



## Module-1: Cloud and Amazon Web Services (AWS) Fundamentals

- What is Cloud Computing?
- Introduction to Amazon Web Services
- AWS Service Models
- AWS Deployment Models
- AWS Global Infrastructure
- AWS Cloud Use-cases
- Overview of AWS Console and different components
- Introduction to AWS CLI

### Labs

- Creating an AWS Account (free tier)
- Installation of AWS CLI

## Module-2: AWS Identity and Access Management (IAM) and KMS Service

- Overview of IAM service
- IAM Users
- IAM Groups
- IAM Roles and Policies
- IAM Policy Structure & Inheritance
- IAM Password policy
- IAM Multi-factor Authentication
- IAM User Access keys
- Key Management Service (KMS)

## Module-3: Amazon Elastic Compute Cloud (EC2) and EBS Service

- Overview of AWS EC2 service
- EC2 Configuration and Sizing options
- EC2 Instance Types
- EC2 Instance Purchasing options - On-demand, Spot, Dedicated and Reserved
- EC2 Security Groups - Inbound and Outbound rules
- EC2 Placement Groups

- EC2 Instance Storage - Elastic Block Store (EBS)
- EBS Volume Types with Use-case
- EBS Encryption
- EBS Snapshots
- EC2 Amazon Machine Image (AMI)
- Understanding Scalability and High Availability
- EC2 Load Balancing services
- EC2 Auto-scaling groups

#### Labs

- Launching an AWS EC2 Instance (Linux and Windows) and login
- Demonstrating the use of Security Group with Inbound and Outbound rules
- Creating an Elastic IP and attaching it to an EC2 Instance
- Creating snapshot of EC2 EBS Volumes for Backup
- Creating custom AMI of EC2 Instance
- Creating an EC2 Auto-scaling group for demonstrating the horizontal scaling with EC2

### Module-4: AWS Storage Services – Amazon Simple Storage Service (S3) and EFS

- Overview of Amazon Simple Storage Service (S3)
- Amazon S3 Objects and Buckets
- S3 Object Versioning
- S3 Encryption - SSE, KMS
- S3 Security - User based IAM Policies, Resource based Policies
- S3 Static Site Hosting
- S3 Logging and Audit - Access logs
- S3 CORS (Cross Object Resource Sharing)
- S3 Storage classes - Standard, Standard IA, Intelligent Tier, Glacier
- S3 Lifecycle Rules
- S3 Pre-signed URLs
- Overview of Amazon Elastic File System (EFS) service

#### Labs

- Creating S3 Bucket and uploading files in it
- Enabling S3 Versioning
- Enabling S3 Encryption
- Creating and S3 Bucket and publishing it as static website
- Configuring S3 Lifecycle rules for Cost optimization

## **Module-5: AWS Networking Services – Amazon Virtual Private Cloud (VPC), Route53**

- Networking Primer – IP Addressing, Network Types
- Overview of Amazon VPC service
- Components of VPC: Network Interface, Route Tables, Internet Gateway, and NAT
- VPC Security – Network Access Control List (NACL), Security Groups
- VPC Connectivity mechanism – VPC Peering, Site-to-Site VPN, Direct Connect
- VPC Endpoints
- VPC Pricing
- VPC Monitoring and Logging
- Route 53

### **Labs**

- Creating custom VPC of specific size with subnets
- Demonstrating the implementation of Internet Gateway (IGW)
- Creating and Configuring NACL for allowing and denying network traffic

## **Module-6: AWS Monitoring, Auditing and Notification Services – CloudWatch, CloudTrail, Config & SNS**

- Overview of AWS CloudWatch
- CloudWatch Metrics - Standard and Custom
- CloudWatch Dashboard
- CloudWatch Logs
- CloudWatch Alarms
- CloudWatch Events -Rules
- Overview of CloudTrail
- CloudTrail Events
- CloudTrail Insights
- AWS Config
- Simple Notification Service (SNS)

## Module-7: Amazon Relational Database Services (RDS)

- Overview of Amazon RDS Service
- RDS Database Engines
- RDS Database Instances
- RDS Read Replicas and Multi AZ Architectures
- RDS Replication
- RDS Backup

## Module-8: AWS Container Services – Docker, ECS, ECR, Fargate and EKS

- Containerization and Docker Primer
- Docker Architecture
- Docker Installation – Linux/Windows/MacOS
- Docker Images, Repositories, Dockerfile
- Amazon Elastic Container Services (ECS) and AWS Fargate
- Amazon Elastic Container Registry (ECR)
- Overview of Amazon Elastic Kubernetes Service (EKS)
- K8s Pods Definition

## Module-9: AWS DevOps Services – Git, CodeCommit, CodeBuild, CodeDeploy, CodePipeline

- Overview of DevOps practices (CI/CD)
- Technology Stack for CI/CD in AWS
- Git Primer – VCS, Branches, Merge, Pull, Fork, Commit, Push actions
- Building DevOps pipeline with **CodeCommit, CodeBuild, CodeDeploy** and **CodePipeline Labs**
- Creating an end-to-to CI CD Pipeline with AWS DevOps services to deploy an Application on EC2
- Creating an end-to-to CI CD Pipeline with AWS DevOps services to deploy an Application on ECS/EKS Cluster

## Module-10: Infrastructure-as-Code (IaC): AWS CloudFormation and Terraform

- Understanding Infrastructure-as-Code (IaC) concept
- Overview of **AWS CloudFormation service**
- CloudFormation Template Anatomy
- Introduction to YAML for writing CloudFormation Templates
- Overview of **Hashicorp Terraform**

- Terraform Installation
- Terraform - Remote State, Data Source, Modules, and Variables
- Integrating and Building AWS Resources with Terraform

## Labs

- Terraform Installation (on Windows/Linux)
- Provisioning AWS resources (EC2, S3 Bucket, VPC, Lambda) using Terraform