



# DevOps

DevOps + AWS + Linux

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Phone **9154112233**

Email Id : [info@qedgetech.com](mailto:info@qedgetech.com)

Website : [www.qedgetech.com](http://www.qedgetech.com)

    /qedgetech

QEdge Technologies, 2nd Floor, Nagasuri Plaza, Opp. Mythri vihar,  
**Ameerpet, Hyderabad.**

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Flat No 39, 3rd Floor, Abbyas-1, Behind Karachi Bakery,  
Near IMAGE Hospital, Vittal Rao Nagar, **Madhapur, Hyderabad.**

# DevOps Course Content

Duration - 50 hours

## DEVOPS BASICS

### SOFTWARE DEVELOPMENT LIFE CYCLE (SDLC)

- Introduction to SDLC
- Purpose of SDLC
- Phases of SDLC
- Various Teams and Roles in SDLC
- Various Models of SDLC
- Waterfall model
- Agile Model
- Dev Vs Ops
- New trends in SDLC
- Why Corporates are shifting to DevOps
- Expected Interview Questions on SDLC

### INTRODUCTION TO DEVOPS

- Introduction to DevOps
- History of DevOps
- Why DevOps
- What is DevOps
- Fundamental Principles of DevOps
- Values of DevOps
- Definition of DevOps
- DevOps Features
- Benefits of DevOps after Implementation
- Benefits of DevOps for Business Organisations
- Difference between Left shift and Right shift Implementation in SDLC
- DevOps Roles and Responsibilities

### DEVOPS LIFECYCLE AND TERMINOLOGIES

- DevOps Life Cycle Stages
- Continuous Development
- Continuous Integration
- Continuous Delivery
- Continuous Testing

- Continuous Deployment
- Continuous Monitoring
- Continuous Feedback
- Code Delivery Pipeline
- Example on DevOps Delivery Pipeline

## DEVOPS TOOLS OVERVIEW

- Continuous Development tools
- Continuous Integration tools
- Continuous Delivery tools
- Continuous Testing tools
- Continuous Deployment tools
- Continuous monitoring tools

## VERSION CONTROL SYSTEMS (VCS)

- Introduction to VCS
- Purpose of VCS
- VCS Workflow
- Types of VCS
- Local VCS
  - Benefits
  - Drawbacks
- Centralized VCS
  - What is CVCS?
  - Benefits of CVCS
  - Drawbacks of CVCS
  - Notable Vendors of CVCS
- DVCS
  - What is DVCS?
  - Benefits of DVCS
  - Drawbacks of DVCS
  - Notable Vendors of DVCS
- Differences between DVCS and CVCS
- VCS Basic Setup Terminologies
  - Repository
  - Server
  - Client
  - Working Copy
  - Trunk

- VCS Basic Actions Terminologies
  - Add
  - Revision
  - Head
  - Checkout
  - Check In/commit
  - Change log
  - Update/Sync
  - Revert
- VCS Advanced Actions Terminologies
  - Pull
  - Push
  - Branch
  - Delta
  - Merge/patch
  - Conflict
  - Resolve
  - Locking
  - Reverse Integration
  - Forward Integration
- Version Control Systems Best Practices
- Sample Architectures of DCVS and CVCS
- Exercises on VCS Architecture understanding
- Expected Interview Questions on VCS

## **GIT**

- Introduction to Git
- Git Features
- Role of Git in Real Time
- Git installation on Windows and Screen shots
- Git installation on Linux
- Git Architecture
  - Working Directory
  - Staging Area (Index Area)
  - Local Repo
- What is Git Repository?
- Git with Local Repositories
- Git with Remote Repositories
- Git Configuration Files
  - git configuration files understanding

- Git Configuration files Precedence
- git config command usage
- Set git environment variables for global level
- Set git environment variables for local level
- Setup git repository using git init
- Difference between git init, git init --bare
- Stop git tracking files using git ignore
- Case study to understand Git config global and local levels
- Create alias for git commands
- Troubleshoot git init issues
- Expected Interview Questions
- Git Making Changes
  - git add
  - git status
  - git status color coding system
  - git commit
  - Exercises on adding single files, multiple files commits
  - Committing Changes in one go
  - Case Study on how developers use git commit in real time
  - Case Study on how to find what files are being tracked in project
  - Case Study on how to add the changes recursively to git
  - Troubleshoot changes made to Staging area
  - Troubleshoot changes made to Local Repository
  - Expected Interview Questions
- Git History - log and show
  - View all commit logs
  - View only latest commits logs
  - View commits of specific author or committer
  - View log commit changes based on date ranges
  - View log changes of each commit
  - View logs based on files
  - View logs based on commit message
  - git show command
- Git Rename, Move and Delete Files
  - How to rename the files using git
  - How to rename the files using a operating system level
  - How to move the files in git
  - How to delete the files in git before staging
  - How to delete the files in git after staging
  - How to delete the files that are tracked by git - Local Repository
  - Submit the changes of rename move and delete in git

- Git Parallel Development
  - git branch
  - git merge
  - git rebase
- Comparing git project files from working area with Local Repo using git diff
- Git diff --staged
- Git Backout the Changes
  - git reset HEAD
  - git checkout
  - Case study on backout changes in git
- Git Remote
- Real Time Workflow of Git Branching
- Delete Git branches on Local Repo and Remote Repo
- How to remove git files from Local Repo and Remote repo
- How to Rename Git files in Repositories
- Expected Interview Questions on Git

## GITHUB

- Introduction to Github
- Various vendors of Remote Repository
- Features of github
- Create Account in github
- Create Project Repository in github
- Create files in github
- Clone Github Repository
- Pull changes from github Repository
- Push changes to github Repository
- Best Practices of Git
- Troubleshooting Git Error messages
- Expected Interview Questions on GitHub

## CI/CD - JENKINS WITH MAVEN, CHECKSTYLE

### CONTINUOUS INTEGRATION

- About Continuous Integration (C.I)
- Need of Continuous Integration
- Benefits of Continuous Integration
- Best practices of Continuous Integration

- Generic Architecture of Continuous Integration in Projects
- Continuous Integration Workflow
- Components of Continuous Integration
- Case Study - situation if there is no C.I tool used in Projects
- Few notable Continuous Integration Tools
- Market Share of C.I Tools
- Expected Interview Questions on Continuous Integration

## JENKINS - CI/CD TOOL

- Introduction to Jenkins
  - Why Jenkins
  - Relation between Jenkins and Hudson
  - History of Jenkins
  - Why Jenkins is so popular
- Features of Jenkins
  - General Features
  - Technical Features
- Jenkins Architecture
- Jenkins Prerequisites
  - Minimum Hardware Requirements
  - Recommended Hardware Requirements
  - Docker Container Requirements
  - Software Requirements
  - Supported Platforms
- Setup Jenkin Server
  - Install Software Pre-Requisite software's (Java)
  - Setup Environment Variables
  - Install Jenkins using war file
  - Deploy Jenkins on RHEL
  - Setup firewall settings for Jenkins Server
- Jenkins Terminologies
  - Master
  - Slave or Node
  - Job or Project
  - Executor
  - Build
  - Plugin
- Jenkins Dashboard Overview
  - Job Listing Section
  - Jenkins Menu Section

- Jenkins Menu- Item
  - Jenkins Menu-People
  - Jenkins Menu-Build History
  - Jenkins Menu-Manage Jenkins
  - Jenkins Menu-views
  - Build Queue Section
  - Build Executor status Section
- Jenkins - Creating Jobs in Jenkins
  - Naming a Project or Job
  - Choosing right Project Type
  - About Project Descriptions
  - Set the storage limits for old discard builds
  - How to disable the build systems
  - Source Code Management
  - Build Triggers
  - Create a Sample Project
- Understand Jenkins Job Process
  - How to check Build Information
  - Jenkins Build Color Code system
- Configure Jenkins Build Server
  - Configure Java JDK for Jenkins Build Server
  - Configure Apache Maven for Jenkins Build Server
  - Configure the JAVA JDK for Build jobs in Jenkins
  - Configure the Maven for Build Jobs in Jenkins
  - Configure Github for Build Jobs in Jenkins
  - Configure SCM-Git Plugin for Build Jobs in Jenkins
- Secure Jenkins
- Manage Jenkins Plugins
  - Install Plugins
  - Upgrade Plugins
  - Backup plugins
- Jenkins User administration
  - Create Jenkins User Accounts by various methods
  - Configure Jenkins User Accounts
  - Delete Jenkins User Accounts
- Manage Jenkins Users based on Roles
  - Install plugins to manage roles
  - Roles - Manage Roles, Assign Roles, Role Strategy
- Configure Jenkins
  - How to change the Jenkins Admin Password
  - Change Home Directory



- Configure system messages in Plain text or HTML format
  - Configure - Executors, Labels, Quiet Period, SCM Checkout Retry Count
  - Configure - Jenkins URL Location and Admin email ID
- Build Triggers
  - Configure Poll Source Code management in Jenkins
  - Configure Poll SCM Changes using Crontab in Jenkins
  - Trigger Builds Remotely using URL
  - Trigger builds using Token ID
  - Trigger Builds based on build Pipeline or other Projects
  - Case Study on Access Denied Error message when trigger builds remotely
  - Build triggers periodically
  - Build triggers when changes pushed to Github or SCM
- Distributed Builds
  - What is Distributed Build?
  - Architecture of Distributed Build
  - Configure Jenkins Master Server
  - Configure Jenkins Slave Server
  - Configure authentication between Master-Slave
  - Setup Relationship between Master and Slave
  - Configure Project to build on Jenkins slave server
  - Configure Various Launch options using SSH, Java Web Start
- Email Notifications in Jenkins
  - Purpose of Email Notification
  - Email Notification plugins
  - Configure Email Notification in Jenkins
  - Demonstrate usage of email notification on builds
- Expected Interview Question on Jenkins

## INTRODUCTION TO BUILD TOOLS

- What is Build?
- Purpose of Build Tools
- Build Tools Ideology
- Evolution of Build Tools
- Few Notable Build Tools
- Environment Based Build Tools
- Java Based Build Tools
- Sample Build Code of Ant-Ivy
- Sample Build code of Maven
- Sample Build Code of Gradle
- Market Share of Build Tools

- Expected Interview Questions on Build Tools

### **BUILD TOOL - APACHE MAVEN**

- About to build tools
- Introduction to Apache Maven
- Maven Architecture
- Installation of Maven
- Various Phases of Maven
- Configure path variables for Apache Maven in Jenkins
- Expected Interview Questions on Apache Maven

### **CODE COVERAGE TOOL - CHECKSTYLE**

- Continuous Inspection in Jenkins
- What is Continuous Inspection?
- What is Code Coverage?
- Code Coverage Benefits
- Few notable Code Coverage Tools
- Configure checkstyle code coverage tool for maven projects

### **Configuration Management**

- Introduction Configuration Management
- Configuration Management terminologies
- Configuration Management tools
- Difference between Chefs, puppet, Ansible
- Expected Interview Questions on Configuration Management

### **CHEF - CONFIGURATION MANAGEMENT TOOL**

- Introduction to Chef
- Features of Chef
- Architecture of Chef
- Chef Server setup
- Chef Workstation setup
- Chef node setup
- Chef Client commands
- Chef knife commands
- Chef concepts - Cookbooks, Resources, Runlist, Recipes, Environment, data bags, Roles
- Chef Resources

- What is a chef Resource?
  - Resource Types
  - Resources Definition
  - What is Desired State in chef?
  - What is Convergence in chef?
  - Case Study on Resources
  - How to Execute a Resource file (Recipe)
  - Exercise on Resources
- Chef Cookbooks
  - What is Chef Cookbook?
  - Chef Cookbook Components
  - Chef Common Cookbook Components
  - Chef Cookbook Types
  - Chef help procedures
  - How to create Cookbooks in Chef
  - About cookbook component - Recipes
  - About Cook Component - Unit Testing
  - About Cook Component - Integration Testing
  - How to track changes in chef using git
  - How to configure Git on a Chef cookbook
  - Procedure to be followed when made changes to a Cookbook
  - How to apply Semantic versioning on Cookbook
  - How to verify the syntax errors in recipe file
- LAB Exercises on Cookbook and Recipe
  - Applying semantic versioning with changes on cookbook
  - Setup apache web server
  - Demonstrate functionality test on recipe files in a cookbook
- Applying chef-client methods
  - How to apply single recipes using chef-client in local mode
  - What is Local Mode?
  - What is Runlist
  - How to apply chef-client using runlist on single cookbook
  - How to apply chef-client using runlist on multiple cookbooks
  - How to use include recipe method
  - Sample case studies
- Chef knife commands
  - Create a cookbook using knife command
  - Delete a cookbook using knife command from workstation
  - Delete a cookbook using knife command
  - How to upload a cookbook to chef server
  - How to attach a recipe or cookbook to chef node

- List nodes using knife command
- See details about node using knife command
- Knife command to check all cookbook lists
- Download a cookbook from Chef Server to Workstation
- How to generate metadata of a cookbook
- How to test a cookbook syntax using knife commands
- How to check recent change status on chef node
- How to bootstrap a node
- How to delete a node
- Implementation Procedures of Chef in Real Time
- Expected Interview Questions on Chef

## **PUPPET**

### **Configuration Management Basics for Puppet**

- Life Cycle Management
- Approaches for Deployment
- Use Case of Script Approach
- Use Case of IAAC Approach
- Benefits of IAAC
- Pull model Of IAAC
- Separation of Code and Data in Puppet
- Case Study on Separation of Code and Data in Chef -
- On Reusability of Code - Puppet Forge
- Use Case of Puppet
- Misconceptions of Puppet
- Expected Interview Questions

### **Puppet Features, Architecture, Terminologies**

- Introduction to Puppet
- Puppet Features
- Why Puppet
- How Puppet Is Different From Script
- Difference between Imperative and Declarative Style
- Puppet Use-cases
- Notable CM Tools Based Pull and Push Mechanisms
- Sample of Puppet Code
- Puppet Documentation

- Puppet Architecture
- How Puppet Works
- Execution Flow of Puppet Master and Puppet Agent
- Puppet Terminologies - Puppet Master
- Puppet Terminologies - Puppet Agent
- Puppet Terminologies - Puppet Config Repository
- Puppet Terminologies - Puppet Facts
- Puppet Terminologies - Puppet Catalog
- Puppet Terminologies - Puppet Resources
- Puppet Terminologies - Puppet Manifests
- Puppet Terminologies - Puppet Module
- Few Exercises of Puppet Basics
- Expected Interview Questions

### **Puppet System Requirements and Installation**

- Puppet Master System Requirements
- Puppet Agent System Requirements
- Lab Setup - Puppet Infrastructure for Practice
- Puppet Master Prerequisites
- Setup NTP Server on Puppet Master
- Setup Puppet Master
- Setup Puppet Master Memory Allocation
- Setup Puppet Master Services
- Puppet Agent Prerequisites
- Setup Puppet Agent NTP Services
- Setup Puppet Agent
- Setup Puppet Agent Services
- Expected Interview Questions

### **Puppet Configuration Files and Certificates**

- Puppet Configuration Files
- Make Entries into Configuration Files
- Configuration File of Puppet Master
- Configuration File of Puppet Agent
- Request for Puppet Agent Certificate from Server
- Puppet Cert Commands
- Puppet Exercises

## **Puppet Resources Types and Puppet Utility**

- Puppet Resources
- Resources Types
- Built In Resources
- Defined Resources
- Custom Resources
- Puppet Resources Declaration
- Sample Puppet DSL Code
- How to Find Resource Types in Puppet
- Puppet Describe
- Puppet Code Creation Process
- Puppet Parser
- Puppet Apply

## **Puppet Resources Use Cases**

- Steps To Execute Puppet Code
- Use Case of User Resource
- Use Case of File Resource
- Use Case of Package Resource
- Use Case of Service Resource
- Use Case of Directory Resource
- Exercises on Puppet Code

## **Puppet Classes, Manifests and Site**

- Puppet Classes
- Class Definition and Syntax
- Sample Class Code
- Puppet Class Exercise
- Puppet Manifests
- Puppet Config Print Utility
- Puppet Code Execution Process on Agents
- Site.pp File
- Node Definition
- How to Bind Site.pp Files to Specific Agent
- Use Case of Default Session in Site.pp File
- Expected Interview Questions

## Introduction to Ansible

- Features of Ansible
- Use Cases of Ansible
- What Ansible Can Do In Production Environment
- Ansible Documentation
- How Ansible Is Different From Configuration Management Tools
- Ansible Architecture
- Ansible Control Machine Requirements
- Ansible Installation Process on RHEL
- Ansible Terminologies
- How Ansible Works
- Ansible Lab-setup

## YAML Basics

- Representation of Array in Yaml
- Representation of Dictionary In Yaml
- Non-group Inventory File
- Group Inventory File
- Ansible Inventory Parameters
- Use Case of - Ansible\_host
- Use Case of - Ansible\_port
- Use Case of - Ansible\_connection
- Use Case of - Ansible\_user
- Use Case of - Ansible\_ssh\_pass
- Use Case of - Ansible\_password
- Ansible Exercise - To Setup Inventory File and Perform Ping Test
- Case Study on Ping Test Error Message:
- Ansible Inventory Exercise 1: Create a Inventory File
- Ansible Inventory Exercise 2: To Create A Group
- Ansible Inventory Exercise 3: To Create Nested Groups (Parent\_group)

## Ansible Playbooks and Modules

- Ansible Playbooks
- Sample Ansible Playbook
- Ansible Playbook Format
- Ansible Modules
- Ansible Tasks

- How to Run Playbooks
- How to check syntax of a Playbook
- How to run a playbook on multiple hosts
- How to run a playbook on target hosts
- Ansible Run Command Methods
- Ansible Playbook Exercise 1: Perform Ping Test on All Hosts of Inventory File
- Ansible Playbook Exercise 2: To Install Git on All Hosts using script module
- Ansible Playbook Exercise 3: To Install a Web Server httpd using yum module
- Ansible Playbook Exercise 4: To start an httpd service using service module
- References on Playbook and Modules

## **Ansible Variables**

## **Ansible Galaxy**

## **Containerization with Docker**

## **DOCKER**

- Introduction to Docker
- Why docker
- What is a container?
- Relation between container and docker
- Docker features
- Why docker is so popular
- Difference between container and image
- Containers History
- Docker Architecture
- Docker Editions
- Docker system Requirements
- Docker installation and setup
- How to verify docker installation
- About Docker version
- How to see list images in docker
- What is Docker Registries?
- How to see all docker images
- How to pull images from docker registries
- What is pulling in docker



- Difference between Docker Pull, run, Push
- How to run docker image
- How to exit from container without killing it
- How to exit from container by killing it
- How to see all running container on docker host
- How to check history of all containers
- How to stop a container that is running
- How to find latest containers that are created
- How to get inside of already a running container
- How to start a container and remove it once task is completed
- How to delete or remove a container
- How to delete or remove image from docker host
- Relation between Images and Containers
- How to attach a port of docker host to docker container
- How to run a container in background
- Difference between docker container run and docker container start
- How to specify a name to docker container
- How to see container logs
- How to see processes that are currently running in a docker container
- How to see all commands related to a container
- How to remove docker multiple containers
- How to check docker container metadata using docker inspect
- How to see docker container stats
- How to list what ports are being used by docker container
- How to see Docker Image History
- How to see docker image metadata
- How to tags docker images
- How to log into docker registries using docker CLI
- How to logout from docker registries using docker CLI
- How to push docker image to docker registries
- About Docker file
- How to create Dockerfile to build an image
- How to build an image from Dockerfile
- About Dockerfile Instructions
- Expected Interview Questions on Docker

## NAGIOS

- Introduction to Monitoring
- Setup and configure Nagios

- Server Monitoring
- Application Monitoring
- Expected Interview Questions on Nagios

## **VAGRANT**

- Introduction to Vagrant
- Features of Vagrant
- Vagrant Architecture
- Vagrant Terminologies
- Setup of Vagrant
- Vagrant Commands (CLI)
- Configure Vagrant File
- Expected Interview Questions on Vagrant

# AWS Course Content

**Duration: 30 Hours**

## CLOUD COMPUTING BASICS

- Introduction to cloud computing
- What is Cloud?
- Uses of Cloud Computing
- Case Study on use of Personal Cloud Services
- Why Corporates are opting for Cloud Services
- Core terminologies of cloud
- Advantages of Cloud
- Concerns of Cloud
- Expected Interview Questions on Cloud Computing basics

## CLOUD COMPUTING TYPES

- Types of Cloud Computing
- Public Cloud
- Private Cloud
- Hybrid Cloud
- Community Cloud
- Difference between Public, Private and Hybrid Clouds

## CLOUD COMPUTING SERVICES

- Introduction to Cloud Services
- Types of Cloud services
- IAAS
- PAAS
- SAAS
- CAAS
- Difference between IAAS, PAAS, SAAS, CAAS
- Market growth rates in Cloud Services
- Market leaders in Cloud Computing Services
- International Cloud Vendors
- Domestic Cloud Vendors
- Expected Interview Questions on Cloud Computing Services

## **CLOUD COMPUTING PROVISIONING**

- Introduction to Cloud Provisioning
- Types of Provisioning
- On-Premises Provisioning
- Cloud Provisioning
- Difference between On-premises and Cloud Provisioning
- Notable Cloud Providers
- Expected Interview Questions in Cloud Computing

## **INTRODUCTION TO AWS**

- Why AWS
- Brief History of AWS
- AWS Service Graph
- AWS Partner Program
- AWS Re-Invent
- AWS Re-Pay
- AWS Features
- Gartner Statistics on AWS
- Expected Interview Questions

## **AWS GLOBAL INFRASTRUCTURE**

- AWS Regions
- AWS Availability Zones (AZ)
- AWS Edge Zones
- Difference between AWS - Regions, Availability Zones, Edge Zones
- Expected Interview Questions

## **AWS- IDENTITY AND ACCESS MANAGEMENT (IAM)**

- About IAM
- What is Root Account?
- IAM Features
- What is Identify Federation?
- IAM Resource is Global Nature
- IAM Dashboard Overview
- How to create Customize sign in link for IAM users
- How to create Multi Factor Authentication (MFA)
- How to create IAM User Accounts

- How to delete IAM User Accounts
- Use of Programmatic Access
- Use of AWS Console Access
- Use of Access Key ID
- How to reset IAM User Account
- How to Disable IAM User Password
- Roles in IAM
- Groups in IAM
- Account Settings
- Creating permissions for IAM Users
- Deleting permission for IAM Users
- Expected Interview Questions

## **AWS - ELASTIC COMPUTE CLOUD (EC2)**

- Introduction to EC2
- Features of EC2
- EC2 Dashboard Overview
- About Amazon Machine Images (AMI)
- Different types of AMI's
- How to create AWS AMI
- How to create AWS AMI in different regions
- How to create a Key Pairs
- Download a key pairs
- Activate a Key Pairs
- Deactivate key Pairs
- Configure Microsoft Outlook to send Key Pairs to AIM Users
- What is pem file?
- What is ppk file?
- Why need to convert pem file into ppk file
- What are default usernames to connect AMI'S?
- How to Login into LINUX AMI from Windows
- How to Login into LINUX AMI from Linux
- Instance Life Cycle
- How to reboot the Instance
- How to stop instance
- How to terminate instance
- Expected Interview Questions

## **AWS - SIMPLE STORAGE SERVICE (S3)**

- About S3
- Features of S3
- What is Data Consistency in S3?
- What is Atomic in S3?
- S3 Properties
- S3 Storage types
- Comparison of S3 Storage types
- Create S3 bucket
- Delete S3 bucket
- Adding Objects to S3 Bucket
- Deleting objects from S3 Bucket
- How to set permissions on S3 Bucket
- How to set permissions on S3 objects
- How to enable or Disable S3 for static Website hosting
- How to set S3 Bucket to host a static website hosting
- About Endpoint in S3
- How to Enable or Disable versioning on S3 Bucket
- How to set versioning on S3 objects
- Expected Interview Questions

## **AWS - ELASTIC BEANSTALK**

- Introduction to Elastic Beanstalk
- Features of Elastic Beanstalk
- Workflow of Elastic BeanStalk
- Create Application
- Launch Environment
- Manage Environment
- Expected Interview Questions

## **AWS - VIRTUAL PRIVATE CLOUD (VPC)**

- Introduction to VPC
- Fundamentals of VPC
- IP address fundamentals
- IPV4 Address classes
- Public IP address
- Private IP address

- Static IP
- Dynamic IP
- Default VPC
- Non-default VPC
- Internet Gateway
- How to attach Internet Gateway to a VPC
- How to Deattach Internet Gateway to a VPC
- Elastic IP
- How to create a Elastic IP
- How to assign an Elastic IP to an EC2
- How to release an Elastic IP from an EC2
- Expected Interview Questions

### **AWS - ROUTE53**

- Introduction to Route53
- Route 53 for DNS Services
- Traffic Flow
- Route 53 Health Checks
- Use cases of Route53

### **AWS - AUTO SCALING**

- Features of Auto Scaling
- Auto Scaling Components
- Create Auto Scaling
- Configure Auto Scaling
- Expected Interview Questions

### **AWS - CLOUDWATCH**

- Introduction to CloudWatch
- Features of CloudWatch
- List of services under CloudWatch
- Metrics
- Monitor logs
- Monitor Graphs

## **AWS - GLACIER**

- Introduction to Glacier
- Glacier Features
- Glacier Pricing
- AWS Glacier Access Models
- AWS Glacier use cases
- What is an Archive?
- How to create Life Cycle Management Rule to move an object into Glacier
- How to restore an archived object from glacier
- Expected Interview Questions
- What is a Vault?
- AWS Glacier Select
- AWS Snowball
- AWS Vault Lock
- AWS Direct Connect

## **AWS - SECURITY GROUPS**

- About Security Groups
- Purpose of Security Groups in AWS
- Security Groups Lab Practice
- Modify an existing Security Groups
- Control inbound traffic in Security Groups
- Control outbound traffic in Security Groups
- Adding inbound traffic to Security Groups
- Delete outbound rule of Security Groups
- View Security Groups information of an Instance
- Assign or Modify Security Groups for an Instance
- Security Groups notable points

## **AWS - ELASTIC BLOCK STORE**

- Introduction to EBS
- EBS Features
- EBS Benefits
- EBS Free Tier usage details
- EBS Volume Types - SSD, HDD
- EBS Use Cases of SSD
- EBS use cases of HDD



- Instance EBS Volumes
- How to check EBS volumes availability
- Creating EBS Volumes
- Deleting EBS Volumes
- Attaching EBS volumes
- De-Attach EBS Volumes
- How to create Filesystems on EBS
- Mount EBS volumes in EC2 instance
- Unmount EBS Volumes in EC2 instance
- How to verify if there exists any data on EBS Volumes

## **AWS - SNAPSHOT**

- What is snapshot?
- Purpose of Snapshot
- How to create snapshot from EBS Volumes
- How to create EBS Volumes from snapshot
- How to upgrade EBS Volume types
- How to delete a Snapshot

## **AWS - RELATIONAL DATABASE SERVICE (RDS)**

- Introduction to RDS
- RDS Fundamentals
- Create RDS instance using mysql
- Manage RDS Database Engine
- Automatic Database backup setup
- How to Access to RDS Database Engine
- Delete an RDS Database Engine
- About DBAAS

## **AWS - DYNAMODB**

- Introduction to DynamoDB
- Features of DynamoDB
- Workflow of DynamoDB
- DynamoDB Console
- Create Tables using DynamoDB
- Query Operations in DynamoDB
- Expected Interview Questions

## **AWS - ELASTIC LOAD BALANCING**

- Introduction to Elastic Load Balancing
- Features of ELB
- Use cases of ELB
- Types of ELB
- Application ELB
- Network ELB
- Classic ELB
- Internal Load Balancer
- External Load Balancer
- How to Create ELB
- Load Balance Protocols
- Security group for Load Balancer
- Health check for Load balancer
- Expected Interview Questions

## **AWS - SIMPLE EMAIL SERVICES (SES)**

- Introduction to SES
- Features of SES
- Configure SES
- Email Formats
- Limitations of SES

## **AWS - SIMPLE QUEUE SERVICE (SQS)**

- Introduction to SQS
- Features of SQS
- Configure SQS
- Create Queue
- Manage Permissions on Queue

## **AWS - SIMPLE NOTIFICATION SERVICE (SNS)**

- Introduction to SNS
- Features of SNS
- Topics
- Publishers
- Subscribers
- Notification Changes

# Linux Essentials for DevOps Course Content

## LINUX ESSENTIALS FOR DEVOPS

### LINUX BASICS

- Introduction to Operating Systems
- Types of Operating Systems
- History of UNIX
- General Architecture of UNIX
- **UNIX basics**
  - Kernel
  - Shell
  - System Calls
  - Utilities
- Difference between Kernel, Shell, Utilities
- Evolution of Linux
- Linux File Hierarchy Structure
- Expected Interview Questions

### LINUX COMMANDS AND ADMINISTRATION CONCEPTS

- Understanding Login Screen of Linux systems
- Case Study of Login incorrect or Password Incorrect
- How to know default shell that is assigned to a user
- Linux Commands
- How to create hidden files or directories
- How to unhide files or directories
- Understanding various Shell types
- **File Permissions**
  - File permission types
  - Understanding symbolic Method of permissions
  - Understanding Absolute Method of permissions
  - How to set read, write and execute permissions
  - How to remove read, write and execute permissions
  - How to change file permissions based on use case
  - How to apply permission to a directory
- **Change Ownership of Files**
  - How to change group name of a file
  - How to change Ownership of a file

- **Sudo Access**
  - What is Sudo
  - About /etc/sudoers file
  - About visudo
  - Steps to give sudo access to a normal user
  - About su
  - Difference between su and sudo
  - Service Request Procedures for Sudo Access in Real Time
- **Linux Service Management**
  - Need of Service management
  - Service - start, stop, reload and restart status
  - Chkconfig - list, on, off, runlevels
  - Systemctl - start, stop, reload and restart status
  - Troubleshooting Service Error messages
  - Implementation Procedures of Service Management in Real Time
- **Linux User Administration**
  - Types of users
  - User creation Process
  - Useradd commands
  - Usermod commands
  - Userdel commands
  - Passwd change commands
  - About /etc/passwd file
  - About /etc/shadow file
- **Linux Package Management**
  - About Utilities of Software Installation
  - Install software using RPM
  - Install Software using YUM
  - Perform consistency tests on software packages before installation
  - Troubleshooting Software installation issues

## VIRTUALISATION - LAB SETUP

- Introduction to Virtualization
- Virtualization Types
- Hosted
- Bare metal
- Hypervisors
- Virtual Machine Setup

# Linux Shell Scripting Course Content

## LINUX - SHELL SCRIPTING

- Introduction to Scripting
- About Shell
- Shell Scripting
- Purpose of Shell Scripting
- Various Types of Shells
- Shell Flavors and their default shells

## Scripting Basics

- How to view available shells in system
- How to switch to different shells
- How to exit from shell
- How to create a script file
- File permissions for Script file
- How to Execute Script file using relative and absolute methods
- Exercise on creating a sample script file

## Understanding profile scripts

- bash\_profile
- bash\_logout

## Use of shebang or hashbang

## Case Study on error message related to bad interpreters

## Commenting in bash scripting

## Variables

- What is variable?
- Types of variable
- Difference between System Defined and User Defined variables
- Naming Conventions to declare a Variable

- Syntax for Variable Declaration
- Few Case studies on Valid and invalid variable declarations
- Scalar Variables
- Accessing the Variables

### Reading variables from standard input

- Reading single variables from standard input
- Reading multiple variables from standard input
- Reading Variables in Silent Mode
- Reading Variables into an array
- Reading Variables into inbuilt System Built Variable `REPLY`

### Passing Arguments

- Passing arguments to shell script
- Passing arguments to arrays
- Difference between passing arguments to shell script and to array
- Print all arguments passed into array
- How to count number of arguments of an array using script

### Operators

- Arithmetic Operators
- Numeric comparison Operators
- Logical Operators
- Assignment Operators

### Control Statements

- If condition
- If else conditions
- While Loop
- For loop
- Continue
- Break
- Case condition

### File Operations using Bash Scripting

- How to find if the file exists or not

- How to know file type
- How to know if the directory exists or not
- How to know file permissions using script
- How to know if the file is empty or not

### **Few Sample scripts**

### **Expected Interview questions**