KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

# Architecting with Google Cloud Platform: Design and Process

Learn to design, deploy and secure microservice-based applications and reliable systems on Google Cloud Platform.

| 9 | 50 |
| --- | --- |
| MODULES | TOPICS |

## COURSE OVERVIEW

This course covers defining services through user roles, stories and KPIs, then moves into designing microservice architectures with RESTful APIs and 12-factor practices. It addresses DevOps automation with CI/CD pipelines, Cloud Build and infrastructure as code, followed by selecting storage solutions such as Cloud Storage, Cloud SQL, Spanner, Firestore, Bigtable and BigQuery. Further topics include designing hybrid and VPC network architecture, deploying applications using Kubernetes, GKE, App Engine and Cloud Functions, designing reliable and fault-tolerant systems, securing resources with IAM and Cloud Armor, and maintaining and monitoring services with Cloud Monitoring and billing tools.

## WHO THIS COURSE IS FOR

**Cloud Architects** | **Solutions Architects** | **DevOps Engineers** | **Software Developers** | **Systems Administrators**

## LEARNING OBJECTIVES

- Describe users and requirements with personas, user stories and KPIs
- Design microservice boundaries and RESTful service APIs
- Automate deployments using CI/CD pipelines and Cloud Build
- Compare Google Cloud storage services for relational, NoSQL and binary data
- Design VPC and hybrid network architecture for cost and performance
- Deploy applications using Kubernetes, GKE, App Engine and Cloud Functions
- Design fault-tolerant systems using circuit breaker and backoff patterns
- Secure systems and networks using IAM, firewalls and Cloud Armor

COURSE SYLLABUS

# 9 Modules, 50 Topics

01

## Defining the Service

TOPICS

- Describe users in terms of roles and personas
- Write qualitative requirements with user stories
- Write quantitative requirements using key performance indicators (KPIs)
- Evaluate KPIs using SLOs and SLIs
- Determine the quality of application requirements using SMART criteria

02

## Microservice Design and Architecture

TOPICS

- Decompose monolithic applications into microservices
- Recognize appropriate microservice boundaries
- Architect stateful and stateless services to optimize scalability and reliability
- Implement services using 12-factor best practices
- Build loosely coupled services by implementing a well-designed REST architecture
- Design consistent, standard RESTful service APIs

03

## DevOps Automation

TOPICS

- Automate service deployment using CI/CD pipelines
- Leverage Cloud Source Repositories for source and version control
- Automate builds with Cloud Build and build triggers
- Manage container images with Google Container Registry
- Create infrastructure with code using Deployment Manager and Terraform

04

## Choosing Storage Solutions

TOPICS

- Choose the appropriate Google Cloud data storage service based on use case, durability, availability, scalability and cost
- Store binary data with Cloud Storage
- Store relational data using Cloud SQL and Spanner
- Store NoSQL data using Firestore and Cloud Bigtable
- Cache data for fast access using Memorystore
- Build a data warehouse using BigQuery

05

## Google Cloud and Hybrid Network Architecture

TOPICS

- Design VPC networks to optimize for cost, security, and performance
- Configure global and regional load balancers to provide access to services
- Leverage Cloud CDN to provide lower latency and decrease network egress
- Evaluate network architecture using the Cloud Network Intelligence Center
- Connect networks using peering and VPNs
- Create hybrid networks between Google Cloud and on-premises data centers using Cloud Interconnect

06

## Deploying Applications to Google Cloud

TOPICS

- 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)
- Create serverless applications using Cloud Functions

07

## Designing Reliable Systems

TOPICS

- Design services to meet requirements for availability, durability, and scalability
- Implement fault-tolerant systems by avoiding single points of failure, correlated failures, and cascading failures
- Avoid overload failures with the circuit breaker and truncated exponential backoff design patterns
- Design resilient data storage with lazy deletion
- Analyze disaster scenarios and plan for disaster recovery using cost/risk analysis

08

## Security

TOPICS

- Design secure systems using best practices like separation of concerns, principle of least privilege, and regular audits
- Leverage Cloud Security Command Center to help identify vulnerabilities
- Simplify cloud governance using organizational policies and folders
- Secure people using IAM roles, Identity-Aware Proxy, and Identity Platform
- Manage the access and authorization of resources by machines and processes using service accounts
- Secure networks with private IPs, firewalls, and Private Google Access
- Mitigate DDoS attacks by leveraging Cloud DNS and Cloud Armor

09

## Maintenance and Monitoring

TOPICS

- Manage new service versions using rolling updates, blue/green deployments, and canary releases
- Forecast, monitor, and optimize service cost using the Google Cloud pricing calculator and billing reports and by analyzing billing data
- Observe whether 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

WHAT IS INCLUDED

## Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

## Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

## Learn the Way That Suits You

Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

### Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

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