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SEPM

Assignment No. 2
Experiment No. 1

To understand DevOps : principles, practices & DevOps Engineer Roles & Responsibilities.

→ (1) what is DevOps ?

DevOps is a Collaborative approach where teams work together to Build & Deliver secure Software efficiently. (ops)

It combines Software Development (Dev) & operations to accelerate delivery through automation, collaboration, fast feedback & iterative improvement built on Agile methodology. DevOps creates a culture of accountability collaboration & shared responsibility for Business outcomes.

Core Principles of DevOps :-

- Develop and test in production like environ^{ments}.
- Develop Builds frequently.
- Continuously Validate operational Quality.

Key practices 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 to be known to be good becomes part of a Software product.

(2) Continuous Deployment

This is the phase that involves Planning & coding or versioning and managing

Builds of the software applications functionality. Eg:- Git, Github, Maven.

(3) Continuous Testing

Continuous testing is executing automated tests, continuously & separated against the code base & the various deployment methodology which focuses on Achieving ^{improvement} Eg:- Appium, Bamboo.

(4) Continuous Integration

Continuous integration refers to the build & unit testing stages of the software release process. Every revision that is committed triggers an automated build & test. Eg:- Jenkins, Travis, etc.

(5) Infrastructure Management

without automation Building & maintaining large scale modern without automation. IT systems can be a resource intensive undertaking & can lead to increased risk due to manual error configuration & resource management is an automated method for maintaining computer systems & software in a known, consistent state.

(6) Configuration Management

Infrastructure as code is practice of describing all software runtime environment & networking setting & parameters in simple textual format, that can be stored in your version control system (VCS) &

versioned on request. These test files are called manifests & are used by DevOps tools to automatically provision & configure servers, testing, staging & production environments.

Eg:- Chef, Saltstack.

DevOps Engineer Role :-

A DevOps engineer manages a company i.e. IT infrastructures, bridging development & operation, the primary goal is to improve the process & efficiency throughout the software development lifecycle.

Key Role :-

1. Facilitator of collaboration :
Bridging the gap between development, operation & QA teams to streamline communication.
2. Automation specialist :
Automate repetitive tasks like testing, deployment & monitoring.
3. Continuous Integration & Continuous Delivery (CI/CD)
Design, implement & maintain CI/CD pipelines to enable faster, reliable & repeatable software releases.
4. Infrastructure as Code :-
Use tools like Terraform, Ansible or cloud formation to define & provision infrastructure through code.
5. Monitoring & Incident Management
Set up monitoring system to track application performance & troubleshoot issues in real time. It also ensures that systems are resilient & downtime is minimize.

6. cloud & Infrastructure Management.

Deploy, manage & optimize applications on cloud platform like AWS, Azure or Google cloud, also handles Container Orchestration.

Key Responsibilities

- (1.) Collaboration & Planning :
work with development & operations teams to plan & design scalable solution.
- (2.) Configuration Management :
uses tools like Puppet, Chef or Ansible to manage server configuration & ensure consistency.
- (3.) Pipeline management
Maintain CI/CD pipelines to ensure seamless Build Test & Deployment workflows.
- (4.) Monitoring & logging
Implement monitoring tools like Prometheus Grafana or Splunk to track system health & measurement performance.
- (5.) Support & Troubleshooting.
Respond to incidents & resolve production issues promptly & identify root causes of failure & implement fixes.
- (6.) Documentation & Reporting
Document system configurations Deployment process & troubleshooting guides.

DevOps Practices :-

