost to variable

→ Device and location independence :

» Enable users to access systems using a web browser regardless of their location or what device they are using, e.g., PC, mobile

→ Multi-tenancy:

» Enables sharing of resources and costs among a large pool of users, allowing for:

» Centralization of infrastructure in areas with lower costs (such as real estate, electricity, etc.)

» Peak-load capacity increases (users need not engineer for highest possible load-levels)

» Utilization and efficiency improvements for systems that are often only 10-20% utilized

Key Characteristics

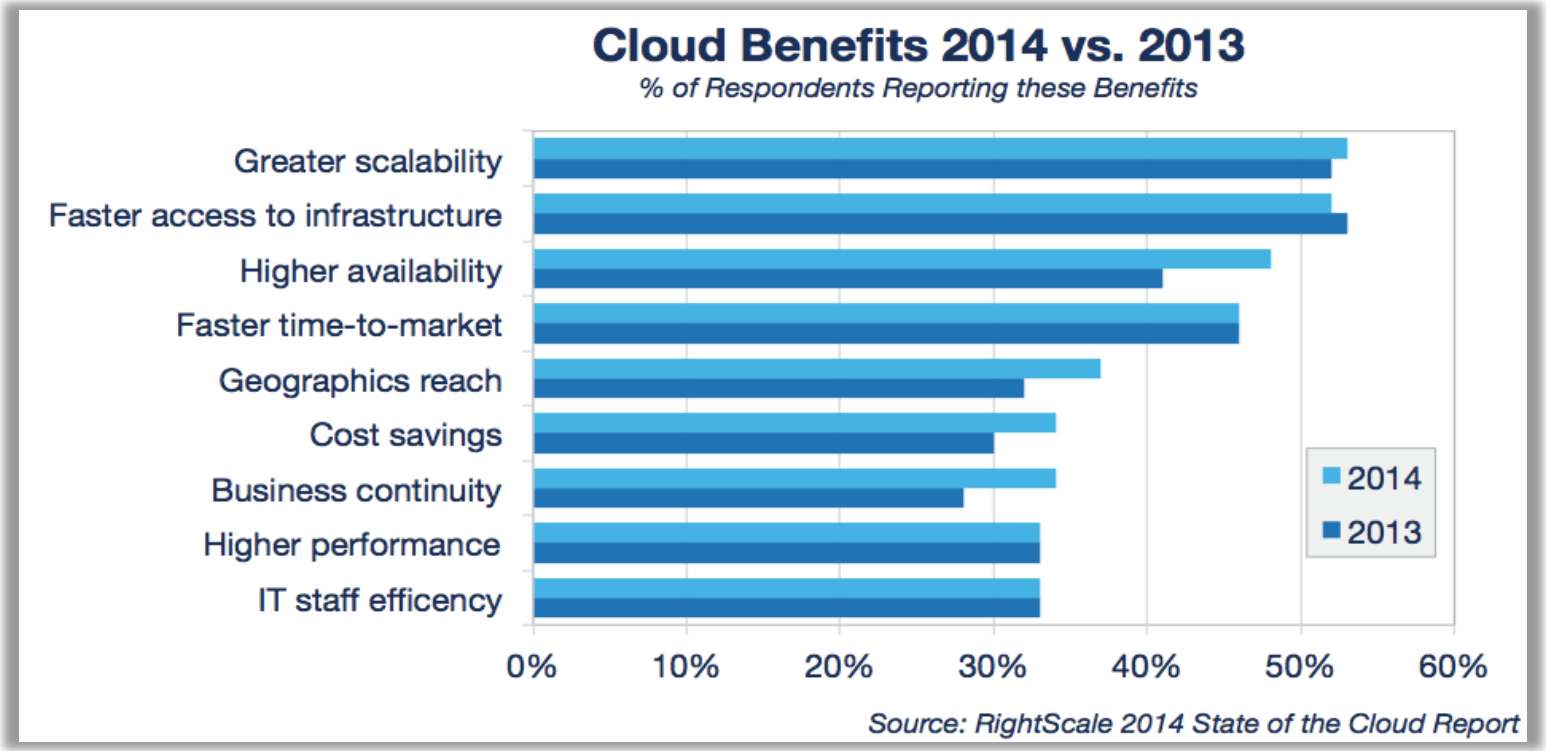
- → Reliability : improves through the use of multiple redundant sites, which makes it suitable for business continuity and disaster recovery

- → Scalability : via dynamic ("on-demand") provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads

- → Sustainability : comes about through improved resource utilization, more efficient systems, and carbon neutrality. Nonetheless, computers and associated infrastructure are major consumers of energy

- → Virtualized : applications are decoupled from the underlying hardware. Multiple applications can run on one computer (virtualization a la VMWare) or multiple computers can be used to run one application

Key Benefits



http://www.rightscale.com/blog/cloud-industry-insights/cloud-computing-trends-2014-state-cloud-survey

Typical Use Case for Cloud

- Infrastructure Transformation
- SaaS (e-mail, collaboration, etc.)
- Dev and Test
- Hosted solutions
- Content Delivery Networks
- High Performance Computing
- POCs
- Backup
- DR
- VPCs / Private Clouds

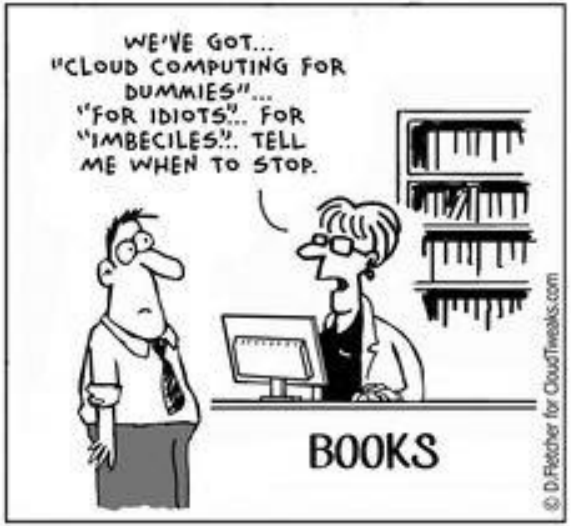
Technologies Useful for Cloud Computing

Programming Languages:

- ✓ Java
- ✓ .Net
- ✓ PHP
- ✓ Ruby
- ✓Python
- ✓C/C++
- ✓Swift / Android

IS Skills:

- ✓ Windows Administration
- ✓ Network Administrator
- ✓ Virtualization
- ✓ VMWare / Hypervisor
- ✓ Storage
- ✓ DBA
- ✓ Container Service



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Cloud & Open Source

→ Cloud Computing offers new opportunities for Open Source and it is core to cloud computing success

→ Open Source provides option for interoperability & portability

→ No Vendor lock-in

→ Open Cloud = Open Formats + Open Interfaces

→ Not only Open source but Open Formats and Open Interfaces will empower the users but it cannot regulate the market dynamics

Cloud Computing Concerns

http://www.glasbergen.com/wp-content/gallery/wireless/toon_48.gif

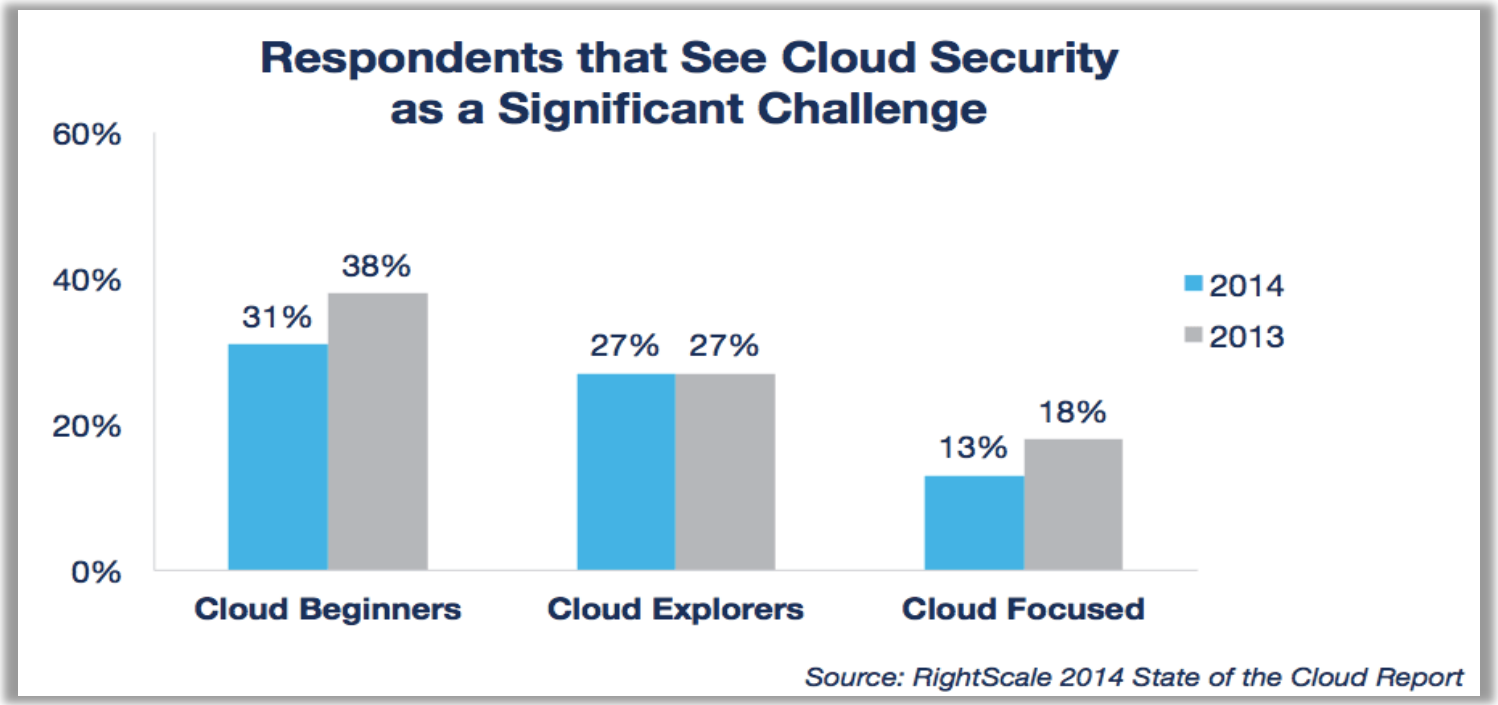
Cloud Computing Concerns

- → Loss of control
- → Integration: enterprise & federated authorization
- → Interoperability: with key enterprise applications
- → Accessibility and UI limitations of web apps
- → Reliability, performance, security; offline access
- → Features; changes; vendor lock-in

Cloud Computing Concerns

- → Policy/compliance concerns (privacy)
- → Breach forensics and mitigation
- → Business “surprises”
- → Support; More Logins
- → Consequences of “Creative Destruction”

Cloud Computing Concerns



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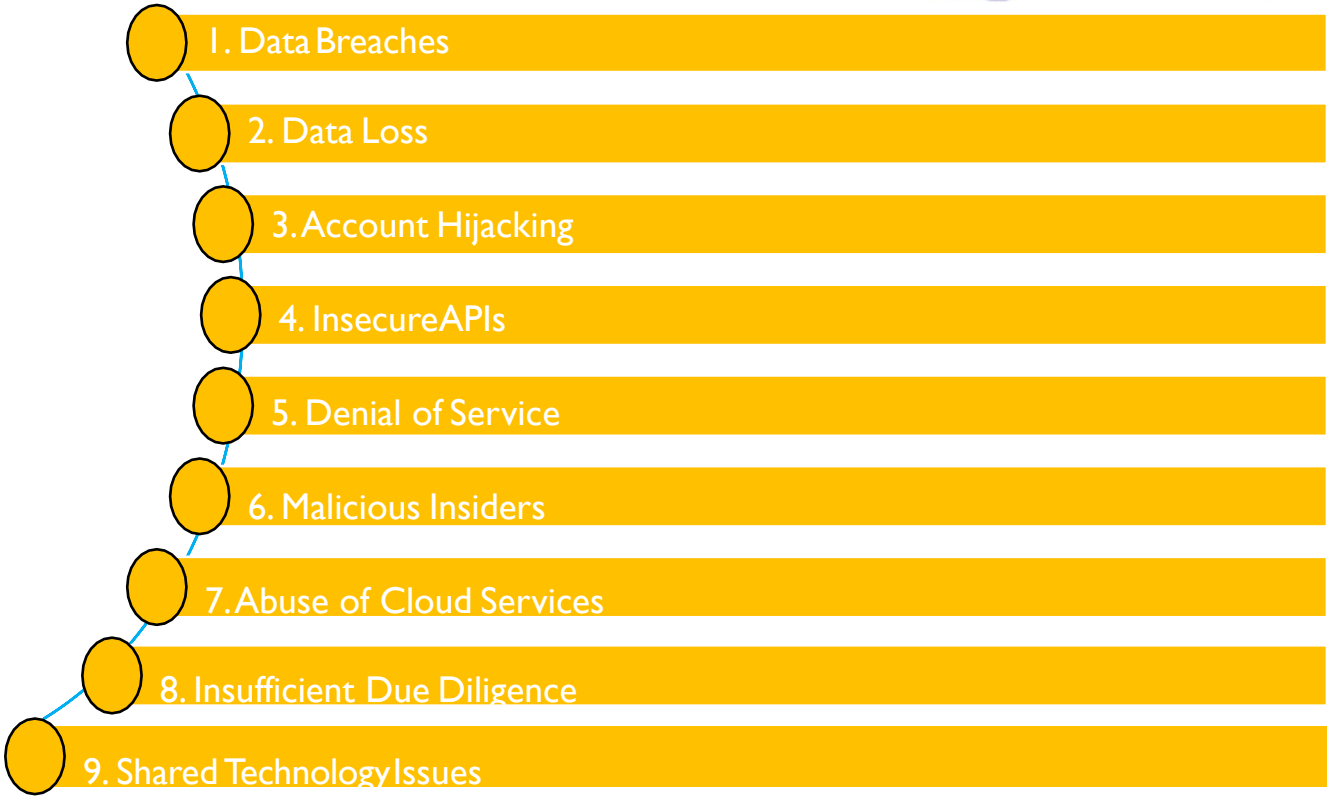
Security issues in Cloud Computing

Notorious Nine

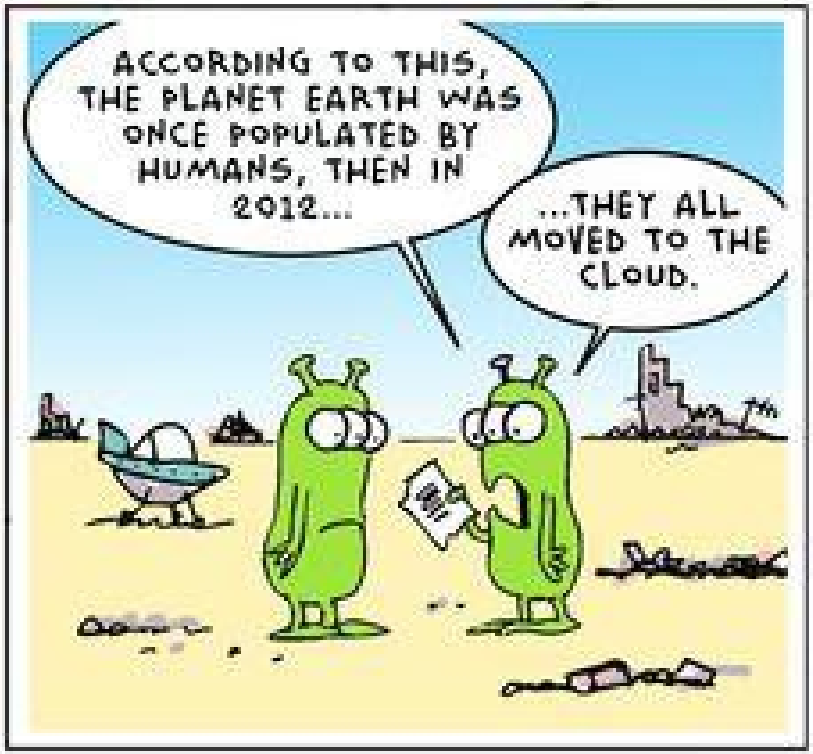


https://downloads.cloudsecurityalliance.org/initiatives/top_threats/The_Notorious_Nine_Cloud_Computing_Top_Threats_in_2013.pdf

Cloud Computing - Summary

Plus	Minus
CHEAP	HARDWARE FAILURE
SCALABLE	NOT YET MATURE
SMALL STARTUP COST	Lock-in
On-demand	Security

Cloud Computing Summary



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We learned about

- » What is Cloud Computing and its definition
- » Cloud Computing Models

In next session we will have overview about
Cloud Computing Leader AWS

Thank You

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