

AWS Solutions Architect and DevOps Training Program

# (Duration: 135 Hours (108 Hours Contents + 27 Hours Q&A))

**Module 1: AWS Solutions Architect (32 Hours + 8 Hours Q&A)**

# Module 1 (A) Introduction to Cloud Computing

What is Cloud Computing Advantages of Cloud Computing

Types of Cloud Computing Based on Service and Deployment Models Overview of AWS

Regions and Availability Zones Global Infrastructure

# Module 1 (B) Computer Service Overview

Introduction to Amazon EC2

Amazon EC2 Part Console Demonstration Features of EC2

AMI Instance Type

Instance Purchasing Options Public IP, Private IP, Elastic IP Instance Lifecycle Placement Groups

Security Groups Key Pair

EC2 Product Demonstration (LAB) Knowledge Check

# Module 1 (C) Elastic Block Stores

Introduction to EBS

Benefits of Having EBS EBS Volume types Encryption (Data Security)

Root and Data Volumes Life Cycle Manager AMI vs. Snapshots

EBS Product Demonstration (LAB) Knowledge Check



# Module 1 (D) Elastic File System

Introduction to EFS

Comparison between EBS and EFS Mount Targets

Supporting Operating Systems Performance and Throughput in EFS Benefits of having EFS

EFS Product Demonstration (LAB) Knowledge Check

# Module 1 (E) Simple Storage Service

Introduction to S3 Bucket and Object Object Versioning Server Access Logging Multipart Upload Object Lock

Data Encryption

Static Website Hosting

Understanding S3 Durability and Availability Storage Classes -

Types of Storage Classes Life Cycle Management

Cross Region and Same Region Replication Introduction to Cloud Front

S3 Product Demonstration (LAB) Knowledge Check

# Module 1 (F) Virtual Private Cloud

Introduction to VPC Understanding CIDR

Default and Non-default VPC Components of VPC

VPC and Subnet Sizing

1. Security in Amazon VPC
2. VPC Flow Logs
3. Security Groups
4. Network Access Control Lists (NACL)
5. Route Tables
6. Internet Gateway
7. Network Address Translation VPC Peering

Introduction to VPN and Direct Connect

VPC Product Demonstration (LAB) Knowledge Check

# Module 1 (G) Database Services

Introduction to RDS

Types of Database Engines in RDS Database Subnet Group Database Read Replicas

Manual and Automatic Snapshots Multi-AZ Deployment

Alternative to RDS

RDS Product Demonstration (LAB) Introduction to DynamoDB Durability and Performance

Dynamo DB Basic Components Introduction to Elastic Cache Introduction to Redshift Data Security & Performance

Knowledge Check



# Module 1 (H) Route 53

Introduction to Route 53 Domain Registration

Public and Private Hosted Zone Routing Policies

Types of DNS Servers Types of DNS Queries Global Accelerator Knowledge Check

# Module 1 (I) Identity and access management

Introduction to IAM IAM Features

Protect your AWS by different authentication system

AWS User Account and Groups in detail Associating policies to the user and groups Introduction about Roles and its Use

Multi Factor Authentication AWS Organization

IAM Product Demonstration (LAB) Knowledge Check

# Module 1 (J) AWS Security Management

Well Architected Framework – The 5 pillars of AWS Describing Trusted Advisor Importance of Cloud Trail How Cloud Trail Works

Cloud Trail Concepts Insights Events

Cloud Trail Event History

Validating Cloud Trail log file Integrity Cloud Watch (Monitoring Service) Introduction to Cloud Watch

How Cloud Watch Works Cloud Watch Concepts Knowledge Check



# Module 1 (k) Application Integration Service

Introduction to SNS How SNS works Topic

* 1. Publishers
  2. Subscribers Introduction to SQS

Life Cycle of an SQS Message

SQS Limits

SQS Retention Period

Types of Message Queues FIFO Queue Standard Queue

Benefits

How SQS is different from SNS

SNS & SQS Product Demonstration (LAB) Knowledge Check

# Module 1 (L) Elastic Load Balancer and Auto Scaling

Introduction to ELB Necessity of Load Balancer Features of Load Balancer

Availability Zones and Load Balancer nodes Internal and Internet Load Balancer Cross Zonal Load Balancer

DNS setup for ELB Introduction to Auto Scaling Entities of Auto Scaling Auto Scaling Groups

Manual and Dynamic Scaling

ELB & ASG Product Demonstration (LAB) Knowledge Check



# Module 1 (M) Other Services

Lambda FSx

Cloud Formation Migration Services Data Migration Snowball Snowball Edge Snow Mobile

Database Migration Storage Gateway File Gateway Volume Gateway Tape Gateway Certificate Manager

# Module 2: Linux Fundamentals (Online Self Learning)

1. Overview of Linux
2. Linux Architecture
3. Linux Distributions
4. Basic Linux Commands
5. File Permission Management
6. User Creation
7. Shell Scripts
8. SSH and VI Utility

# Module 2 Practical’s

* Creation of User
* Establishing SSH Connection to the Server
* File creation and Manipulation using VI editor
* Managing permissions
* Basic commands execution
* Writing Shell Scripts Program



# Module 3: Overview of Python (15 Hours + 3.5 Hours Q&A)

1. Overview of Python
2. Features, Benefits, Uses of Python
3. Installation and Setup of Python Environment
4. Various Types of Sequences in Python
5. File Operations
6. Python Functions
7. OOPs Concepts
8. Modules
9. Errors and Exception Handling
10. Python Console based application and Web Application using Flask
11. Deploying and Consuming Python Applications

# Module 3 Practical’s

* Create a Console based Python Application
* Create a Web Application Using Flask
* Create Python Applications Demo Covering Various Concepts

# Module 4: DevOps Overview (4 Hours + 1 Hour Q&A)

1. Evolution of Waterfall, Agile, and DevOps
2. What is DevOps
3. Why DevOps
4. Benefits of DevOps
5. DevOps Stages
6. DevOps Lifecycle
7. Various Automation in DevOps
8. Overview of CICD

# Module 5: DevOps on Cloud (AWS) (4 Hours + 1 Hours Q&A)

1. Overview of AWS DevOps and Azure DevOps
2. Code Build
3. Code Commit
4. Code Deploy
5. Code Pipeline
6. Overview of Cloud Formation



# Module 6: Managing Source Code – Git and GitHub (10 Hours + 2.5 Hours Q&A)

1. Overview of Version Control System
2. Central vs Distributed Version Control System
3. Introduction to Git
4. Installation and Setting-up Git
5. Important Git Commands
6. Creating and Managing git Repositories
7. Git File Workflow
8. GIT - IGNORE
9. GIT Misc Commands
10. Reverting and Resetting
11. GIT Branching Strategies
12. Working with GIT Branching
13. Branching, Merging
14. Rebase and Squash
15. GIT Stash
16. Introduction to GitHub
17. Managing Remote Repositories
18. Handling GitHub repositories using Visual Studio Code

# Module 6 Practical’s

* Installation and Configuration of Git
* Creating Git Repositories
* Demonstrating Various Git Repositories
* Merging Branches and Managing Merge Conflicts
* Stashing, Reverting, Rebasing and Resetting
* Collaborating Local and Remote Repositories

# Module 7: Understanding and Using Build Tools (2 Hours + 0.5 Hour Q&A)

1. Overview of Various Build Tools
2. What is Maven
3. Maven Architecture
4. Maven Plugins
5. Maven Archetypes
6. Maven Commands
7. Integration of Jacoco Plugin for Code Coverage
8. Overview of Maven Applications



# Module 8: Continuous Integration Using Jenkins (10 Hours + 2.5 Hours Q&A)

1. Overview of Continuous Integration
2. Difference between Continuous vs Traditional Integration
3. Overview of Jenkins
4. Jenkins Master-Slave Architecture
5. Jenkins Installation and Configuration
6. Jenkins Plugins
7. Jenkins Management
8. Jenkins Freestyle and Pipeline Jobs
9. Scripted and Declarative Pipelines
10. Configuring Slave Node to Jenkins
11. Configure Tomcat Server
12. Integrate and Deploy to Tomcat Server using Jenkins
13. Jenkins Build Triggers
14. Enable Email Notifications

# Module 8 Practical’s

* Installation and Configuration of Jenkins
* Configuration of Tools
* Configuration of Plugins
* Creation of Freestyle Jobs, Scripted and Declarative Pipeline Jobs
* Demonstrate Pipeline Triggering Using GitHub Webhooks
* Scripted and Declarative Pipelines
* Integration of Code Coverage Tools and Static Code Analysis Tools
* Triggering Pipelines Using Git Webhooks
* Creation of CICD Pipelines
* Adding Slave Node to Jenkins

# Module 9: Containerization, Docker, and Docker Hub (7 Hours + 1.5 Hours Q&A)

1. Introduction to Virtualization and Containerization
2. What is Containerization
3. Docker Architecture
4. Overview of Docker Hub
5. Docker Installation
6. Docker Commands
7. Container Modes
8. Port Binding
9. Docker file
10. Managing Docker Images
11. Running and Managing Containers
12. Docker Volume
13. Docker Compose
14. Overview of Docker Swarm

# Module 9 Practical’s

* Installation of Docker and Docker Compose on AWS EC2
* Running Docker Commands
* Writing Docker Files for various applications
* Building Docker Images
* Pushing Images to Docker Hub
* Running Docker Containers
* Container Port Binding
* Running Multiple Containers Using Docker Compose file
* Initialize a Docker Swarm and Demonstrate Workload Deployments

# Module 10: Container Orchestration Tool - Kubernetes (8 Hours + 2 Hours Q&A)

1. Overview of Container Orchestration
2. Difference between Docker Swarm and Kubernetes Cluster
3. Kubernetes Architecture
4. Installation of Kubernetes - Minikube and EKS
5. Kubernetes Nodes
6. Kubernetes Pods
7. Kubernetes Deployments
8. Rolling updates and Rollbacks
9. Scaling up and Down of the Application
10. Services in Kubernetes
11. Kubernetes Host Path Volume
12. Namespaces

# Module 10 Practical’s

* Installation and Configuration of Kubernetes Minikube
* Creation of Pods and Deployments using Ad-Hoc Commands
* Creation of Pods and Deployments using YAML files
* Scaling up and Scaling Down of the Application
* Rolling out Deployments and Rolling Back
* Creation of Services



# Module 11: Configuration Automation using Ansible (5 Hours + 1.5 Hours Q&A)

1. Overview of Configuration Automation
2. Introduction to Ansible
3. Ansible Architecture
4. Components of Ansible
5. Installation and Configuration of Ansible
6. Ansible Ad-Hoc Commands
7. Ansible Playbooks
8. Ansible Variables
9. Ansible Handlers
10. Ansible Role using Ansible Galaxy

# Module 11 Practical’s

* Installation and Configuration Ansible
* Running Ansible Ad-Hoc Commands
* Writing Ansible Playbooks to Configure Servers
* Creating Ansible Roles

# Module 12: Terraform Overview (4 Hours + 1 Hour Q&A)

1. Introduction to Terraform
2. Terraform vs. Ansible
3. Terraform Architecture
4. Terraform Configuration
5. Terraform Commands
6. Managing Terraform Resources
7. Terraform End to End Project



# Module 12 Practical’s

* Installation of Terraform on AWS EC2 Instance
* Writing Terraform Configuration
* Creation of AWS EC2 instance using Terraform
* Managing AWS Resources using Terraform
* End to End Infrastructure Creation Project

# Module 13: Continuous Monitoring using Prometheus and Grafana (4 Hours + 1 Hour Q&A)

1. Overview of Continuous Monitoring
2. Continuous Monitoring tools in DevOps
3. Installation and Configuration of Prometheus and Grafana
4. Prometheus Architecture
5. Monitoring using Prometheus
6. Dashboard Visualization using Grafana

# Module 14: Capstone Projects (4 Hours + 1 Hour Q&A)

* + Finance Me - Finance and Banking Domain
  + Medi cure - Health Domain

**Note: Practical sessions are integrated with each module for hands-on learning.**

