Course Duration: 32 hours (4 Days)

From Fundamentals to Specialty: Advanced AWS Networking Concepts

The course covers fundamentals to complex networking concepts, hybrid connectivity, routing, security, network automation, and monitoring using AWS native services. Through hands-on labs, architectural examples, and real-world scenarios, learners will gain the skills needed to design, deploy, and manage advanced networking solutions on AWS.

Course objectives

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

- Design and implement hybrid cloud and multi-region network architectures on AWS
- Configure secure and scalable connectivity using VPC, Transit Gateway, VPN
- Optimize routing, DNS, and content delivery using Route 53 and CloudFront
- Automate and monitor networking environments using AWS tools and services

Prerequisites

- AWS Certified Solutions Architect – Associate or equivalent knowledge
- Strong understanding of TCP/IP, DNS, VPN, and routing
- Experience with AWS services like EC2, VPC, IAM, and networking basics
- Familiarity with cloud concepts and basic scripting (e.g., Python, Bash) is helpful

Target Audience

- Network Engineers and Cloud Network Architect
- DevOps and Site Reliability Engineers (SREs)
- Security professionals focusing on cloud infrastructure

Course outline

🟦 Day 1: Foundations

Module 1: Introduction to Amazon Web Services

- Introduction to AWS Cloud
- Security in the AWS Cloud

Module 2: AWS Compute

- Compute as a service in AWS
- Introduction to Amazon Elastic Compute Cloud
- Amazon EC2 instance lifecycle
- AWS container services
- What is serverless?
- Introduction to AWS Lambda
- Choose the right compute service

Module 3: AWS Storage

- AWS storage types
- Amazon EC2 instance storage and Amazon Elastic Block Store (Amazon EBS)
- Object storage with Amazon S3
- Choose the right storage service

Module 4: Databases

- Explore databases in AWS
- Amazon Relational Database Service
- Purpose-built databases
- Introduction to Amazon DynamoDB
- Choose the right AWS database service

🟩 Day 2: AWS Networking Core & Hybrid Architectures

Module 5: Introduction to AWS Networking Stack

- AWS Networking reference architecture

- Understanding CIDR Notation
- Key services: VPC, ENI, Subnets, Route Tables
- IPv4 vs IPv6 in AWS
- Configuring and Deploying VPCs with Multiple Subnets

Module 6: VPC Design and Routing Deep Dive

- Custom VPCs and subnet design
- Route propagation and route priorities
- TGW Architecture
- VPC Peering vs Transit Gateway
- Multi-AZ and Multi-Region designs

Module 7: Load Balancers

- Getting Started with Application Load Balancer
- Getting Started with Gateway Load Balancer
- Getting Started with Network Load Balancer (NLB)
- ELB, ALB, NLB selection and tuning

Hands-on Lab: Configuring Application Load Balancer

Module 8: Hybrid Connectivity: VPN and Direct Connect

- Static Routing vs Dynamic Routing
- How Border Gateway Protocol (BGP) works?
- Site-to-Site VPN setup and troubleshooting
- AWS Client VPN
- AWS Direct Connect architecture
- Redundancy and failover strategies

Hands-on Lab: Configuring VPN connection

🟨 Day 3: Advanced Network Security, Performance & Content Delivery

Module 9: Security and Network Access Control

- NACLs vs Security Groups
- VPC endpoints and private connectivity
- AWS Network Firewall and Firewall Manager
- AWS Web Application Firewall (WAF)
- AWS Shield
- AWS Certificate Manager

Hands-on Lab: Working with AWS WAF

Module 10: DNS and strategies

- Route 53 hosted zones and routing policies
- Geo DNS and latency-based routing
- AWS Global Accelerator

Module 11: Content Delivery and Edge Networking

- What is a CDN (Content Delivery Network)?
- CloudFront overview
- Origin configurations and cache behaviors
- Using Lambda@Edge for request modification

Hands-on Lab: Security and CDN Setup

- Implement NACLs, CloudFront, and VPC endpoints

🟩 Day 4: Automation, Monitoring, and Certification Preparation

Module 12: Network Automation and Infrastructure as Code

- AWS CloudFormation for network provisioning
- Using AWS CLI and SDKs for automation

- Automating routing and endpoint updates

Hands-on Lab: Working with AWS Cloudformation

Module 13: Monitoring, Logging, and Troubleshooting

- VPC Flow Logs and Traffic Mirroring
- AWS CloudWatch and CloudTrail for networking
- Network troubleshooting tools (Reachability Analyzer, ELB access logs)
- Best practices for proactive network monitoring

Module 14: AWS Networking Management and Governance

- Introduction to AWS Management & Governance Services
- Amazon VPC IP Address Manager (IPAM)
- AWS CloudFormation
- AWS Service Catalog
- AWS Config
- AWS CloudTrail

Hands-on Lab: Setup IPAM