**Introduction**

**1.Cloud:**

🡪 It is the process of accessing the data and storing the data via internet.

**Cloud Computing:**

🡪Cloud Computing is the delivery of computing services-such as servers, storage, databases, software and more over the internet (the cloud).

🡪We can access the data from anywhere.

🡪It can be divided into two modes:

**1.Service Model**:It is a way for organizations to create, test, and scale the design of whole service.

In server model we have SAAS, PAAS, IAAS, FAAS.

* IAAS: (Infrastructure as a service)

Infrastructure will be provided for us we can have to build our own applications.

* PAAS: (Platform as a service)

This service will provide platform where can deploy our own application.

* SAAS: (Software as a service)

Using the service which is already maintain by someone.

* FAAS: (Function as a service)

It allows developers to build, compute, run, and manage applications packages as functions without having to maintain their own infrastructure.

**2.Deployment Model:** It describes how the resources of a system are employed to execute the application function.

There are four types of deployment modes:

1.Private cloud:

* It has limited access.
* It is mainly used for security purpose.
* It is only for particular organization or institute.

2. Public cloud:

* It is publicly accessible cloud environment.
* It is owned by third-party cloud providers.

3. Hybrid cloud:

* We can maintain the hybrid cloud for both the private and public.

4.Community cloud:

* It is similar to the public cloud expect that its access is limited to a specific community of cloud consumers.

**There are 10 cloud providers:**

1. AWS 6.Alibaba Cloud
2. Microsoft Azure 7.Salesforce
3. IBM Cloud 8.Digital Ocean
4. Google Cloud 9.VMware Cloud
5. Oracle Cloud 10.Tencent Cloud

**AWS (AMAZON WEB SERVICE):**

* Amazon was started in 2005.
* This is the first cloud which is introduced in the market.
* This is top and best cloud provider.
* It is having an option like “pay as you go”.
* Without any physical space this AWS allows people to store the data.
* We have 18 geographical regions- AWS is covering.
* It is a combination of saas and paas.

**DEVOPS:**

DevOps is the “process of delivering the product/project by ensuring automation in place, ensuring the quality with continuous monitoring and continuous testing”.

DevOps: It is a combination of developers team and operational team.

* It is the way of software development.
* It is a methodology.
* It is a set of tools.
* It is the way to automatic things.

**Why DevOps?**

* To deliver the software or product or project on time.

Ex: Phonepe- When the application has version1, then we what to update in version2, then without using DevOps it will take 10 days. While using DevOps it will take 2 days.

* DevOps uses CI/CD (continuous integration and continuous deployment).

**SDLC (Software Development Life Cycle):**

* SDLC is a process used by the software industry to design, develop and test high quality software.
* It is a step-by-step procedure to developing a new software is called software development life cycle.
* It can divided into two models.

1. **Waterfall Model:-**

* It can be used for small product.
* It is also called as linear sequential development model.
* It is non-iterative model.
* Every phase is depend on previous phase.
* Requirement changes are not allowed.
* Testing will start after the coding.

There are five phases in waterfall model:

Requirement Analysis🡪System Design🡪Implementation🡪

Deployment🡪Maintenance

SRS- Software Requirement Specification.

* Requirement Analysis:

🡪In this we can gather the requirements, what the client need

for the project.

🡪There is a person called Business Analyst, he can collect the requirements from the client and inform to developers.

* System Design:

There are two types of design:

🡪One is High level design and another one Low level design.

🡪 High level design means designing the architecture of the application.

🡪 Low level design means how the each and every modules will look like.

* Implementation:

🡪 Implementation refers to the phase where the actual coding and development of the software take place.

* Deployment:

🡪 Complete software will be moved/shifted to the local server to global server.

🡪 Deployment refers to the process of delevering a software application to its end user.

* Maintenance:

🡪 The last phase of software development life cycle is called as Maintenance.

🡪 Maintenance is mainly done by developer and QA.

🡪 While using the software, if customer is facing any problem, then developer can develop it and tester will testing it then we will give the new software to the customer.

🡪 Monitoring the software or application.

1. **Agile Model: -**

🡪 It can be used for large product.

🡪 Agile means “the ability to respond to the changes from requirements, technology and people”.

🡪 It is an incremental model and iterative to develop a software or an application.

🡪 It will be completed in couple weeks only.

Requirement Analysis🡪System Design🡪Development🡪testing🡪deployment🡪Review🡪Delivery🡪Feedback.

Advantages:

1. Requirement changes are allowed at any stage of development.
2. Releases will be very fast.
3. Customers no need of waiting for longer time.
4. Good communication will be there between all the teams.
5. It is very easy to adopt.

Disadvantages:

1. It is having less focus on design and documentation.

**Testing:**

* It is a part of software development process.
* It is used for checking errors and gaps in the software.
* The objective of testing is to release quality product to the client.

It is undergo for manual testing.

🡪 Manual testing is testing, where the tester can test the application without any knowledge of any programming language.

🡪 In manual testing, the test engineer tests the application like a user to make it bug-free or stable.

It has three types:

1. White box testing: (with coding)

* It was conducts on internal logic of the programs.
* Programming skills are required.
* It is followed by developers.
* It is used for low level.
* Monitoring internal structure, check internal logic, done by developer.
* It includes unit testing and integration testing.
* Developers will test each and every line of code.
* Developer fixes bugs and performs one round of white box testing team.
* Fixing bugs and clearing the errors.
* White box testing is also known as glass box, clear box testing, open box, Transparent and code-based.

1. Black box testing: (without coding)

* It was conducts on functionality of application whether it was working according to customer requirement or not.
* This testing is followed by testers.
* It is used for high level.
* The testing is done without the internal knowledge of the products.
* It includes system testing and user acceptance testing.
* There are 2 types of testing:

1.Functional Testing:

* For testing the software or application functionality end to end process is called functional testing.
* It consists of three types:

1.Unit testing: The process where we can test the smallest functional unit of code.

2.Integration testing: It is type of software testing in which the different units, modules or components of a software application are tested as a combined entity.

3.System testing: It is a software testing method that evaluates the functionality of an integrated software system to ensure it meets the specialized requirements.

2. Non-functionality:

* Non-functional testing is a type of software testing that evaluates a product’s non-functional attributes, such as performance, usability, and security.

1. Grey box testing:

* Combination of white box and black box is known as Grey box testing.

Bug: An error found during the testing phase is called bug.

* A mismatch between the expected and actual result of software development is called Defect/Bug.

Error: A problem is created by human actions in the system is called Error.

Defect: An error found during the unit testing in the development

Failure: While using the system the deviation is identified by end-user is called Failure(Total wrong).

SDLC Models:

* V-Model
* Spiral Model
* Prototype
* Incremental Model

Tools Required:

1. Planning/Coding/SCM: git, jira
2. Building the code:Maven, grade, apache ANT
3. Testing: Selenium testing with python.
4. Integration: Jenkins (CI/CD)
5. Deployment: Dockers, Kubernates
6. Operations: Ansible
7. Monitoring: Teraform