

Networking in Google Cloud

Overview

Learn about the broad variety of networking options on Google Cloud. This course uses lectures, demos, and hands-on labs to help you explore and deploy Google Cloud networking technologies, including Virtual Private Cloud (VPC) networks, subnets, and firewalls; interconnection among networks; load balancing; Cloud DNS; Cloud CDN; and Cloud NAT. You'll also learn about common network design patterns and automated deployment using Cloud Deployment Manager or Terraform.

Prerequisite Comments

To get the most out of this course, participants should have:
Completed Google Cloud Platform Fundamentals: Core Infrastructure or have equivalent experience
Prior understanding of the OSI 7-layer model
Prior understanding of IPv4 addressing
Prior experience with managing IPv4 routes

Target Audience

This class is intended for network engineers and network admins that are either using Google Cloud Platform or are planning to do so. The class is also for individuals that want to be exposed to software-defined networking solutions in the cloud.

Course Objectives

- Configure Google VPC networks, subnets, and routers
- Control administrative access to VPC objects
- Control network access to endpoints in VPCs
- Interconnect networks among GCP projects
- Interconnect networks among GCP VPC networks and on-premises or other-cloud networks
- Choose among GCP load balancer and proxy options and configure them
- Use Cloud CDN to reduce latency and save money
- Optimize network spend using Network Tiers
- Configure Cloud NAT or Private Google Access to provide instances without public IP addresses access to other services
- Deploy networks declaratively using Cloud Deployment Manager or Terraform
- Design networks to meet common customer requirements
- Configure monitoring and logging to troubleshoot networks problems

Course Outline

1 - Google Cloud VPC Networking Fundamentals

Recall that networks belong to projects.
Explain the differences among default, auto, and custom networks.
Create networks and subnets.
Explain how IPv4 addresses are assigned to Compute Engine instances.
Publish domain names using Google Cloud DNS.
Create Compute Engine instances with IP aliases.
Create Compute Engine instances with multiple virtual network.

2 - Controlling Access to VPC Networks

Outline how IAM policies affect VPC networks.
Control access to network resources using service accounts.
Control access to Compute Engine instances with tag-based firewall rules.

3 - Sharing Networks across Projects

Outline the overall workflow for configuring Shared VPC.
Differentiate between the IAM roles that allow network resources to be managed.
Configure peering between unrelated VPC Networks.
Recall when to use Shared VPC and when to use VPC Network Peering.

4 - Load Balancing

Recall the various load balancing services.
Configure Layer 7 HTTP(S) load balancing.
Whitelist and blacklist IP traffic with Cloud Armor.
Cache content with Cloud CDN.
Explain Layer 4 TCP or SSL proxy load balancing.
Explain regional network load balancing.
Configure internal load balancing.
Recall the choices for enabling IPv6 Internet connectivity for Google Cloud load balancers.
Determine which Google Cloud load balancer to use when.

5 - Hybrid Connectivity

Recall the Google Cloud interconnect and peering services available to connect your infrastructure to Google Cloud.
Explain Dedicated Interconnect and Partner Interconnect.
Describe the workflow for configuring a Dedicated Interconnect.
Build a connection over a VPN with Cloud Router.
Determine which Google Cloud interconnect service to use when.
Explain Direct Peering and Partner Peering.
Determine which Google Cloud peering service to use when.

6 - Networking Pricing and Billing

Recognize how networking features are charged for.
Use Network Service Tiers to optimize spend.
Determine which Network Service Tier to use when.
Recall that labels can be used to understand networking spend.

7 - Network Design and Deployment

Explain common network design patterns.
Configure Private Google Access to allow access to certain Google Cloud services from VM instances with only internal IP addresses.
Configure Cloud NAT to provide your instances without public IP addresses access to the internet.
Automate the deployment of networks using Deployment Manager or Terraform.
Launch networking solutions using Cloud Marketplace.

8 - Network Monitoring and Troubleshooting

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