Cloud Computing Deployment Models (Types of Clouds):
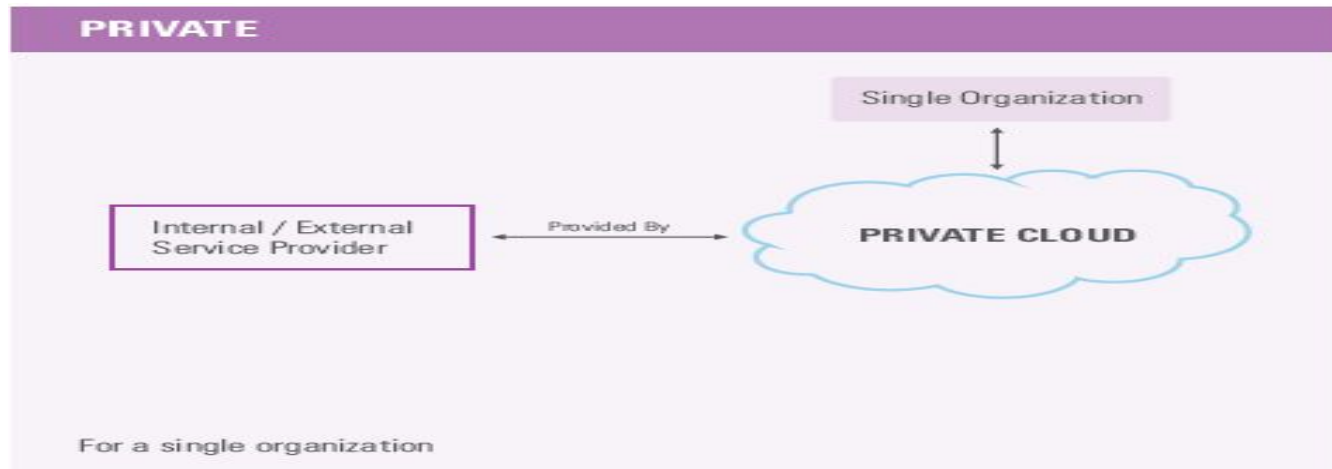
There are four cloud computing deployment models:

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

Cloud Computing Deployment Models Cont….

1. Private Cloud:

PRIVATE

Single Organization

Internal / External Service Provider — Provided By → PRIVATE CLOUD

For a single organization

- The cloud infrastructure is operated solely for an organization.

- The cloud infrastructure is provisioned for exclusive use by a single organization. It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises.

- A private cloud enables enterprises to implement cloud computing solution at either their own site or at service provider's datacenter.

- Two private cloud scenarios exist:
    i. On-site Private Cloud   ii. Outsourced Private Cloud

Cloud Computing Deployment Models Cont….

1. Private Cloud Cont….

i. On-site Private Cloud:

- It is a private cloud implemented at a customer's premises.

- On-site private cloud requires to setup cloud infrastructure within subscriber's organization for providing cloud services internally.

- On-site private clouds are perceived to be more protected because they are in-house and managed by the organization's IT department.

- Subscriber organizations will need the traditional IT skills required to manage user devices that access the private cloud, and will require cloud IT skills as well.

- One of the leading benefits of an on-site private cloud solution is that organization get complete control on security, scalability, and configurability of private cloud. However, organization is limited to the option of scalability depending on the size of current infrastructure.

Cloud Computing Deployment Models Cont….

1. Private Cloud Cont….

i. On-site Private Cloud Cont….

- Deploying on-site private cloud, client organization need to take full responsibility for costs and maintenance.

- In an on-site private cloud, a subscriber can implement strong security perimeter to protect private cloud resources against external threats.

ii. Outsourced Private Cloud:

- It is a private clouds where the server side is outsourced to a hosting company.

- In the outsourced private cloud scenario, the resources are provisioned by the provider.

- In the outsourced private cloud scenario, subscribers may have an option to provision unique protected and reliable communication links with the provider.

Cloud Computing Deployment Models Cont….

1. Private Cloud Cont….

ii. Outsourced Private Cloud Cont….

- On-demand bulk data import/export is limited by the network capacity between a provider and subscriber, and real-time or critical processing may be problematic because of networking limitations.

- In case of outsourced private cloud, subscriber has to negotiate SLA, upgrade the network to connect to the outsourced private cloud, switch from traditional applications to cloud-hosted applications, port existing non-cloud operations to the cloud.

- In the case of the outsourced private cloud, a subscriber can rent resources in any quantity offered by the provider.
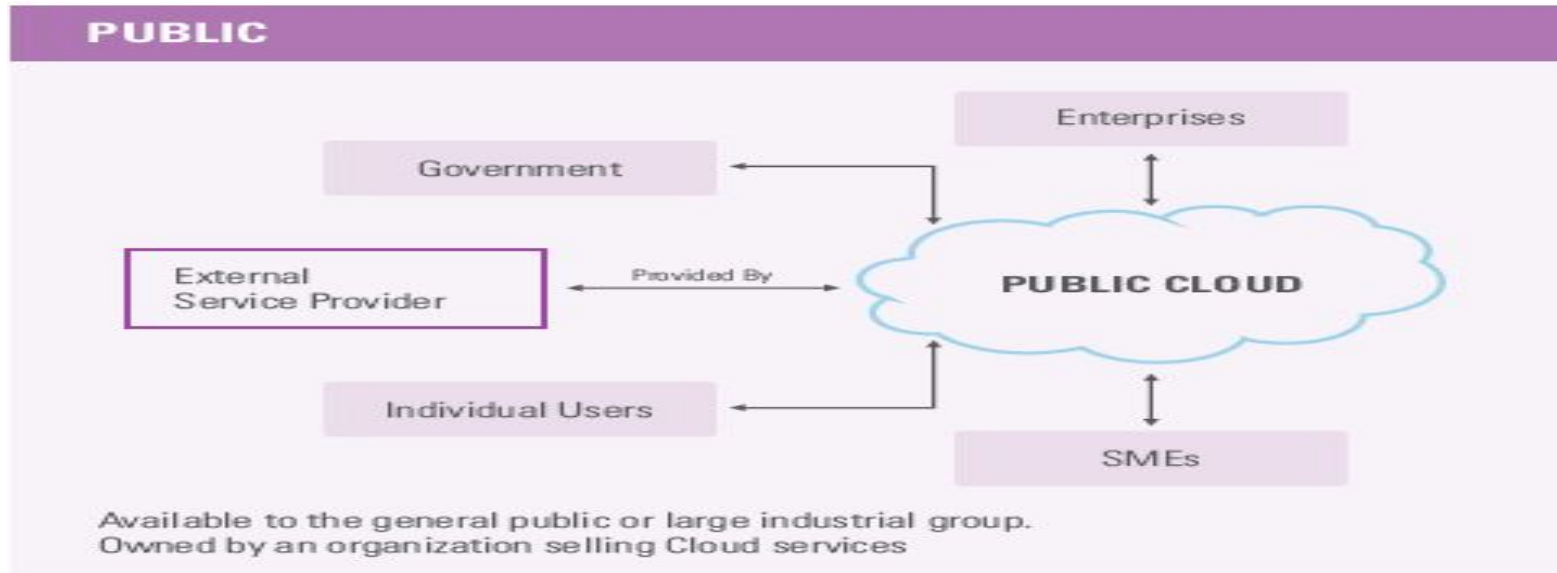
Examples of private cloud:

Eucalyptus, Ubuntu Enterprise Cloud, Amazon VPC, VMware Cloud Infrastructure Suite, Microsoft ECI data center.

Cloud Computing Deployment Models Cont….

2. Public Cloud:

PUBLIC

Government

Enterprises

External Service Provider → Provided By → **PUBLIC CLOUD**

Individual Users

SMEs

Available to the general public or large industrial group.
Owned by an organization selling Cloud services

- The cloud infrastructure is made available to the general public.

- A public cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, or government organization, or some combination of them. It exists on the premises of the cloud provider.

- A public cloud enables organizations to use infrastructure and applications via the Internet that reside in the cloud.

Cloud Computing Deployment Models Cont….

2. Public Cloud Cont….

- End users without actually possessing the resources can gain access to them easily on demand via a Web browser from a laptop or a terminal.

- The provider's computing and storage resources are potentially large; the communication links are implemented over the public Internet; and the cloud serves a diverse pool of clients.

- In public cloud scenario, a provider may migrate a subscriber's processing or data, anywhere at any time.

- A single machine may be shared by the processing and data of any combination of subscribers.

- Public clouds are generally unrestricted in their location or size.

- As compared to private cloud, public cloud involves low up-front costs to migrate into the cloud environment.

- As compared to private cloud provider, under SLA, public cloud provider makes limited promises to subscriber.

Cloud Computing Deployment Models Cont….

2. Public Cloud Cont….

Examples of Public Cloud:

Google App Engine,

MS Windows Azure,

IBM Smart Cloud,

Amazon EC2,

Google Docs,

Google Spreadsheets.

Cloud Computing Deployment Models Cont….

3. Community Cloud:

☐ The cloud infrastructure is shared by several organizations and supports a specific goal.

☐ Cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns. It may be owned, managed, and operated by one or more of the organizations in the community, a third party, or some combination of them, and it may exist on or off premises.

☐ There are two types of community clouds:

    i. On-site Community Cloud

    ii. Outsourced Community Cloud

Cloud Computing Deployment Models Cont….

3. Community Cloud Cont….

i. On-site Community Cloud:

- Community cloud is made up of a set of participant organizations. Each participant organization may provide cloud services, consume cloud services, or both.

- At least one organization must provide cloud services.

- Each organization implements a security perimeter.

- Access policy of a community cloud may be complex. For example: if there are N community members, a decision must be made, on how to share a member's local cloud resources with each of the other members.

- The subscribers in an on-site community cloud need to either provision controlled communication links or use cryptography over a less controlled communications media.

- The reliability and security of the community cloud depends on the reliability and security of the communication links.

Cloud Computing Deployment Models Cont….

3. Community Cloud Cont….

i. On-site Community Cloud Cont….

- Organizations in the community that provides cloud resources, requires higher IT skills as compared to on-site private cloud as overall cloud configuration becomes complex.

- The up-front costs of an on-site community cloud for a participant organization depend on whether the organization consumes cloud services or also provide cloud services.

ii. Outsourced Community Cloud:

- Community cloud infrastructure is implemented at service provider's premises.

- One or more organizations having common business goals use the common services and infrastructure provisioned by community cloud service provider.

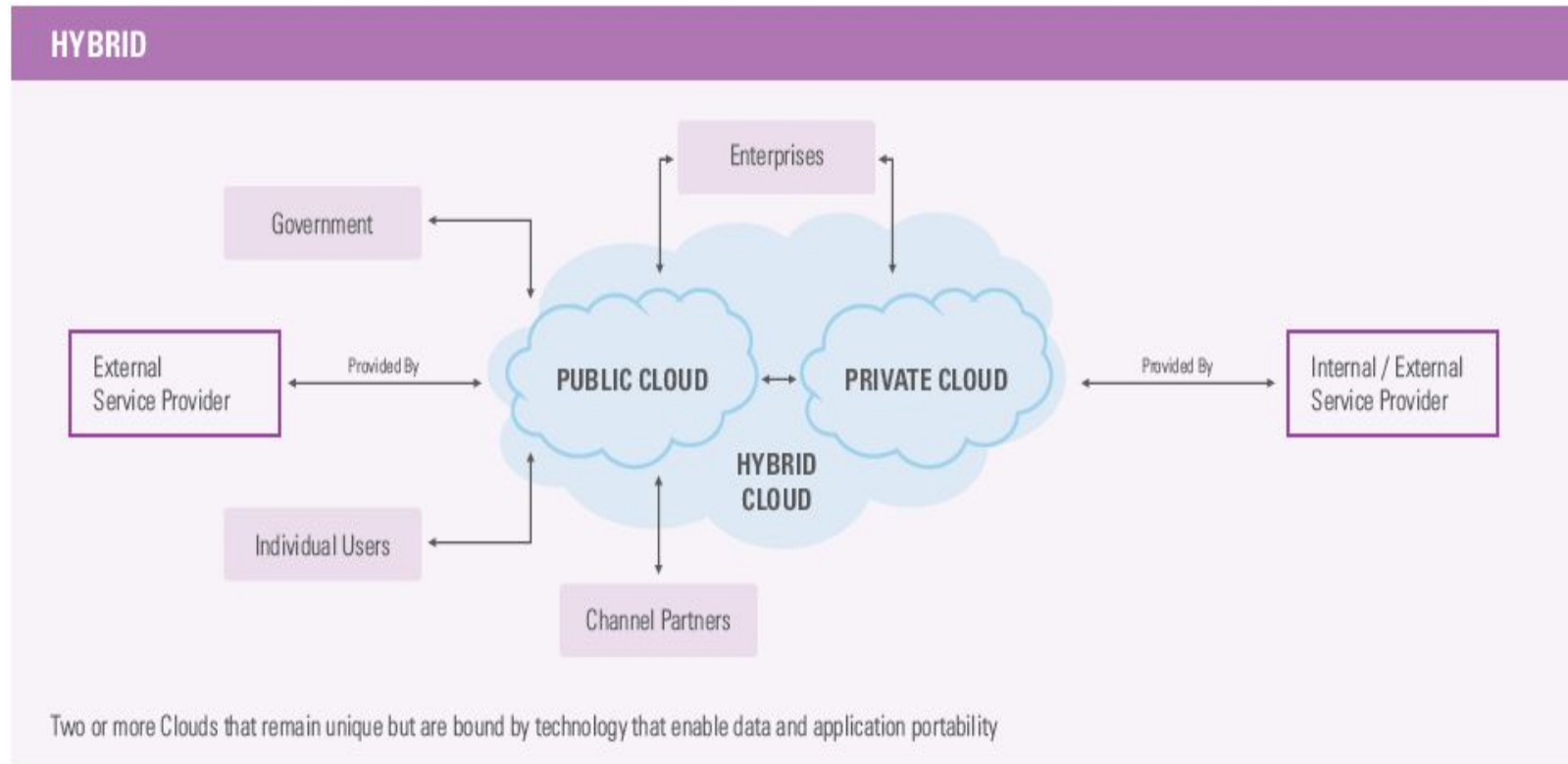# Cloud Computing Deployment Models Cont….

3. Community Cloud Cont….

ii. Outsourced Community Cloud Cont….

- Outsourced community cloud has two security perimeters, one implemented by subscriber organization and one implemented by a provider organization.

- On-demand bulk data import/export is limited by the network capacity between a provider and subscriber organizations, and real-time or critical processing may be problematic because of networking limitations.

- In case of outsourced community cloud, subscriber has to negotiate SLA, upgrade the network to connect to the outsourced community cloud, switch from traditional applications to cloud-hosted applications, port existing non-cloud operations to the cloud.

Cloud Computing Deployment Models Cont….

4. Hybrid Cloud:

HYBRID

Enterprises

Government

External Service Provider — Provided By → **PUBLIC CLOUD** ↔ **PRIVATE CLOUD** ← Provided By → Internal / External Service Provider

HYBRID CLOUD

Individual Users

Channel Partners

Two or more Clouds that remain unique but are bound by technology that enable data and application portability

- A hybrid cloud is composed of two or more private, community, or public clouds.

- They have significant variations in performance, reliability, and security properties depending upon the type of cloud chosen to build hybrid cloud.

Cloud Computing Deployment Models Cont….

4. Hybrid Cloud Cont….

- The hybrid cloud infrastructure bound together by standardized technology that enables data and application portability.

- A hybrid cloud can be extremely complex.

- A hybrid cloud may change over time with constituent clouds joining and leaving.
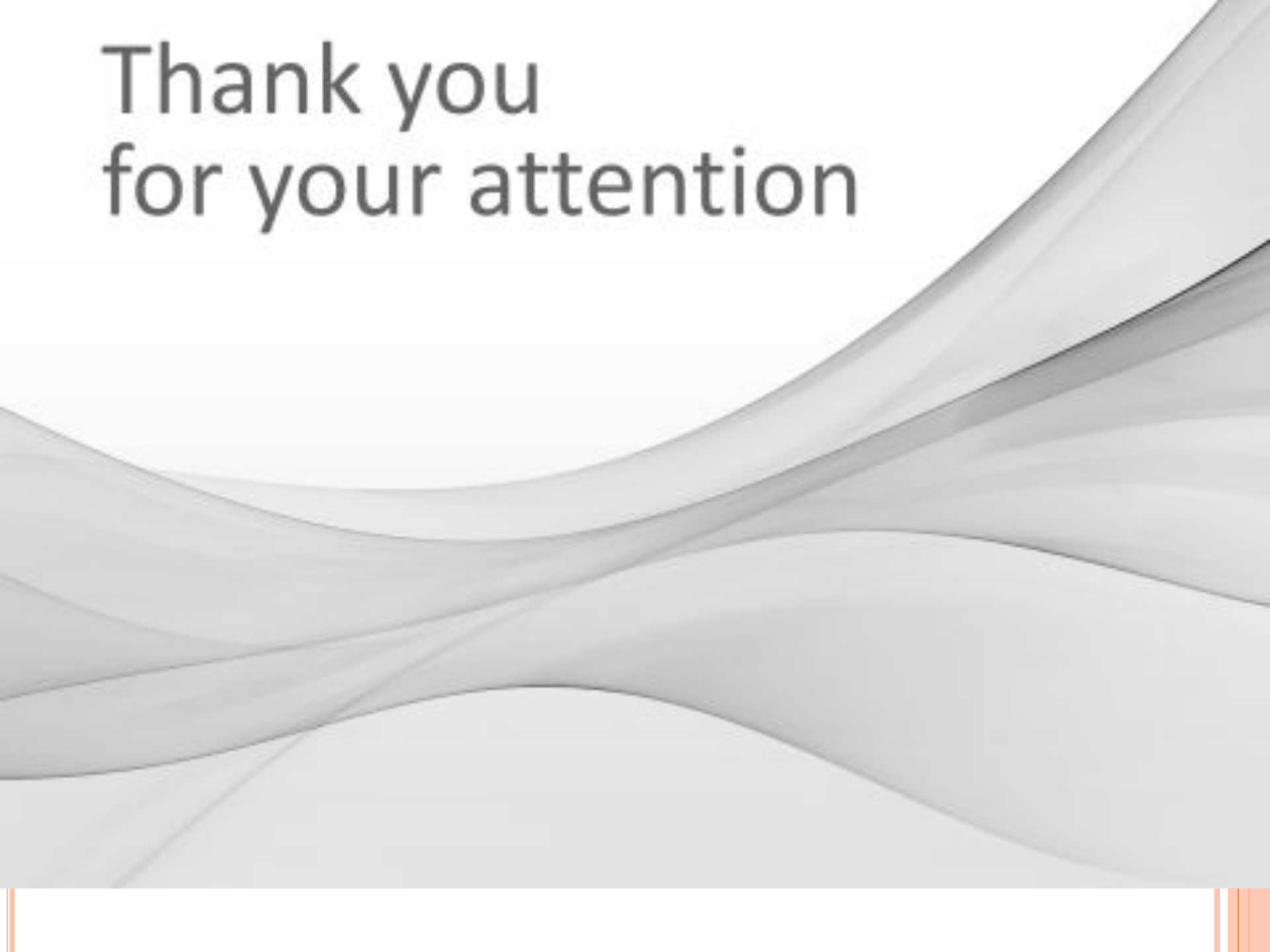
Examples of Hybrid Cloud:

Windows Azure

VMware vCloud

Thank you
for your attention