

Networking in Google Cloud Platform

3 jours / 21h

Course Objectives

- Configure VPC networks, subnets, and routers.
- Control administrative access to VPC objects.
- Control network access to endpoints in VPCs.
- Interconnect networks among Google Cloud projects.
- Implement network connectivity between Google Cloud projects.
- Implement load balancing.
- Configure traffic management among load balancer backend services.
- Use Cloud CDN to reduce latency.
- Optimize network spend using Network Service Tiers.
- Configure private connection options to provide access to external resources and services from internal networks.

Target audience

- Network engineers and administrators who use the Google Cloud console or are planning to do so.
- Individuals who want to be exposed to software-defined networking solutions in the cloud.

Prerequisites

- Having completed the Google Cloud Fundamentals: Core Infrastructure course or having equivalent experience.
- Prior understanding of the 7 layer OSI model.
- Prior understanding of IPv4 addressing.
- Prior experience with managing IPv4 routes.

Course objectives

Module 01: VPC Networking Fundamentals

Topics

- VPC networks
- Multiple Network Interfaces
- Network Service Tiers

Objectives

- Create a Compute Engine VM with multiple network interfaces.
- Use the standard tier to lower cloud networking costs.
- Use the premium tier to provide lower latency and faster access to Google Cloud resources.

Activities

- 1 quiz

Module 02: Sharing VPC Networks

Topics

- Shared VPC
- VPC Network Peering
- Migrating a VM between networks

Objectives

- Describe the different ways to share VPC networks that are available in Google Cloud.
- Recognize when to use Shared VPC and when to use VPC Network Peering.
- Configure peering between unrelated VPC networks.

Activities

- 1 lab
- 1 quiz

Module 03: Network Monitoring and Logging

Topics

- Monitoring
- Logging

Objectives

- Configure uptime checks, alerting policies, and charts for your network services.
- Monitor Google Cloud network resources.
- Use VPC Flow Logs to log and analyze network traffic behavior.

Activities

- 2 labs
- 1 quiz

Module 04: Network Routing and Addressing in Google Cloud

Topics

- VPC Routing
- IPv6
- BYOIP
- Cloud DNS

Objectives

- Define key routing and addressing concepts relevant to Google Cloud, including IP addresses, subnets, route tables, firewalls, BYOIP, and NATs.
- Describe the configuration and management options for Google Cloud DNS, including private and managed zones.
- Configure and manage route tables to control traffic flow, resolve domain names effectively, and utilize NAT rules for secure access.

Activities

- 1 lab
- 1 quiz

Module 05: Private Connection Options

Topics

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

Objectives

- Define and differentiate various private connection options (e.g., Private Google Access, Private Services Access, Private Service Connect).
- Explore use cases of Private Service Connect, Private Service Access, and Private Google Access.
- Implement Private Google Access with Cloud NAT.

Activities

- 1 lab
- 1 quiz

Module 06: Introduction to Network Architecture

Topics

- Cloud network architecture overview
- Key considerations

Objectives

- Describe the Google Cloud provides components that create a good network architecture, such as Cloud Interconnect, VPC Network Peering, Shared VPC, and Network Tiers.
- Summarize key considerations for network design.

Activities

- 1 quiz

Module 07: Network Topologies

Topics

- Hub and spoke topology
- Other topologies
- Getting topology data
- Best practices

Objectives

- Explain when to use each network topology based on specific requirements.
- Identify potential bottlenecks or security vulnerabilities in network topologies.
- Implement a meshed topology for a resilient and scalable network architecture.

Activities

- 1 lab
- 1 quiz

Module 08: Distributed Denial of Service (DDoS) Protection

Topics

- How DDoS attacks work
- Google Cloud mitigations
- Types of complementary partner products

Objectives

- Identify the four layers of DDoS Mitigation.
- Identify methods Google Cloud uses to mitigate the risk of DDoS for its customers.
- Use Google Cloud Armor to blocklist an IP address and restrict access to a global external Application Load Balancer.

Activities

- 1 lab
- 1 quiz

Module 09: Controlling Access to VPC Networks

Topics

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

Objectives

- Describe how IAM policies affect VPC network access.
- Identify the benefits of using Cloud Firewall's hierarchical policies at different levels of the cloud infrastructure hierarchy.
- Apply global and regional network firewall policies using Cloud Firewall.
- Explain the role of Cloud IDS in protecting VPC networks from malicious activity.
- Deploy Cloud IDS and configure its settings according to specific security needs.
- Describe the role of Secure Web Proxy in improving network resilience and availability.
- Describe best practices for cloud network security.

Activities

- 2 labs
- 1 quiz

Module 10: Advanced Security Monitoring and Analysis

Topics

- Packet Mirroring for network traffic inspection
- Network security best practices

Objectives

- Define Packet Mirroring and explain its purpose in network monitoring and security.
- Learn network security best practices.

Activities

- 1 quiz
- 1 lab

Module 11: Hybrid Load Balancing and Traffic Management

Topics

- Hybrid load balancing
- Traffic management

Objectives

- Describe the benefits of hybrid load balancing.
- Configure traffic management in a load balance

Activities

- 1 lab
- 1 quiz

Module 12: Caching and Optimizing Load Balancing

Topics

- Internal network load balancers as next hops
- Cloud CDN
- Cloud Armor
- Load balancer optimization strategies

Objectives

- Describe how to configure an internal network load balancer as a next hop.
- Use Cloud CDN configuration to optimize content delivery performance.
- Create a Google Cloud Armor edge security policy to protect content.

Activities

- 1 quiz
- 1 lab

Module 13: Connectivity options

Topics

- Google Cloud connectivity options
- Dedicated Interconnect
- Partner Interconnect
- Cross-Cloud Interconnect

Objectives

- Describe the various connectivity options offered by Google Cloud for hybrid and multi-cloud environments, including Network Connectivity Center, Cloud VPN, Cloud Interconnect, and Cloud CDN.
- Define and differentiate between the various Cloud Interconnect options available in Google Cloud, including Dedicated Interconnect, Partner Interconnect, and Cross-Cloud Interconnect.

Activities

- 1 quiz

Module 14: Cloud VPN

Topics

- Use case for Cloud VPN
- HA VPN topologies
- HA VPN over Cloud Interconnect
- Influence best path selection

Objectives

- Implement high availability VPN (HA VPN) for redundancy and failover.
- Identify the benefits and use cases for Cloud HA VPN.

Activities

- 1 quiz
- 1 lab