CLOUD COMPUTING

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Module II

Cloud Based Services

- Cloud Computing can be defined as the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer. Companies offering such kinds of cloud computing services are called *cloud providers* and typically charge for cloud computing services based on usage. Grid and cluster are the foundations for cloud computing.
- **Types of Cloud Computing**

  Most cloud computing services fall into three broad categories:

  1. Software as a service (Saas)
  2. Platform as a service (PaaS)
  3. Infrastructure as a service (IaaS)
  4. Anything as a service (XaaS)

1. Software as a service (Saas)

- A way of delivering services and applications over the Internet.
- Instead of installing and maintaining software, we simply access it via the Internet, freeing ourselves from the complex software and hardware management.
- It removes the need to install and run applications on our own computers or in the data centers eliminating the expenses of hardware as well as software maintenance.
- SaaS provides a complete software solution that you purchase on a **pay-as-you-go** basis from a cloud service provider.
- Most SaaS applications can be run directly from a web browser without any downloads or installations required.
- The SaaS applications are sometimes called **Web-based software, on-demand software, or hosted software.**

1. Software as a service (Saas)

- **Advantages of SaaS**
  1. **Cost-Effective:** Pay only for what you use.
  2. **Reduced time:** Users can run most SaaS apps directly from their web browser without needing to download and install any software. This reduces the time spent in installation and configuration and can reduce the issues that can get in the way of the software deployment.
  3. **Accessibility:** We can Access app data from anywhere.
  4. **Automatic updates:** Rather than purchasing new software, customers rely on a SaaS provider to automatically perform the updates.
  5. **Scalability:** It allows the users to access the services and features on-demand.
- The various companies providing *Software as a service* are Cloud9 Analytics, Salesforce.com, Cloud Switch, Microsoft Office 365, Big Commerce, Eloqua, dropBox, and Cloud Tran.

2. Platform as a service (PaaS)

- A category of cloud computing that provides a platform and environment to allow developers to build applications and services over the internet.
- PaaS services are hosted in the cloud and accessed by users simply via their web browser.
- A PaaS provider hosts the hardware and software on its own infrastructure.
- As a result, PaaS frees users from having to install in-house hardware and software to develop or run a new application.
- Thus, the development and deployment of the application take place **independent of the hardware**.

2. Platform as a service (PaaS)

- The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.
- To make it simple, take the example of an annual day function, you will have two options either to create a venue or to rent a venue but the function is same.
- The various companies providing *Platform as a service* are Amazon Web services Elastic Beanstalk, Salesforce, Windows Azure, Google App Engine, cloud Bess and IBM smart cloud.

2. Platform as a service (PaaS)

- **Advantages of PaaS:**
  1. **Simple and convenient for users:** It provides much of the infrastructure and other IT services, which users can access anywhere via a web browser.
  2. **Cost-Effective:** It charges for the services provided on a per-use basis thus eliminating the expenses one may have for on-premises hardware and software.
  3. **Efficiently managing the lifecycle:** It is designed to support the complete web application lifecycle: building, testing, deploying, managing, and updating.
  4. **Efficiency:** It allows for higher-level programming with reduced complexity thus, the overall development of the application can be more effective.

3. Infrastructure as a service (IaaS)

- Infrastructure as a service (IaaS) is a service model that delivers computer infrastructure on an outsourced basis to support various operations.
- Typically IaaS is a service where infrastructure is provided as an outsource to enterprises such as networking equipment, devices, database, and web servers.
- It is also known as **Hardware as a Service (HaaS).**
- IaaS customers pay on a per-user basis, typically by the hour, week, or month.
- Some providers also charge customers based on the amount of virtual machine space they use.
- It simply provides the underlying operating systems, security, networking, and servers for developing such applications, services, and for deploying development tools, databases, etc.

3. Infrastructure as a service (IaaS)

- **Advantages of IaaS:**
  1. **Cost-Effective:** Eliminates capital expense and reduces ongoing cost and IaaS customers pay on a per-user basis, typically by the hour, week, or month.
  2. **Website hosting:** Running websites using IaaS can be less expensive than traditional web hosting.
  3. **Security:** The IaaS Cloud Provider may provide better security than your existing software.
  4. **Maintenance:** There is no need to manage the underlying data center or the introduction of new releases of the development or underlying software. This is all handled by the IaaS Cloud Provider.
- The various companies providing *Infrastructure as a service* are Amazon web services, Bluestack, IBM, Openstack, Rackspace, and Vmware.

Anything as a service (XaaS)

- Most of the cloud service providers nowadays offer anything as a service that is a compilation of all of the above services including some additional services.
- **Advantages of XaaS:** As this is a combined service, so it has all the advantages of every type of cloud service.

IaaS Vs PaaS Vs SaaS

IaaS	Paas	SaaS
It provides a virtual data center to store information and create platforms for app development, testing, and deployment.	It provides virtual platforms and tools to create, test, and deploy apps.	It provides web software and apps to complete business tasks.
It provides access to resources such as virtual machines, virtual storage, etc.	It provides runtime environments and deployment tools for applications.	It provides software as a service to the end-users.
It is used by network architects.	It is used by developers.	It is used by end users.
IaaS provides only Infrastructure.	PaaS provides Infrastructure+Platform.	SaaS provides Infrastructure+Platform +Software.