Architecting with Google Compute Engine Training

Duration: **3 Day**

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Overview

Architecting with Google Compute Engine introduces participants to the flexible infrastructure and platform services available in Google Cloud, with a particular emphasis on **Compute Engine**.

The course combines instructor-led presentations, demonstrations and hands-on labs. Participants work with core infrastructure components such as networks, virtual machines, storage services and application services while learning how to design and deploy practical Google Cloud solutions.

The programme also explores secure network connectivity, customer-supplied encryption keys, identity and access management, quota and billing control, resource monitoring, load balancing and autoscaling.

By the end of the course, participants develop practical experience in planning, configuring, monitoring and automating Google Cloud infrastructure in a structured way.

Prerequisites

Participants should:

- Have completed **Google Cloud Platform Fundamentals: Core Infrastructure** or have equivalent experience
- Have basic proficiency with command-line tools
- Be comfortable working in Linux operating system environments
- Have systems operations experience, including deploying and managing applications on-premises or in a public cloud environment

Who Should Attend

This course is particularly suitable for:

- Cloud Solutions Architects
- DevOps Engineers
- Professionals developing new solutions on Google Cloud Platform
- Technical teams integrating existing systems, applications and infrastructure with Google Cloud
- Individuals designing and operating Compute Engine-based cloud environments

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What You Will Learn

By the end of the course, participants will be able to:

- Configure VPC networks and virtual machines
- Manage Identity and Access Management for Google Cloud resources
- Implement appropriate data storage services
- Monitor resource usage and billing
- Use monitoring services to observe cloud resources
- Connect existing infrastructure to Google Cloud
- Configure load balancing and autoscaling for VM instances
- Automate deployment of Google Cloud infrastructure services
- Make effective use of managed services in Google Cloud

Outline

Module 1: Introduction to Google Cloud

Explore the principal ways of interacting with Google Cloud and become familiar with core platform tools.

- Different methods for interacting with Google Cloud
- Using Cloud Console
- Using Cloud Shell
- Creating Cloud Storage buckets
- Deploying solutions through Google Cloud Marketplace

Module 2: Virtual Networks

Examine Google Cloud VPC architecture and core networking components.

- Google Cloud VPC objects
- Different VPC network types
- Creating VPC networks
- Configuring firewall rules
- Using Private Google Access
- Configuring Cloud NAT

Module 3: Virtual Machines

Explore the capabilities and configuration options available in Compute Engine.

- CPU options for virtual machines
- Memory options
- Virtual disk choices
- VM pricing
- Discount options
- Creating VM instances with Compute Engine
- Customising VM instances

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Module 4: Cloud IAM

Learn how resource access and permissions are controlled in Google Cloud.

- Cloud IAM resource hierarchy
- Different IAM role types
- Different IAM member types
- Implementing access control for resources
- Role-based access management

Module 5: Storage and Database Services

Compare the main Google Cloud data storage services and determine when each one should be used.

- Cloud Storage
- Cloud SQL
- Cloud Spanner
- Cloud Firestore
- Cloud Bigtable
- Choosing storage according to requirements
- Implementing data storage services

Module 6: Resource Management

Explore techniques for organising cloud resources, managing quotas and controlling costs.

- Cloud Resource Manager hierarchy
- How quotas protect Google Cloud customers
- Using labels to organise resources
- Understanding budget alert behaviour
- Reviewing billing information
- Analysing billing data with BigQuery

Module 7: Resource Monitoring

Examine the services used to monitor infrastructure, identify issues and analyse system behaviour.

- Overview of monitoring services
- Logging
- Error Reporting
- Tracing
- Debugging
- Creating charts with Cloud Monitoring
- Configuring alerts
- Creating uptime checks
- Using Cloud Debugger to identify and resolve application problems

Module 8: Interconnecting Networks

Learn how Google Cloud networks can be connected securely with existing infrastructure.

- Google Cloud interconnect services
- Peering options

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- Selecting an appropriate connectivity method
- Creating and configuring VPN gateways
- Shared VPC use cases
- VPC Network Peering use cases

Module 9: Load Balancing and Autoscaling

Explore how applications can distribute traffic and scale resources dynamically.

- Google Cloud load balancing services
- Selecting the appropriate load balancer
- Understanding autoscaling behaviour
- Configuring load balancers
- Configuring autoscaling

Module 10: Infrastructure Modernization

Learn how infrastructure deployment can be automated and managed with modern cloud practices.

- Automating deployment with Deployment Manager
- Using Terraform to provision infrastructure
- Infrastructure as Code principles
- Overview of Google Cloud Marketplace

Module 11: Managed Services

Review the managed services available in Google Cloud and how they can support data processing workloads.

- The concept of managed services
- Google Cloud managed services for data processing
- Selecting services according to application requirements

This course is designed to help participants move beyond individual Compute Engine tasks and develop a broader understanding of Google Cloud infrastructure across networking, security, storage, monitoring and automation.