



Department of Information Technology

Academic Year: 2024-25

Semester: V

Class / Branch: SEIT/Div A

Subject: DevOps Lab

Name of Instructor: Harprit Bhatia

Name of Student: Chirag Jayesh Malde

Student ID: 22104186

Date of Performance: 19/07/24

Date of Submission: 19/07/24

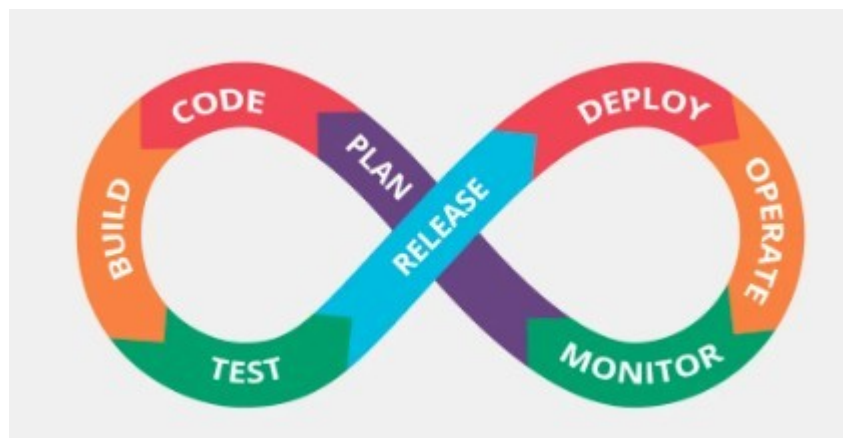
Experiment No. 1

Aim: To understand the principles of DevOps along with its role and responsibilities.

Q1. What is DevOps?

DevOps is a combination of Development and Operation which increases the efficiency and security of the software deployment. DevOps is a work procedure where development teams of software collaborate with IT operations teams. Automation and other tools are leveraged to make development and deployment of software way faster, more reliable, and efficient. The objective is to deliver updates to software more frequently and of better quality.

Q2. Give Lifecycle of DevOps?



Plan: Define objects and requirements

Code: Write and test code.

Build: Compile code into deployable artifacts.

Test: Verify code quality and functionality.

Deploy: Release code into production.

Operate: Monitor and manage deployed applications.

Monitor: Track performance and user feedback.

Iterate: Continuously improve based on insights.

Q3. Explain different phases of DevOps Life cycle.

I) Continuous Development

In Continuous Development code is written in small, continuous bits rather than all at once, Continuous Development is important in DevOps because this improves efficiency every time a piece of code is created, it is tested, built, and deployed into production. Continuous Development raises the standard of the code and streamlines the process of repairing flaws, vulnerabilities, and defects. It facilitates developers' ability to concentrate on creating high-quality code.

II)Continuous Testing

Continuous testing is a key practice in DevOps that emphasizes testing early, often, and throughout the software development lifecycle. It integrates automated testing into every stage from code development to deployment and beyond ensuring that potential issues are caught early and consistently

III)Continuous Integration

Any firm can deploy continuous testing with the use of the agile and DevOps methodologies. Depending on our needs, we can perform continuous testing using automation testing tools such as Testsigma. With these tools, we can test our code and prevent problems and code smells, as well as test more quickly and intelligently. With the aid of a continuous integration platform like Jenkins, the entire process can be automated, which is another added benefit

IV)Continuous Deployment

Continuous Deployment is the process of automatically deploying an application into the production environment when it has completed testing and the build stages. Here, we'll automate everything from obtaining the application's source code to deploying it.

V) Continuous Monitoring

DevOps lifecycle is incomplete if there was no Continuous Monitoring. Continuous Monitoring can be achieved with the help of Prometheus and Grafana we can continuously monitor and can get notified before anything goes wrong with the help of Prometheus we can gather many performance measures, including CPU and memory utilization, network traffic, application response times, error rates, and others. Grafana makes it possible to visually represent and keep track of data from time series, such as CPU and memory utilization.

VI)Continuous Feedback

Once the application is released into the market the end users will use the application and they will give us feedback about the performance of the application and any glitches affecting the user experience after getting multiple feedback from the end users' the DevOps team will analyze the feedbacks given by end users and they will reach out to the developer team tries to rectify the mistakes they are performed in that piece of code by this we can reduce the errors or bugs that which we are currently developing and can produce much more effective results for the end users

VII)Continuous Operations

We will sustain the higher application uptime by implementing continuous operation, which will assist us to cut down on the maintenance downtime that will negatively impact end users' experiences. More output, lower manufacturing costs, and better quality control are benefits of continuous operations.

Q4. Explain Different DevOps tools with its functionalities

I)Gradle:

Gradle is a build automation tool for multi-language software development. It controls the development process in the tasks of compilation and packaging to testing, deployment, and publishing. Supported languages include Java, C/C++, and JavaScript.

II)GIT

Git is a distributed version control system that tracks versions of files. It is often used to control source code by programmers collaboratively developing software.

III)Jenkins

Jenkins is an open source automation server. It helps automate the parts of software development related to building, testing, and deploying, facilitating continuous integration, and continuous delivery. It is a server-based system that runs in servlet containers such as Apache Tomcat.

IV)Bamboo

Bamboo is a continuous integration and delivery tool from Atlassian, designed to automate the build, test, and release processes for software applications

V)Docker

Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. The service has both free and premium tiers. The software that hosts the containers is called Docker Engine. It was first released in 2013 and is developed by Docker

VI)Kubernetes

Kubernetes is an open-source container orchestration system for automating software deployment, scaling, and management. Originally designed by Google, the project is now maintained by a worldwide community of

contributors, and the trademark is held by the Cloud Native Computing Foundation.

VII)Ansible

Ansible is a suite of software tools that enables infrastructure as code. It is open-source and the suite includes software provisioning, configuration management, and application deployment functionality.

VIII)Selenium

Selenium is an open source umbrella project for a range of tools and libraries aimed at supporting browser automation. It provides a playback tool for authoring functional tests across most modern web browsers, without the need to learn a test scripting language.

Conclusion:

In this lab session, we have learnt about DevOps , Life cycles of DevOps its phases. And also learnt about many DevOps tools such as Git, Docker, Jenkins, etc.