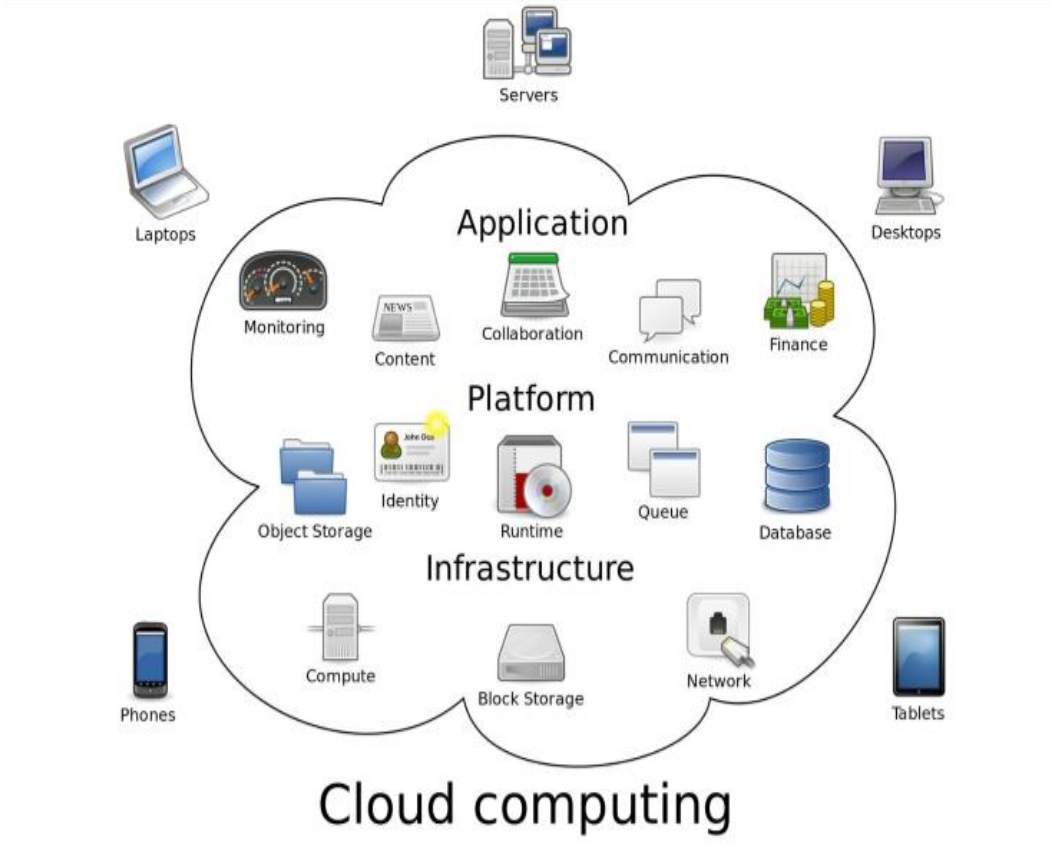
Class: 4th stage CS+IT **Subject: Lab I- Cloud Computing**

Experiment No. 1 Aim: To study in detail about cloud computing



Theory :

. 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 .

A Cloud is a type of parallel and distributed system consisting of a collection of inter-connected and virtualized computers that are

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dynamically provisioned and presented as one or more unified computing resource(s) based on service-level agreements established through negotiation between the service provider and consumers.

When you store your photos online instead of on your home computer, or use webmail or a social networking site, you are using a cloud computing service.

If you are in an organization, and you want to use, for example, an online invoicing service instead of updating the in-house one you have been using for many years, that online invoicing service is a —cloud computing service.

Cloud computing is the delivery of computing services over the Internet. Cloud services, Allow individuals and businesses to use software and hardware that are managed by third parties at remote locations. Examples of cloud services include online file storage, social networking sites, webmail, and online business applications. The cloud computing model allows access to information and computer resources from anywhere.

Cloud computing provides a shared pool of resources, including data storage space, networks, Computer processing power, and specialized corporate and user applications.

Architecture

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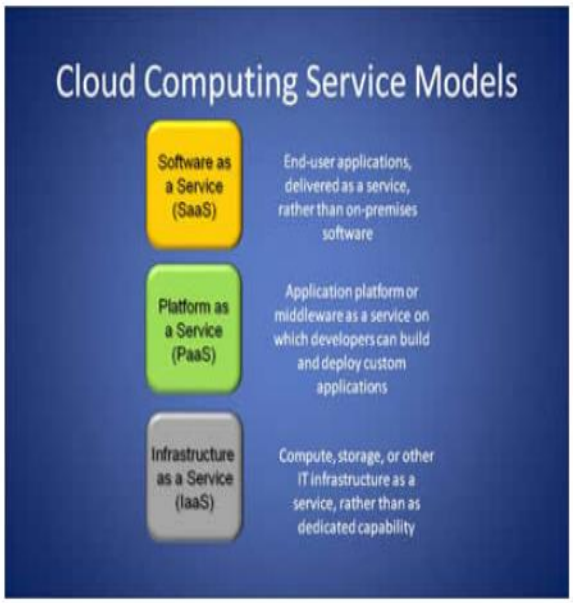
- Cloud Service Models
- Cloud Deployment Models

Service Models:



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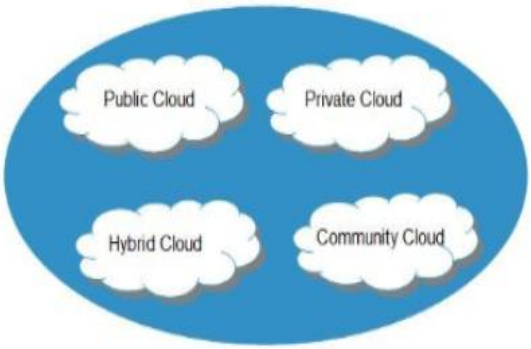
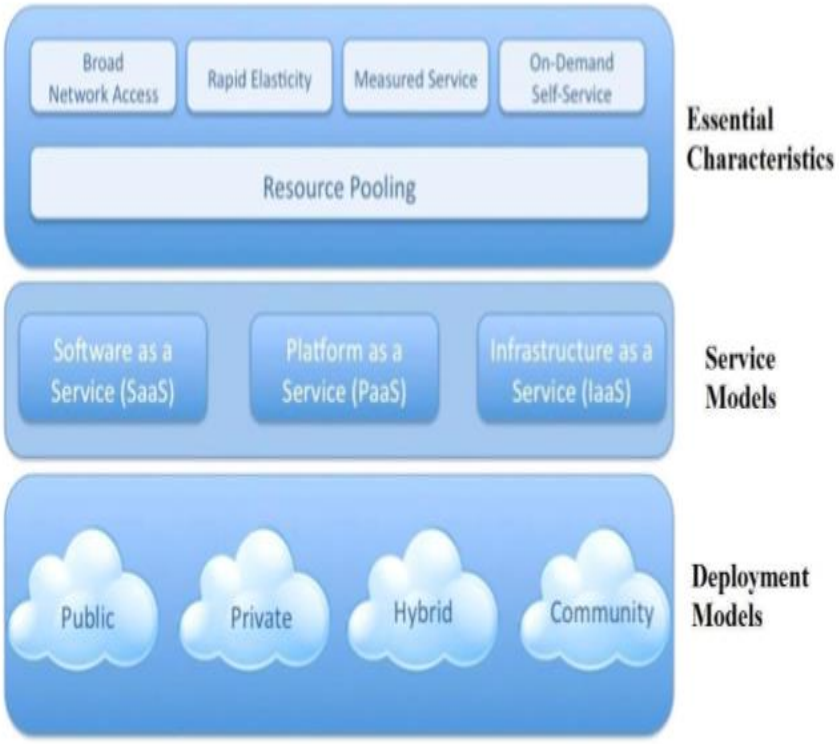
Deployment Models:



Essential Characteristics of Cloud Computing



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National Institute of Standards and technology (NIST)Visual Model of Cloud Computing Definition

Cloud Service Models

- Cloud Software as a Service (SaaS)
- Cloud Platform as a Service (PaaS)
- Cloud Infrastructure as a Service (IaaS)

Infrastructure as a Service (IaaS):--

- The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources.
- Consumer is able to deploy and run arbitrary software, which can include_operating systems and applications.
- The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems; storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

- **Platform as a Service (**PaaS**):--**

- The capability provided to the consumer is to deploy onto the cloud infrastructure consumer created or acquired applications created using programming languages and tools supported by the provider.
- The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and

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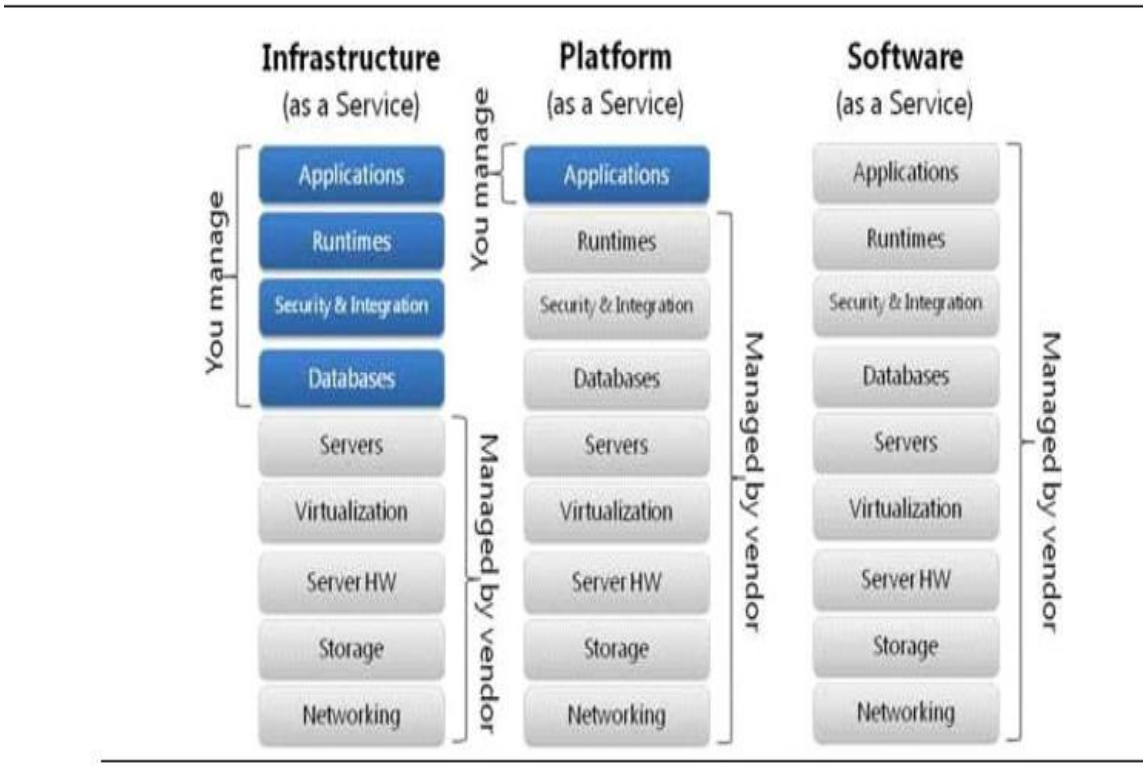
- Possibly application hosting environment configurations.



- **Software as a Service (SaaS):--**

- The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure.
- The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email).
- The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings.

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Cloud Deployment Models:

- Public
- Private
- Community Cloud
- Hybrid Cloud

- Public Cloud:The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

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- Private Cloud: The cloud infrastructure is operated solely for a single organization. It may be managed by the organization or a third party, and may exist on-premises or offpremises.
- Community Cloud:The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, or compliance considerations). It may be managed by the organizations or a third party and may exist on-premises or off-premises.
- Hybrid Cloud: The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or Proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

ESSENTIAL CHARACTERISTICS:--

- On-**demand** self-service:--A consumer can unilaterally provision computing capabilities such as server time and network storage as needed automatically, without requiring human interaction with a service provider.
- Broad network access:--Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client

- platforms (e.g., mobile phones, laptops, and PDAs) as well as other traditional or cloud based software services.
- Resource pooling:--The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources ,
- dynamically assigned and reassigned according to consumer demand.
- Rapid elasticity:

--Capabilities can be rapidly and elastically provisioned in some cases automatically - to quickly scale out; and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

- Measured service:--Cloud systems automatically control and optimize resource usage by leveraging a metering capability at some level of abstraction appropriate to the type of service. Resource usage can be monitored, controlled, and reported –
- providing transparency for both the provider and consumer of the service.

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