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## Basics of cloud computing

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### ABSTRACT

The term Cloud refers to network or internet in other words. Cloud is something which is present at remote location. Cloud Computing provides the ability to manipulating, configuring & accessing the hardware and software resources remotely. It offers online data storage, infrastructure and application. Cloud Computing is the on-demand availability of computer system resources, specially data storage and computing power, without direct active management by the user. The term cloud computing used to describe the data centers available to many users over the internet.

**Keywords:** *Cloud service, Infrastructure as service, Software as service, Platform as service*

### 1. Introduction :

Cloud computing offers online data storage, infrastructure and application. The availability of high capacity networks, low cost computers and storage devices as well as the well-known adoption of hardware virtualization, service-oriented architecture has led to growth in cloud computing. Cloud computing is a technology consisting of three types of computing services which are delivered remotely to clients via the internet facility. Clients are able to pay water or electricity bill. Cloud Computing has provided Software as a Service (Saas), Platform as a Service (PaaS), Infrastructure as a Service (IaaS). The characteristics of cloud computing exhibits following key characteristics:

- 1) **On-demand Self Service:** Clients of cloud are able to use web services on demand. Cloud Computing allows user to log on any time and use resources.
- 2) **Measured Services:** Cloud vender controls and monitors all the aspects of cloud service. Resource optimization, billing and capacity planning all are depending on it.
- 3) **Resource Pooling:** Cloud Computing allows to share pool of resources with multiple tenant. It allows sharing single physical instance of hardware, database, and basic structure.
- 4) **Broad Network Access:** As cloud computing is completely web based, it can be accessed from anywhere and at any time.

- 5) **Rapid Elasticity:** It allows scaling resources at any time. Scaling of resources means the ability of resources to deal with increasing or decreasing demand.

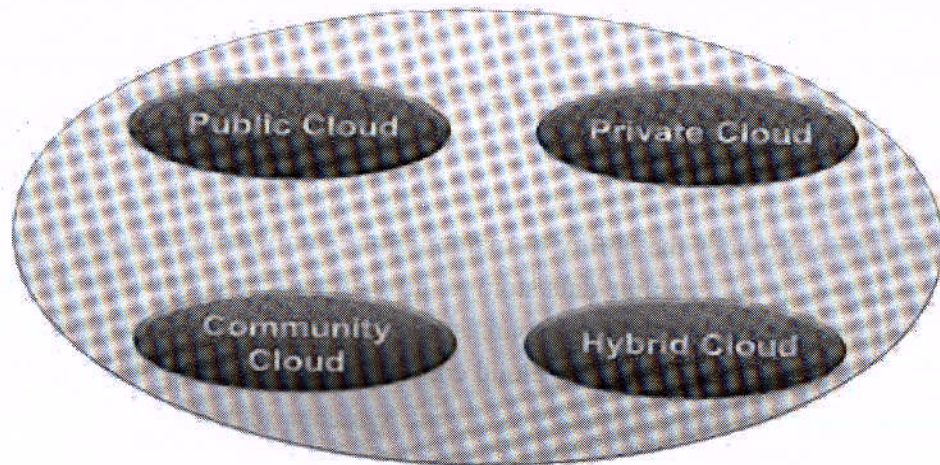
## 2. Cloud Computing Models :

There are certain services and models working behind the scene making the Cloud Computing feasible and accessible to end user. There are two basic types of working models.

- A. Deployment Models
- B. Service Models

### 2.1 Deployment Model :

Deployment Model defines the type of access to the cloud. Cloud can have any one of the four types of access: Public, Private, Hybrid, and Community [1]. Fig.1 shows the Cloud deployment models.

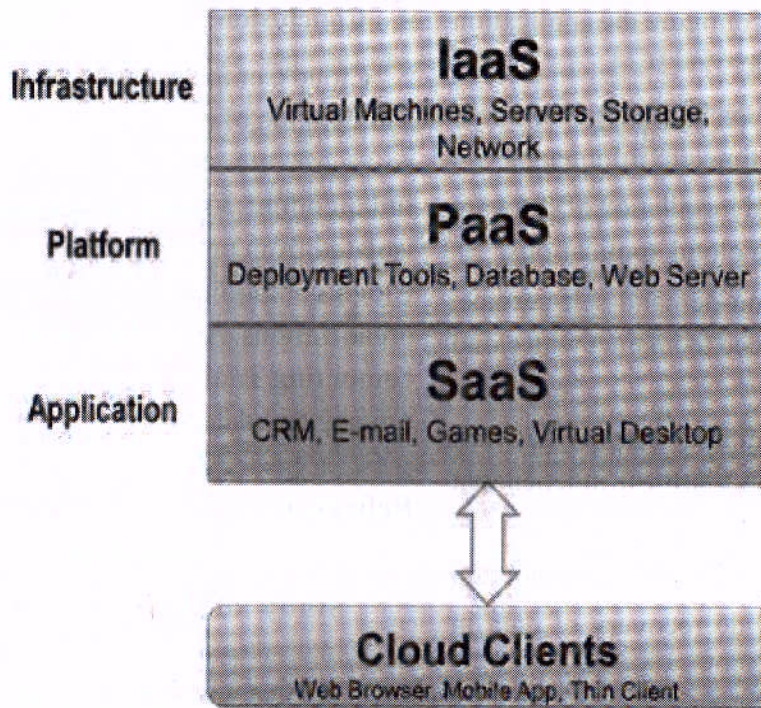


**Fig.1. Cloud deployment models**

- 1) **Public Cloud:** Public cloud allows system and services to be easily accessible to the general public (i. e. Open to all). Public cloud may be less secure due to its openness.
- 2) **Private Cloud:** Private cloud allows system and services to be accessible within an organization. It is more secured.
- 3) **Hybrid Cloud:** Hybrid cloud is an assortment of public and private cloud in which the critical activities are performed using private cloud while non-critical activities are performed using public cloud.
- 4) **Community Cloud:** Community cloud allows system and services to be accessible by a group of organization. Cloud resources are shared by every participant which is being a part of community of organizations whose needs are similar.

### 2.2 Service Model:

Cloud computing comprises their "Services" according to different models, of which the three standard models as per NIST (National Institute for Standard and Technology): Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). This service model contains the three standard



**Fig. 2 Cloud Service Architecture**

service models as shown in Fig.2 [2-5].

### 1) Infrastructure as a Service (IaaS):

IaaS is the most basic level of service. Cloud Computing describes IaaS as “Where the consumer is able to deploy and run arbitrary software, which include operating system and application. The consumer does not manage essential cloud infrastructure but has control over operating system, storage and deployed application. Virtualization is the base in IaaS to fulfill the growing resource demand of cloud consumer. Virtualization means to arrange independent Virtual Machine (VM) that is separated from both hardware and other virtual machines. The main goal of IaaS is to create multiple instances of application software architecture that can run on single application.

### 2) Platform as a Service (PaaS):

PaaS provides the runtime environment for applications, development and deployment tools. In PaaS, consumer do not manage or control the essential cloud infrastructure including network, server, operating system and storage but have control

over deployed applications. It allows consumer to deploy onto cloud infrastructure, consumer created applications using programming languages, libraries, services and tools supported by the providers.

### 3) Software as a Service (SaaS):

SaaS model allows using software applications as a service to end user. Cloud user do not manage the cloud infrastructure and platform where application runs. In SaaS user only get access to application software and database. Cloud providers control the infrastructure and platform that run the application. It is sometimes referred as “On Demand Software”. In SaaS model, Cloud vendors install and operate software in the cloud and cloud clients access the software from cloud.

### 3. Merits and Demerits of cloud computing:

#### 3.1. Merits of cloud computing:

Cloud Computing has to many advantages some of them are listed below.

- One can access application as utilities over the internet.

- One can manipulate and configure the application online at any time instance.
- It provides online development and deployment tools, programming, runtime environments.
- There is no requirement of installation of software to access and manipulate cloud applications.
- Cloud computing offers on-demand-self-service, it means that there is no need to interact with cloud service provider.
- Cloud resources are available over the network in a manner that provide platform independent access to any type of clients.
- Reliability is proven by offering load balancing.
- The cloud vendors provide recovery of data in disastrous situation.

### 3.2. Demerits of cloud computing:

As coin has two sides with advantages of cloud computing it comes with some limitations.

- Without internet connection client can't able to access cloud.
- Privacy and confidentiality are big concerns in some activities of cloud, such as sensitive data that are not encrypted.
- Cloud providers decide on the management policies, which moderates where the cloud users are able to do with their deployment.
- Cloud users are limited to the control privacy and management of their applications, data and services.
- A cloud vendor controls the back-end infrastructure.
- Insecure API's abuse of cloud account hacking is some other limitation of cloud computing.

### 4. Conclusion:

Cloud Computing is on demand self-service. It is a integration of internet, operating system, hardware, software, etc. Virtualization that able to create independent Virtual Machines (VM) which are isolated from underlying hardwires and other VM's. Cloud computing is a growing aspect for business organizations. As we have seen advantages of cloud computing it also face the challenging issues of privacy and data security.

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