

## Architecting with Google Compute Engine

### Overview

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This class introduces participants to the comprehensive and flexible infrastructure and platform services provided by Google Cloud Platform, with a focus on Compute Engine. Through a combination of presentations, demos, and hands-on labs, participants explore and deploy solution elements, including infrastructure components such as networks, systems, and application services. This course also covers deploying practical solutions including securely interconnecting networks, customer-supplied encryption keys, security and access management, quotas and billing, and resource monitoring.

### Prerequisite Comments

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Completion of Google Cloud Platform Fundamentals or equivalent experience Basic proficiency with command-line tools and Linux operating system environments Systems operations experience, including deploying and managing applications, either on-premises or in a public cloud environment.

### Target Audience

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Cloud Solutions Architects, DevOps Engineers. Individuals using Google Cloud Platform to create new solutions or to integrate existing systems, application environments, and infrastructure with a focus on Google Compute Engine.

### Course Objectives

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Configure VPC networks and virtual machines Administer Identity and Access Management for resources Implement data storage services in GCP Manage and examine billing of GCP resources Monitor resources using Stackdriver services Connect your infrastructure to GCP Configure load balancers and autoscaling for VM instances Automate the deployment of GCP infrastructure services Leverage managed services in GCP

### Course Outline

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#### 1 - Introduction to Google Cloud Platform

- List the different ways of interacting with GCP
- Use the GCP Console and Cloud Shell
- Create Cloud Storage buckets
- Use the GCP Marketplace to deploy solutions

## 2 - Virtual Networks

- List the VPC objects in GCP
- Differentiate between the different types of VPC networks
- Implement VPC networks and firewall rules
- Design a maintenance server

## 3 - Virtual Machines

- Recall the CPU and memory options for virtual machines
- Describe the disk options for virtual machines
- Explain VM pricing and discounts
- Use Compute Engine to create and customize VM instances

## 4 - Cloud IAM

- Describe the Cloud IAM resource hierarchy
- Explain the different types of IAM roles
- Recall the different types of IAM members
- Implement access control for resources using Cloud IAM

## 5 - Storage and Database Services

- Differentiate between Cloud Storage, Cloud SQL, Cloud Spanner, Cloud Firestore and Cloud Bigtable
- Choose a data storage service based on your requirements
- Implement data storage services

## 6 - Resource Management

- Describe the cloud resource manager hierarchy
- Recognize how quotas protect GCP customers
- Use labels to organize resources
- Explain the behavior of budget alerts in GCP
- Examine billing data with BigQuery

## 7 - Resource Monitoring

- Describe the Stackdriver services for monitoring, logging, error reporting, tracing, and debugging
- Create charts, alerts, and uptime checks for resources with Stackdriver Monitoring
- Use Stackdriver Debugger to identify and fix errors

## 8 - Interconnecting Networks

- Recall the GCP interconnect and peering services available to connect your infrastructure to GCP
- Determine which GCP interconnect or peering service to use in specific circumstances
- Create and configure VPN gateways
- Recall when to use Shared VPC and when to use VPC Network Peering

## 9 - Load Balancing and Autoscaling

Recall the various load balancing services  
Determine which GCP load balancer to use in specific circumstances  
Describe autoscaling behavior  
Configure load balancers and autoscaling

## 10 - Infrastructure Automation

Automate the deployment of GCP services using Deployment Manager or Terraform  
Outline the GCP Marketplace

## 11 - Managed Services

Describe the managed services for data processing in GCP

## Related Courses, Certifications, Exams

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- Google Cloud Fundamentals - Core Infrastructure