Cloud Computing

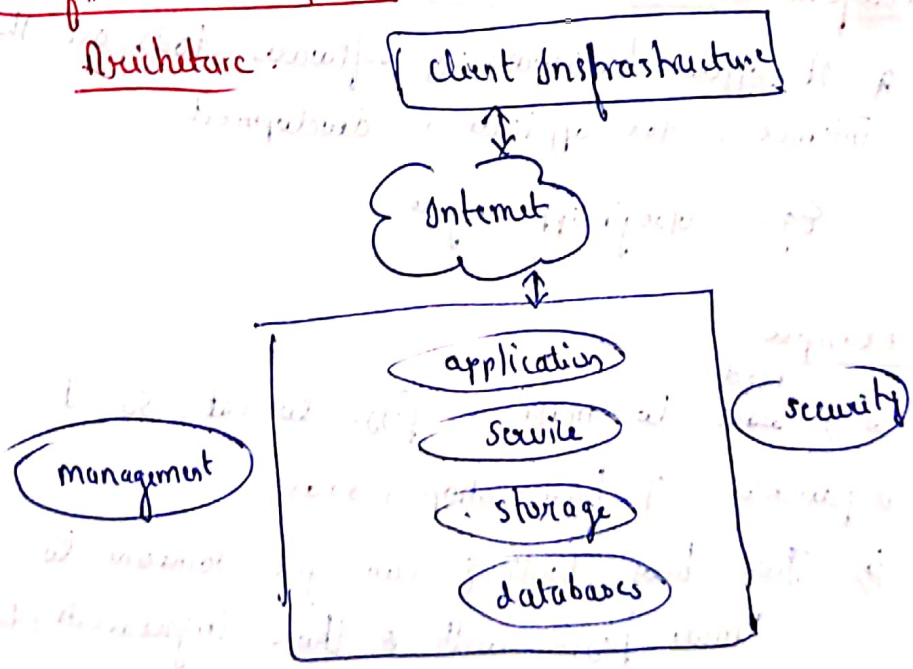
Cloud Computing: Cloud Computing refers to delivery of Computing services - such as servers, storage, databases, networking, software & over internet to offer faster innovation, flexible resources.

(or

Cloud Computing means storing & accessing the data and programs on remote servers that are hosted on internet instead of the computer's hard driver or local driver.

~~Benifit or Adv of CC~~

→ **Architecture:**



Uses/ Benifit/ Adv of CC

- → Data storage
- → Data backup
- → Testing
- → flexibility
- → Accessibility
- → Effective data management
- → less Cost
- → Scalability

Types of cloud Computing: (Cloud Service Models)

1) **Software as a Service (SaaS)**

Delivers software applications over the internet.

→ It helps users to easily access applications without having requirement of local installations

Eg:- ~~AWS~~ EC2, ~~microsoft~~ azure, google workspace

2) **Infrastructure as a Service (IaaS)**

→ Provide virtualized computing resources over internet such as Virtual machines, storage & networks.

Eg:- AWS EC2, MS Azure.

3) **Platform as a Service (PaaS)**

⇒ It offers hardware & software tools over the internet, for application development

Eg:- Google app Engine.

My own Example:

Suppose if I want to make a pizza to eat, so, I need

i) can purchase it from shop (SaaS)

ii) ~~First buy tools & can give someone to make pizza with those ingredients (PaaS)~~

iii) ii) Purchase ingredients & make on my own (IaaS)

iii) Tools & ingredients are provided, just we need to prepare the pizza. (PaaS)

Cloud Deployment Models / Types of clouds

1) ~~Private~~ CDM defines how cloud services are made available to users & with varying (different) levels of access & control.

2) Public cloud: A service provider makes resources (applications & storage) available to general public over the internet
Eg. AWS, Microsoft Azure, google cloud.

adv: lower cost, no need for hardware management
~~less~~ bar scalability

⇒ It is useful for small-medium sized businesses, startups, hosting web applications.

3) Private cloud: A service provider which offers hosted services to limited no. of people so it minimizes the security concerns.
→ It dedicated to single organization

adv: High level of security, Scalability

⇒ Large organizations with strict security & uses private cloud.

Eg:- financial (Bank) and government agencies institutes

3) Hybrid cloud: A hybrid cloud combines both public & private cloud environments, allowing data & applications to be shared between them

adv: flexible, cost-effective, less critical workload

⇒ It used by organizations that require both public & private environments.

Cloud Paradigms:

It is a fundamental approach or model for performing computation, organizing data, designing systems of higher levels & solving problems using computers

Types of Cloud Paradigms:

1) **High Performance Computing:**

In modern world of AI & ML they require huge amount of data, & also need high performance computing. To overcome this we require high performance computing which practice parallel data processing.

→ HPC aggregate data such that advanced applications can run efficiently, quickly.

→ HPC performes at most 3 billion calculations per/sec

adv:
- → High speed
- → lower cost
- → Time saving & money
- → Pay as you go model

Applications:
- → Science, business engineering
- → In military, hospital etc
- → healthcare, media & entertainment
- → Aerospace

Eg: of HPC :- Super Computer. (Is made of many computers)

2) Parallel Computing :-

It is kind of Computing architecture where the large problems break into smaller & parts & Computed one by one. Problem → (Parts) → Process

→ It refers to the process of executing several processors simultaneously.

→ It helps in faster application processing

→

Applications: ⇒ Science & Engineering
⇒ Database & Data mining
⇒ Multimedia
⇒ advanced graphics

advantages: → Multitasking (multiple tasks are performed simultaneously)
→ Save time & money
→ Reduces complexity

3) Distributed Computing

⇒ Distributed Computing refers to use of multiple interconnected cloud environments, spread across various geographical locations or data centers, working together to deliver services such as storage, computing power, networking

→ They are not located in a single data center but instead distributed across multiple regions.

refer my chatGPT Notes