UNIT V – CLOUD COMPUTING FUNDAMENTALS

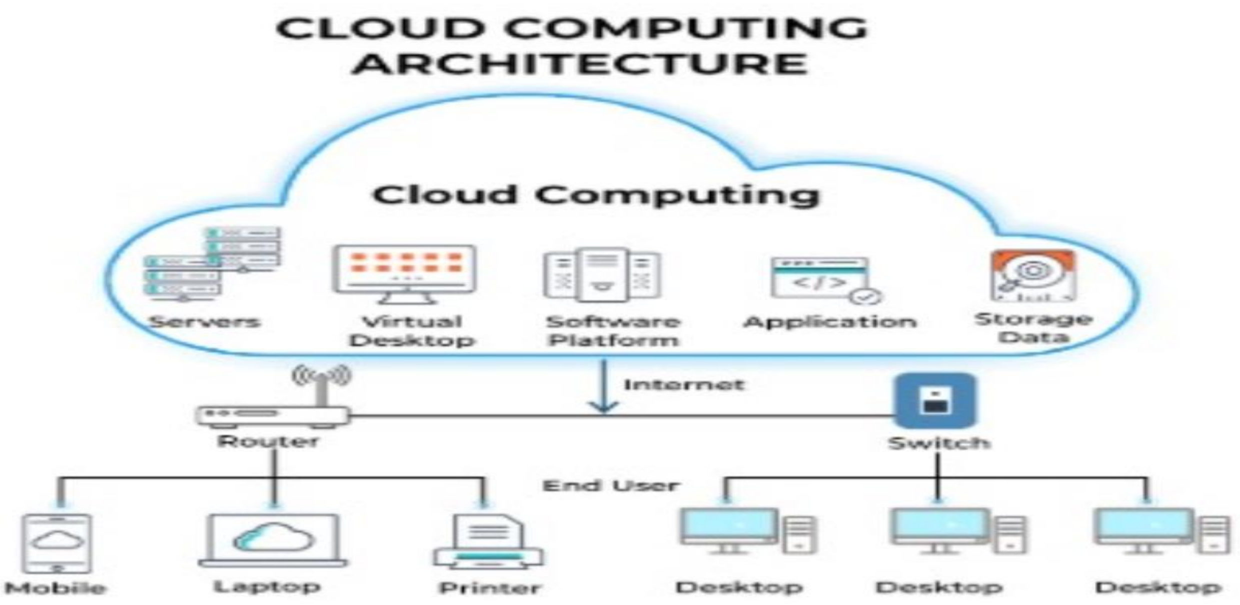
Introduction to Cloud Computing , Cloud Service Models: IaaS, PaaS, SaaS, Deployment Models: Public, Private, Hybrid, Overview of AWS/GCP/Azure, Cloud Storage (S3, BigQuery), Compute (EC2, Lambda), ML Services (SageMaker, Vertex AI), Security and Cost Optimization in Cloud

5.1 Introduction to Cloud Computing

Definition:

Cloud computing is the delivery of on-demand IT resources, such as servers, storage, software, and networking, over the internet on a pay-as-you-go basis. Instead of owning physical hardware, users access these services remotely from a shared pool of resources managed by a third-party provider, like Amazon Web Services or Google Cloud. Everyday examples include online email services like Gmail, cloud storage like Google Drive, and streaming platforms, all of which deliver applications and data over the internet.

CLOUD COMPUTING ARCHITECTURE



Front End

1.The **front end** refers to the client part of cloud computing system.

2.It consists of interfaces and applications that are required to access the cloud computing

platforms, Example - Web Browser.

3.The interaction is done through middleware or via web-browser or virtual sessions.

Back End

1.The **back End** refers to the cloud itself.

2.It consists of all the resources required to provide cloud computing services.

3.It comprises of huge data storage, virtual machines, security mechanism, services, deployment models, servers, etc.

4.It is the responsibility of the back-end to provide the security of data for cloud users along with the traffic control mechanism. The server also provides the middleware which helps to connect devices & communicate with each other.

1. Client Infrastructure:

Client Infrastructure is a Front end component. It provides GUI (Graphical User Interface) to interact with the cloud.

2. Application: The application may be any software or platform that a client wants to access.

3. Service: A Cloud Services manages that which type of service you access according to the client's requirement. Eg. IaaS, PaaS and SaaS.

4. Runtime Cloud: Runtime Cloud provides the **execution and runtime environment** to the virtual machines.

5. Storage : Storage is one of the most important components of cloud computing. It provides a huge amount of storage capacity in the cloud to store and manage data.

6. Infrastructure: It provides services on the **host level**, **application level**, and **network level**. Cloud infrastructure includes hardware and software components such as servers, storage, network devices, virtualization software, and other storage resources that are needed to support the cloud computing model.

7. Management: Management is used to manage components such as application, service, runtime cloud, storage, infrastructure, and other security issues in the backend and establish coordination between them.

8. Security: Security is an in-built back end component of cloud computing. It implements a security mechanism in the back end.

9. Internet: The Internet is medium through which front end and back end can interact and communicate with each other.