Yash Gokana
TI2
30

26/1/25 SEPM Experiment ~~Assignment~~ No. 1

THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

① To understand DevOps principles, practices and devops engineer role and responsibilities.

→ What is DevOps?
It is a collaborative approach where teams work together to build and deliver secure software efficiently.
It combines software development (dev) and operations (ops) to accelerate delivery through automation, collaboration, fast feedback and iterative development built on Agile methodology. DevOps creates a culture of accountability, collaboration and shared responsibility for business outcomes.

Core Principles of DevOps →
- Develop and test in production-like environments
- Develop builds frequently
- Continuously validate operational quality.

Key principles of DevOps →
① Continuous Deployment
Continuous Delivery and Deployment originate from continuous integration, a method to rapidly develop build and test new code with automation to that only code that is known to be good become part of a software product.

② Continuous Development

This is phase that involves planning and coding, versioning and managing builds of the software appl" functionality eg: Git, Github, Maven -

③ Continuous testing →

It is executing automated tests, continuously and repeated against the code base and the various deployment environments. It is a software testing methodology which focuses on achieving continuous quality and improvement

Eg: Appium, Bamboo.

④ Continuous Integration →

It refers to the build and unit testing stages of the software release process. Every revision that is committed triggers an automated build & test.

Eg: Jenkins, Travis CI.

⑤ Infrastructure Management →

Without automation, building and maintaining large-scale modern without automation IT systems can be a resource intensive undertaking can lead to increased risk due to manual error configuration and resource management is an automated method

for maintaining computer systems and software in a known, consistent attack.

⑥ Configuration management →
Infrastructure as code is the practice of describing all software runtime environment and networking settings & parameters in simple textual format., that can be stored in your VCS & versioned on req.
These text files are called manifests & are used by DevOps tools to automatically provision & configure build servers, testing, staging & production environment.
Eg → chef, saltstack.

DevOps Engineer Role.
A DevOps Engineer manages a company ie IT infrastructures, bridging development and operation, the primary goal is to improve the process and efficiency throughout software development lifecycle.

Key Role →
① Facilitator of Collaboration
Bridging the gap b/w development, operations and QA teams to streamline communication.
② Automation specialist
Automate repetitive task like testing, deployment and monitoring.

③ Continuous iteration and continuous delivery (CI/CD)
Design, & implement & maintain CI/CD pipelines to enable faster, reliable and repeatable software releases.

④ Infrastructure as code
Use tools like Terraform, Ansible or cloud formation to define & provision infrastructure through code.

⑤ Monitoring and Incident Management
Setup monitoring system to track appl^n performance and troubleshoot issue in real time. It also ensures systems are resistent.

Key Responsibilities :→

① Collaboration and Planning : Work with development and operations teams to plan and design scalable sol^n.

② Configurat^n Management →: Use tools like puppet, chef or ansible to manage server configuration and ensure consistency.

③ Pipeline Management: Maintain CI/CD pipelines to ensure seamless build, test and deployment workflows.

④ Monitoring and logging : Implement monitoring tools like prometheus, curafana or splunk :

⑤ Support and Troubleshooting : Respond to incidents & resolve production issues promptly and identify root causes of failure & implement fixes

⑥ Documentation & Reporting : Document system configurations deployment processes & troubleshooting guidelines.