**Introduction to DevOps**

**1.Cloud:**

**What is cloud?**

Cloud refers to the network of servers it is used to store, and process and manage the data over internet virtually.

**Cloud Computing:**

Cloud computing is the delivery of services

In this we have two modes

1.Service mode - Saas,Paas,Iaas,Faas

2. Deployment mode - Private cloud , Public cloud , Hybrid cloud , Community cloud

About Saas

In cloud computing model cloud delivers the software over the internet we can use in our browser without installing in our local drivers it follows pas u use model.

About Paas

Platform as a service provides the platform for developer to build test and deploy the software.

About Iaas

It offers fundamental infrastructure over the internet such as servers storage and networking

About faas

We can run the pieces of code without managing servers we focus on only writing the code for specific task you need and cloud provider handles the rest.

About private cloud

In the name it self we have private means this cloud is used by only specific organization only we share the data or store the data within in the specific organization only

About public cloud

Public cloud is used by many users

About Hybrid cloud

Hybrid cloud is the combination of both the private cloud and public cloud

Community Cloud

In this cloud infrastructure is shared among the group of organizations with similar goals and requirements

**AWS(Amazon as a service)**

* Top most and best cloud provider
* First cloud introduced In the market
* It is the combination of Saas Paas and Iaas if it is the combination of saas and paas then we can say it is perfect combination of the cloud
* Without any physical space it allows to store the data
* We uses the policy pay as u go
* We have 18 geographical regions where AWS is covering
* It was started in 2005

**Top cloud providers**

1. Amazon web services – 36%
2. Azure Cloud – 27%
3. Google cloud – 15%
4. Alibaba – 10%
5. IBM Cloud – 7%

**DevOps Definition:**

DevOps is the process of delivering the Product or project. By ensuring the automation in place, ensuring the quality with continuous monitoring and continuous testing.

**Why DevOps:**

To deliver the software or project on time and to improve the collaboration and communication developers and communication team. To deliver the software in less time and with quality. And faster issue solving.

We Use **Waterfall model** and **agile model** in DevOps

Waterfall model for small projects

Agile model for larger projects

In water fall model we have:

1. Requirement and analysis
2. Design
3. Development
4. Testing
5. Deployment
6. Maintain/Support

In agile model we have:

1. Requirement and analysis
2. Design
3. Development
4. Testing
5. Deployment
6. Maintain/Support

If any error or negative feedback encountered again we do the system design phase the process will repeat until the feedback is positive

**Waterfall model**

Waterfall model is the linear sequential model it is used to develop the software in step by step procedure it will be moving to next phase after the completion of the present phase if any error raises in the present phase the error will be moved to the next phase also in this model testing will be done at the end. It takes 6months to 12months to develop a software using this model.

1.Requirements and analysis phase:

In this phase we talk to the customer and make the SRS (software requirement specification) document according to the specification and requirements we can say this phase is the foundation for whole project and clear understanding of the project goals, functionalities, limitations, restrictions should be followed during the execution of the project. and analysis will be done in technical aspects and in financial way.

2.System Design:

Based on the requirements of the client SRC designing will be done and assigning work to team and again we have 2 phases in in system design

1.low level design

2.high level design

And assign the work to the team and coding will be done in this phase only.

3.Implementation:

Integrates all the coding which is done in the previous step and testing will be done.

4.Deployment:

Complete software will be moved to the local server to the global server

5.maintaince:

Monitoring the software will be done.

**Agile model**

Agile model is the combination of iterative and incremental model agile means the ability to respond to the changes from requirements, technology & people in agile model we can change and add the new requirements in the middle of the process and we are using agile is used in Flipkart, Facebook, twitter, Instagram, whatsapp, in this model we collaborate the customers through out the process and we get continuous feedback from the customers so due to continuous feedback we make the adjustments early.

Advantages of agile model

Requirement changes are allowed at any stage of development

Releases will be very fast

Every week at least on release will be there

There will be good communication b/w all the teams

It is very easy to adopt

Disadvantages of Agile

Less focus on the design and documentation phase

Unable to predict the time and cost of the project because of continuous changes will take place

Contunious involvement of the customers it will slow down the process if customers are not available

**Manual testing**

**Definition of Manual testing**

Testing the software manually without using the automation or tools.

In manual testing we have 3 types

1.White box

2. black box

3.gray box

About White box testing

To perform this white box testing developers should have knowledge on coding if any error raises developer will test the each and every line of the code first developers will do white box testing and send it to the testing team.

About Black box testing

To perform this black box testing testers need not to have knowledge on the internal logic of the code just to examine the functionality of the code we perform black box testing to check whether it is giving the expected out put or not.

In black box testing we have two types of testing

1.functional testing

2.non-functional testing

About functional testing:

Functional testing we check whether the software is working according to the requirements or not

For example:

We are testing a simple calculator I give an input as 2+2

We check whether app gives expected output as 4 or not

Functional testing we have 3 types of testing

1.unit testing

2.integration testing

3.system testing

About unit testing:

Unit testing primarily falls under white box testing in some seniors it may apply black box testing where we are focusing on input and output.

About integration testing:

In the name it self we have integration testing is the process of combining all the units of code to ensure all the different units of the system work as expected or not.

About system testing

In this phase we test whole application. And the goal is to ensure the whole system meets the specified requirements from the end-user perspective testing is done by the tester.

**Gray box testing**

Gray box testing is the combination to white box and Blackbox testing

**Error:** mistakes in the coding made by the developer

**Defect:** error accepted by the developer is called defect

**Failure:** completely wrong

**Bug**: if any error found during the testing is called bug

**Tools:**

1. **Plaining/coding:** Git
2. **Building the code:** Maven
3. **Testing :** Selenium testing with python
4. **Integration :** Jenkins(CI/CD)
5. **Deployment:** docker,kubernates
6. **Operations** : Ansible
7. **Monitoring:**teraform