



INTRODUCTION TO DEVOPS

- **What is Software Development**
- **Software Development Life Cycle (SDLC)**
- **What is DevOps?**
- **DevOps Lifecycle**
- **DevOps Tools**

INFRASTRUCTURE

DevOps Tools

- **Linux**
- **Git**
- **Jenkins**

- **Maven**
- **Apache & Tomcat Servers**
- **Shell Scripting**
- **Docker**
- **Kubernetes**
- **Ansible**
- **Nagios**
- **AWS**

Computer Fundamentals:

1. **Computer & Computer Types**
2. **Computer & Server Architecture**
3. **Hardware**
 - a. **Types of Storage**
 - i. **RAM, ROM, Hard Disk and CACHE**
 - b. **CPU and Memory Units**
 - c. **Computer Networks**
 - i. **Networks Components - NIC Card, Network cables, Routers**
 - ii. **Internet, Intranet**
 - iii. **Types of Computer Networks**
4. **SOFTWARE**

- a. Types of Software
 - b. BIOS, Operating System
- 5. Peripheral Devices
- 6. Client - Server Architecture
- 7. Languages, Translators - Compilers, Interpreters
- 8. Network OSI Model
- 9. IP Address Types
- 10. Data Center and DNS

LINUX:

- 1. Linux History and Architecture
- 2. Linux Directory Structure
- 3. File Management
- 4. VI Editor
- 5. Users and Groups
- 6. Process Management
- 7. File Permissions
- 8. Scheduling Tasks/Jobs
- 9. Networking Management
- 10. Service Management
- 11. Package Management

12. Linux Advanced Commands

- a. Grep, sort, head, less, more, view, pipe, find

13. Standard Streams and File descriptors

GIT:

- 1. GIT Introduction & Installation**
- 2. Version Control System & Types & Uses**
- 3. Difference b/w Centralized and Distributed VCS**
- 4. GIT Clients Explore (Git Bash, Tortoise GIT and Web Client)**
- 5. GIT Architecture**
- 6. **.git** explore**
- 7. Working On GITHUB**
- 8. Working On GITLAB**
- 9. Pull Requests and Merge Requests**
- 10. SSH Keys**
- 11. GIT commands**
- 12. GITLAB Administration**
- 13. Branches and Branching Strategy**
- 14. Merge and Merge conflicts resolution**
- 15. GIT Rebase**
- 16. GIT Stashing**

17. GIT Tagging

18. GIT Mirroring and Migration

Jenkins:

- 1. Jenkins Installation and Configuration**
- 2. Jenkins Job Creation**
- 3. Jenkins Job Configuration**
- 4. Jenkins Administration**
 - a. Plugins**
 - b. Configure System**
 - c. Global Tools Configuration**
 - d. Authentication and Authorization**
 - e. Credentials**
- 5. Variables and Parameters**
- 6. Deployment of Different applications to Web servers and Application Servers**
- 7. Continuous Integration with Jenkins**
 - a. Jenkins Integration with GIT**
 - b. Hooks and Web Hooks**
- 8. Continuous Deployment and Continuous Delivery with Jenkins**
- 9. Distributed Builds in Jenkins**
 - a. Master Slave Concept**

10. Pipelines (Pipeline as a Code)

- a. Build Pipeline**
- b. Scripted Pipeline**
- c. Declarative Pipeline**

11. Backup and Restore

12. Miscellaneous

- a. Build Triggers**
- b. Email Setup**
- c. Static Code Analysis Tools (Sonarqube, find bugs analysis etc.)**
- d. Types of Testing**

Maven:

- 1. Project Build Tool: MAVEN**
- 2. Difference B/W MAVEN, ANT and GRADLE**
- 3. Life Cycle**
- 4. Maven Project structure**
- 5. Maven Repositories**
- 6. Maven Plugins**
- 7. Pom.xml**
- 8. Remote Repository Installation and Setup**

Tomcat Application Server:

1. **JDK and JRE**
2. **2 Tier and 3 Tier Architecture**
3. **Web servers and Application servers overview**
4. **Tomcat Home Directory Structure**
5. **Tomcat Architecture**
6. **Web Application Structure (WAR)**
7. **Session Management**
8. **Configure Tomcat to work with Apache web server**
9. **Tomcat Virtual Hosting**
10. **HTTP Error Codes**

Shell Scripting:

1. **Shell Scripting and It's Advantages**
2. **Executing and sourcing of Shell scripts**
3. **Positional Parameters**
4. **Symbols and usage**
5. **Environment Variables**
6. **Operators**
7. **I/O Redirection**
8. **Commands**

a. Echo

b. Sed

c. Awk

d. Xargs

9. Loops

a. If then else

b. For loop

c. While loop

d. Until loop

e. Case

10. Advance shell

a. Function

b. Eval

c. Let

Docker:

1. Containers Overview

2. Docker Architecture

3. Installation and configuration of Docker

4. Creating Docker Containers

a. Docker commands

5. Application Containerization
6. Image Registry
7. Docker Namespaces
8. Docker Networking
9. Docker Storage
10. Portainer Web UI Deployment
11. Docker Compose: Multi Container Tool
 - a. Docker compose commands

Kubernetes:

1. Kubernetes : Archestartion Tool
2. Kubernetes Architecture
3. Kubernetes Cluster Installation options
 - a. Local Installation – Minikube
 - b. Install on Data Center – Kube ADM
 - c. Install on Cloud - AWS
4. PODS Deployments
5. POD YAML File
6. Kubernetes Services and Deployments
 - a. Nodeport
 - b. Cluster IP

- c. Load Balancer
 - d. External Name
- 7. Replication Controller
- 8. Kubernetes Deployment API Resource
 - a. Scale up and scale down deployments
 - b. Rollback deployments
- 9. K8s Secret and config map
- 10. Kubernetes Namespaces
- 11. Kubernetes Networking
- 12. K8s Volumes
 - a. PV and PVC
- 13. Multi POD Container
- 14. RBAC Explore
- 15. Dash Board Deployment

ANSIBLE:

- 1. Ansible installation and setup
- 2. Ansible Inventory
- 3. Introduction to YAML
- 4. Ansible Playbooks
- 5. Ansible Modules

6. Ansible Variables

7. Conditionals

8. Loops

9. Ansible Roles

10. Error Handling

11. Lookups

12. Plugins

AWS:

1. Understanding Virtualization

2. AWS Signup and account creation

3. Create EC2 VM Instances on AWS

4. Access EC2 VM instances using Putty and Mobaxterm

5. Understanding AWS CLI, SDK, IAM Roles and Policies

6. AWS Storage – S3

7. High Availability and Scalability

a. Load Balances

b. Auto Scaling Groups

8. AWS Monitoring – Cloud watch, cloud trail and config

9. AWS Networking

a. VPC, Subnets, CIDR and Route Tables

b. Gateways

c. Security groups

d. VPC Peering

e. DNS

f. Service Endpoints

10. KMS, SSM, Cloud HCM and WAF

11. Disaster Recovery and Migrations

Other Topics:

- **ITIL Concepts**
- **Sonarqube**
- **Apache Archiva**
- **Artifactory**
- **JIRA**
- **Nagios**
- **Database Overview**