Cloud Computing Basics

What is Cloud?

The term Cloud refers to a Network or Internet. Cloud can provide services over network i.e. on public networks or on private networks i.e. WAN, LAN.

Applications such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud.
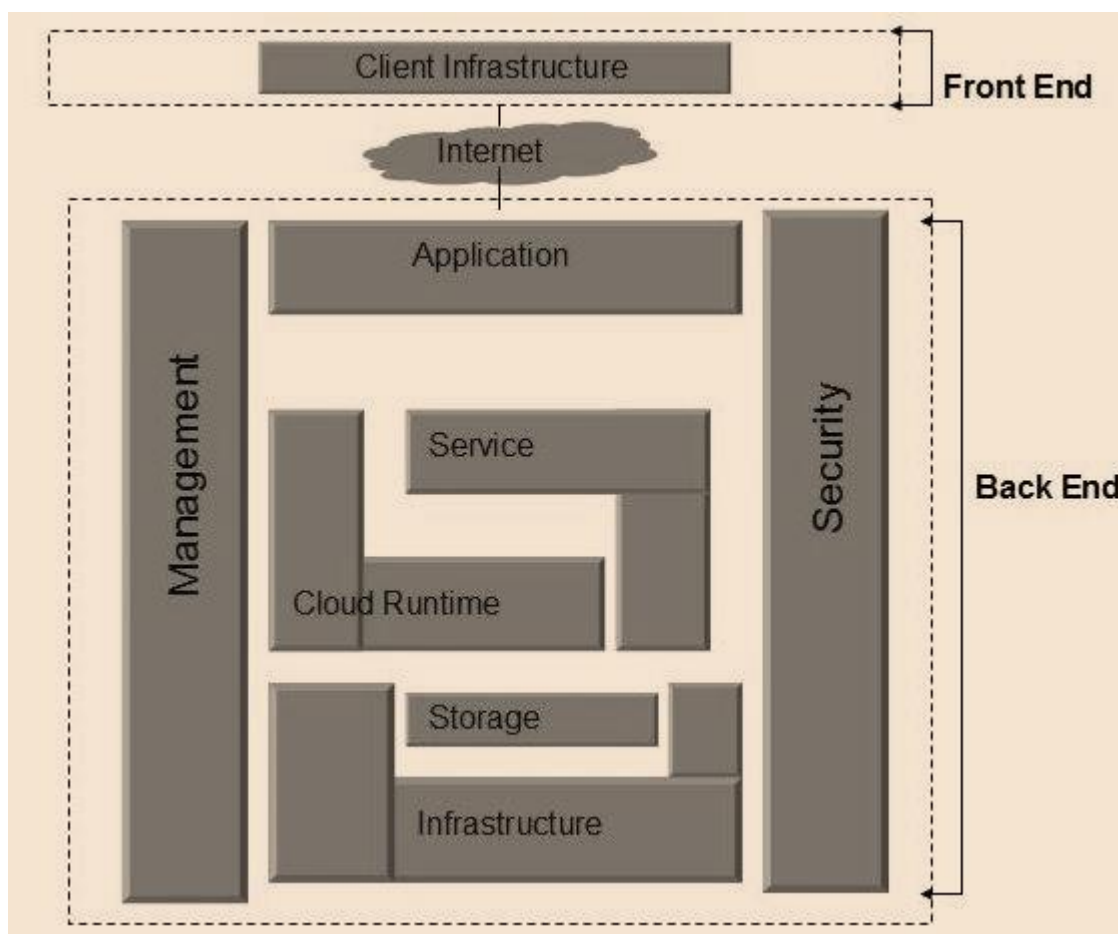
What is Cloud Computing?

It is defined as a mode for enabling convenient, on-demand network access to a shared pool of configurable and reliable computing resources like networks, servers, storage, application, services etc. that can be manipulated, configured and accessed remotely.

Cloud computing offers platform independency, as the software is not required to be installed locally on the PC. Hence, the Cloud Computing is making our business applications, mobile and collaborative.

Cloud Computing Architecture

The Cloud Computing architecture comprises of many cloud components, each of them are loosely coupled. We can broadly divide the cloud architecture into two parts:

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Front End

Front End refers to the client part of cloud computing system. It consist of interfaces and applications that are required to access the cloud computing platforms. E.g. Web Browser

Back End

Back End refers to the cloud itself. It consist of all the resources required to provide cloud computing services. It comprises of huge data storage, virtual machines, security mechanism, services, deployment models, servers etc.

Deployment Models of Cloud

Deployment models define the type of access to the cloud, i.e., how the cloud is located?

There are 4 types of deployment models of cloud namely:

Public Cloud Model

The Public Cloud Model allows systems and services to be easily accessible to general public. E.g. Google AppEngine, Amazon EC2.

Private Cloud Model

The Private Cloud allows systems and services to be accessible within an organization. The Private Cloud is operated only within a single organization. However, it may be managed internally or by third-party.

Community Cloud Model

The Community Cloud allows system and services to be accessible by group of organizations. It shares the infrastructure between several organizations from a specific community. It may be managed internally or by the third-party.

Hybrid Cloud Model

The Hybrid Cloud is mixture of public and private cloud. Non Critical activities are performed using public cloud while the critical activities are performed using private cloud

Cloud Service Models:

There are basically 3 types of cloud service models:

Infrastructure as a Service (IaaS)

IaaS provides access to fundamental resources such as physical machines, virtual machines, storage etc.

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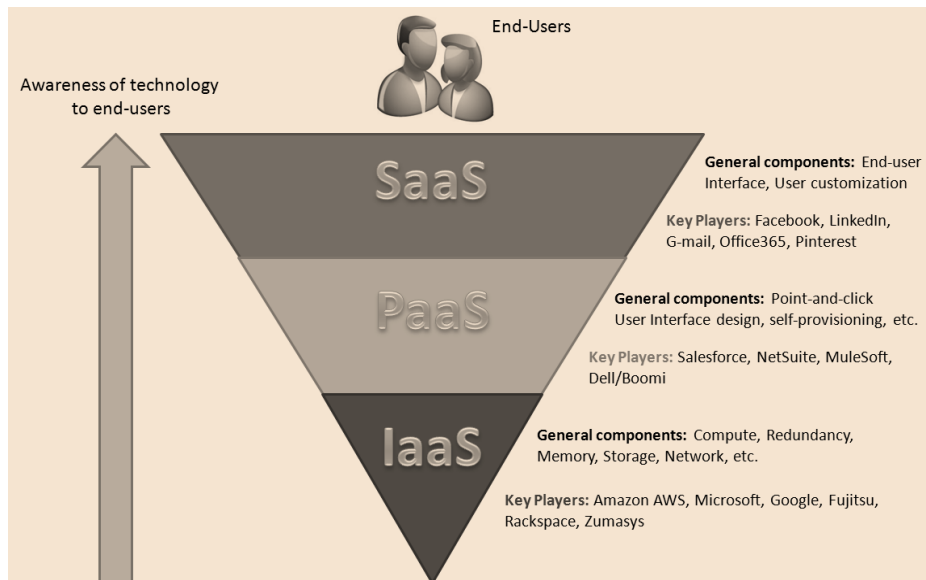**Plot no.8, Pratap Nagar Scheme 3, Near Glass Factory, Tonk Road, Jaipur, Rajasthan 302015**
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All of the above resources are made available to end user via server virtualization. Moreover, these resources are accessed by the customers as if they own them.

Characteristics:

- Virtual machines with pre-installed software.
- Virtual machines with pre-installed Operating Systems such as windows, Linux, and Solaris.
- On-demand availability of resources.
- The computing resources can be easily scaled up and down.

Platform as a Service (PaaS)

PaaS offers the run time environment for applications. It also offers development & deployment tools, required to develop applications. PaaS has a feature of point-and-click tools that enables non-developers to create web applications.

Force.com platform is an example of PaaS in salesforce.

Characteristics

- PaaS offers browser based development environment. It allows the developer to create database and edit the application code either via Application Programming Interface or point-and-click tools.
- PaaS provides built-in security, scalability, and web service interfaces.
- PaaS also provides web services interfaces that allow us to connect the applications outside the platform.

Software as a Service (SaaS)

Software as a Service (SaaS) makes the software available over the internet. This model allows to provide software applications as a service to the end users. It refers to a software that is deployed on a hosted service and is accessible via internet. There are several SaaS applications such as Billing and Invoicing System, Customer Relationship Management (CRM) applications, Help Desk Applications, Human Resource (HR) Solutions.

Characteristics

- Available on demand.
- The Software are maintained by the vendor rather than where they are running and hence making it cost effective.
- The license to the software may be subscription based or usage based. And it is billed on recurring basis.
- Scaled up or down on demand.
- Automatically upgraded and updated.
- SaaS offers share data model.
- All users are running same version of the software.

Anything-as-a-Service (XaaS) is yet another service model, which includes Network-as-a-Service, Business-as-a-Service, Identity-as-a-Service, Database-as-a-Service or Strategy-as-a-Service.

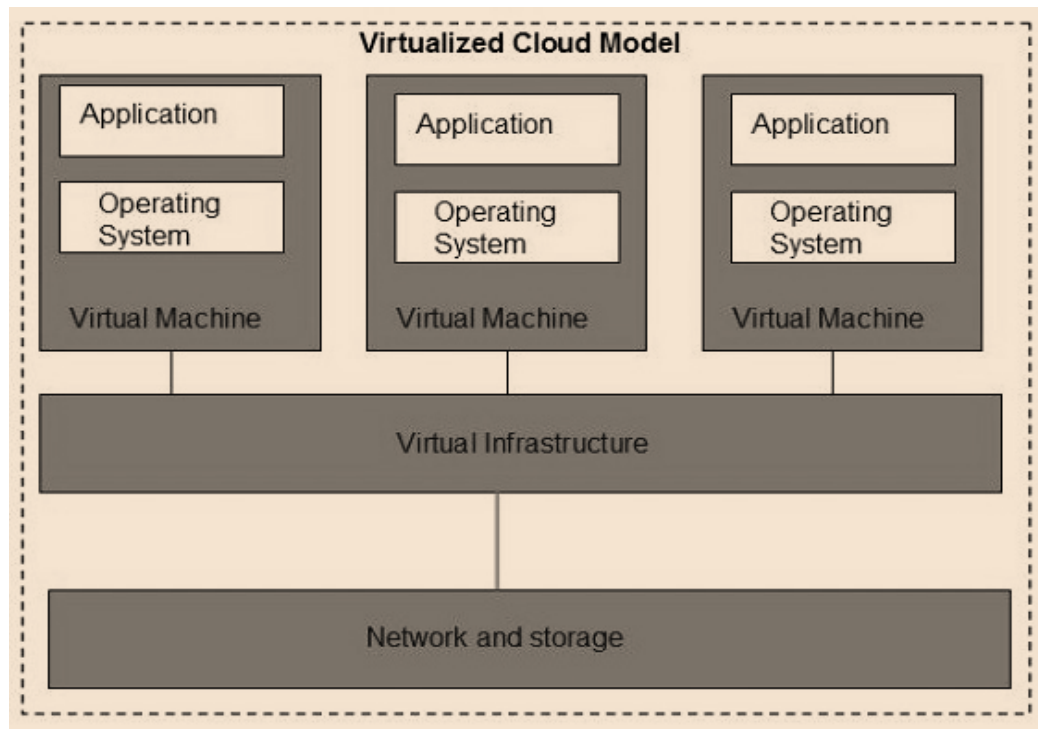# Differences between IaaS, PaaS, SaaS.
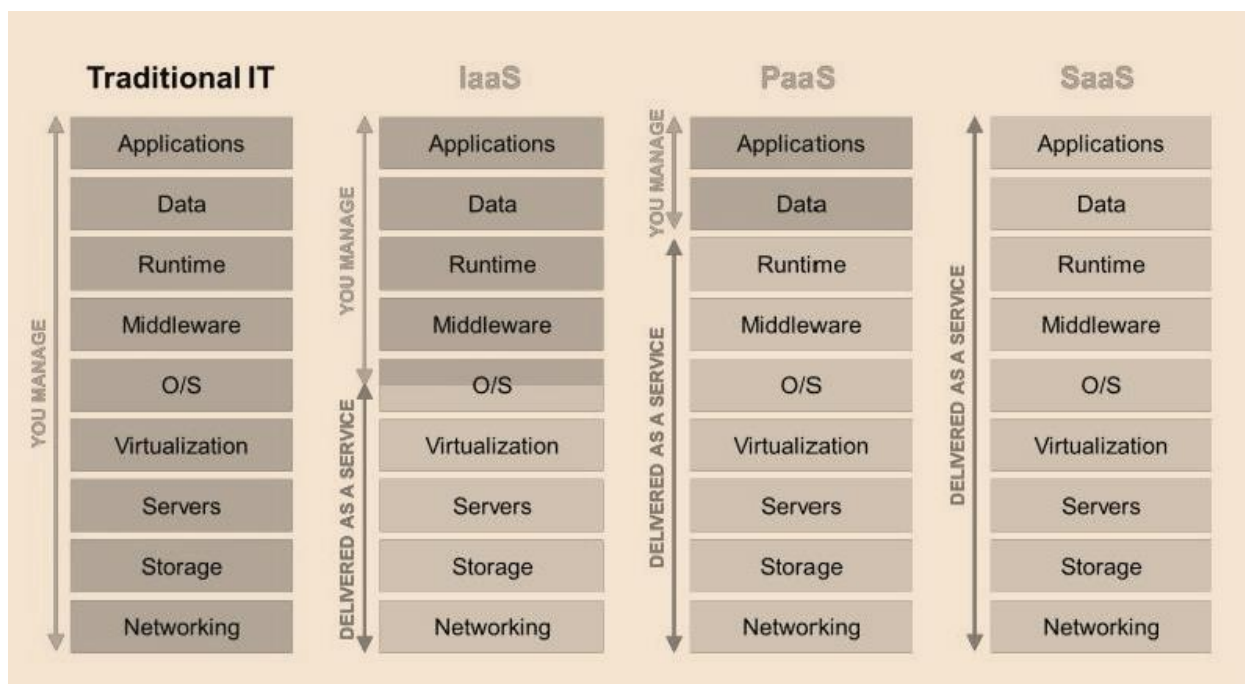
Virtualization

Virtualization is a technique, which allows to share single physical instance of an application or resource among multiple organizations or tenants (customers). It does this by assigning a logical name to a physical resource and providing a pointer to that physical resource when demanded.

The Multitenant architecture offers virtual isolation among the multiple tenants. Here multiple clients share the same infrastructure under different logical ids according to their requirement. Hence, the organizations can use and customize their application as though they each have their instances running.

Major Benefits of Cloud Computing:

- Lower Cost
- Lower Risks
- Higher profit margins

- Higher security
- Collaborative
- Better Performance

- Reliability
- Simplicity
- Scalability

Some misconceptions about Cloud Computing:

1. Cloud is not secure.
2. You lose control with the cloud.
3. We won't need PCs any more with cloud computing.
4. Cloud is not reliable.
5. The cloud will give you performance problems.