**What is Cloud:**

* It is the distributed Collection of servers that are hosted on the internet, instead of local servers.
* Processes the data and uses the application.

**What is Cloud Computing**

Cloud computing is an on demand delivery of resources and services over the internet allowing users to access storage,applications and other resources without owning the infrastructure.

Cloud computing offers pay as you use.

Studying of cloud services.

**Key characteristics of cloud computing**

**On-Demand Self-Service:**Users resources as needed without requiring human interaction with the service provider.

**Broad Network Access:** Resources are available over the internet and accessible from various devices.

**Two Types Of cloud Computing models**

**Service Model:**Cloud models in cloud computing define how cloud providers deliver resources and services to users.There are 4 service models.

1. Iaas
2. Paas
3. Saas
4. Faas

**Iaas(Infrastucture as Service):**

* It is computing Infrastructure managed over the internet.
* The main advantage of using Iaas is it helps users to avoid cost and complexity of purchasing and managing the physical servers.

Ex:AWS

**Paas(Platform as Service):**Paas is created for the programmer to develop,test,run and manage the applications.

**Saas(Software as Service):I**t is a software in which applications are hosted by a cloud service provider.Users can access these applications with the help of internet connection and browser.

**Faas(Functional as Service):**Faas allows customers to run code in response to events,without managing the complex infrastructure associated with building and managing applications.

**2. Deployment Model:** The deployment model is a way of how resources are available to the users and how they are managed. There are 4 types of Deployment model:

1. **Private Cloud:** In the Private cloud the resources are shared with the single organization.

**Example:** College Website for checking the attendance

1. **Public Cloud:** In the public cloud the cloud resources are shared to the industry group by the cloud service provider.

**Example:** Social media

1. **Hybrid Cloud:** Hybrid Cloud combines elements of both public and private clouds, allowing data and applications to be shared between them.

**Example:** Netflix

1. **Community Cloud:** Community cloud that combines two organizations that may have the same interests and objectives.

**Example:**Two Organizations combine and work on the research paper.

**AWS**

* AWS is one of the top and best cloud providers started in 2005 offered by Amazon..
* Aws is the first cloud introduced into the market.
* AWS offers tools such as computing, storage and content delivery.
* The advantage of AWS is without any physical space it allows people to store the data.
* Around 18 geographical locations, AWS is located.
* 36% of the companies are using the AWS Cloud Platform.
* In 2006, it offered the IaaS Infrastructure services.
* With more than 200 services, AWS offering for individuals and the public as well as private organizations to create applications.
* The first company that introduced the “pay as you go” how much service they are used for that they need to pay the cost.

**DevOps**

* DevOps is a combination of the development team and the Operation team.
* DevOps is a methodology.
* It is a set of tools.
* It is a way to automate tools.
* DevOps is a process of delivering a project/product or application by ensuring the automation in place, by ensuring quality with continuous monitoring and continuous testing.
* DevOps is a software development approach by emphasizes communication, automating, and delivering the application to the customers in a high-quality manner as quickly as possible.
* It allows to handle the complete application from development to testing and operations to development.

**Why DevOps**

The main goal of DevOps is as follows:

**To Provide High-quality Software/projects:** DevOps is a continuous testing and continuous monitoring that can deliver high-quality applications.

**Delivers product Quickly:** Both the Development team and operations team combine and deliver the product fast.

**Continuous Improvement:** By continuous monitoring, collect the feedback from the client and given the developer team to minimize it.

**Improved Customer Satisfaction:** By Continuous Improvement of the application customers will be satisfied with the product.

**Top 10 Cloud Providers**

1. Amazon web service(36%)
2. Microsoft Azure(25%)
3. Google cloud platform(11%)
4. Alibaba Cloud(4%)
5. Salesforce(3%)
6. IBM(2%)
7. Oracle(2%)
8. Tencent cloud(2%)
9. Digital ocean(1%)

10.VMware cloud(1%)

DAY-2

26/11/2024

**Developer Team**:Writes the code as per client requirement.

**Operation Team**:Manages whole infrastructure of the application.

**SDLC**

Software Development Life Cycle is a structured process used by the developers to develop,test,deploy,monitor high quality applications.There are basically 2 models used by the developers to create and manage application according to the complexity of the project.There are 2 models used:

1. Waterfall model
2. Agile model

**1. Waterfall Model:**

* Waterfall is a linear sequential model in the software development life cycle that consists of several phases.
* It is one of the simplest models, used for smaller projects.
* In each phase where the output of the current phase is the input to the next phase.
* The waterfall model is used when the project requirements and goals are clear.
* It takes 6 to 12 months to develop a software or application.
* It is non iterative model after completing first step we are moving to the next step of the process and there is no revisiting of previously completed phase.

**Phases in the Waterfall model**

**1. Requirement Analysis:** Gathering and collecting the data from stakeholders and understanding the scope and objective of the application.SRS(System Requirement Specification) is documented which contains the requirements, scope, and objectives and is used for designing in the next phase.

**2. System Design**: Based on the requirements gathered ,the system architectures,components and designs are planned and assigning work/tasks to teams.It includes high level design and low level design.The low level which contains internal structure each modules and high contains overall architecture how different modules or components of the system interact..Coding will be done with Implementation in the second phase.

**3.Implementation:** It Integrates all the coding done in the previous phase and starts testing.It checks whether application is meeting client requirement and includes various testing strategies like unit,integration and system testing

**4.Deployment:**Complete application will be moved to global server from local server as per the requirement of the client.

**5.Maintenance:**The last phase in waterfall model where monitoring bug fixes,adding new features to the application and collect feedback from clients and try to improve overall product.

**Agile Model**

* Every Software application follows agile model.
* Agile is defined as “Ability to respond to the changes from requirements,technology and people”.
* It is an incremental and iterative model to develop a software or application.
* As Agile is iterative approach we can deliver the software at any time.
* In agile model we will be keep adding new features into the software.
* Agile model should respond to different kinds of people and from oldest to latest versions.
* Difference between waterfall and agile model is we can deliver after completion of all phases but in agile they can deliver a piece of software in the form versions.

Steps followed in agile model

Requirement analysis Design Development Testing

Deployment Maintenance/Review Delivery

Feedback System Design

**Advantages**

* Requirement changes are allowed at any stage of development.
* Releasing of the application will be too fast(might be in 1 week).
* Customers are no need of waiting for longer time.
* Good communication will be there between teams.
* We can easily adopt.

**Disadvantages**

* Less focus on design and documentation.
* Project timelines and outcomes are difficult to predict due to iterative method.
* Agile demands continuous collaboration with stakeholders that may not be feasible at every time.

In agile model ,manual testing will be done.

**Manual testing** is defined as manually verifying the software without using any automation tools.

Manual Testing

White Box Black Box Gray Box

Functional Non Functional

Unit Integration System Testing

There are 3 types of manual testing

1. Black Box
2. White Box
3. Gray Box

**Black Box Testing:**It will examine the functionality of the software without knowing its internal structure,application or implementation.

**Types of black box testing**

**Functional Testing:**It validates the functionality of the software application against its requirement and specification.

**Non Functional Testing:**It focus on how well a system is performs rather than specific behaviour and functions.

**Function testing types**

**i.Unit Testing:**It focuses on testing the individual components or modules of the software.

**ii.Integration Testing:**It combines or integrates all modules into one and perform testing while it getting any error after integrating .

**iii.System Testing:**It checks whetherentire tested application is meeting the client requirements or not.

**White Box Testing**

* The developer will test each and every line of the code.Tester need knowledge or programming skills to test the design test cases.
* The bugs occurred during the testing are documented in a report by the tester and handling it to the developer to rectify it.
* Developer fixes the bugs and perform 1 round of white box testing and send it to the testing team.
* **Difference** between Black box and white box testing is that the tester will not have any knowledge on the architecture or implementation whereas in white box the tester will have knowledge about the implementation.

**Bugs**:Development team will develop the code and operation team will perform operations on it.If they find any error during testing is called Bugs.

**Error**:Any mistake in the code done by the developer is called error.

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

**Failure**:Total mistake in the code is called failure.

**Tools used in Devops**

1. Planning/coding/SCM:**Git** or Jira
2. Building code:**Maven**,Gradle,Apche ANT
3. Testing:Selenium with python
4. Integration:Jenkins(CI/CD)
5. Deployment:Docker,Kubernetes
6. Operations:Ansible
7. Monitoring:Terraforms