

AWS Compute Stack

Duration 5 days

Course Learning Objectives

By the end of this course, participants will be able to:

- Design compute architectures based on workload characteristics
 - Deploy applications using all AWS compute services
 - Compare EC2, Containers, Serverless, and Managed Platforms
 - Build highly available and scalable architectures
 - Optimize compute cost and performance
 - Secure compute workloads
 - Monitor and troubleshoot production deployments
 - Design enterprise-grade AWS compute solutions
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Day 1 – Foundations of AWS Compute (8 Hours)

Session 1 – AWS Compute Strategy (1 Hour)

- Evolution of Compute
 - Physical Servers
 - Virtualization
 - Containers
 - Serverless
 - Edge Computing
 - Choosing the right compute service
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Session 2 – Amazon EC2 Deep Dive (2.5 Hours)

- Nitro System
- EC2 Families
- Instance Types
- Purchasing Options

- ENI
- Security Groups
- User Data
- IMDSv2
- Launch Templates
- Placement Groups
- EBS Integration

Lab 1

Launch Linux EC2 and deploy a sample application

Lab 2

Create custom AMI and launch an instance using it

Session 3 – Elastic Load Balancer (1.5 Hours)

- ALB
- NLB
- GWLB
- Health Checks
- Target Groups
- SSL Termination
- Sticky Sessions

Lab 3

Deploy ALB and Configure Path Routing, Health Checks

Session 4 – Auto Scaling (2 Hours)

- ASG
- Scaling Policies
- Warm Pools
- Lifecycle Hooks

- Instance Refresh

Lab 4

Implement a highly available and scalable architecture using ASG

Day 2 – Platform Services and Serverless (8 Hours)

Elastic Beanstalk

- Architecture
- Deployment Policies
- Environment Types
- Blue/Green Deployments

Lab 5

Deploy Sample Application using Elastic Beanstalk

AWS App Runner

- Source Deployment
- Container Deployment
- Autoscaling

Lab 6

Deploy GitHub Application

AWS Amplify

- Amplify Hosting
- Amplify Gen 2
- Backend Integration
- CI/CD
- Authentication
- Hosting
- Serverless Backend

Lab 7

Deploy Sample Application with REST API

AWS Lambda

- Execution Model
- Cold Starts
- SnapStart
- Layers
- Versions
- Aliases
- Event Sources
- API Gateway

Lab 8

Implement a serverless REST API using API gateway and add lambda as backend server

Day 3 – Containers on AWS (8 Hours)

Docker Refresher

- Images
 - Containers
 - Networking
 - Volumes
 - Docker Compose
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Amazon ECR

Lab 9

Push Docker Image into ECR private Repository

Amazon ECS

- Cluster
- Tasks
- Services
- Capacity Providers
- ECS on EC2
- ECS on Fargate

AWS Fargate

- Serverless Containers
- Pricing
- Security

Lab 10

Deploy sample application on ECS with Fargate

Day 4 – Kubernetes and Specialized Compute (8 Hours)

Amazon EKS

- Kubernetes Architecture
- Control Plane
- Worker Nodes
- Managed Node Groups
- Fargate
- Networking
- Storage
- IAM Roles for Service Accounts
- Autoscaling

Lab 11

Create EKS Cluster

AWS Batch

- Compute Environments
- Job Queues
- Scheduling

Amazon Lightsail

Edge Computing

- Outposts
 - Local Zones
 - Wavelength
 - VMware Cloud on AWS
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Day 5 – Production Readiness & Capstone (8 Hours)

Security

- IAM Roles
 - Least Privilege
 - SSM Session Manager
 - Patch Manager
 - Secrets Manager
 - Inspector
 - GuardDuty
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Monitoring

- CloudWatch
- X-Ray
- Container Insights
- Lambda Insights
- CloudTrail

Cost Optimization

- Savings Plans
- Spot
- Compute Optimizer
- Graviton
- Right Sizing

Final Capstone Project (5 Hours)

Scenario

Design and deploy a production-ready cloud-native e-commerce platform.

Students work in teams of 3–4 and justify every compute service selection.

Functional Requirements

- User Registration & Login
- Product Catalog
- Shopping Cart
- Order Processing
- Image Upload
- Reporting
- Admin Portal
- Auto Scaling
- Monitoring
- Security
- Cost Optimization