Architecting with Google Cloud Platform: Design and Process

Course Duration: 16 Hours **Course code: AGCP-DP**

1. Course Overview

This two-day course focuses on the design principles and processes required to build robust, secure, scalable, and cost-effective solutions on Google Cloud Platform (GCP). It emphasizes architectural frameworks, design methodologies, and best practices used by Solutions Architects to translate business requirements into cloud-based solutions.

2. What you'll learn?

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

- Understand GCP architecture frameworks and design principles
- Translate business and technical requirements into cloud architectures
- Design scalable, resilient, and highly available systems
- Choose appropriate GCP services for different workloads
- Implement networking, security, and data strategies
- Optimize architectures for performance and cost
- Apply DevOps and automation in solution design
- Follow structured design and decision-making processes

3. Target Audience

- Solutions Architects
- Cloud Architects and Engineers
- Technical Leads and Consultants
- DevOps Engineers
- IT Professionals involved in solution design

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4. Pre-Requisites

Before taking this course, you should have:

- Basic understanding of Google Cloud Platform services
- Knowledge of cloud computing concepts and models
- Familiarity with networking, storage, and compute concepts
- Experience with system design or IT infrastructure

5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Role of a Solutions Architect
- Overview of GCP architecture design process

Module 2: Google Cloud Architecture Framework

- Google Cloud Architecture Framework pillars
- Operational excellence
- Security, reliability, performance, and cost optimization
- Sustainability considerations

Module 3: Gathering and Analyzing Requirements

- Business vs technical requirements
- Functional and non-functional requirements
- Stakeholder analysis
- Defining SLAs, SLOs, and SLIs

Module 4: Designing Compute Architecture

- Choosing compute services (Compute Engine, GKE, App Engine, Cloud Run)
- Workload classification
- Autoscaling and elasticity
- High availability design

Module 5: Designing Storage and Database Solutions

- Storage options (Cloud Storage, Filestore, Persistent Disk)
- Database selection (Cloud SQL, Spanner, Bigtable, Firestore)
- Data lifecycle management
- Backup and disaster recovery

Module 6: Networking Design

- VPC design and subnetting
- IP addressing strategies
- Load balancing design
- Hybrid connectivity (VPN, Interconnect)

Module 7: Security Architecture

- IAM design and access control
- Identity management strategies
- Data security and encryption
- Security best practices and compliance

Module 8: Reliability and High Availability

- Designing for fault tolerance
- Multi-zone and multi-region architectures
- Disaster recovery strategies
- Failover mechanisms

Module 9: Performance Optimization

- Performance tuning strategies
- Caching mechanisms
- Load testing and benchmarking
- Latency reduction techniques

Module 10: Cost Optimization and Governance

- Cost estimation and budgeting
- Resource optimization
- Billing and cost monitoring
- Governance and policy management

Module 11: DevOps and Automation in Architecture

- CI/CD pipeline design
- Infrastructure as Code (Terraform, Deployment Manager)
- Automation strategies
- Monitoring and feedback loops

Module 12: Migration Design Strategies

- Cloud migration approaches
- Designing hybrid and multi-cloud architectures
- Migration planning and risk mitigation
- Data migration considerations

Module 13: Designing for Big Data and Analytics

- BigQuery architecture
- Data pipelines (Dataflow, Pub/Sub)
- Real-time vs batch processing
- Data warehousing strategies

Module 14: Application Modernization

- Monolith to microservices transformation
- Containerization strategies
- Serverless architecture design
- API management

Module 15: Solution Design Process and Documentation

- Architecture diagrams and documentation
- Design review and validation
- Decision frameworks
- Presenting solutions to stakeholders

Module 16: Case Studies and Design Scenarios

- Real-world architecture scenarios
- End-to-end solution design exercises
- Best practices and common pitfalls
- Exam-focused design strategies