Cloud Computing

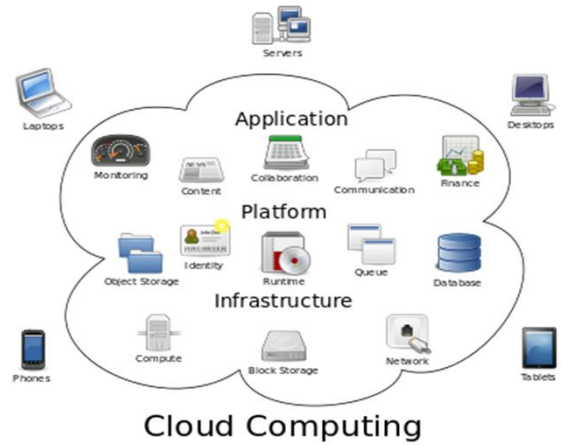
V.Mareeswari
Assistant Professor
SITE, VIT University

Challenges

- Alignment with the needs of the business / user / non-computer specialists / community and society
- Need to address the **scalability issue**: large scale data, high performance computing, automation, response time, rapid prototyping, and rapid time to production
- Need to effectively address (i) ever shortening cycle of obsolescence, (ii) heterogeneity and (iii) rapid changes in requirements
- Transform data from diverse sources into intelligence and deliver intelligence to right people/user/systems
- What about providing all this in a cost-effective manner?

Definition

Cloud computing is network-based computing in which large groups of remote servers are networked to allow the centralized data storage, and online access to computer services or resources. Clouds can be classified as public, private or hybrid.



Essential Characteristics

- **On demand self services :** computer services such as email, applications, network or server service can be provided without requiring human interaction with each service provider. Typically, you are billed with a monthly subscription or a pay-for-what-you-use scenario. Cloud service providers providing on demand self services include Amazon Web Services (AWS), Microsoft, Google, IBM and Salesforce.com.
- **Broad network access:** Your team can access business management solutions using their smartphones, tablets, laptops, and office computers. This mobility is particularly attractive for businesses so that during business hours or on off-times, employees can stay on top of projects, contracts, and customers whether they are on the road or in the office.

- **Resource pooling:** The cloud enables your employees to enter and use data within the business management software hosted in the cloud at the same time, from any location, and at any time. The resources include among others storage, processing, memory, network bandwidth, virtual machines and email services.
- **Rapid elasticity:** If anything, the cloud is flexible and scalable to suit your immediate business needs. You can quickly and easily add or remove users, software features, and other resources.
- **Measured service :** Cloud computing resource usage can be measured, controlled, and reported providing transparency for both the provider and consumer of the utilised service. Cloud computing services use a metering capability which enables to control and optimise resource use. This implies that just like air time, electricity or municipality water IT services are charged per usage metrics – pay per use . The more you utilise the higher the bill. Just as utility companies sell power to subscribers, and telephone companies sell voice and data services, IT services such as network security management, datacenter hosting or even departmental billing can now be easily delivered as a contractual service.

Service Models

- SaaS – Software as a Service
- PaaS – Platform as a Service
- IaaS – Infrastructure as a Service

What is Software as a Service? (SaaS)

- SaaS is a software delivery methodology that provides licensed multi-tenant access to software and its functions remotely as a Web-based service.
- SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis.
- In the SaaS model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients.
- The pricing model for SaaS applications is typically a monthly or yearly flat fee per user, so price is scalable and adjustable if users are added or removed at any point.

SaaS Examples

9 V.Mareeswari / AP / SITE / VITU 06-11-2014

Platform as a Service (PaaS)

- In the PaaS models, cloud providers deliver a computing platform, typically including operating system, programming language execution environment, database, and web server.
- Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers.

10 V.Mareeswari / AP / SITE / VITU 06-11-2014

PaaS Examples

11 V.Mareeswari / AP / SITE / VITU 06-11-2014

Infrastructure as a Service (IaaS)

- Cloud providers of IaaS offer computers – physical or (more often) virtual machines – and other resources.
- IaaS clouds often offer additional resources such as a virtual-machine disk image library, raw block storage, and file or object storage, firewalls, load balancers, IP addresses, virtual local area networks (VLANs), and software bundles.

12 V.Mareeswari / AP / SITE / VITU 06-11-2014

IaaS Examples

OpSource

NTT Communications

GO GRID

terremark

BLIZZARD ENTERTAINMENT

at&t

13 V.Mareeswari / AP / SITE / VITU 06-11-2014

Key Players in Cloud Computing Platforms (adapted from Lakshmanan (2009))

Company	Cloud Computing Platform	Year of Launch	Key Offering
Amazon.com	AWS (Amazon Web Services)	2006	Infrastructure as a service (Storage Computing), Datasets and Content Distribution
Microsoft	Azure	2009	Application platform as a service (.Net, SQL data services)
Google	Google App. Engine	2008	Web Application Platform as Service
IBM Salesforce.com	Blue Cloud Force.com	2008	Proprietary 4GL Web application as an demand platform