Google Cloud Network Engineer Advance Course

Course Duration: 40 Hours **Course code: GCNEA**

1. Course Overview

This advanced course is designed to equip learners with in-depth knowledge and hands-on expertise in designing, implementing, and managing complex networking solutions on Google Cloud. It covers advanced VPC design, hybrid connectivity, network security, load balancing, and network optimization techniques to build highly available, scalable, and secure cloud infrastructures.

2. What you'll learn?

By the end of the course, you will be able to:

- Design and implement advanced VPC architectures
- Configure hybrid connectivity using VPN and Interconnect
- Implement advanced routing and traffic management
- Deploy and manage load balancing solutions
- Apply network security best practices on GCP
- Monitor and troubleshoot network performance
- Optimize network cost and scalability
- Implement high availability and disaster recovery strategies

3. Target Audience

- Network Engineers
- Cloud Engineers
- Cloud Architects
- DevOps Engineers
- System Administrators

4. Pre-Requisites

Before taking this course, you should have:

- Basic knowledge of networking (TCP/IP, DNS, routing)
- Familiarity with Google Cloud Platform
- Understanding of VPC and subnet concepts
- Basic experience with command-line tools

5. Course content

Module 1: Course Introduction

- Course objectives and structure
- Overview of GCP networking services
- Networking in cloud vs on-premises

Module 2: Advanced VPC Design

- VPC architecture deep dive
- Custom mode VPCs
- Subnet design and IP addressing strategies
- Shared VPC and service projects
- Best practices for scalable network design

Module 3: Network Connectivity and Hybrid Architecture

- Cloud VPN (Classic and HA VPN)
- Cloud Interconnect (Dedicated and Partner)
- Hybrid connectivity architectures
- Redundancy and failover design
- Use cases for hybrid networking

Module 4: Advanced Routing and Traffic Management

- Static vs dynamic routing
- Cloud Router and BGP configuration

- Route advertisement and custom routes
- Traffic flow control
- Network path optimization

Module 5: Load Balancing Solutions

- Types of load balancers in GCP
- HTTP(S), TCP/UDP, and Internal load balancing
- Global vs regional load balancing
- SSL offloading and proxy configurations
- Traffic distribution strategies

Module 6: Network Security in GCP

- Firewall rules and policies
- Hierarchical firewall policies
- Identity-Aware Proxy (IAP)
- Private Google Access
- VPC Service Controls

Module 7: DNS and Domain Management

- Cloud DNS overview
- Private and public zones
- DNS peering and forwarding
- Managing domain resolution
- High availability DNS design

Module 8: Network Monitoring and Logging

- VPC Flow Logs
- Cloud Monitoring and Logging
- Network Intelligence Center
- Troubleshooting connectivity issues

- Performance analysis

Module 9: High Availability and Disaster Recovery

- Designing for high availability
- Multi-region deployments
- Failover mechanisms
- Backup connectivity strategies
- DR planning for network infrastructure

Module 10: Network Automation and Infrastructure as Code

- Introduction to automation in networking
- Using Deployment Manager / Terraform
- Automating network provisioning
- Configuration management

Module 11: Cost Optimization and Performance Tuning

- Cost components in GCP networking
- Optimizing bandwidth and traffic
- Efficient resource allocation
- Monitoring and reducing costs

Module 12: Advanced Networking Features

- Private Service Connect
- Network Service Tiers
- Packet Mirroring
- Traffic Director
- Advanced use cases

Module 13: Multi-Cloud Networking Strategies

- Connecting GCP with other cloud providers

- Cross-cloud networking patterns
- Security considerations
- Real-world implementations

Module 14: Hands-On Labs and Real-World Scenarios

- Configuring VPC and subnets
- Setting up VPN and Interconnect
- Implementing load balancing
- Troubleshooting network issues

Module 15: Capstone Project

- Design and implement a complete GCP network architecture
- Deploy hybrid connectivity solution
- Apply security and monitoring
- Final project evaluation and presentation