**Introduction to DevOps**

**1.What is cloud?**

Cloud can be defined as a vast network of servers (means computer/system) accessible via the internet that store, manage, and process data. Instead of relying on local computers or devices for storage and computing power, people and businesses use cloud to access these resources remotely.

**2.What is cloud computing?**

Cloud computing can be defined as the delivery of services over the internet such as servers, storage, databases, networking and software without the use of physical infrastructure.

**The cloud computing is of two types:**

* Service mode
* Deployment mode

The service mode provides services such as IAAS, PAAS, SAAS and FAAS

**IAAS (Infrastructure as a service):** Here, in simple terms the infrastructure is like the servers, storage, networking and virtualization. These are all provided/managed by the cloud provider (AWS). You only need to manage the OS, middleware, runtime and application data

**PAAS (Platform as a service):**  Coming to the PAAS the cloud provider manages all the IAAS and OS, middleware, and runtime. The objective of the client is to manage the application

**SAAS (Software as a service):** This is the service that manages all the IAAS, PAAS and applications. The objective of the client is to manage or develop the data and configurations of the software

**FAAS (Function as a service):** This is a cloud computing service that allows developers to run small codes called functions. This is a part of serverless computing

**Ex:** Assume you are a travel agency. Your need is when a user books a ticket from your website you want to send an email to the user with the booking details. Instead of setting up a separate server for this task we can use Faas to simplify this process. You write a function and deploy it into a Faas platform such as AWS lambda. When a trigger occurs in the cloud this automatically sends the email with details to the users. You are billed for milliseconds or seconds that the function took to execute; this makes the cost effective

**The deployment mode is of four types namely:**

* **Public** **cloud**: it is a type of cloud computing service in which the resources such as servers, storage and applications are shared among the multiple users.

**Ex:** Netflix uses AWS platform for storing and streaming the movies and web series. When a new movie is launched the AWS automatically scales up the resources for handling a large amount of load

* **Private** **cloud**: it is a cloud computing service in which the resources are shared with a single organization. This increases security, control and privacy for the organization.

**Ex:** this is used in healthcare, banking and more

* **Hybrid** **cloud**: it is cloud computing service and a combination of private and public cloud.

**Ex:** if we take an e-commerce application as an example it uses both the public and private clouds. For scalability it uses the public cloud and for payments and other sensitive information it uses private cloud

* **Community** **cloud**: as the name says it is a cloud computing service that is shared among a group or community. The infrastructure is shared among a group of people with similar goals and compliance

**Ex:1.** A group of hospitals share the cloud for accessing the patient’s data. It is only accessible to the authorized people

**2.** A group of universities form a community cloud for sharing resources for academic and research purposes

**3.What is AWS?**

* AWS stands for amazon web services.
* It was introduced in the year 2005
* It is the top and best cloud provider at present
* This allows the users to store data without any physical space
* It follows the pay as you go model
* It is the widely used and is present across 18 geographical locations all over the world

**4.Top 10 cloud providers:**

* AWS
* Microsoft Azure
* GCP (Google cloud platform)
* Alibaba cloud
* Salesforce
* IBM
* Digital ocean
* Dell
* Adobe
* Drop box

**5.What is DevOps?**

DevOps can be defined in many ways such as:

* It is a methodology
* It is a process
* It is a set of tools
* It is used to automate things/Tasks

***“The DevOps can be defined as the process of delivering the product/project by ensuring automation in place and ensuring the quality with continuous monitoring and continuous testing”***

**6.Why DevOps?**

There are many reasons for using DevOps

For every IT industry there are basically two departments namely the **development** **team** and the **operations** **team**

Without DevOps there is a huge miscommunication between the both teams such as the work is delayed for example assume the development team has developed a code and committed to the GitHub.

Now the task of the operations team is to extract the code from the GitHub and perform the release operation. Even though this is performed assume that the code/application is not accessible for the users. Now there develops a misconception and a misunderstanding between the two teams. As both teams got their work done properly there might be an issue. So, in order to eliminate the misconception, the DevOps team is developed. Their task is to bridge the gap between the both teams

* The DevOps is used to bridge the gap between the development and operations team
* This is used to finish the project on time
* This is used to deliver the quality product to the end user without any errors
* This reduces the time to advance or update the application

**Ex:** Assume you have a gaming app and you want to update it, without DevOps it takes about 10 days or even more. But, using DevOps it takes limited time such as 2 days. Not only this but it also monitors the application frequently and finds the errors or bugs as soon as possible

**7.Define SDLC (software development life cycle)?**

* As the name explains it is a process used by the software development team in the IT industry used to design, develop, test and deploy the product/project
* This process contains a sequence of steps in completing a product/project
* This ensures a quality output
* This contains various phases such as:

1. **Requirement analysis and gathering**
2. **System design**
3. **Implementation**
4. **Testing**
5. **Deployment**
6. **Maintenance**

There are various types of methodologies such as:

Waterfall method, Agile method, V-model, spiral model

**8.waterfall method:**

* It is a linear and sequential approach and a non-iterative model
* While moving to the future steps the present step should be completed
* It is simple and used for small projects
* The only disadvantage of this is that new updates cannot be added later once the steps are completed
* There is no overlap between the phases
* **Advantages:**

1. Simplicity
2. Structured approach
3. Well documented
4. Good for fixed requirements

* **Disadvantages:**

1. Inflexible
2. Late testing
3. Risky for long projects
4. Delay in customer feedback