

# Devops



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## Introduction to Devops:

- What is DevOps?
- Why DevOps?
- Principles of DevOps
- History of DevOps
- SDLC models
- Understand Agile Methodology
- Prerequisites for DevOps
- DevOps with Agile using Scrum
- Overview of DevOps Tools
- How to achieve DevOps?
- What is CICD?

## Prerequisite for DevOps

Topic 1: – Networking Concepts (Duration: 02:00:00 Hrs)

- Network Fundamental
- Communication Models and Protocols
- IP Addressing and Subnetting

Topic 2: - Introduction to Virtualization (Duration: 00:30 Mins)

- What is Virtualization?
- What is Hypervisor?
- Types of Server Virtualization
- Benefits of Virtualization
- Important Virtualization products
- Create VM's using Hypervisors



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### Topic 3: - Linux Administration (Duration: 04:00 Hrs)

Linux Introduction

Linux Installation

Basic Linux concepts

Vim Editor

Process Management

Controlling Services & Daemons

SSH with key-based Authentication

Linux Networking

System logs management

Archiving and Copying Files Between Systems

Package Management

Cron Jobs Scheduling

Configure Apache server

Limiting Network Communication with firewall

### Topic 4: - Database Concepts and Shell Scripting (Duration: 02:00 Hrs)

Installing MariaDB

Working with MariaDB Databases

Managing Databases Users and Access Rights

Creating and Restoring MariaDB Backups

Shell scripting examples

How real-time shell scripts work

How to call scripts with different tools

Different conditions while using scripts

Database Backup using Scripts

#### Development ide setup

Installation of java and configuration

Eclipse ide software installation and configuration

Backup / Artifactory Tool:



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## Jira Bug Tracking Tool

- Introduction to Jira
- Scrum introduction with Scrum Roles
- Jira login and creating projects
- User creation and deletion
- Account creation and bug issues checking
- Standalone Jira vs cloud Jira
- The workflow of the Scrum process with project

## Version Control System

- What is Version Control System?
- What Is Git?
- Git Installation with Different environments
- Commands And Operations In Git with GitHub  
(Initialize, Status, Add, Commit,  
Clone, Pull, Push, Difference, Reset, Log, Show, Tag, Stash, Remove)
- Advanced Git operations (Branching, Merging, Rebasing,  
Merge vs Rebase, Conflict resolving, Deleting remote repositories,  
Fork Operation)
- Git integration with Eclipse

## Build Tool

- Introduction to maven
- Maven compare with ant and other tools
- Maven setup in multiple environments
- Maven lifecycle
- Maven repository structure
- Real-time maven settings for the project
- Maven structure coding and implementation with Eclipse

Backup / Artifactory Tool:



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## Application Server Implementation

- Need for application and web server
- Deploy Tomcat server in different environments
- Setup, configure of Tomcat, Apache, Nginx servers
- Deploy war file using Tomcat Server

## Working with Cloud computing

Cloud Computing + AWS Introduction

Create a free tier AWS account

Basic Overview of services, AWS Billing and account

Virtual Private Cloud:

Set Budget

- Instance creation and access using MobaXterm & putty also with RDP

- using different platforms

- Basic Overview of VPC

- Subnetting

- VPC Creation with multi-tier architecture

- Inter VPC peering

- VPN - On-premises to Cloud premise connectivity

- NAT

- AWS Marketplace

EC2:

- Purchase, Type & Pricing

- Instance Monitoring

- SNS

- Cloud Watch

- IAM

- Boot Script

- EBS

- EFS

- Snapshot

- AMI Creation

- Auto Scaling

- ELB

- Backup / Artifactory Tool:



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## Storage:

- Basic Storage introduction
- Versioning
- Replication
- S3 Browser
- Fast Glacier

## Cloud Formation

### Container Management:

- Why need configuration management?
- Introduction to tools like ansible, chef, puppet
- What is Ansible?
- How Ansible Works?
- Ansible setup and configuration
- Ansible Inventory Introduction
- Ansible ad-hoc commands
- Managing Ansible Configuration file
- Creating playbooks with structures and conditions
- Managing Ansible Roles
- Real-time servers management
- Ansible vault to protect ansible playbooks
- AWS Provisioning using Ansible

### Container Management

- What is Containerization?
- What is Docker?
- Docker setup in multiple environments
- Docker Images
- Docker file creation and deployment
- Working with Docker hub
- Docker ad-hoc commands like push, pull, etc.
- Create Your Own Private Docker Registry on Linux Server
- Manage Docker Volumes
- What is Docker Compose?
- Manage containers using Docker Compose files



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## Container Orchestration

- What is Container Orchestration?
- What is Docker Swarm?
- Working with Docker Swarm Using EC2 Instance
- Introduction of Kubernetes
- Installing Kubernetes Cluster
- Manage Kubernetes Master and Nodes
- What is Pod?
- Managing pod network with Example
- Replication Controller
- ReplicaSet
- Deployment
- Volume management

## Jenkins – Continuous Integration

- Introduction to CICD
- Introduction to Jenkins, TeamCity
- Installation and configuration of Jenkins
- Jenkins users and Roles Management
- Jobs in Jenkins
- Jenkin node setup and configuration
- Jenkins integration with GIT (SCM)
- AutoDeployment with Jenkins using git, maven and Tomcat server

## Backup / Artifactory Tool

- What is Artifactory tools and purposes
- Jfrog vs nexus
- Install and setup Jfrog
- Maven dependencies backup with Jfrog
- Jenkin Jfrog automation job



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## Monitoring Tools

- Introduction to Nagios XI and Zabbix
- Installation and setup of Nagios
- Adding nodes to Nagios master
- Monitor Windows Servers
- Monitor Linux Servers
- Monitor EC2 Instances
- Monitoring different metrics in Nagios

## DevOps Projects:

- Project 1: Simple DevOps project for CI/CD through Jenkins
- Project 2: CI/CD pipeline using GIT, Jenkins, and Ansible
- Project 3: Automatic deployment using Docker



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