1. What is Cloud

The cloud refers to servers that are accessed over the Internet, and the software and databases that run on those servers. Cloud servers are located in data centers all over the world

cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale.

1. What are the different types of cloud based on service and deployment

Based on Cloud service: There are 3 main types of cloud computing services

1. Infrastructure-as-a-Service (IaaS)

2.Platforms-as-a-Service (PaaS)

3.Software-as-a-Service (SaaS)

**1 Infrastructure-as-a-Service (IaaS) :**

Iaas is also known as Hardware as a Service (HaaS). It is one of the layers of the cloud computing platform. It allows customers to outsource their IT infrastructures such as servers, networking, processing, storage, virtual machines, and other resources. Customers access these resources on the Internet using a pay-as-per use model.

Example : AWS EC2, Rackspace, Google Compute Engine (GCE),Microsoft Azure.

2.**Platforms-as-a-Service (PaaS)**:

Platform As A Service (PAAS) is a cloud delivery model for applications composed of services managed by a third party. It provides elastic scaling of your application which allows developers to build applications and services over the internet and the deployment models include public, private and hybrid.

Example : AWS Elastic Beanstalk ,Windows Azure, Force.com, OpenShift.

**3.Software-as-a-Service (SaaS) :**

Software as a service (SaaS) is a software distribution model in which a cloud provider hosts applications and makes them available to end users over the internet. In this model, an independent software vendor (ISV) may contract a third-party cloud provider to host the application.

Example : Google Workspace, Dropbox, Salesforce, Cisco WebEx

Based on the different types of cloud computing deployment models are:

1.Public cloud

2.Private cloud

3.Hybrid cloud

4.Community cloud

5.Multi-cloud

1. **Public Cloud :** The public cloud is defined as computing services offered by third-party providers over the public Internet, making them available to anyone who wants to use or purchase them.

The public cloud makes it possible for anybody to access systems and services. The public cloud may be less secure as it is open for everyone.

Example : AWS ,AZURE GOOGLE CLOUD

1. **Private cloud :** A Private Cloud is a model of cloud computing where the infrastructure is dedicated to a single user organization.

It’s a one-on-one environment for a single user (customer). There is no need to share your hardware with anyone else

Example : HP Data Centers, Microsoft, Elastra-private cloud, and Ubuntu

1. **Hybrid Cloud** : A hybrid cloud is one in which applications are running in a combination of different environments. Hybrid cloudcomputing approaches are widespread because almost no one today relies entirely on the public cloud

Example : AWS Outposts, Azure Stack, Azure Arc, Google Anthos and VMware Cloud on AW

**Community Cloud :**  It allows systems and services to be accessible by a group of organizations. It is a distributed system that is created by integrating the services of different clouds to address the specific needs of a community, industry, or business. The infrastructure of the community could be shared between the organization which has shared concerns or tasks. It is generally managed by a third party or by the combination of one or more organizations in the community.

**Multi Cloud** : It’s similar to the hybrid cloud deployment approach, which combines public and private cloud resources. Instead of merging private and public clouds, multi-cloud uses many public clouds. Although public cloud providers provide numerous tools to improve the reliability of their services, mishaps still occur .As a result, multi-cloud deployment improves the high availability of your services even more.

3.What is scaling?

Cloud scalability in cloud computing refers to the ability to increase or decrease IT resources as needed to meet changing demand. Scalability is one of the hallmarks of the cloud and the primary driver of its exploding popularity with businesses.

4. What are the different types of scaling? Explain

There are two basic types of scalability in cloud computing: vertical and horizontal scaling

Horizontal scaling :

Horizontal scaling (scaling out) refers to adding additional nodes or machines to your infrastructure to cope with new demands. If you are hosting an application on a server and find that it no longer has the capacity or capabilities to handle traffic, adding a server may be your solution

Example:

One of the good example of horizontal scaling is Cassandra, MongoDB and that of vertical scaling is MySQL. Scaling vertically can be achieved easily by switching from small to bigger machines

Vertical scailing :

Vertical scaling can essentially resize your server with no change to your code. It is the ability to increase the capacity of existing hardware or software by adding resources. Vertical scaling is limited by the fact that you can only get as big as the size of the server.

Example:

Scaling or vertical scaling is the process of moving more resources to a single server to accommodate the growth of your application. Cloud Vertical Scaling is the addition of an existing server or the replacement of a server with a more powerful server

1. What are the advantages of Cloud?

Advantages of cloud are

1) Back-up and restore data

Once the data is stored in the cloud, it is easier to get back-up and restore that data using the cloud.

2) Improved collaboration

Cloud applications improve collaboration by allowing groups of people to quickly and easily share information in the cloud via shared storage.

3) Excellent accessibility

Cloud allows us to quickly and easily access store information anywhere, anytime in the whole world, using an internet connection. An internet cloud infrastructure increases organization productivity and efficiency by ensuring that our data is always accessible.

4) Low maintenance cost

Cloud computing reduces both hardware and software maintenance costs for organizations.

5) Mobility

Cloud computing allows us to easily access all cloud data via mobile.

6) IServices in the pay-per-use model

Cloud computing offers Application Programming Interfaces (APIs) to the users for access services on the cloud and pays the charges as per the usage of service.

7) Unlimited storage capacity

Cloud offers us a huge amount of storing capacity for storing our important data such as documents, images, audio, video, etc. in one place.

8) Data security

Data security is one of the biggest advantages of cloud computing. Cloud offers many advanced features related to security and ensures that data is securely stored and handled.

1. What is Data center?

A data center is a facility that centralizes an organization's shared IT operations and equipment for the purposes of storing, processing, and disseminating data and applications. Because they house an organization's most critical and proprietary assets, data centers are vital to the continuity of daily operations

1. What is mean by Multi Tenancy ?

Multitenancy is a reference to the mode of operation of software where multiple independent instances of one or multiple applications operate in a shared environment. The instances (tenants) are logically isolated, but physically integrated. Multitenancy is a software architecture where a single software instance can serve multiple, distinct user groups. Software-as-a-service (SaaS) offerings are an example of multitenant architecture.

8. What do you mean by Pay-as-you-go?

Pay-as-you-go cloud computing (PAYG cloud computing) is a payment method for cloud computing that charges based on usage. The practice is similar to that of utility bills, using only resources that are needed.

9. What do you mean by cloud provider?

A cloud service provider is a third-party company offering a cloud-based platform, infrastructure, application, or storage services pay only for the amount of cloud services they use, as business demands require.

Types of cloud services: IaaS, PaaS, serverless, and SaaS

These are sometimes called the cloud computing "stack" because they build on top of one another.

10 . What is cloud service?

The term "cloud services" refers to a wide range of services delivered on demand to companies and customers over the internet. These services are designed to provide easy, affordable access to applications and resources, without the need for internal infrastructure or hardware.

11. What are the key characteristics of cloud computing?

There are basically 5 essential characteristics of Cloud Computing.

On-demand self-services:

The Cloud computing services does not require any human administrators, user themselves are able to provision, monitor and manage computing resources as needed.

Broad network access:

The Computing services are generally provided over standard networks and heterogeneous devices.

Rapid elasticity:

The Computing services should have IT resources that are able to scale out and in quickly and on as needed basis. Whenever the user require services it is provided to him and it is scale out as soon as its requirement gets over.

Resource pooling:

The IT resource (e.g., networks, servers, storage, applications, and services) present are shared across multiple applications and occupant in an uncommitted manner. Multiple clients are provided service from a same physical resource.

Measured service:

The resource utilization is tracked for each application and occupant, it will provide both the user and the resource provider with an account of what has been used. This is done for various reasons like monitoring billing and effective use of resource.