



Networking in Google Cloud

Course description

In this comprehensive course, you will delve into the intricacies of networking within Google Cloud Platform (GCP). You will gain a deep understanding of GCP's global network infrastructure, virtual private cloud (VPC) networks, and the wide array of networking services that enable secure, scalable, and highly available applications. This course covers everything from fundamental VPC design to advanced topics like hybrid connectivity, load balancing, DNS management, and network security. Through a combination of theoretical knowledge and practical application, you will learn to design, implement, and manage robust network architectures in GCP, preparing you to tackle real-world challenges and optimize network performance and cost.

- **Course level:** Intermediate
- **Duration:** 3 days

Activities

This course includes detailed presentations, architecture deep-dives, hands-on labs, live demonstrations, and collaborative group exercises to reinforce learning.

Course objectives

In this course, you will learn to:

- Summarize the core components and global infrastructure of Google Cloud's network.

- Design and implement secure and scalable Virtual Private Cloud (VPC) networks, including shared VPC and VPC peering.
- Establish robust hybrid connectivity solutions using Cloud VPN and Cloud Interconnect.
- Configure and manage various load balancing options to ensure high availability and optimal performance for applications.
- Implement advanced network security measures using firewalls, Cloud Armor, and network intelligence tools.
- Effectively manage DNS resolution with Cloud DNS and understand IP addressing strategies within GCP.
- Troubleshoot common networking issues and optimize network configurations for performance and cost.

Intended audience

This course is intended for professionals with a foundational understanding of networking and some prior experience with Google Cloud:

- Cloud Architects
- Network Engineers
- DevOps Engineers
- Security Specialists
- Site Reliability Engineers (SREs)
- Solutions Architects
- IT Managers overseeing cloud infrastructure

Prerequisites

We recommend that attendees of this course have:

- A solid understanding of general networking concepts (e.g., TCP/IP, routing, firewalls, DNS).

- Familiarity with Google Cloud Platform fundamentals, including IAM, projects, and basic compute services (e.g., Compute Engine).

Course outline

Module 01 – VPC Networking Fundamentals

Topics

- VPC Networks
- Multiple Network Interfaces
- Network Service Tiers

Learning Outcomes

- Configure VPC networks and multiple interfaces.
- Optimize networking costs and latency using service tiers.
- Understand premium and standard network tiers.

Activities

- VM Networking Exercise
- Network Tier Demonstration
- Quiz

Module 02 – Sharing VPC Networks

Topics

- Shared VPC
- VPC Network Peering
- VM Migration Between Networks

Learning Outcomes

- Implement VPC sharing strategies.

- Configure peering between VPC networks.
- Manage connectivity across projects.

Activities

- Shared VPC Lab
- Peering Configuration Exercise
- Quiz

Module 03 – Network Monitoring and Logging

Topics

- Monitoring
- Logging
- VPC Flow Logs

Learning Outcomes

- Monitor network resources and services.
- Configure uptime checks and alerts.
- Analyze network traffic behavior.

Activities

- Monitoring Labs
- VPC Flow Log Analysis
- Quiz

Module 04 – Network Routing and Addressing in Google Cloud

Topics

- VPC Routing
- IPv6
- BYOIP
- Cloud DNS

Learning Outcomes

- Configure routing and address management.
- Manage DNS zones and traffic flow.
- Implement NAT and route table configurations.

Activities

- Routing Configuration Lab
- DNS Management Exercise
- Quiz

Module 05 – Private Connection Options

Topics

- Private Google Access
- Private Services Access
- Private Service Connect
- Cloud NAT

Learning Outcomes

- Implement private connectivity solutions.
- Secure access to Google Cloud services.
- Configure Cloud NAT with private networking.

Activities

- Private Connectivity Lab
- Cloud NAT Configuration Exercise
- Quiz

Module 06 – Introduction to Network Architecture

Topics

- Cloud Network Architecture Overview
- Network Design Considerations

Learning Outcomes

- Design scalable cloud networking architectures.
- Evaluate connectivity and topology requirements.

Activities

- Architecture Design Discussion
- Network Planning Workshop
- Quiz

Module 07 – Network Topologies

Topics

- Hub-and-Spoke Topology
- Mesh Topology
- Topology Best Practices

Learning Outcomes

- Compare network topology patterns.
- Design resilient and scalable network architectures.
- Identify security and performance bottlenecks.

Activities

- Network Topology Lab
- Topology Design Exercise
- Quiz

Module 08 – Distributed Denial of Service (DDoS) Protection

Topics

- DDoS Attacks
- Google Cloud Mitigation Strategies
- Partner Security Products

Learning Outcomes

- Understand DDoS mitigation layers.
- Protect applications using Cloud Armor.
- Restrict access to load balancers securely.

Activities

- Cloud Armor Lab
- DDoS Mitigation Exercise
- Quiz

Module 09 – Controlling Access to VPC Networks

Topics

- IAM
- Cloud Firewall
- Cloud IDS
- Secure Web Proxy

Learning Outcomes

- Secure VPC networks using IAM and firewall policies.
- Deploy IDS for threat detection.
- Apply network security best practices.

Activities

- Firewall Policy Labs
- IDS Configuration Exercise
- Quiz

Module 10 – Advanced Security Monitoring and Analysis

Topics

- Packet Mirroring
- Network Security Best Practices

Learning Outcomes

- Inspect network traffic using packet mirroring.
- Improve visibility and threat analysis.

Activities

- Packet Mirroring Lab

- Security Monitoring Exercise
- Quiz

Module 11 – Hybrid Load Balancing and Traffic Management

Topics

- Hybrid Load Balancing
- Traffic Management

Learning Outcomes

- Configure hybrid load balancing.
- Manage backend traffic distribution and failover.

Activities

- Load Balancer Lab
- Traffic Routing Exercise
- Quiz

Module 12 – Caching and Optimizing Load Balancing

Topics

- Internal Network Load Balancers
- Cloud CDN
- Cloud Armor
- Load Balancer Optimization

Learning Outcomes

- Optimize content delivery performance.

- Configure CDN and edge security policies.
- Improve load balancing efficiency.

Activities

- Cloud CDN Lab
- Load Balancer Optimization Workshop
- Quiz

Module 13 – Connectivity Options

Topics

- Cloud VPN
- Cloud Interconnect
- Dedicated Interconnect
- Partner Interconnect
- Cross-Cloud Interconnect

Learning Outcomes

- Compare connectivity options for hybrid environments.
- Implement Interconnect solutions.
- Build resilient multi-cloud connectivity architectures.

Activities

- Connectivity Planning Exercise
- Hybrid Networking Discussion
- Quiz

Module 14 – Cloud VPN

Topics

- Cloud VPN Use Cases
- HA VPN Topologies
- HA VPN over Cloud Interconnect
- Best Path Selection

Learning Outcomes

- Configure high availability VPN solutions.
- Implement resilient VPN architectures.
- Optimize route selection for hybrid connectivity.

Activities

- HA VPN Lab
- VPN Topology Exercise
- Quiz

Your course overview ends here.
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About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

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