Unit-1: Fundamentals of Cloud Computing

Cloud Deployment Models

What is a Cloud Deployment Model?

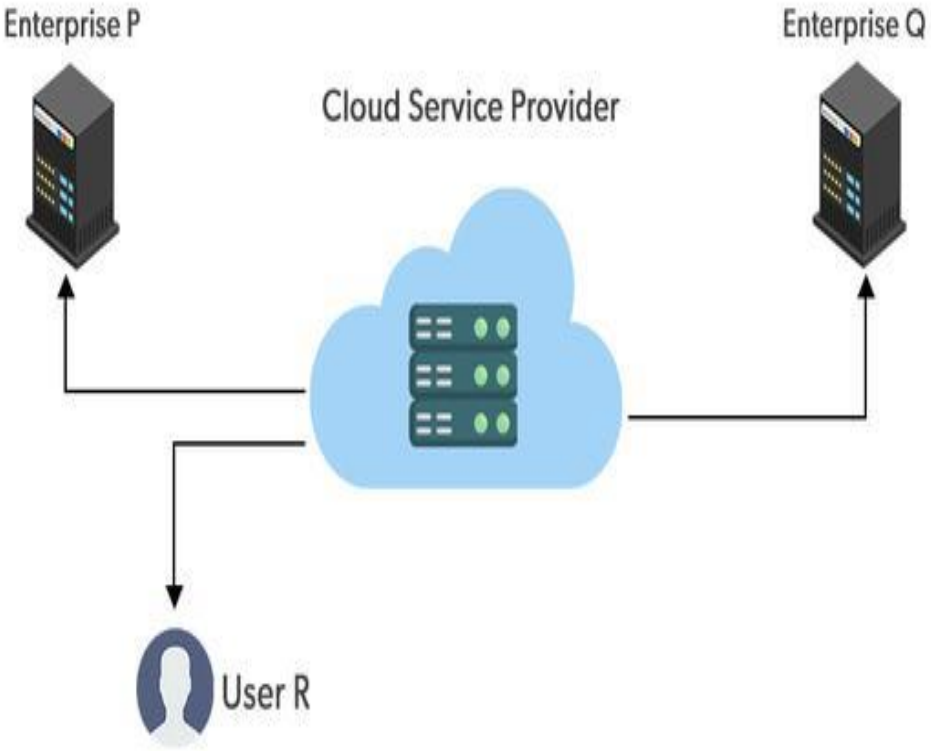
A cloud deployment model defines the specific type of cloud environment based on ownership, size, and access. It determines how and where the cloud infrastructure is located and managed, as well as who has access to it. The choice of a deployment model is crucial as it impacts the scalability, performance, cost, and security of the cloud services.

Different types of cloud computing deployment models are there:

- **Public Cloud**
- **Private Cloud**
- **Hybrid Cloud**
- **Community Cloud**

Public Cloud

- The public cloud makes it possible for anybody to access systems and services. The public cloud may be less secure as it is open to everyone.
- The public cloud is one in which cloud infrastructure services are provided over the internet to the general people or major industry groups.
- The infrastructure in this cloud model is owned by the entity that delivers the cloud services, not by the consumer. It is a type of cloud hosting that allows customers and users to easily access systems and services.
- This form of cloud computing is an excellent example of cloud hosting, in which service providers supply services to a variety of customers.
- In this arrangement, storage backup and retrieval services are given for free, as a subscription, or on a per-user basis. For example, Google App Engine etc.



Public Cloud

Advantages of the Public Cloud Model

- **Minimal Investment:** Because it is a pay-per-use service, there is no substantial upfront fee, making it excellent for enterprises that require immediate access to resources.

- **No setup cost:** The entire infrastructure is fully subsidized by the cloud service providers, thus there is no need to set up any hardware.

- **Infrastructure Management is not required:** Using the public cloud does not necessitate infrastructure management.

- **No maintenance:** The maintenance work is done by the service provider (not users).

- **Dynamic Scalability:** To fulfill your company's needs, on-demand resources are accessible.

Disadvantages of the Public Cloud Model

- **Less secure:** Public cloud is less secure as resources are public so there is no guarantee of high-level security.

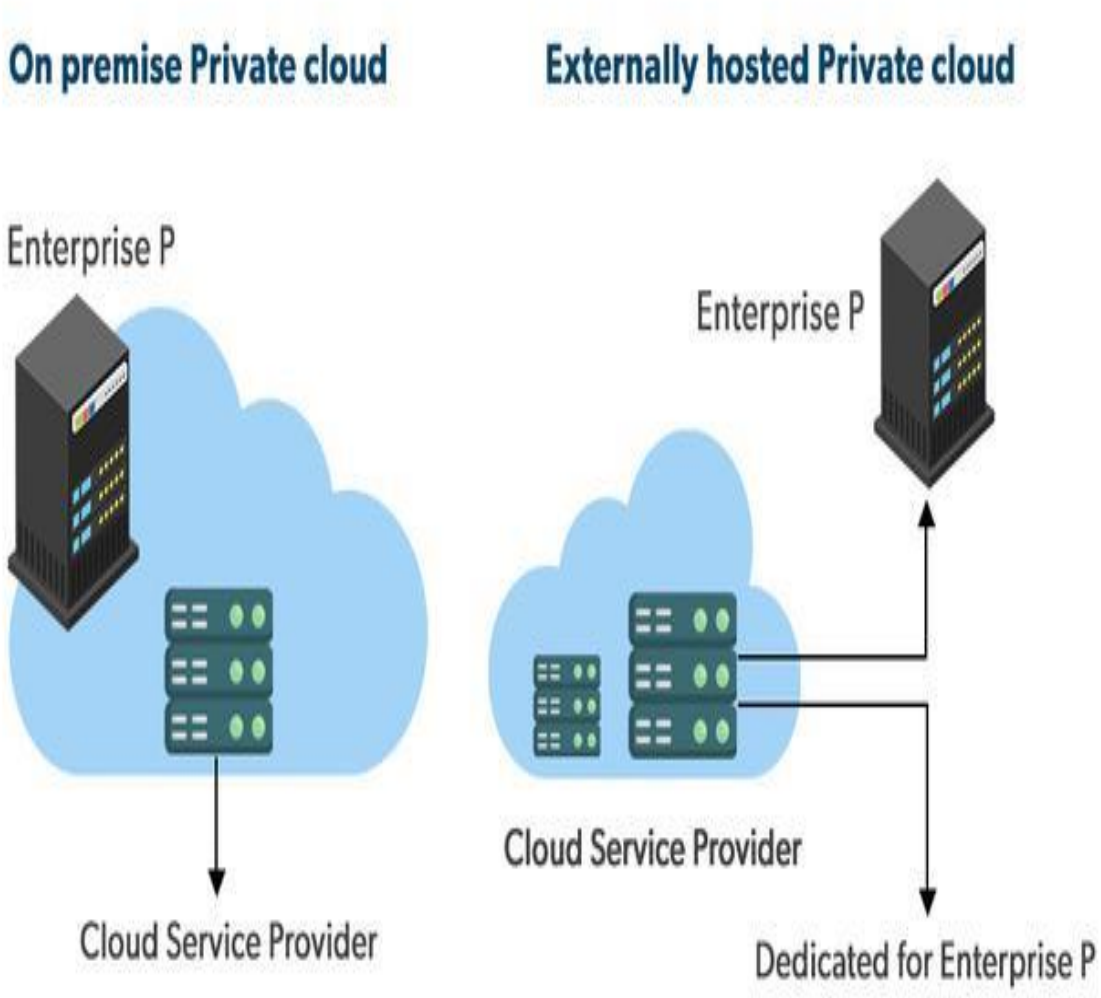
- **Low customization:** It is accessed by many public so it can't be customized according to personal requirements.

Private Cloud

- The private cloud deployment model is the exact opposite of the public cloud deployment model. It's a one-on-one environment for a single user (customer).

- There is no need to share your hardware with anyone else. The distinction between private and public clouds is in how you handle all of the hardware. It is also called the "internal cloud" & it refers to the ability to access systems and services within a given border or organization.

- The cloud platform is implemented in a cloud-based secure environment that is protected by powerful firewalls and under the supervision of an organization's IT department. The private cloud gives greater flexibility of control over cloud resources.



Private Cloud

Advantages of the Private Cloud Model

- **Better Control:** You are the sole owner of the property. You gain complete command over service integration, IT operations, policies, and user behavior.
- **Data Security and Privacy:** It's suitable for storing corporate information to which only authorized staff have access. By segmenting resources within the same infrastructure, improved access and security can be achieved.
- **Supports Legacy Systems:** This approach is designed to work with legacy systems that are unable to access the public cloud.
- **Customization:** Unlike a public cloud deployment, a private cloud allows a company to tailor its solution to meet its specific needs.

Disadvantages of the Private Cloud Model

- **Less scalable:** Private clouds are scaled within a certain range as there is less number of clients.
- **Costly:** Private clouds are more costly as they provide personalized facilities.

Differences between Public Cloud and Private Cloud

Public Cloud	Private Cloud
Cloud Computing infrastructure is shared with the public by service providers over the internet. It supports multiple customers i.e, enterprises.	Cloud Computing infrastructure is shared with private organizations by service providers over the internet. It supports one enterprise.
Multi-Tenancy i.e, Data of many enterprises are stored in a shared environment but are isolated. Data is shared as per rule, permission, and security.	Single Tenancy i.e, Data of a single enterprise is stored.

Public Cloud	Private Cloud
Cloud service provider provides all the possible services and hardware as the user-base is the world. Different people and organizations may need different services and hardware. Services provided must be versatile.	Specific services and hardware as per the need of the enterprise are available in a private cloud.
It is hosted at the Service Provider site.	It is hosted at the Service Provider site or enterprise.
It is connected to the public internet.	It only supports connectivity over the private network.
Scalability is very high, and reliability is moderate.	Scalability is limited, and reliability is very high.
Cloud service provider manages the cloud and customers use them.	Managed and used by a single enterprise.
It is cheaper than the private cloud.	It is costlier than the public cloud.
Security matters and dependent on the service provider.	It gives a high class of security.
Performance is low to medium.	Performance is high.
It has shared servers.	It has dedicated servers.
Example: Amazon web service (AWS) and Google AppEngine etc.	Example: Microsoft KVM, HP, Red Hat & VMWare etc.