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## Architecting with Google Cloud Platform: Design and Process

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### Duration

2 Days

### Course Description

This two-day instructor-led class equips students to build highly reliable and efficient solutions on Google Cloud Platform, using proven design patterns and the principles of Google Site Reliability Engineering (SRE). It is a continuation of the Architecting with Google Cloud Platform: Infrastructure course and assumes hands-on experience with the technologies covered in that course.

Through a combination of presentations, demos, and hands-on labs, participants learn to design GCP deployments that are highly reliable and secure; and how to operate GCP deployments in a highly available and cost-effective manner.

### Objectives

- This course teaches participants the following skills:
- Design for high availability, scalability, and maintainability.
- Assess tradeoffs and make sound choices among Google Cloud Platform products.
- Integrate on-premises and cloud resources.
- Identify ways to optimize resources and minimize cost.
- Implement processes that minimize downtime, such as monitoring and alarming, unit and integration testing, production resilience testing, and incident post-mortem analysis.
- Implement policies that minimize security risks, such as auditing, separation of duties and least privilege.
- Implement technologies and processes that assure business continuity in the event of a disaster.

### Audience

- This class is intended for the following participants:
- Cloud Solutions Architects, Site Reliability Engineers, Systems Operations professionals, DevOps Engineers, IT managers.
- Individuals using Google Cloud Platform to create new solutions or to integrate existing systems, application environments, and infrastructure with the Google Cloud Platform.

### Prerequisites

- To get the most out of this course, participants should have:
- Completed Architecting with Google Cloud Platform: Infrastructure or have 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

### Course Outline

The course includes presentations, demonstrations, and hands-on labs.

#### Module 1: Defining the Service

- Design in this class.
- State and solution.
- Measurement.
- Gathering requirements, SLOs, SLAs, and SLIs (key performance indicators).

#### Module 2: Business-logic layer design

- Microservices architecture.
- GCP 12-factor support.
- Mapping compute needs to Google Cloud Platform processing services.
- Compute system provisioning.

#### Module 3: Data layer design

- Classifying and characterizing data.
- Data ingest and data migration.
- Identification of storage needs and mapping to Google Cloud Platform storage systems.

#### Module 4: Presentation layer design

- Network edge configuration.

- Network configuration for data transfer within the service, including load balancing and network location.
- Network integration with other environments, including on premise and multi-cloud.

**Module 5: Design for resiliency, scalability, and disaster recovery**

- Failure due to loss of resources.
- Failure due to overload.
- Strategies for coping with failure.
- Business continuity and disaster recovery, including restore strategy and data lifecycle management.
- Scalable and resilient design.

**Module 6: Design for security**

- Google Cloud Platform security.
- Network access control and firewalls.
- Protections against denial of service.
- Resource sharing and isolation.
- Data encryption and key management.
- Identity access and auditing.

**Module 7: Capacity planning and cost optimization**

- Capacity planning.
- Pricing.

**Module 8: Deployment, monitoring and alerting, and incident response**

- Deployment.
- Monitoring and alerting.
- Incident response.