

Architecting with Google Cloud Platform: Design and Process

2journs / 14h

Learning outcomes

- Apply a tool set of questions, techniques and design considerations
- Define application requirements and express them objectively as KPIs, SLO's and SLI's
- Decompose application requirements to find the right microservice boundaries
- Leverage Google Cloud developer tools to set up modern, automated deployment pipelines
- Choose the appropriate Google Cloud Storage services based on application requirements
- Discuss Google Cloud network architectures, including hybrid architectures
- Implement reliable, scalable, resilient applications balancing key performance metrics with cost
- Choose the right Google Cloud deployment services for your applications
- Secure cloud applications, data and infrastructure
- Monitor service level objectives and costs using Cloud Monitoring

Target audience

- Cloud Solutions Architects, Site Reliability Engineers, Systems Operations professionals, DevOps Engineers, IT managers
- Individuals using Google Cloud to create new solutions or to integrate existing systems, application environments, and infrastructure with Google Cloud

Prerequisites

- Have completed Architecting with Google Compute Engine, Architecting with Google Kubernetes Engine, or have equivalent experience
- Have basic proficiency with command-line tools and Linux operating system environments
- Have systems operations experience, including deploying and managing applications, either on-premises or in a public cloud environment

Course Outline

Module 1: Defining the Service

Objectives

- Describe users in terms of roles and personas
- Evaluate KPIs using SLOs and SLIs
- Determine the quality of application requirements using SMART criteria

Activities

- 3 activities
- quiz

Module 2: Microservice Design and Architecture

Objectives

- Decompose monolithic applications into microservices
- Recognize appropriate microservice boundaries
- Design consistent, standard RESTful service APIs
- Identify the 12-factor best practices for implementing services

Activities

- 2 activities
- 1 quiz

Module 3: DevOps Automation

Objectives

- Discuss the automation of service deployment using CI/CD pipelines
- Explain how to leverage Cloud Source Repositories for source and version control
- Automate builds with Cloud Build and build triggers
- Manage container images with Container Registry

Activities

- 1 lab
- 1 quiz

Module 4: Choosing Storage Solutions

Objectives

- Identify the use cases for Spanner
- Identify the use cases for Cloud SQL
- Identify the use cases for Firestore
- Identify the use cases for Memorystore

Activities

- 2 activities
- 1 quiz

Module 5: Google Cloud and Hybrid Network Architecture

Objectives

- Discuss the design of VPC networks to optimize for cost, security, and performance
- Describe how global and regional load balancers provide access to services
- Connect networks using peering and VPNs
- Define hybrid networks between Google Cloud and on-premises data centers using Cloud Interconnect

Activities

- 2 activities
- 1 quiz

Module 6: Deploying Applications to Google Cloud

Objectives

- Choose the appropriate Google Cloud deployment service for your applications
- Configure scalable, resilient infrastructure using Instance Templates and Groups

- Orchestrate microservice deployments using Kubernetes and GKE
- Leverage App Engine for a completely automated platform as a service (PaaS)

Activities

- 1 lab
- 1 quiz

Module 7: Designing Reliable Systems

Objectives

- Discuss the design of services to meet requirements for availability, durability, and scalability
- Identify the failures to be avoided to implement a fault-tolerant system

Activities

- 2 activities
- 1 quiz

Module 8: Security

Objectives

- Identify the best practices for designing secure systems
- Discuss the use of organizational policies and folders to simplify cloud governance
- Identify Google Cloud services that can be leveraged for access management
- Identify Google Cloud services that can be leveraged to mitigate DDoS attacks

Activities

- 1 activity
- 1 quiz

Module 9: Maintenance and Monitoring

Objectives

- Discuss different ways to manage new service versions
- Describe how to forecast, monitor, and optimize service costs
- Observe if your services are meeting their SLOs using Cloud Monitoring and Dashboards
- Use Uptime Checks to determine service availability
- Respond to service outages using Cloud Monitoring Alerts

Activities

- 1 activity
- 1 lab
- 1 quiz