QEdge®

DevOps &
Multi-Cloud

CLASSROOM TRAINING

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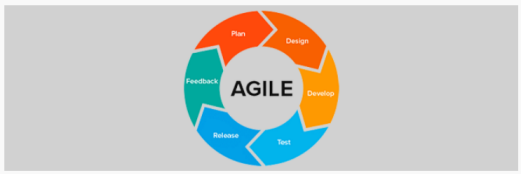
Skills Covered



DevOps & Multi-Cloud

DevOps with AWS & Azure Course Content

Why DevOps

- Business Perspective
- IT Perspective
- Developer Perspective
- Tester Perspective
- Operations Perspective

What is DevOps

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

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
- Making a DevOps Transition
- Introduction to DevOps Automation
- Role of Dev in Agile Scrum
- Role of Ops in Agile Scrum

Problem which resolves DevOps Implementation in Project Implementation

DevOps Life Cycle

- Introduction to DevOps Automation
- Tools
- DevOps Technology Categories
- Collaboration
- Planning
- Issue Tracking
- Monitoring
- Configuration Management
- Source Control
- Dev Environments
- Continuous Integration
- Continuous Testing
- Continuous Deployment

Linux Essentials for DevOps

- Linux Overview
- What is Operating system
- What is Unix, Linux
- Unix vs Linux
- Linux Distributions
- Linux Architecture & Installation
- Linux Boot process
- Linux commands
- Linux admin level commands
- Reading files
- Redirection operators
- User management
- Group management
- File system management
- Linux volume manager hands on
- Linux installation using iso

- Directory structure
- Editors
- VMware overview

Virtualization

- what is virtualization
- Brief explation on hyperviser
- The difference between local and virtual servers

Shell / BASH Scripting

- Role of Shells in Linux Environment
- Types of shells
- Shell Commands
- Command line arguments
- Variables
- Types of Operators
- Conditional Statements
- Bash Loops
- Case statement
- Functions
- Interactive Scripts
- Awk
- Sed
- Adv. Script Programs

GIT

- 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
- Installation and Configuration
- Obtaining Git Installing Git

- Common configuration options GUI tools
- Key Terminology
- Clone Working Tree Checkout Staging area Add
- Commit Push Pull Stash
- Git - Local Repository Actions Creating a repository (git init) Checking status (git status)
- Adding files to a repository (git add) Committing files (git commit) Removing staged files (git reset) Removing committed files (git rm) Checking logs (git log)
- Git - Remote Repository Actions Creating a remote repository (git init) Cloning repositories (git clone)
- Updating the remote repository from the local (git push) Updating the local repository from the remote (git pull)
- Tagging in Git What are Git Tags? Listing tags Lightweight tags
- Displaying tag details (tag show) Annotated tags
- Checking out tags Pushing tags Pulling tags
- Branching in Git
- What is a branch
- A note about <HEAD> Listing branches Create new branch Checkout branch Pushing branches Pulling branches Merging in Git
- Fetching Changes (git fetch) Rebasing (git rebase)
- Git Pull
- Git Workflows Different ways of using Git Centralized
- Feature Branch Gitflow Workflow Forking Workflow
- Creating a branch from a Stash Advanced Repository Actions Removing untracked files (git clean) Remove staged changes (git reset) Revert a commit (git revert)
- Checkout a previous commit (git checkout)
- Advanced Branching & Merging
- Deleting a Branch Fast forward merge Three-way merge
- Real Time Use Case: Merge Conflicts

MAVEN (Build Tool)

- Issues before in manual process of build process
- Automated build process
- Introduction
- Maven Structure and Installation
- Maven Dependencies
- Maven Repositories
- Maven Plug-ins
- Maven Configuration
- Integration with SCM tools
- Maven Project

CI & CD Servers

Jenkins

- What is Jenkins?
- Best Practices
- Installation and Configuraiton
    - Pre-requisites
    - Download & Install
    - Configurations
- Jenkins plugins – how to download and use
- Parameterizing the build
- Overview of Continuous Integration (CI)
- What it means Continuous Integration? Fundamental of CI
- How CI helps to Agile Development History of Jenkins
- Where Jenkins Fit in Organization Overview of Jenkins community
- Install Jenkins on Ubuntu / Windows Configuring a Node
- Configuring Jenkins server
- Configure Dashboard Configure System Environment Global Properties
- Configure Build Tools Configure Proxy
- Working with Jenkins Build Job

- Create and Configure a job Run a job manually Triggering a Build Scheduled Build job Manual Build job
- Polling SCM
- Maven and ANT Build Step Execute a Shell
- Post-Build Actions Archiving Build Results Notifications
- Working with Automate Testing
- Advanced Jenkins
- File fingerprint tracking Parameterized Build Job Parameterized Trigger
- Automated Deployment and Continuous Delivery
- CI & CD Pipeline Deployment using pipeline Script
- Jenkins Plugins
- Secure and Notification in Jenkins
- Overview of Notification Email Notification
- Other Notification
- Best Practices on Jenkins

Configuration Management Tools

ANSIBLE (Configuration Management Tool)

- IT Automation
  - History of IT Automation
  - Advantages of IT Automation
  - Disadvantages of IT Automation
  - Types of IT Automation
- What is Ansible?
- Ansible Architecture
- Installing Ansible
  - Installing Ansible on Linux OS
  - Installing Ansible using the systems package manager
- Ansible Version and Configuration
- Working with inventory files
  - Basic inventory file
  - Groups in an inventory file

- Regular expression in the inventory file
- Automating Simple Tasks
- YAML Scripting
- Working with Playbooks
  - Anatomy of a playbook
  - Playbook commands
  - Writing Playbooks
  - Executing the Playbooks
  - Variables in Playbooks
  - Terminology in Playbooks
- Ansible Core Modules
- Ansible Ad-hoc commands
- Installing and configuring a web server
- Working with Handlers
- Ansible Role

Note: Realtime Use Case in Ansible integrate with Jenkins,Git and Maven

DOCKER (Containerization Tool)

- Containerization Vs Virtualization
  - Traditional Virtualization
  - Containerization
- Understanding Docker
  - Difference between Docker and Other VMs
  - Docker file
  - Docker Networking
- Docker Installation
- Docker Hub and expose to official images
- Docker Images registry
- Running the Docker Container
- Handling Docker Containers
- Docker Adv.Commands
- Docker Terminology
- Working with Docker Images

- Docker Hub
- Searching Docker images

- Docker file build instructions
  - FROM instruction
  - MAINTAINER instruction
  - COPY instruction
  - ADD instruction
  - RUN instruction
  - ENV instruction
  - ARG instruction
  - Environment variables
  - USER instruction
  - WORKDIR instruction
  - VOLUME instruction
  - CMD instruction
  - ENTRYPOINT instruction
  - SHELL instruction
- A Brief on the Docker image management
- Publish your build images into Docker Hub
- Understanding the Docker Hub
- Working with Containers
  - What is container
  - Docker run command
  - Theory of pulling and Running Containers
  - Container Life cycle
- Data Volume
- Sharing data between Containers
- Docker Swarm Mode
- Swarm Mode Theory
  - Configuring Swarm Mode
  - Services
  - Scaling Services
  - Rolling Updates

Note: Docker Real Time UseCases

KUBERNETES

- What is kubernetes
- Purpose of Kubernetes for micro services
- How kubernetes works
- Master components, how works
- Node Components, how works
- How pods works
- Installations and configuration kubernetes cluster
- Pod lifecycle
- Work with pods
- Work Services
- **Blue/green deployments with real time examples**
    - What is blue and green deployments
    - How it helps in real time
    - Overview of Blue/Green Deployments
    - Implementation Strategies
    - Benefits and challenges

Provisioning using Terraform

Goal: Learn how to provision and manage infrastructure on a Cloud Platform (AWS) using Terraform Configuration Files.

Objectives

After completing this module, you should be able to

- Understand Provisioning using Terraform
- Learn the Difference between Terraform vs Ansible
- Understand Terraform Architecture
- Deploy a Terraform Configuration File
- Use Basic Terraform Commands
- Manage Terraform Resources
- Perform Terraform State Commands

Topics

- Introduction to Terraform
- Terraform vs Ansible
- Terraform Architecture
- Terraform Configuration
- Terraform Common Commands
- Managing Terraform Resources
- Terraform State

Hands-On

- Setting Up AWS and Terraform
- Executing a Terraform Configuration
- Managing Terraform Resources
- Referencing Terraform Resources
- Terraform State commands

AWS

Introduction to Cloud Computing

- What is Cloud
- Why Cloud?
- Types of Cloud Deployment Models
- Types of Cloud Services
- Future of Cloud Technologies
- Advantages and Disadvantages of Cloud

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

Elastic Compute Cloud (EC2)

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

Regions and Availability Zone Concepts

- Describing Regions
- Availability Zones, and Endpoints
- Managing instances in an Availability Zone

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
- 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
- AmazonEBS snapshots

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 load balancing
- Connection Draining

Auto Scaling

- What is auto scaling?
- Auto scaling components

Advantages of Auto Scaling

- Creation of launch configuration
- Configuration of auto scaling policies
- Advantages of using auto scaling with ELB

Network & Security

- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

Networking Services

Amazon Virtual Private Cloud (VPC)

- What is Amazon VPC?
- VPC Essentials
- Default and Nondefault 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

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

Storage & Content Delivery Services

Amazon S3

- What is object Storage?
- Data as objects
- Lifecycles of S3
- Managing Buckets
- Accessing S3 storage via tools
- Creation of a static website using S3 storage

Database Services

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

Amazon Cloud Watch

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

Amazon Security Groups and NACL

- What is Security Group?
- Where the Security Groups are used in AWS?
- What is NACL?
- Difference between NACL and Security Groups
- Implementation of Security Groups and NACL service

Cloud Formation

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

Application Services

Amazon Simple Email Service (SES)

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

Azure

What is Microsoft Azure?

Types of Azure Clouds

- Azure as IaaS
- Azure as PaaS
- Azure As SaaS

Azure key Concepts

Azure Domains (Components)

- Compute
- Storage
- Azure Networking
- Database

Overview of DevOps

- Why DevOps?
- What is DevOps?
- DevOps Market Trends
- DevOps Engineer Skills
- DevOps Delivery Pipeline
- DevOps Ecosystem

Version Control with Git

- What is version control
- What is Git
- Why Git for your organization
- Install Git
- Common commands in Git
- Working with Remote Repositories

Azure DevOps CI/CD pipelines

- Introduction to CI/CD
- Tasks
- YAML Templates
- Create .NET Core CI pipeline
- Create .NET Core CD pipeline
- Sonar cloud integration

Implement and manage build infrastructure

- Private and hosted agents
- Integrate third party build systems
- Recommend strategy for concurrent pipelines
- Manage Azure pipeline configuration (e.g. agent queues, service endpoints, pools, webhooks)

Deploying ARM Template in Azure

- Introduction to CI-CD ARM templates
- Create ARM template
- Create and Run ARM deployment CI pipeline
- Create and Run ARM deployment CD pipeline

Application Secrets in the pipelines

- Introduction to Azure Key vault
- Accessing Secrets from Azure Key Vault
- Linking Secrets from Azure Key Vault

Azure Artifacts

- Introduction to Azure Artifacts
- Create NuGet packages and Versioning
- Package management with DevOps
- Maven packages

Continuous Integration using Jenkins

- Jenkins Management
- Adding a slave node to Jenkins
- Building Delivery Pipeline
- Pipeline as a Code

Implementation of Continuous Testing with Selenium

- Introduction to Selenium
- Why Selenium?
- Selenium – Webdriver
- Creating Test Cases in Selenium WebDriver (Waits)
- What and why X-Path
- Handling different controls on Webpage
- Framework in Selenium
- Selenium Integration with Jenkins
- Integrating Selenium with Jenkins

Continuous Deployment: Containerization with Docker

- Shipping Transportation Challenges
- Introducing Docker
- Understanding images and containers
- Running Hello World in Docker
- Introduction to Container
- Container Life Cycle
- Sharing and Copying
- Base Image
- Docker File
- Working with containers
- Publishing Image on Docker Hub

Containerization with Docker: Ecosystem and Networking

- Introduction to Docker Ecosystem
- Docker Compose
- Docker Swarm
- Managing Containers
- Running Containers
- Introduction to Docker Networking
- Network Types
- Docker Container Networking

Configuration Management with Ansible

- Introduction to Ansible
- Ansible Installation
- Configuring Ansible Roles
- Write Playbooks
- Executing adhoc command

CRT

Placement Preparartion Program

1 Technical Interview Questions

2 HR Interview Questions

3 Mock Interviews

4 Resume Preparation

5 Placement Support

Reasons to Join us

1. Offline & Online training options
2. Day to day class videos & Materials access through LMS App
3. Live Project
4. Lab support for offline and online
5. Placement preparation program

SOFTWARE TESTING

Selenium

Java

DevOps

aws Azure

python

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