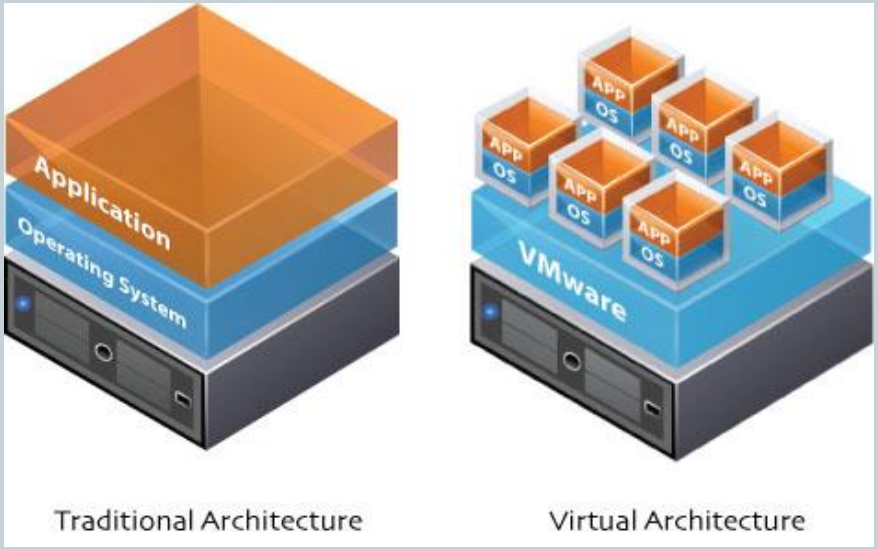
Cloud Computing

MODULE CODE:CIS435
MODULE NAME: CLOUD COMPUTING
MODULE TEACHER: MD. MINHAJ HOSEN

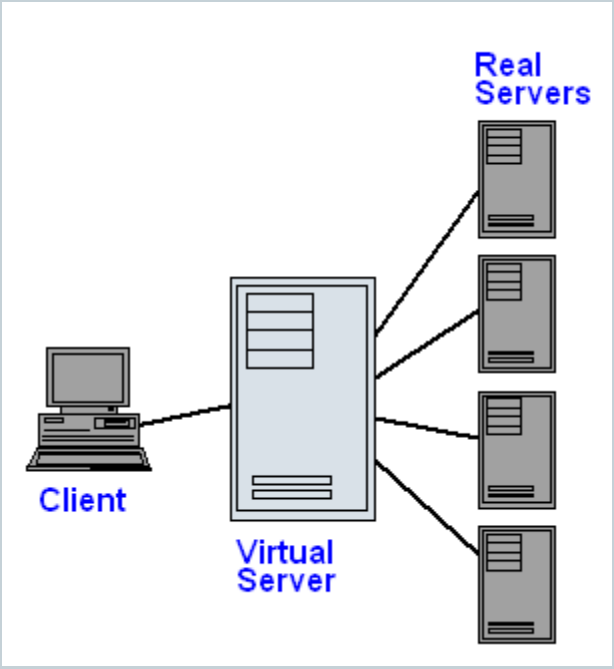
What is Cloud Computing?

Cloud computing is Internet based computing where virtual shared servers provide software, infrastructure, platform, devices and other resources and hosting to customers on a pay-as-you-use basis.



Traditional Architecture

Virtual Architecture

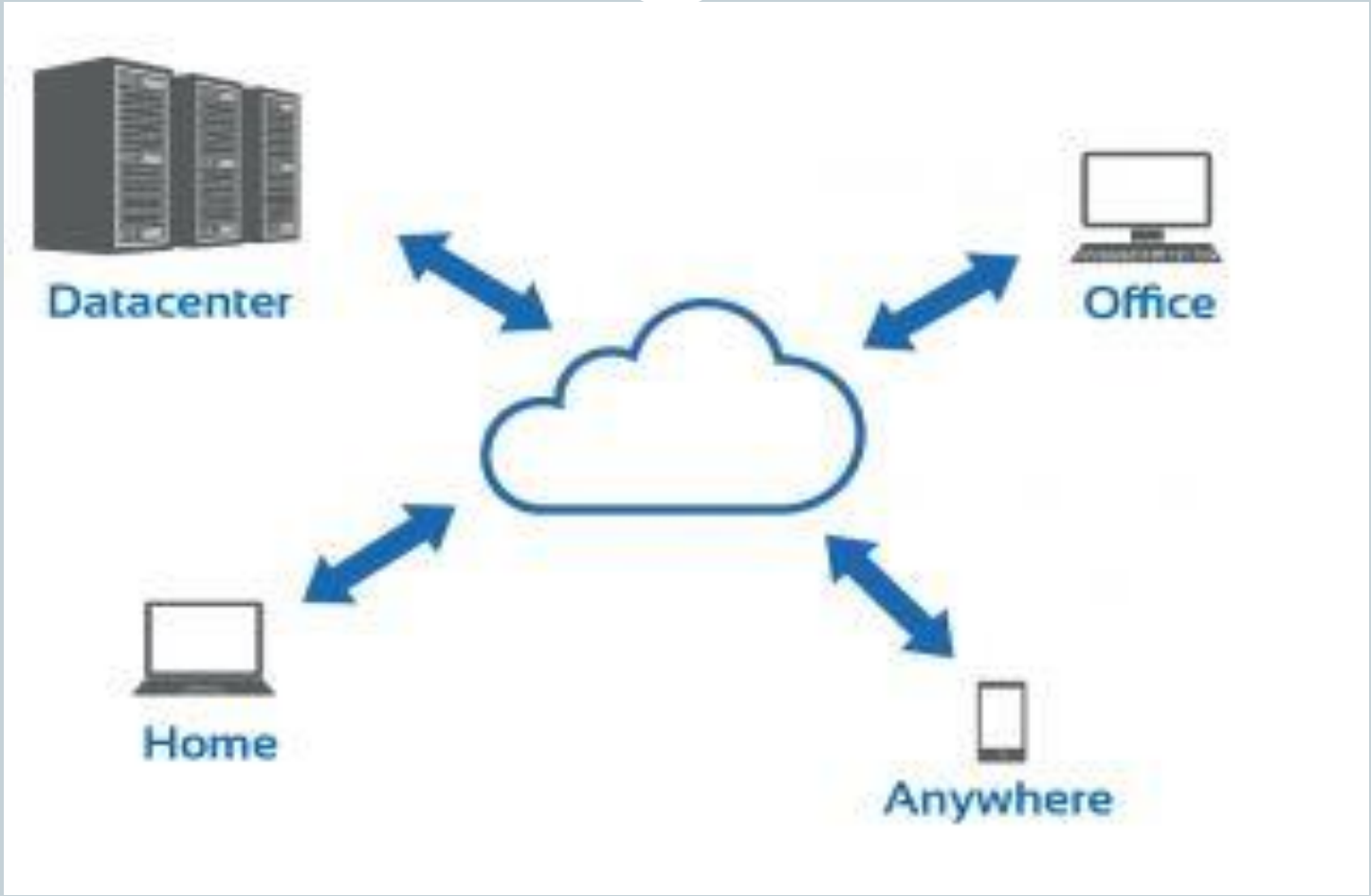


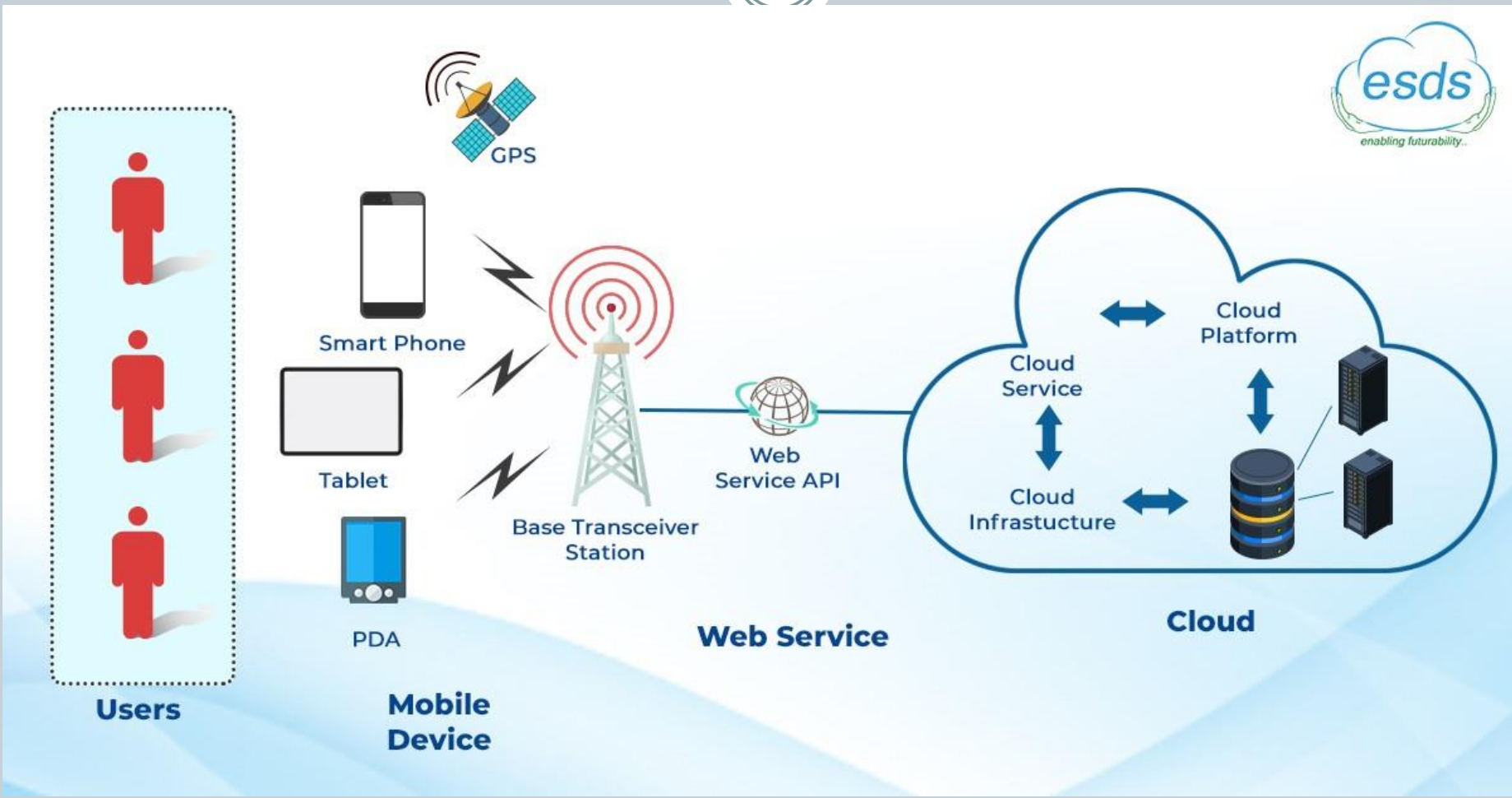
Facebook Data Center

Access to Cloud Computing-1

All information that a digitized system has to offer is provided as a service in the cloud computing model. Users can access these services available on the "Internet cloud" without having any previous know-how on managing the resources involved.

Access to Cloud Computing-2



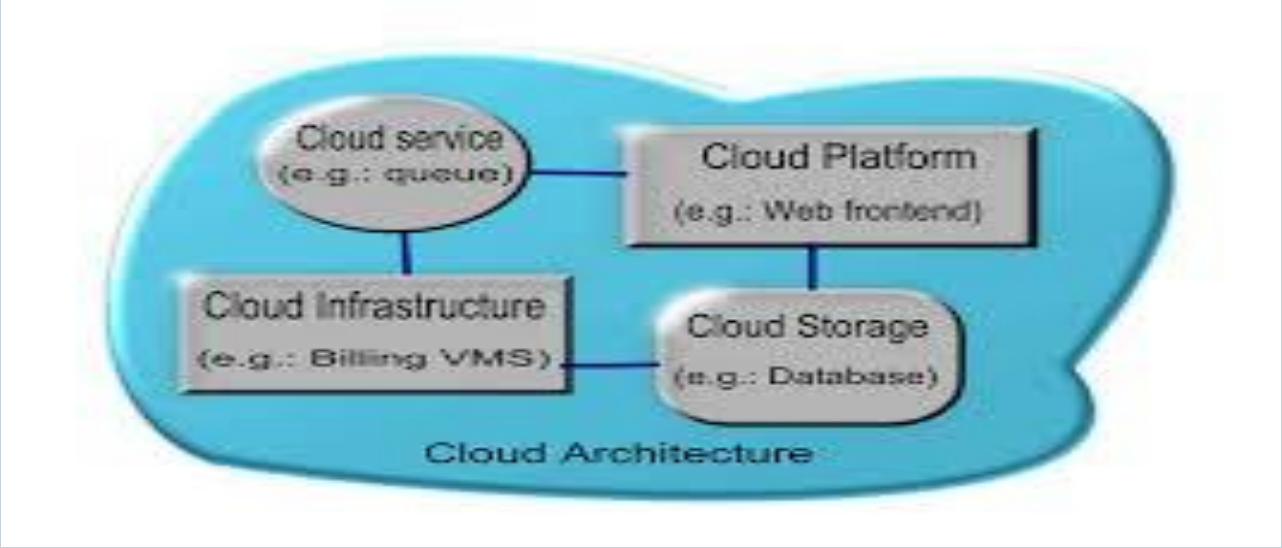

esds
enabling futurability..
GPS
Smart Phone
Tablet
PDA
Base Transceiver Station
Web Service API
Cloud Platform
Cloud Service
Cloud Infrastucture
Users
Mobile Device
Web Service
Cloud

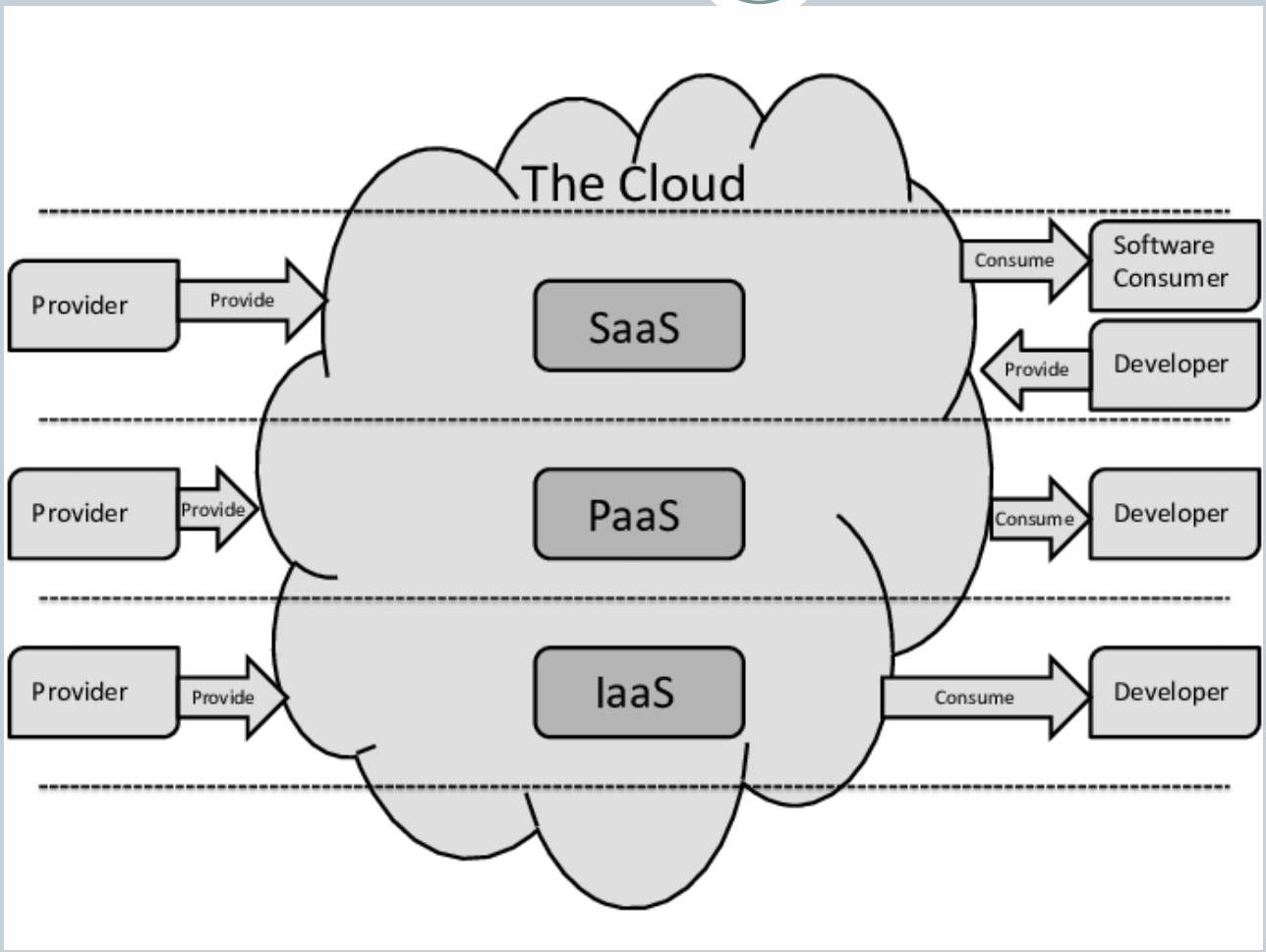
History

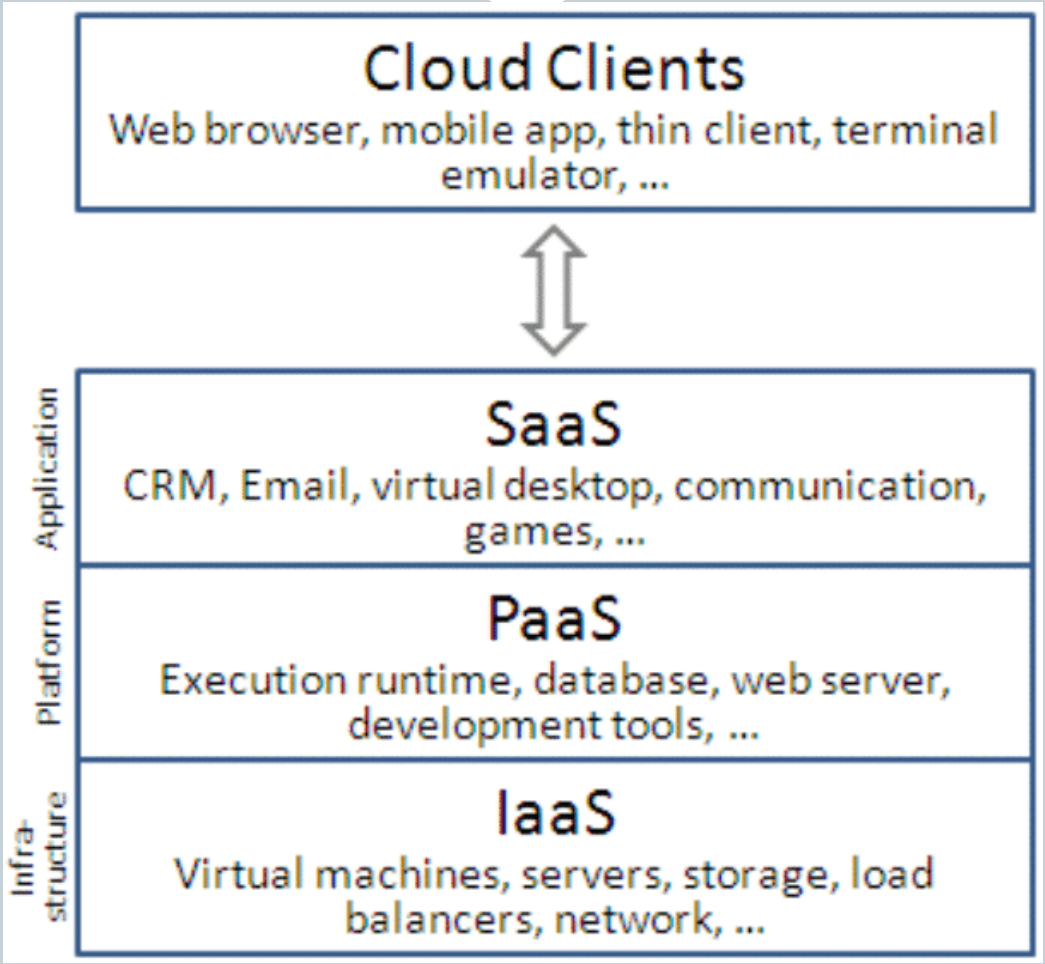
- Concept originated from telecommunication companies changing to VPN
- 1999:Salesforce. com - Delivery of applications via web
- 2002: Amazon launches Amazon Web Services (AWS)
- 2006: Google Docs, Amazon Elastic Compute Cloud (EC2)
- 2008: Eucalyptus
- 2009: Microsoft Azure

Architecture

- Cloud architecture, the systems architecture of the software systems involved in the delivery of cloud computing, typically involves multiple cloud components communicating with each other over application programming interfaces, usually web services.

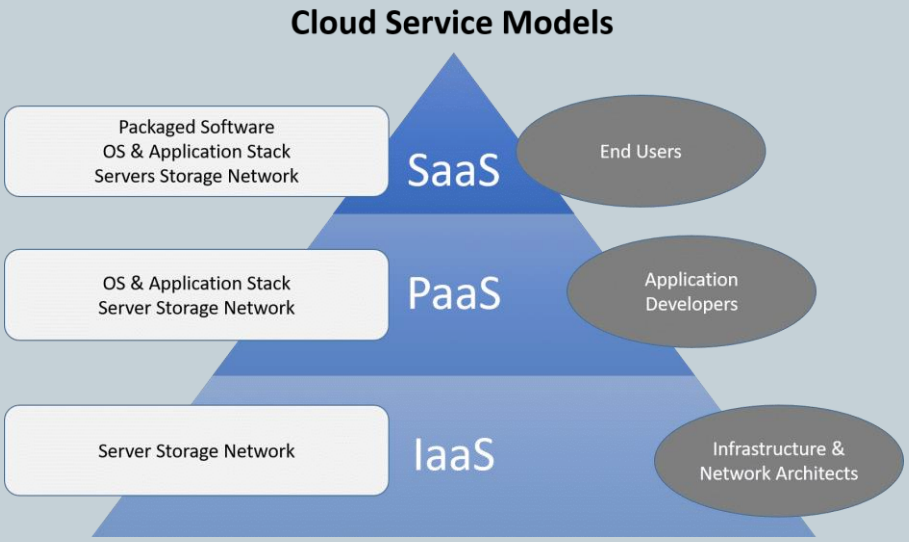



The Cloud
Provider
Provide
SaaS
Consume
Software Consumer
Provide
Developer
Provider
Provide
PaaS
Consume
Developer
Provider
Provide
IaaS
Consume
Developer


Cloud Clients
Web browser, mobile app, thin client, terminal emulator, ...
Application
SaaS
CRM, Email, virtual desktop, communication, games, ...
Platform
PaaS
Execution runtime, database, web server, development tools, ...
Infra-structure
IaaS
Virtual machines, servers, storage, load balancers, network, ...

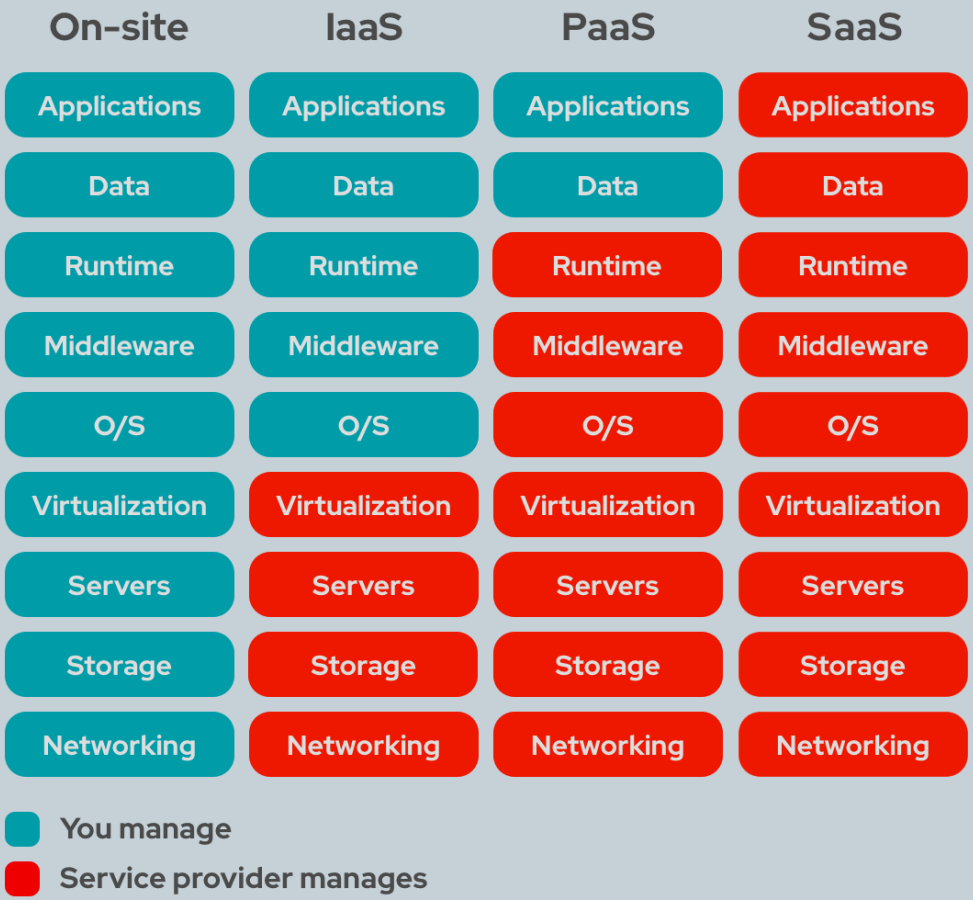
Cloud Components

- **SaaS (software as a service):** SaaS refers to software that's made available as a web-based service.
- **Utility computing:** The predecessor of cloud computing, utility computing provides the ability to access storage and virtual servers on demand.
- **Cloud-based web services:** Similar to Saas, web services in the cloud allow you to offer services online, such as credit card processing services, employee payroll processing or viewing an interactive map.
- **MSP (managed service providers):** The grandfather of cloud computing, an MSP delivers applications to IT instead of end-users.
- **IaaS (infrastructure as a service):** IaaS refers to computer infrastructure (e.g., virtualization) that's delivered as a service.



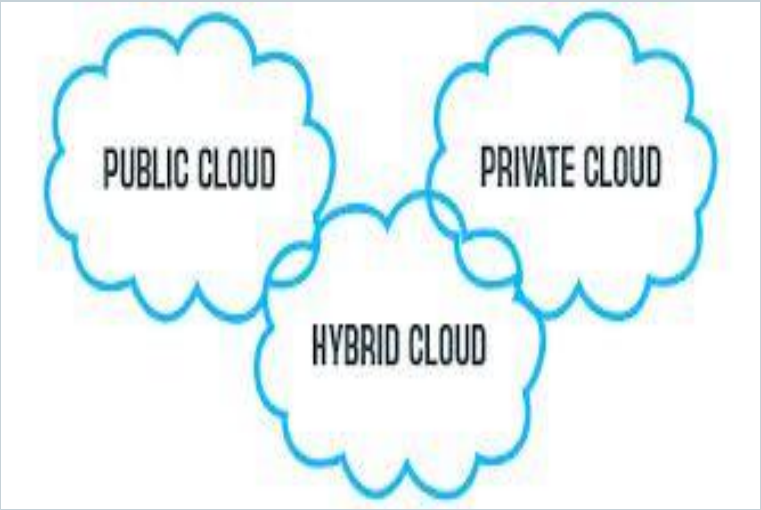
SaaS Enablement	Marketplace Custom Packaging Premium CDN & DNS Built-In Billing	Cloud Scripting, WHMCS, verizon, CloudBlue
PaaS Management	App Deployment Auto-Scaling & Clustering CI/CD Automation Container Orchestration	GitHub, GitLab, kubernetes, docker
IaaS Optimization	Containers Virtual Machines Network Storage	Virtuozzo, KVM, OPEN CONTAINER INITIATIVE, ceph, openstack

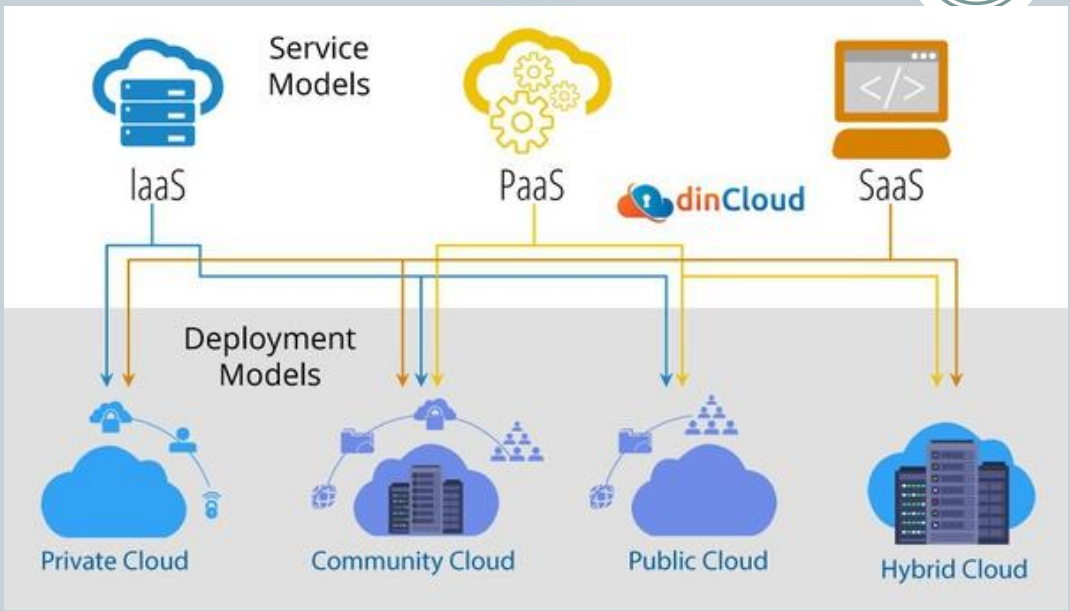
Access Level

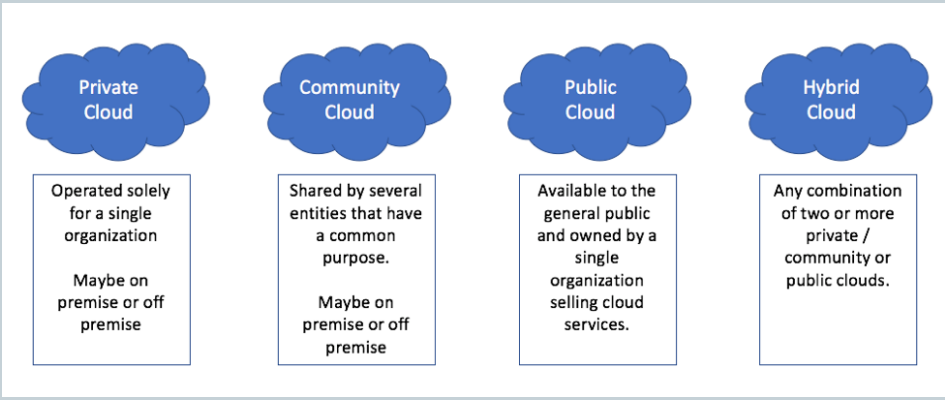


Cloud Deployment Models

Cloud deployment refers to the enablement of SaaS (software as a service), PaaS (platform as a service) or IaaS (infrastructure as a service) solutions that may be accessed on demand by end users or consumers. A cloud deployment model refers to the type of cloud computing architecture a cloud solution will be implemented on. Cloud deployment includes all of the required installation and configuration steps that must be implemented before user provisioning can occur.




Service Models
IaaS
PaaS
dinCloud
SaaS
Deployment Models
Private Cloud
Community Cloud
Public Cloud
Hybrid Cloud


Private Cloud
Operated solely for a single organization
Maybe on premise or off premise
Community Cloud
Shared by several entities that have a common purpose.
Maybe on premise or off premise
Public Cloud
Available to the general public and owned by a single organization selling cloud services.
Hybrid Cloud
Any combination of two or more private / community or public clouds.

Public Cloud

- Public clouds are made available to the general public by a service provider who hosts the cloud infrastructure. Generally, public cloud providers like Amazon AWS, Microsoft and Google own and operate the infrastructure and offer access over the Internet.
- With this model, customers have no visibility or control over where the infrastructure is located.
- It is important to note that all customers on public clouds share the same infrastructure pool with limited configuration, security protections and availability variances.

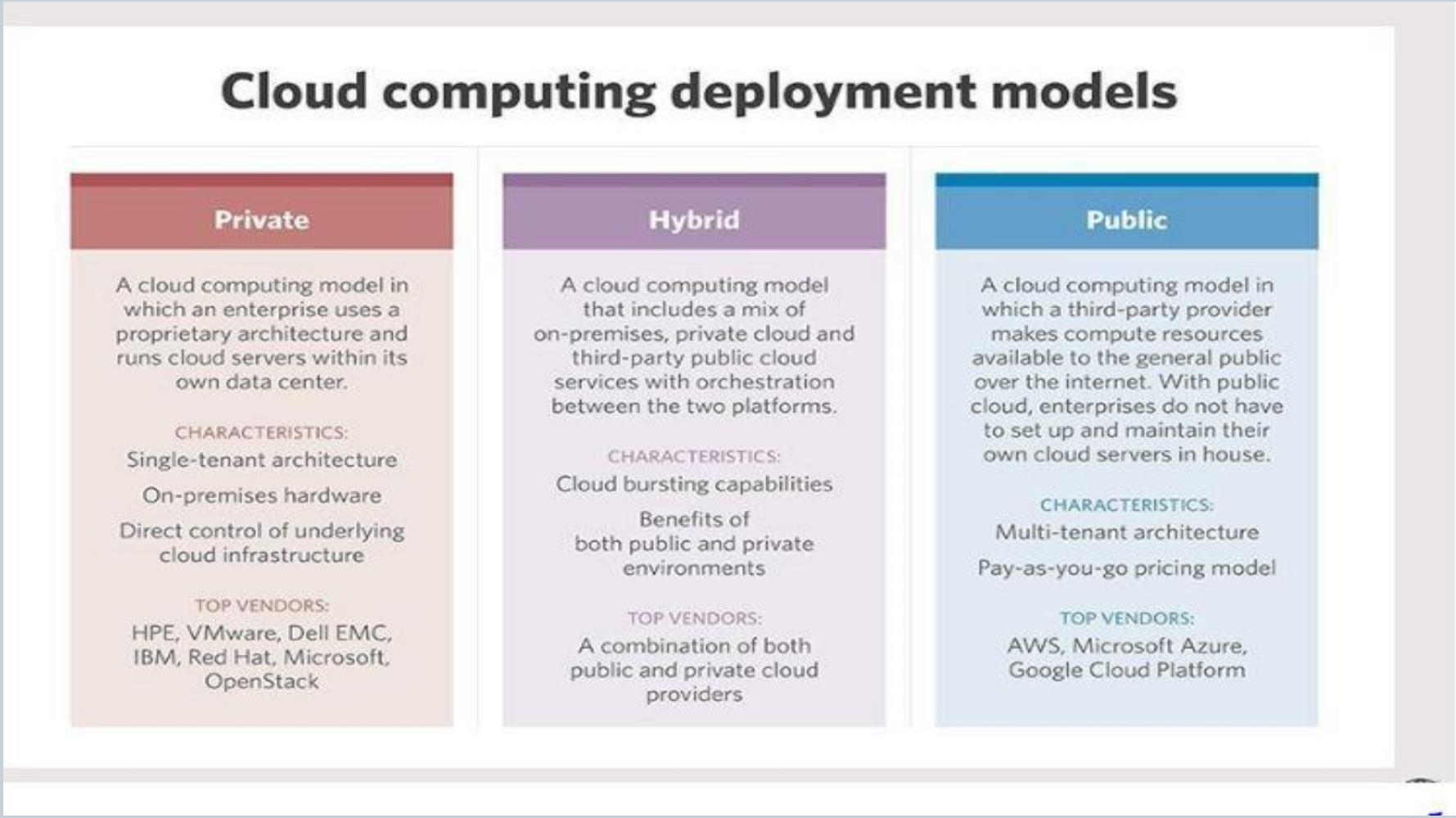
Private Cloud

- Private cloud is cloud infrastructure dedicated to a particular organization. Private clouds allow businesses to host applications in the cloud, while addressing concerns regarding data security and control, which is often lacking in a public cloud environment.
- It is not shared with other organizations, whether managed internally or by a third-party, and it can be hosted internally or externally.

Hybrid Cloud

- Hybrid Clouds are a composition of two or more clouds (private, or public) that remain unique entities but are bound together offering the advantages of multiple deployment models.
- In a hybrid cloud, you can leverage third party cloud providers in either a full or partial manner; increasing the flexibility of computing.
- Augmenting a traditional private cloud with the resources of a public cloud can be used to manage any unexpected surges in workload.

Summary of Deployment Models



Advantages of Cloud Computing

- **Increased Storage Capacity :**Increased Storage Capacity is another benefit of the cloud computing, as it can store more data as compared to a personal computer.
- **Easy to Learn and Understand**: Since people are quiet used to cloud applications like GMail, Google Docs, so anything related to the same is most likely to be understood by the users.
- **Automatic Updating :**It saves companies time and effort to update multiples server.
- **Customize Setting :**Cloud computing also allows you to customize your business applications.

Disadvantages of Cloud Computing

- **Dependency** :One major disadvantages of cloud computing is user's dependency on the provider.
- **Risk** :Cloud computing services means taking services from remote servers.
- **Requires a Constant internet connection** :The most obvious disadvantage is that Cloud computing completely relies on network connections.
- **Security :**Security and privacy are the biggest concerns about cloud computing.
- **Migration Issue :**Migration problem is also a big concern about cloud computing.