Date :..............................

Introduction to Cloud Computing:

cloud computing is the delivery of computing Services. Including servers storage database networking software over the Internet is called cloud computing.

In other words If you want any services Then vendor provides the services Through the internet so we can make to use the services for long as we want by paying money.

That means cloud computing is a renting the services and use it and pay the money.

Definition of cloud computing

cloud computing is a technology that provides computing resources such as servers storage Databases networking software and applications over the internet on a pay-as-you-use basis without the need to own or manage physical hardware

(or)

cloud computing means using computers and software through the internet instead of using your own computer or server

Example: Google Drive, Gmail, Amazon web services (AWS) Microsoft Azure

Differences between cloud computing and Grid computing

Cloud computing

→ cloud computing is client server architecture

→ It Provides computing resources as services over the internet

→ The users pay for the use

→ It is highly accessible service

→ It is highly scalable compared to grid computing

→ It uses virtualization extensively

→ Resources are owned managed by cloud service Provides

→ It supports on demand self-service

→ High availability with backup and fault tolerance

Example: Amazon web services (AWS) Google Drive, Microsoft Azure

Grid computing

→ Grid computing is Distributed computing architecture

→ It Provides Resources are owned by multiple organization

→ It Require advance scheduling of resources

→ It is usually no commercial Pricing model

→ It is failure of nodes can affect execution

→ The users do not pay for the use

→ It is low accessing service

→ It is highly less scalable compared to cloud computing

Example: SETI@Home scientific Grid systems

Services Provided By the cloud :

Cloud computing provides the following main services :

1. Software as a service (saas)
2. Platform as a service (paas)
3. Infrastructure as a service (Iaas)

1. Software as a service (saas) is also called as an on Demand Software or hosted Software

It is a way of providing services and application through the Internet as over Internet

Instead of Installing and maintaining Software we can simply access it via Internet

It removes the need to Install and run applications on our own computers

CRM, office suite Email gums etc are software Applications which are provided as a service through Internet

Advantage
1) cost Effective   2) Reduce time 3) Accessibility
4) Scalability   5) Automatic updates

Disadvantage :
→ Software as a service applications are totally dependent on Internet connection. They are not usable without Internet Application

→ It is difficult to switch amongst the Software as a service vendors

Example: Amazon web service (Aws) SAP Google, Salesforce etc

Platform as a Service (PaaS)

Platform as a Service is Programming Platform for the developers. This platform is generated for the Programmers to create test run and manage the applications.

A developer can easily write the applications and deploy it directly into PaaS layer.

Platform as a service gives the run time environment for application development and development tools.

Advantage:-
→ cost-effective
→ simple & convenient for users
→ Efficiency

Disadvantage :
•One developer can write the Application as per the Platform provided by Platform as a service vendor hence the moving the application to another Platform as a service vendor is a Problem.
Example:- Google App Engine Windows Azure, Sales force.com

Infrastructure as a Service (IaaS)

Infrastructure as a service is a way to deliver a cloud computing Infrastructure like Server and operating system Storage network. The customer can access these resource over cloud computing Platform i.e Internet as an demand service

Infrastructure as a service earlier called as Hardware as a Service (Haas)

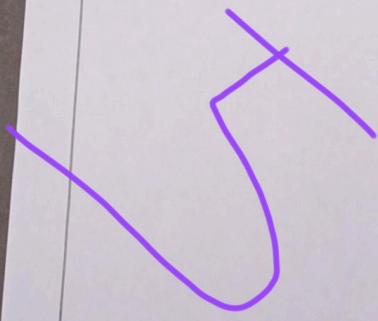Advantage:
1) cost effective
2) website hosting
3) security
4) maintenance

Disadvantage:

Infrastructure as a service (Iaas) cloud computing Platform model is dependent on availability of Internet and virtualization services

Example: Amazon, EC2, Google compute Engine, Microsoft Azure VM.

cloud deployment model:

Cloud deployment model identifies the specific type of cloud environment based on ownership scale and access as well as cloud nature and purpose The location of the servers you are utilizing and who controls them are defined by a cloud deployment model

Different types of cloud deployment models are:-

1- Public cloud:

→ The Public cloud allows system and services to be easily accessible to the general public

→ It is less secured as it is open to everyone

→ cloud Infrastructure services are Provided over the Internet to 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 customer

→ In this storage backup and retrival are given for free as a subscription or on a per-user basis
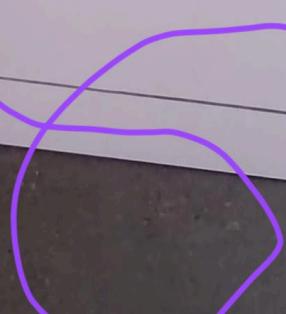
Example: Google APP Engine etc.

Advantages:

1) Minimal Investment
2) NO setup cost
3) Infrastructure Management is not required
4) NO maintenance
5) Dynamic Scalability

Disadvantages:

1) less secure
2) low customization

Private cloud :-

It is also called as the "Internal cloud"

It allows system and services to be accessible within an organization

It can be managed internally by organization or third party

The private cloud gives greater flexibility control over cloud resources

Advantages:

1) Better control
2) Data security and privacy
3) Support legacy system
4) customization

Disadvantages:

1) Limited scalability
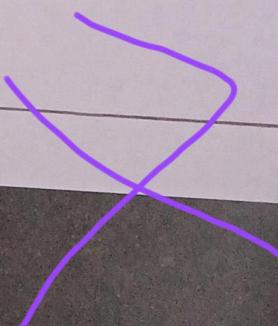2) Restricted area of operations
3) costly

3. Hybrid cloud:

→ combination of public and private cloud
→ Non critical activities are performed using public cloud
→ critical activities are performed using private cloud

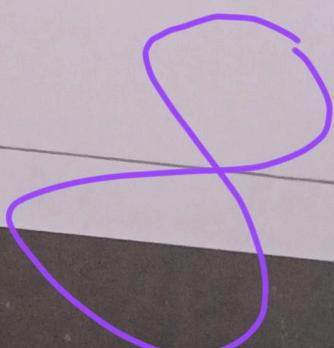| Advantages	Disadvantages
1) cost	1) Difficult to manage
2) flexibility	2) Network issue
3) scalability	3) slow data Transmission
4) security	
5) Efficiency	

4. Community cloud:

→ It allows system and services to be accessible by group of organization

→ It shares Infrastructure between several organization from a specific community

→ It can be managed Internally by the organization on by the third party.

Advantage:
1) cost effective
2) Shared resources
3) Security

Disadvantages:
1) Limited scalability
2) Rigid in customization

Characteristics of Cloud Computing as Per NIST:

NIST stands for National Institute of Standards and Technology

According to NIST there are five characteristics of cloud computing :-

1. On Demand self service
2. Broad network access
3. Resource Pooling
4. Rapid elasticity
5. Measured service

1. On Demand self service :-

user gets on Demand self service users can get computer services like email applications etc. without interacting with each service provider some of the cloud service providers are - Amazon web service, Microsoft IBM Sales force.com

2. Broad network access:

cloud services are available over the network and can be accessed through different client such as mobile laptops etc.

3. Resource Pooling :- some resources can be used by more than one customer at a same time.

for Example:-

storage network bandwidth can be used by any number of customers and without knowing the exact location of that resource

Rapid elasticity :- On users demand cloud services can be available and released cloud service capabilities are unlimited and used in any quantity at a time

Measured service: Resources used by the users can be monitored controlled This reports is available for both cloud Providers and customer on basis of this measured reports cloud systems automatically controls and optimizes the resources based on the type of services.

service like - storage processing bandwidth etc.