Cloud Computing

UNIT - 1 [One Shot]

Topics to be covered:

1. Definition of Cloud Computing
2. Evolution of Cloud Computing
3. Underlying principles of parallel and distributed computing.
4. Cloud characteristics
5. Elasticity in cloud, Cloud Scalability
6. On - demand provisioning.

⊛ What is Cloud Computing ?

★ What is cloud ?

- Cloud is a collection of remotely hosted servers and services that provide resources over the internet.
- These resources includes storage, virtual machines, databases, networking

software platforms, and more.

* What is cloud computing?

Cloud computing is the delivery of computing services like servers, storage, databases, networking, software, etc. over the internet / cloud to offer faster innovation, flexible resources, and economies of scale.

Key aspects:

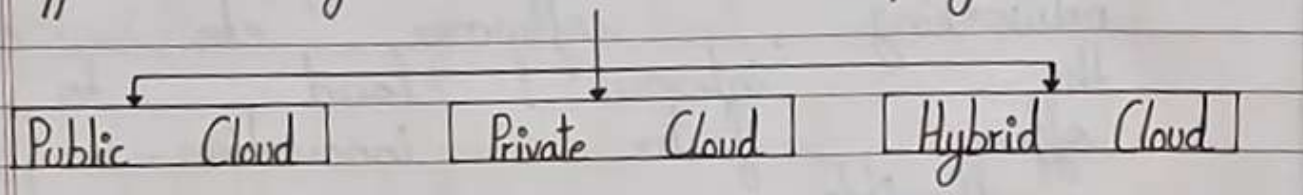
- Instead of owning physical hardware (like servers or storage), users rent them from cloud providers like AWS, Google Cloud, or Azure.
- You only pay for what you use. Also, cloud services are accessible from anywhere at anytime.

Advantages:

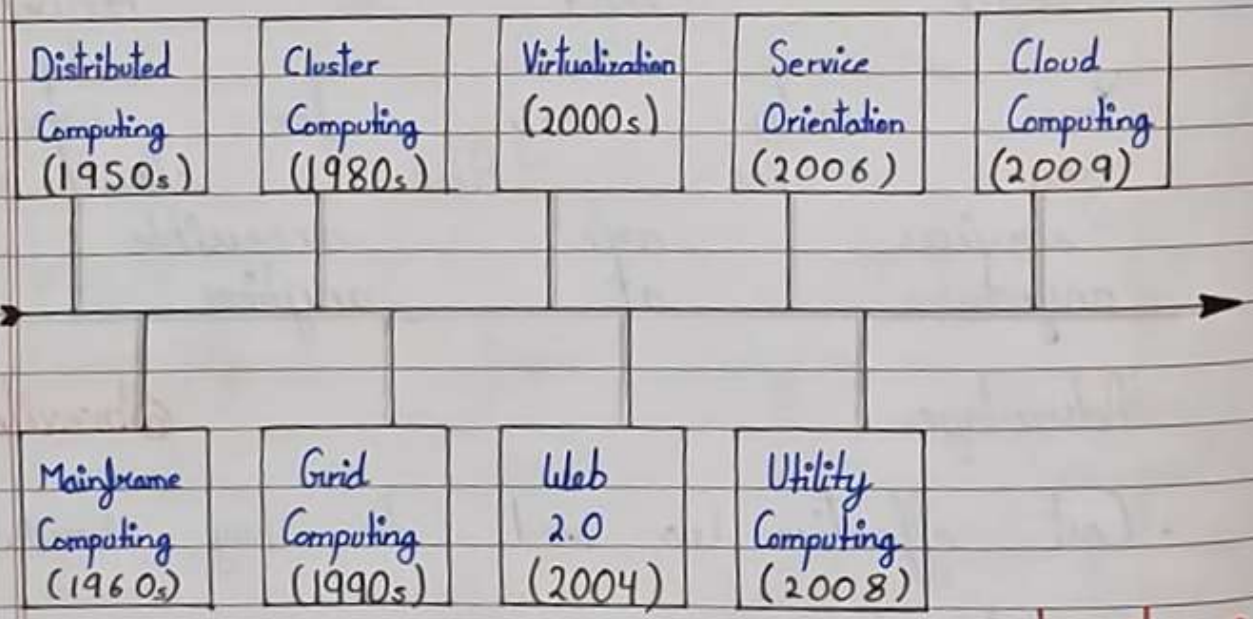
- Cost - effective (no need to buy hardware)
- Scalable (easily increase or decrease resources)

- Reliable (data is backed up and highly available)
- Accessible (access from any device with internet)

★ Types of Cloud Deployment:



Evolution of Cloud Computing:



* Service models in cloud computing:

i) IaaS : (Infrastructure as a service):

Provides virtualized infrastructure or computing services and resources over the internet.

e.g : Amazon EC2

ii) PaaS : (Platform as a service):

- Offers platform to customer for developing, running, and managing their application.
- Customers don't need to manage infrastructure, hardware, O.S., etc.

e.g : Google App Engine

iii) SaaS : (Software as a service):

Software is accessed only via subscription, no installation needed.

Everything else is run managed and secured by service providers.

e.g: Gmail.

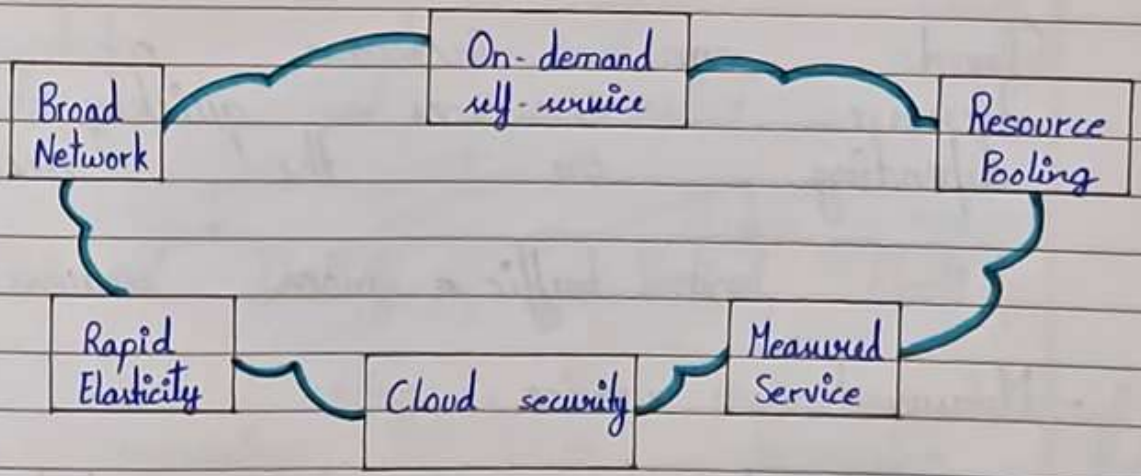
Underlying principles of parallel and distributed computing:

Principles	Parallel computing	Distributed computing
• Parallelism	Task run at same time inside one computer	Task run at the same time on many computers
• Resource management	Uses the resources (CPU, memory) of one computer	Uses resources of many computers connected by network
• Task decomposition	Split tasks into small units that runs together on one system	Split tasks and run them on different computers
• Communication	Tasks share info using memory inside the same system	Tasks share info over network (internet or LAN)
• Co-ordination	Needs simple control to keep tasks in order	Needs more control to manage tasks on different systems.

• Scalability	Can be made faster by adding more CPU to same computer but upto a limit	Can be made faster by adding more computers
• Fault tolerance	If one part failed, whole system may stop	If one computer failed, others still work
• Granularity	Tasks are usually small and quick inside one system	Tasks can be small or big, depending on the system

@brevilearning

Cloud characteristics :



• On-demand self-service :

You can get and use services

(like storage or servers) whenever you want over the internet.

- Broad network access :

Cloud services can work on any devices like mobiles, laptops, tablets, from anywhere using internet.

- Resource pooling :

The cloud provider shares its resources (like memory, storage) with many people at the same time.

- Rapid elasticity :

Cloud can increase or decrease resources quickly depending on the need.

more traffic = more servers

- Measured service :

You only pay for what you use, like electricity or mobile recharge - no extra charges.

- **Cloud security :**

Your data is kept safe from loss, hackers, or damage using snapshots, backups and protection tools.

Elasticity in Cloud :

- It means the cloud system can automatically add or remove resources (like CPU, memory, storage, virtual machines) depending on current need or load.

- This helps to handle more users or traffic when needed and saves money when not needed.

Horizontal Elasticity	Vertical Elasticity
It means adding or removing more machines to handle works.	It means increasing or decreasing the power (CPU, RAM, storage) of a single machine.

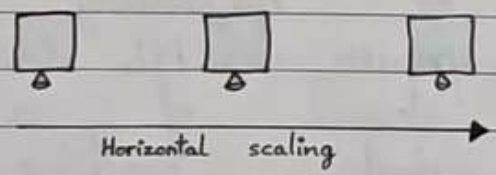
Cloud scalability :

- It means the system can be grown or expanded to handle more work over time.
- It is not automatic like elasticity. but it's planned.
- It helps when a bussiness or website grows in size and needs more resources to support it

Horizontal scaling

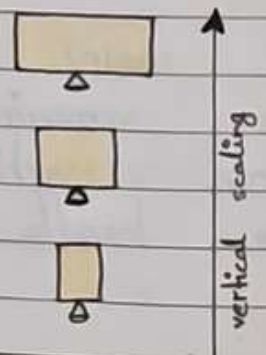
Add more instances or computers.

Many small systems works together.



Vertical scaling

Make a machine more powerful by increasing size of CPU, RAM, SSD, etc.



On - demand provisioning:

- It means getting cloud services (like storage, servers or software) whenever you need them, instantly, through the internet, without needing to set up anything yourself.
- You can start using resources immediately.
- You don't need to buy hardware or wait for setup.
- Everything is ready to use with a few clicks

★ Advantages:

- Fast: Start work immediately - no setup delay.
- Cheap: No need to buy hardware - just pay as per use.
- Flexible: Increase or decrease usage anytime easily.

Thanks for watching → @brevilearning YT