DevOps Training Day1(25-11-2024)

**Cloud:** Cloud is a technology used to access and store the data, applications, and services over the internet instead of on local servers or personal computers. It provides on-demand delivery of IT resources such as servers, storage, databases etc.

**Cloud Computing**: cloud computing is nothing but study of cloud services. There are two modes in cloud computing. They are service mode, deployment mode.

**Service Mode**: We have four types of cloud computing services:

1.Infrastructure-as-a-Service (**IaaS**): It is a cloud computing model that provides on-demand access to IT resources like storage, networking, and compute.,

2.Platforms-as-a-Service (**PaaS**): PaaS is a cloud computing model that provides a scalable platform for developing, deploying, running, and managing applications,

3.Function as a Service (**FaaS**): It is a cloud computing model that allows users to develop, run, and manage applications without the need to build and maintain infrastructure

4.Software-as-a-Service (**SaaS**): It a cloud-based software delivery model that allows users to access software applications over the internet.

Deployment Mode: We have 4 types of clouds in deployment mode

1.Private Cloud: Individual company or organisation will use this private mode because of some security reasons. Persons other than this company will not have the access.

2.Public Cloud: Any person can use the services

3.Hybrid Cloud: It is a combination of private and public clouds, where we can have some part of project in private cloud and some in public cloud.

4.Community Cloud: In this type of cloud computing a company will tie up with other company for some project and uses a particular cloud service.

**Why AWS as cloud Provider?**

1. It is the topmost in the list of best cloud providers.
2. It is the first cloud Provider which was introduced in the year 2005
3. It allows people to store the data without using any physical space.
4. AWS covers 18 geographical regions covering 50 active places.
5. Pay-as-you-go (PAYG) - It allows users to pay for cloud services based on what they use, rather than committing to a fixed contract or prepaid plan

**DevOps:** It is a process of delivering the Product/Project by keeping automation in place and ensuring the quality with continuous monitoring and testing. It is a way of software development with a set of tools.

Dev-Developing Team-who writes the code

Ops-operations Team-who manages the whole infrastructure

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

**Waterfall Model**: It is a traditional software development methodology that follows a linear and sequential approach. It is often used in projects where requirements are well-defined and unlikely to change.

**Key Phases of the Waterfall Model**

1. **Requirements Analysis**
   * Gather and document all functional and non-functional requirements.
   * This phase ensures that developers and stakeholders have a clear understanding of what the software should achieve.
2. **System Design**
   * Design-plan and then assign work to teams.
   * System design includes two levels High Level Design, Low Level Design.
3. **Implementation (Coding)**
   * Developers write code based on the design documents.
   * This phase focuses on converting design specifications into a working software product.
4. **Integration and Testing**
   * Test the software to ensure it meets the requirements and is free of defects.
   * Types of testing include unit testing, system testing, integration testing, and acceptance testing.
5. **Deployment**
   * Deliver the completed software to the client or end-users.
   * This phase includes installation, configuration, and initial setup.
6. **Maintenance**
   * Fix bugs, update the system for compatibility with new technologies, and address any issues that arise post-deployment.
   * Monitor the software or application.

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**Agile Methodology**: Agile means ability to quickly respond to the changes from requirements, technology, and people.

It is an Incremental and Iterative model.

Steps involved in this model include- 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 fast.
3. Customers no need to wait for longer time.
4. Good communication will be there between all the teams.

Disadvantages:

1. It has less focus on design and documentation.

Types of Testing

**1.Manual testing**: Manual testing includes testing a software manually, i.e., without using any automated tool or any script. It has three types they are White box testing, Black box testing, Grey box testing.

**2. Automation Testing**: Automation testing, which is also known as Test Automation. The tester writes scripts and uses another software to test the product. This process involves automation of a manual process. Automation Testing is used to re-run the test scenarios that were performed manually, quickly, and repeatedly.

**White Box Testing**: It is further divided into 3 types they are unit testing, Integration testing, System testing and Acceptance testing.

* Developers will test every line of code.
* Need programming skills to design test cases.
* Developers fixes bugs and performs 1 round of white box testing and then sends code to the testing team.

**Unit Testing:** Testing individual units or components of the software.

**Integration Testing:** Testing the interaction between integratedcomponents or systems.

**System Testing:** Testing the entire system to ensure all components work together.

**Acceptance Testing:** Verifying if the system meets the business requirements and is ready for deployment**.**

**Black Box Testing**: Black box testing is that kind of software testing you can do when you do not have the source code, just the executable code in hand. The testing is done without the internal knowledge of the products.

🡪What are Bugs?

If Operation team find any error during testing, then it is called Bug

🡪What is defect?

Error accepted by the developer is called defect.

🡪What are tools required during each phase of DevOps?

* Planning/coding/SCM: git/Jira
* Building the code: Mavel, Gradle, Apache ANT
* Testing: Selenium testing with python
* Integration: Jenkins (CI/CD)
* Deployment: Dockers, Kubernetes
* Operations: Ansible (managing tool)
* Monitoring: Terraform