Google Infrastructure and Security Management

Course Duration: 32 Hours **Course code: GISM**

1. Course Overview

This course provides a comprehensive understanding of designing, managing, and securing infrastructure on Google Cloud Platform (GCP). It covers core infrastructure components such as compute, networking, storage, and identity management, along with advanced security practices including IAM, data protection, threat detection, and compliance. Learners will gain hands-on experience in building secure, scalable, and resilient cloud environments.

2. What you'll learn?

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

- Understand Google Cloud infrastructure components and architecture
- Design and deploy scalable and highly available cloud environments
- Configure networking, compute, and storage services
- Implement Identity and Access Management (IAM) strategies
- Secure applications, data, and infrastructure on GCP
- Monitor, log, and detect threats using Google Cloud tools
- Apply compliance, governance, and risk management practices
- Optimize infrastructure performance and cost

3. Target Audience

- Cloud Engineers and Administrators
- Network and Security Engineers
- DevOps Engineers
- System Administrators
- IT Professionals transitioning to cloud

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4. Pre-Requisites

Before taking this course, you should have:

- Basic understanding of cloud computing concepts
- Familiarity with networking fundamentals
- Basic knowledge of operating systems (Linux/Windows)
- Experience with IT infrastructure (recommended)

5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Introduction to Google Cloud Platform
- Infrastructure and security fundamentals

Module 2: Google Cloud Infrastructure Overview

- Regions, zones, and global infrastructure
- Resource hierarchy (Organization, Folders, Projects)
- Cloud deployment models
- High availability and fault tolerance

Module 3: Compute Services

- Overview of Compute Engine
- Virtual machine configuration and management
- Instance groups and autoscaling
- Introduction to Kubernetes Engine (GKE)

Module 4: Storage Services

- Cloud Storage (object storage)
- Persistent disks and Filestore
- Data storage classes and lifecycle management
- Backup and disaster recovery strategies

Module 5: Networking in Google Cloud

- Virtual Private Cloud (VPC)
- Subnets, IP addressing, and routing
- Firewall rules and load balancing
- Hybrid connectivity (VPN and Interconnect)

Module 6: Identity and Access Management (IAM)

- IAM concepts and roles
- Users, groups, and service accounts
- Role-based access control (RBAC)
- Best practices for access management

Module 7: Security Fundamentals in GCP

- Shared responsibility model
- Defense-in-depth strategy
- Security best practices
- Threat landscape overview

Module 8: Data Security and Encryption

- Data encryption at rest and in transit
- Key Management Service (KMS)
- Customer-managed encryption keys (CMEK)
- Secrets management

Module 9: Network Security

- Firewall configurations
- Private Google Access
- Identity-Aware Proxy (IAP)
- DDoS protection and mitigation

Module 10: Monitoring, Logging, and Auditing

- Cloud Monitoring and Logging
- Audit logs and activity tracking
- Alerting and incident management
- Troubleshooting infrastructure issues

Module 11: Threat Detection and Security Operations

- Security Command Center (SCC)
- Vulnerability scanning
- Threat detection and response
- Incident response strategies

Module 12: Compliance and Governance

- Compliance standards (ISO, GDPR, etc.)
- Organizational policies
- Resource management and governance
- Risk management strategies

Module 13: Infrastructure Automation and DevOps

- Infrastructure as Code (IaC) concepts
- Deployment Manager / Terraform basics
- CI/CD pipelines in GCP
- Automation best practices

Module 14: Cost Optimization and Performance Management

- Cost management tools
- Resource optimization strategies
- Performance tuning
- Budgeting and forecasting

Module 15: Real-World Use Cases and Capstone Project

- Designing secure cloud architectures
- Industry use cases (Finance, Healthcare, IT)
- End-to-end infrastructure deployment project
- Best practices and final evaluation

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