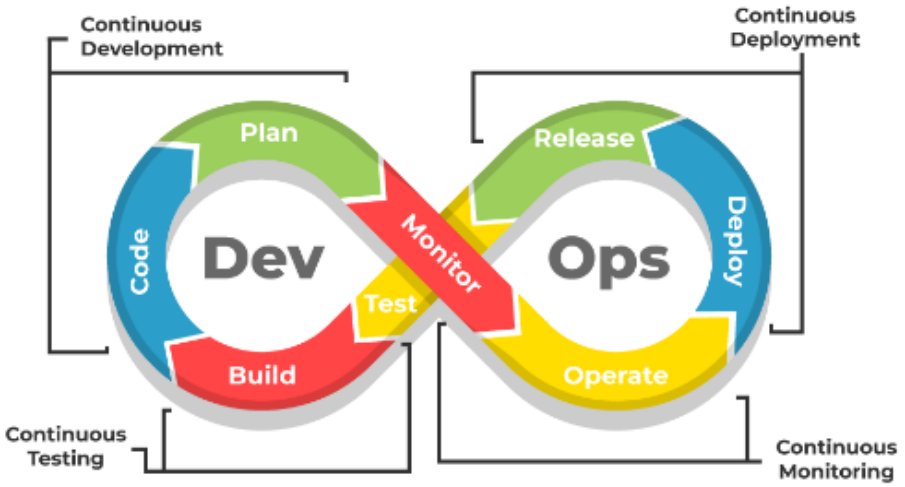
Atharva Yadav
T23-101

Devops Lab Assignment No. 1

Aim : To Understand Devops Principles, Practices, Devops Engineer Roles And Responsibilities.

What is Devops?

DevOps is a set of practices that combines software development (Dev) and IT operations (Ops). It aims to shorten the development life cycle and provide continuous delivery with high software quality. DevOps achieves these goals by fostering a culture of collaboration between teams that historically functioned in relative siloes. This cultural shift is supported by automation and tooling to enable a more agile and efficient software development and deployment process.



Tools Used In Devops ?

DevOps utilises a wide range of tools across different stages of the software development lifecycle. Here are some commonly used tools in various categories of DevOps

Source Code Management: Git, SVN, Mercurial

Continuous Integration / Continuous Deployment (CI/CD): Jenkins, GitLab CI/CD, Travis CI, CircleCI

Configuration Management: Ansible, Chef, Puppet, SaltStack

Containerization and Orchestration: Docker, Kubernetes, Docker Swarm

Infrastructure as Code (IaC): Terraform, CloudFormation, Ansible (can also be used for IaC)

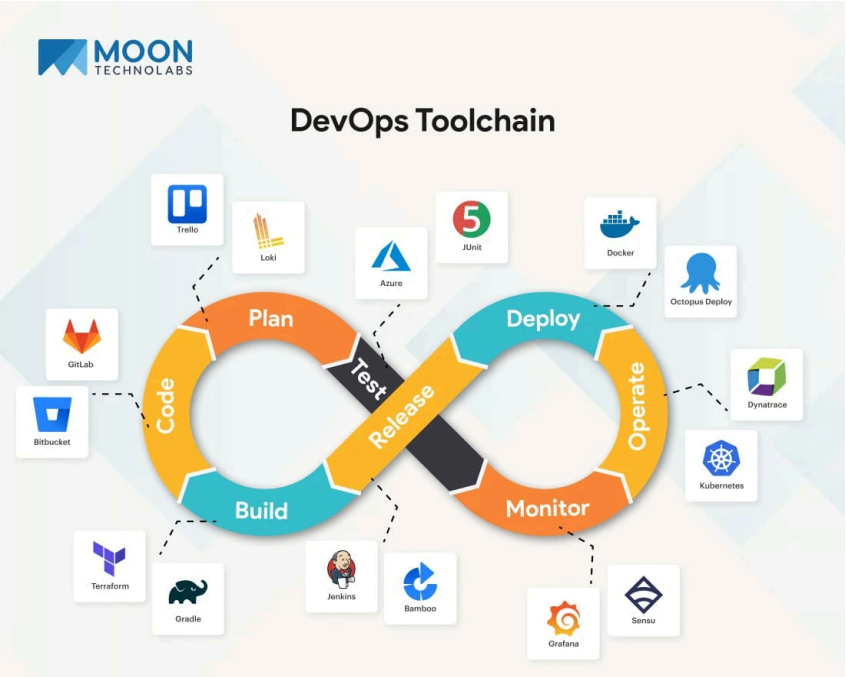
Monitoring and Logging: Prometheus, ELK Stack (Elasticsearch, Logstash, Kibana), Splunk, Grafana

Collaboration and Communication: Slack, Microsoft Teams, Jira, Confluence

Testing Automation: Selenium, JUnit, NUnit, pytest

Version Control: Git, SVN, Mercurial

Cloud Platforms: AWS, Azure, Google Cloud Platform (GCP), Alibaba Cloud



Roles and Responsibilities of an Devops Engineer ?

1. **Infrastructure Automation:** Designing, implementing, and managing infrastructure as code (IaC) using tools like Terraform, CloudFormation, or Ansible to automate infrastructure provisioning and configuration.
2. **Continuous Integration / Continuous Deployment (CI/CD):** Setting up and maintaining CI/CD pipelines using tools like Jenkins, GitLab CI/CD, or Travis CI to automate building, testing, and deploying applications.
3. **Configuration Management:** Managing and automating configuration management processes using tools such as Ansible, Chef, or Puppet to ensure consistency across environments.
4. **Monitoring and Logging:** Implementing monitoring and logging solutions (e.g., Prometheus, ELK stack) to track system performance, detect issues, and troubleshoot problems proactively.
5. **Containerization and Orchestration:** Working with containerization technologies like Docker and container orchestration platforms such as Kubernetes or Docker Swarm to deploy and manage containerized applications at scale.
6. **Collaboration and Communication:** Facilitating collaboration between development and operations teams by integrating tools like Slack, Jira, or Confluence for effective communication and project management.
7. **Security and Compliance:** Implementing security practices and ensuring compliance with organizational policies and industry regulations throughout the development and deployment processes.
8. **Scripting and Programming:** Writing scripts and automation code (e.g., Bash, Python, PowerShell) to streamline operational tasks and improve efficiency.
9. **Continuous Improvement:** Continuously evaluating and improving processes, tools, and technologies to enhance the speed, efficiency, and quality of software delivery.
10. **Technical Support and Troubleshooting:** Providing technical support, troubleshooting issues, and resolving incidents related to infrastructure, deployments, and automation processes.

DevOps engineers play a crucial role in bridging the gap between development and operations teams, promoting collaboration, automation, and efficiency to achieve faster and more reliable software delivery.

Conclusion :

In conclusion, DevOps principles emphasize collaboration, automation, and continuous improvement, while DevOps engineers play a pivotal role in automating infrastructure, implementing CI/CD pipelines, ensuring security, and enhancing efficiency throughout the software development lifecycle. Adopting DevOps practices enables organizations to deliver software faster, with higher quality, and adapt quickly to changing requirements.

LO mapping : LO1