Harsh Patel T21 Roll no 73

THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

SEPM Experiment Assignment 1

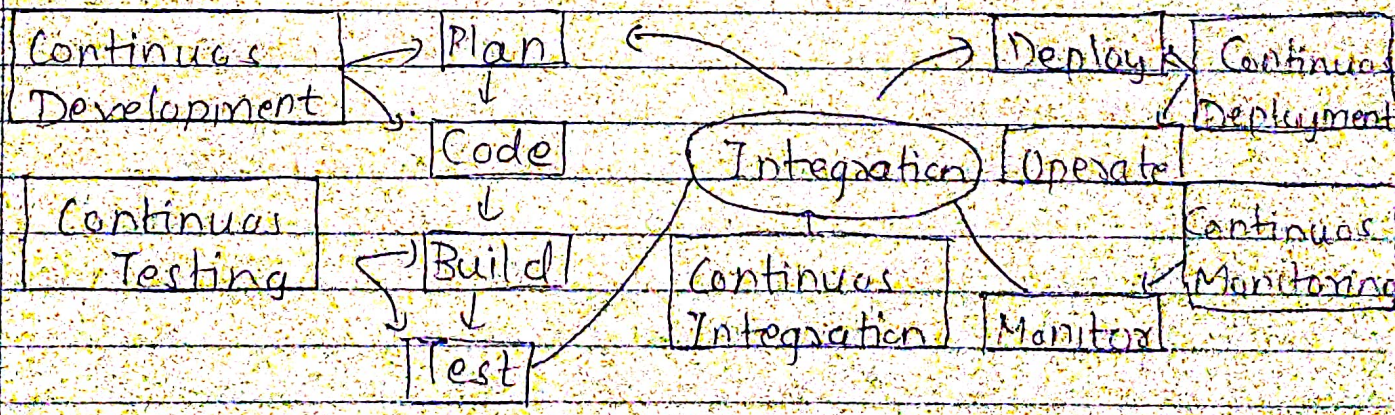
Aim To understand DevOps Principles, practices & DevOps Engineers Role & responsibilities

Q What is DevOps?

→ DevOps is a collaborative approach where teams work together to build & deliver secure software efficiently. It combines software development (dev) & operations (ops) to accelerate delivery through automation, collaboration, fast feedback & iterative improvement. Built on Agile Methodology, DevOps creates a culture of accountability for business outcomes.

- Core Principles:-
  i) Develop & test in production like environments.
  ii) Deploy builds frequently.
  iii) Continuously validate operational quality.

DevOps Practices



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⇒ Continuous Development : This is the phase that involves planning & coding, reasoning & managing builds of the software application's Functionality
Eg: git, github, maven

⇒ Continuous testing : It contains executing automated tests, continuously & repeatedly against the code base & various deployment environments. It is a software testing methodology which focuses on achieving continuous quality and improvement
Eg: Appium, Bamboo, Jira

⇒ Infrastructure Management : Without automation building & maintaining large scale modern IT systems can be a resource-intensive undertaking and can lead to increased risk due to manual error. Configuration & resource management is an automated method for maintaining computer systems and software in a known, consistent state.

⇒ Configuration Management : Infrastructure as code is the practice of describing all software runtime environment & networking settings and parameters in simple textual format, that will be stored in your version control system and versioned on request. These text files are called manifest and are used by DevOps tools to automatically provision & configure build servers, testing & production environment.

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=> Microservice Architecture: Docker is a tool designed to make it easier to create, deploy and run applications by using containers. Containers allows a developer to package up an application with all of the parts it needs such as libraries and other dependencies and deploy it as one package. By doing so, thanks to the containers the developer can rest assured that the application will run on any other linux machine regardless of any customized settings that machine might have.
eg: Nagios, Splunk

* DevOps Engineer Roles:

- A DevOps Engineer manages a company's IT infrastructure, bridging development & operations.

- Facilitation of collaboration: Bridge the gap bt. development, operations & QA teams to streamline communication & workflows.

- Automate tasks: Automate repeatative tasks like testing, deployment & monitoring to improve efficiency & reduce human errors.

- Continuous Integration & Delivery: Design, implement and maintain CI/CD pipelines to enable faster, reliable and repeatable software releases.

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- Monitoring & Incident Management:

- Setup monitoring systems to track application performance & troubleshoot issues in real time.
- Ensure systems are resilient & downtime is minimized.

* Responsibilities:

1) Collaboration & planning: Work with development & op teams to plan & design scalable solutions.

2) Configuration Management: Use tools like puppet, chef or Ansible to manage server configurations & ensure consistency.

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

4) Maintaining & logging: Implement monitoring tools like prometheus, Grafana or Splunk to track system health & performance.

5) Support & troubleshooting: Respond to incidents and resolve production issues promptly.