

CPO200: Google Cloud Platform for Systems Operations Professionals

Course Description

This 4 day instructor-led class introduces participants to the implementation of application environments and public cloud infrastructure using Google Cloud Platform. Through a combination of instructor-led presentations and hands-on labs, students learn how to deploy cloud infrastructure components such as networks, systems, and applications. This course is designed to give participants a robust hands-on experience and is primarily lab-focused.

Audience

This class is intended for Systems Operations professionals and Systems Administrators using Google Cloud Platform to create or migrate application environments and infrastructure.

Prerequisites

Before attending this course, participants should have:

- Attended CP100A - Google Cloud Platform Fundamentals (or equivalent experience)
- Basic proficiency with command-line tools and linux operating system environments
- Prior systems operations experience, either on-premises or in a public cloud environment

Duration

4 days (32 hours)

Delivery Method

Instructor-led, Instructor-led online

Objectives

At the end of this one-day course, participants will be able to:

- Understand the core tenants to be considered when designing and deploying to a public cloud environment
- Use the Google Developers Console to create and manage multiple projects
- Use service accounts and permissions to share view-level access between projects
- Create Google Compute Engine instances
- Create a non-default network and review your network configuration
- Compare default and non-default networks
- Create firewall-rules with and without tags

- Create and use a customized Compute Engine image
- Set authorization scopes for a Compute Engine instance
- Reserve an external IP address for an instance
- Snapshot a Compute Engine instance
- Snapshot a data disk
- Create an image using a boot persistent disk
- Upload an image to Google Container Registry
- Create a Compute Engine instance group with instances
- Create a Cloud SQL instance using the Cloud SDK
- Deploy and test a web application
- Add instance and project metadata
- Query instance and project metadata using the Cloud SDK
- Create an instance using a startup script in metadata and Google Cloud Storage
- Create an instance with a shutdown script and install the Cloud Logging agent
- Use the API Explorer to query an API request
- Run sample code that uses the Google API Client Library
- Test and build a container that uses the Cloud SQL APIs
- Create an instance template and managed instance group
- Configure a managed instance group for autoscaling
- Create multiple autoscaled managed instance groups
- Configure fault-tolerant HTTP load balancing
- Test health checks for use with HTTP load balancing
- Manage application deployment using Jinja and Python templates with Google Cloud Deployment Manager
- Delete Google Cloud Platform projects and resources

Modules

Module 1: Google Cloud Platform Projects

Learning Objectives

- Identify project resources and quotas
- Explain the purpose of Google Cloud Resource Manager and Identity and Access Management

Lab: Google Cloud Platform Projects

Learning Objectives

- Use the Google Developers Console to create and manage multiple projects
- Use service accounts and permissions to share view-level access between projects

Module 2: Instances

Learning Objectives

- Explain how to create and move instances
- Identify how to connect to and manage instances

Lab: Google Compute Engine Instances and Machine Types

Learning Objectives

- Create an instance using the Google Developers Console
- Configure the Cloud SDK on the Compute Engine instance
- Initialize Cloud Source Repositories using Git

Module 3: Networks

Learning Objectives

- Explain how to create and manage networks in projects
- Identify how to create and manage firewall rules, routes, and IP addresses

Lab: Google Compute Engine Networks

Learning Objectives

- Create a non-default network
- Compare default and non-default networks
- Create firewall-rules with and without tags
- Review network configuration in Google Cloud Monitoring

Module 4: Disks and Images

Learning Objectives

- Explain how to create and manage persistent disks
- Identify how to create and manage disk images

Lab: Google Compute Engine Disks and Images

Learning Objectives

- Create an instance and install the Java 7 JRE from OpenJDK
- Create a customized Compute Engine image
- Launch and test a Compute Engine instance based on your image

Module 5: Authorization

Learning Objectives

- Explain the purposes of and use cases for Google Compute Engine service accounts
- Identify the types of service account scopes

Lab: Google Compute Engine Authorization

Learning Objectives

- Set authorization scopes for a Compute Engine instance
- Reserve the external IP address for the new instance
- Install and configure Jenkins on a Compute Engine instance

Module 6: Snapshots

Learning Objectives

- Identify the purpose of and use cases for disk snapshots
- Explain the process of creating a snapshot

Lab: Google Compute Engine Snapshots

Learning Objectives

- Prepare and snapshot a Compute Engine instance
- Restore and test the snapshot to a different zone
- Snapshot a data disk without shutting down an instance

Module 7: Google Cloud Storage

Learning Objectives

- Explain the purpose of and use cases for Google Cloud Storage
- Identify methods for accessing Google Cloud Storage buckets and objects
- Explain the security options available for Google Cloud Storage buckets and objects

Lab: Google Cloud Storage for Backups

Learning Objectives

- Create and configure Nearline and DRA buckets
- Modify the lifecycle management policy for a bucket
- Copy data to a bucket using the Cloud SDK
- Review, modify, and test bucket ACLs
- Configure Jenkins to perform a backup to Cloud Storage
- Test and verify that the backups are working

Lab: Google Container Registry

Learning Objectives

- Create a customized Jenkins build node instance
- Create an image using the instance's boot persistent disk
- Create a test build node instance based on the new image
- Test uploading images to Google Container Registry

Module 8: Instance Groups

Learning Objectives

- Identify the purpose of and use cases for instance groups
- Explain the process of creating and using instance groups

Lab: Google Compute Engine Instance Groups

Learning Objectives

- Create a Compute Engine instance group with instances
- Define Jenkins build tasks and run them
- Run the build tasks to create a guestbook image

Module 9: Google Cloud SQL

Learning Objectives

- Understand how to create and administer Cloud SQL instances
- Explain how to access Cloud SQL instances from Compute Engine instances

Lab: Google Cloud SQL

Learning Objectives

- Create a Cloud SQL instance using the Cloud SDK
- Create a Compute Engine instance from a custom image
- Deploy and test the Guestbook web application

Module 10: Metadata

Learning Objectives

- Explain the purpose of metadata and identify the use cases for project and instance metadata
- Identify how to set and query metadata

Lab: Google Compute Engine Metadata

Learning Objectives

- Add instance and project metadata
- Query instance and project metadata using the Cloud SDK
- Query metadata from inside a Compute Engine instance

Module 11: Startup and Shutdown Scripts

Learning Objectives

- Identify the purpose of and use cases for startup and shutdown scripts

Lab: Google Compute Engine Startup Scripts

Learning Objectives

- Create an instance with a startup script in metadata
- Create an instance with a startup script from Cloud Storage
- Create an instance with a shutdown script and install the Cloud Logging agent

Lab: Google API Client Library

Learning Objectives

- Use the API Explorer to query an API request
- Run sample code that uses the Google API Client Library
- Test and build a container that uses the Cloud SQL APIs
- Create a new Compute Engine image

Module 12: Autoscaling

Learning Objectives

- Explain the use cases for autoscaling and how autoscaling functions
- Identify the purpose of autoscaling policies

Lab: Google Compute Engine Autoscaler

Learning Objectives

- Create an instance template and managed instance group
- Configure the managed instance group for autoscaling
- Generate an artificial load to trigger scaling of your cluster

Module 13: Load Balancing

Learning Objectives

- Explain the differences between network load balancing and HTTP load balancing
- Identify the purpose of and use cases for cross-region and content-based load balancing

Lab: HTTP/HTTPS Load Balancing

Learning Objectives

- Create multiple autoscaled managed instance groups
- Configure fault-tolerant HTTP load balancing
- Test health checks for use with HTTP load balancing

Lab: Google Cloud Deployment Manager

Learning Objectives

- Create a Guestbook deployment using a plain YAML format
- Manage a Guestbook deployment using a Jinja template
- Create a Guestbook deployment using Python templates

Lab: Deleting Cloud Platform Projects and Resources

Learning Objectives

- Delete Google Cloud Platform resources
- Test dependencies between resources
- Delete Google Cloud Platform projects