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# DevOps with AWS

## What is DevOps

- Introduction
- Stakeholders of DevOps
- What is SDLC
- Phases of SDLC
- Role Of Dev in SDLC
- Role of Ops in SDLC

## SDLC (Software Development Lifecycle)

- What is SDLC?
- SDLC Methodologies
- Waterfall Model
- Advantages of Waterfall
- Dis-Advantages of Waterfall

## What is Agile and Scrum

- Agile Development Process
- Agile Manifesto
- Agile Scrum Work Flow
- Agile Analysis Estimation Techniques
- Types of Roles and Responsibilities
- Problem That DevOps Solves

## DevOps Life Cycle

- Introduction
- Tools
- DevOps Technology Categories
- Collaboration
- Planning
- Configuration Management
- Source Control
- Dev Environments
- Continuous Integration
- Continuous Testing
- Continuous Deployment

## Linux

- Linux Overview
  - What is Operating system
  - What is Unix, Linux
  - Linux vs Windows
  - Linux flavors
  - Linux Architecture
  - Linux commands
  - Reading files
  - Redirection operators
  - User management
  - Group management
  - File system management
  - Editors
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## **Shell Scripting**

- Shell history and introduction
- Types of shells
- Shebang line in shell
- Command line arguments
- Variables
- Types of Operators
- Loops
- Case statement
- Functions

## **GIT (Source Code Management)**

- Introduction
- What is a Version Control System (VCS)?  
Distributed Vs Non-distributed VCS
- What is Git and where did it come from?
- Alternatives to Git
- Git Hub Account Setup
- Obtaining Git Installing Git
- Key Terminology
- Staging Vs Un-Staging
- Adding Files to Staging Area
- Removing Files from Staging Area
- Commit to Local Repository
- Push to Central Repository
- Repository Cloning
- Stashes & Stash Apply
- Branching in Git
- Why We need Branches
- Cloning & Switching Branches

- Fetching Changes (git fetch) Rebasing (git rebase)
- Git Pull
- Git Conflicts
- Branch Merging
- Pull Request
- Merging & Re Basing
- Deleting a Branch

## **MAVEN (Build Tool)**

- What is Build Tool
- Automated build process
- Maven Introduction & Objectives
- Maven Installation
- Maven Terminology
- Maven Archetypes
- Maven Project Creation
- Maven Dependencies
- Maven Repositories
  - Local Repo
  - Central Repo
  - Remote Repo
- Maven Goals

## **Continuous Integration Tool (Jenkins)**

- Introduction
  - How to achieve Continuous Integration with Jenkins
  - JENKINS Server Setup
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- Jenkins Jobs
  - How to integrate Jenkins with Maven
  - Jenkins dashboard
  - Jenkins plugins –how to download and use
  - Setup and Running Jenkins Jobs
  - Configure Dashboard Configure System Environment Global Properties
  - Create and configure a job Run a job manually Triggering a Build Scheduled Build job Manual Build job
  - Polling SCM
  - Post-Build Actions Archiving Build Results Notifications
  - Jenkins Plugins
  - Jenkins Master Slave Architecture
  - Jenkins Pipeline Introduction
  - Multi Stage Pipeline
  - Jenkins with Maven & Git Integration
  - Jenkins with Sonar Integration
  - Jenkins with Nexus Integration
  - Jenkins with Docker Integration
  - Jenkins with Kubernetes Integration

### **Sona Type Nexus (Artifactory Repo)**

- Introduction
- What is ArtifactRepo
- Nexus Introduction
- Nexus Setup
- Snap Short Repository
- Release Repository
- Shared Libs

- Maven with Nexus Repo Integration
- Uploading Build Artifacts

### **Configuration Management (ANSIBLE)**

- What is Configuration Management
- What is Ansible
- Introduction
- Installing Ansible
- Testing with First Ansible Commands
- Introduction to Play Books
- YML File
- Writing Play Books
- Play Books Execution
- Tags
- Handlers
- Introduction to Roles
- Role Basics
- Creating Role
- Ansible Galaxy
- Ansible Tower

### **DOCKER (Containerization Tool)**

#### **Introduction**

- What is Docker
  - Life without Docker
  - Life with Docker
  - Installing Docker on Linux
  - What is container
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- Docker run command
  - Working with images
  - Container Life cycle
  - Docker File
  - Docker Network
  - Docker Volumes
  - Docker Compose
  - Docker Swarm
  - Spring Boot App with Docker
  - Python App with Docker
  - MySQL with Docker

## **KUBERNETES**

- What is Kubernetes
- Docker Swarm Vs Kubernetes
- Kubernetes Architecture
- Control Plane
- Worker Nodes
- Namespaces
- Pods
- Pod Life cycle
- Services
  - Cluster IP
  - Node Port
  - Load Balancer
- Replication Controller
- Replication Set
- Daemon Set

- Stateful Set
- Deployment
  - Recreate
  - Rolling Update
  - Blue Green Deployment
- Config Map
- Secrets
- Ingress Controller
- HELM Charts

## **Monitoring Tools**

- Grafana
- Prometheus
- ELK Stack

## **INFRASTRUCTURE AS CODE (IAC)**

### **TERRAFORM**

- Introduction to Terraform
  - Terraform Vs Ansible
  - Terraform installation
  - Terraform Architecture
  - Terraform Scripts
  - Infrastructure Creation
  - Credentials Management
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# **AWS (AMAZON WEB SERVICES)**

## **Introduction to Cloud Computing**

- What is Cloud Computing?
- Why Cloud?
- Types of Cloud Deployment Models
- Types of Cloud Services
- IaaS Vs. SaaS Vs. PaaS
- Future of Cloud Technologies
- Advantages and Disadvantages of Cloud
- Cloud Providers

## **Introduction to Amazon Web Services (AWS)**

- What is AWS?
- How to Subscribe for AWS account
- What is the AWS Free Usage Tier
- AWS Certification
- Introduction to the AWS management Console
- List of services given by AWS

## **VM Creation in AWS**

- Creating Windows VM
- Connecting to Windows VM using RDP
- Creating Linux VM
- Pem file & Ppk File
- Putty & Putty Gen
- MobaXterm
- Connecting to Linux VM using Putty
- Linux Introduction
- Linux Commands

## **Elastic Compute Cloud (EC2)**

- What is Amazon EC2?
- Features of Amazon EC2
- Managing the EC2 infrastructure
- EC2 Dashboard
- Pricing for Amazon EC2
- EC2 instance Types
- EC2 Families

## **AWS Regions and Availability Zones**

- Describing Regions
- Availability Zones, and Endpoints

## **Amazon Machine Images (AMI)**

- Managing AMIs
- Working with Windows, Linux AMIs
- Shared and Paid AMI
- Making an AMI Public

## **EC2 Instances**

- Instance Type
  - Instance life cycle
  - Differences between reboot, stop, and terminate
  - Building an EC2 windows and linux instances
  - To install instance in public and private subnet
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- Security via Key Pairs
  - EC2 Class and VPC Security Groups
  - Managing Elastic IP's
  - Pricing model in EC2 instances
  - EC2 with Amazon command line interface

### **Amazon Elastic Block Store (EBS)**

- Features of Amazon EBS
- Amazon EBS volumes
- Managing EBS volumes
- Increasing the volume size
- Volume Mounting
- Amazon EBS snapshots
- Life Cycle Manager

### **Load Balancing (ELB)**

- Creating a load balancer
- Internal and external load balancer
- Load balancing protocols
- Security groups for the load balancer
- Health check for the load balancer
- Cross-zone loadbalancing
- Target Groups
- Microservices LoadBalancing

### **Auto Scaling**

- What is autoscaling?
- Auto scaling components
- Creation of launch configuration
- Configuration of auto scaling policies
- Advantages of using auto scaling with ELB

### **Network & Security**

- Security Groups
- Inbound Rules
- Outbound Rules
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

### **Amazon Virtual Private Cloud (VPC)**

- What is Amazon VPC?
- VPC Essentials
- Default and Non Default VPC
- VPC Networking and ACL
- Security Groups
- DNS and DHCP Options Sets
- VPC Peering and Endpoints
- Subnet Routing
- VPC Internet Gateway
- Elastic IP addresses and network interfaces
- VPC integration with many other AWS services
- Creating a NAT instance in a VPC
- Configuring a Web application in VPC
- Pricing for Amazon VPC

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## **Amazon Route 53**

- Route 53 as your DNS service
- Using Traffic Flow
- Route 53 Health Checks
- Configuring DNS Failover
- Latency Based Routing
- Weighted Routing Policies
- Hosting web portal using Route53
- Bucket Policies

## **Security & Identity Services**

### **Identity Access Management (IAM)**

- IAM Features
- Getting Started With IAM
- Creation of user, groups, roles
- Managing & Writing policies
- Credential Report
- IAM Console and the Sign-in Page

## **Amazon S3**

- What is object Storage?
- Data as objects
- Lifecycles of S3
- Managing Buckets
- Versioning
- Pre-Signed URL
- Bucket Policies
- Accessing S3 storage via tools
- Creation of a static website using S3 storage

## **Relational Database Service (RDS)**

- RDS Essentials
- Launching RDS instance
- Selecting the Engine
- Configuring the Database Engine
- Managing RDS Database
- Setting up automatic backups
- Authorizing access to the DB
- SQL Vs No SQL Databases

## **Amazon Cloud Watch**

- Amazon CloudWatch Architecture
- List of services monitored by CloudWatch
- Collect and track metrics
- Monitoring memory and disk Metrics
- Monitoring logs, Graphs
- Set Alarms

## **Cloud Formation**

- Building AWS infrastructure as a code
- Design a template
- Create a Stack
- Create a Template from your Existing Resources
- Introduction to JSON

## **Amazon Simple Email Service (SES)**

- Simple email service overview
- Configuring Amazon email service
- Amazon SES and Deliverability
- Amazon SES Email-Sending Process

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- Email format and Limits of SES

### **Amazon Simple Queue Service (SQS)**

- Simple Queue service overview
- SQS for background work task
- Creating a Queue
- Confirming the Queue exists
- Add a permission to the Queue

### **Amazon Simple Notification Service (SNS)**

- Simple Notification Service overview
- SNS architecture
- Publishers and subscribers
- Creation of a topic
- Subscribing to topic via Email
- Setting notification for EC2 instance changes.

### **Elastic Bean Stalk**

- What is Platform as a Service
- Bean Stack Advantages
- EC2 vs Bean Stack
- EC2 Pricing
- Deploy Web Application using BeanStack

### **AWS Lambdas**

- What is Serverless Computing
- Advantages of Serverless Computing
- What is Lambda
- How to Create Lambda
- How to invoke Lambda
- Java App with Lambdas

### **Interview Guide**

- Resume Preparation
- Frequently Asked Interview Questions
- Interview Tips & Tricks
- Certification Overview