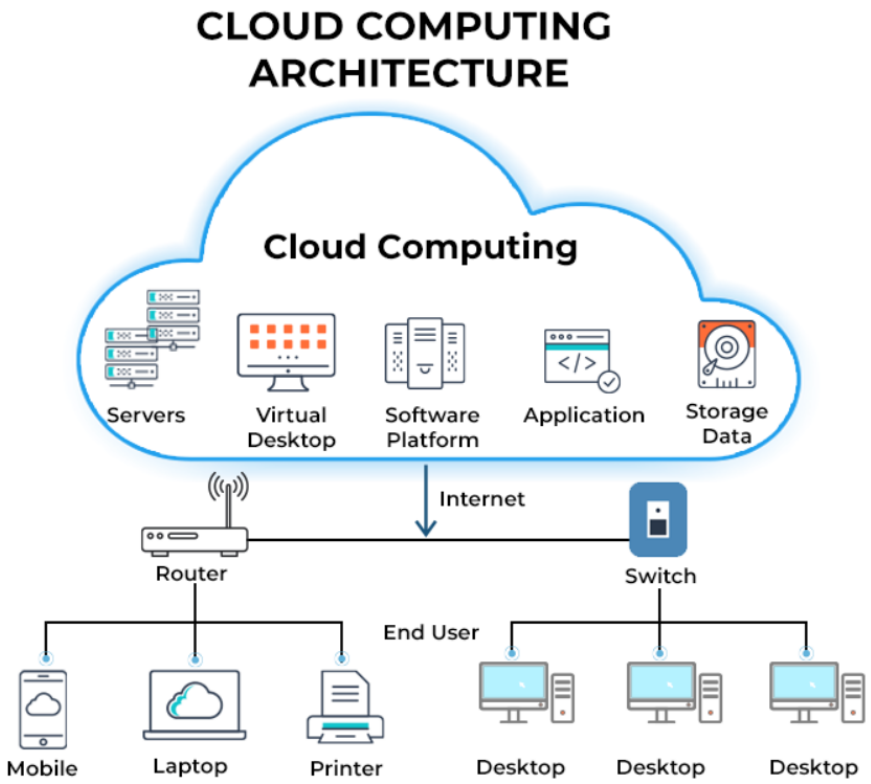
Cloud Computing

- Cloud Computing is a technology that allows individuals and businesses to use computing resources—such as servers, storage, databases, networking, software, and analytics—over the internet (referred to as "the cloud") without owning or managing physical infrastructure.
- These resources are hosted and maintained in data centers by cloud providers like Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and IBM Cloud, and are made available to users on a pay-as-you-go or subscription-based model.



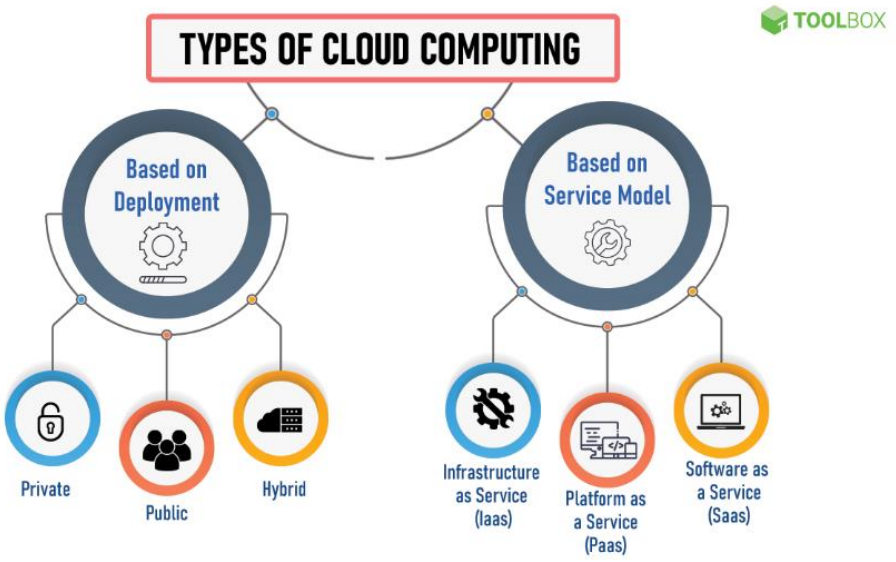
- Instead of storing files on a storage device or hard drive, a user can save them on cloud, making it possible to access the files from anywhere, as long as they have access to the web. The services hosted on cloud can be broadly divided into infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS). Based on the deployment model, cloud can also be classified as public, private, and hybrid cloud.
- Further, cloud can be divided into two different layers, namely, front-end and back-end. The layer with which users interact is called the front-end layer.

This layer enables a user to access the data that has been stored in cloud through cloud computing software.

- The layer made up of software and hardware, i.e., the computers, servers, central servers, and databases, is the back-end layer. This layer is the primary component of cloud and is entirely responsible for storing information securely. To ensure seamless connectivity between devices linked via cloud computing, the central servers use a software called "Middleware" that acts as a bridge between the database and applications.

Types Of Cloud Computing

- Cloud computing can either be classified based on the deployment model or the type of service. Based on the specific deployment model, we can classify cloud as public, private, and hybrid cloud. At the same time, it can be classified as infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS) based on the service the cloud model offers.



Private Cloud

- In Private Cloud, the computing services are offered over a private IT network for the dedicated use of a single organization. Private clouds provide a higher level of security through company firewalls and internal hosting to ensure that an organization's sensitive data is not accessible to third-party providers.

Public Cloud

- Public cloud refers to computing services offered by third-party providers over the internet. Unlike private cloud, the services on public cloud are available to anyone who wants to use or purchase them.

Hybrid Cloud

- **Hybrid cloud uses a combination of public and private cloud features. The "best of both worlds" cloud model allows a shift of workloads between private and public clouds as the computing and cost requirements change.**

Infrastructure as a service or IaaS

- **Infrastructure as a service or IaaS is a type of cloud computing in which a service provider is responsible for providing servers, storage, and networking over a virtual interface. In this service, the user doesn't need to manage the cloud infrastructure but has control over the storage, operating systems, and deployed applications.**

Platform as a service or PaaS

- **Platform as a service or PaaS is a type of cloud computing that provides a development and deployment environment in cloud that allows users to develop and run applications without the complexity of building or maintaining the infrastructure. It provides users with resources to develop cloud-based applications. In this type of service, a user purchases the resources from a vendor on a pay-as-you-go basis and can access them over a secure connection.**

SaaS or software as a service

- **SaaS or software as a service allows users to access a vendor's software on cloud on a subscription basis. In this type of cloud computing, users don't need to install or download applications on their local devices. Instead, the applications are located on a remote cloud network that can be directly accessed through the web or an API.**

Benefits of Cloud Computing

- **Cost-Efficiency: No upfront cost for infrastructure; pay only for usage.**
- **Scalability: Instantly scale resources up or down as demand changes.**
- **Accessibility: Access services anytime, from anywhere with internet.**
- **Disaster Recovery & Backup: Reliable backup and recovery options.**
- **Security: Built-in encryption, identity management, and compliance controls.**
- **Automatic Updates: Regular updates to ensure performance, security, and features.**