GOOGLE CLOUD PLATFORM (GCP) – COMPLETE CONTENT

---

1. INTRODUCTION TO CLOUD & GCP

- What is Cloud Computing
- Cloud Service Models
  - IaaS
  - PaaS
  - SaaS
- Cloud Deployment Models
  - Public
  - Private
  - Hybrid
- What is Google Cloud Platform
- GCP global infrastructure
- Regions, Zones & Locations
- GCP Console, Cloud Shell, SDK
- GCP Resource Hierarchy
  - Organization
  - Folder
  - Project

---

2. GCP CORE SERVICES (FOUNDATION)

2.1 Compute Services

- Compute Engine (VMs)
- Managed Instance Groups
- App Engine
- Cloud Functions (Serverless)
- Cloud Run
- Google Kubernetes Engine (GKE)

2.2 Storage Services

- Cloud Storage
  - Standard
  - Nearline
  - Coldline
  - Archive

- Persistent Disk
- Filestore
- Cloud Storage buckets & lifecycle
- Data transfer options

2.3 Networking

- Virtual Private Cloud (VPC)
- Subnets
- Firewall rules
- Routes
- Cloud Load Balancing
- Cloud NAT
- Cloud VPN
- Interconnect
- Cloud DNS

---

3. DATABASE & DATA SERVICES

3.1 Relational Databases

- Cloud SQL (MySQL, PostgreSQL, SQL Server)
- Cloud Spanner
- Bare Metal Solution (overview)

3.2 NoSQL & Big Data

- Firestore
- Bigtable
- Memorystore (Redis, Memcached)
- BigQuery
- Dataflow
- Dataproc
- Dataplex
- Pub/Sub

---

4. IDENTITY & SECURITY ★

4.1 IAM (Identity & Access Management)

- IAM roles
  - Primitive roles
  - Predefined roles
  - Custom roles
- Service Accounts
- Workload Identity
- IAM best practices

4.2 Security Services

- Cloud KMS
- Secret Manager
- Security Command Center
- VPC Service Controls
- Cloud Armor
- Identity-Aware Proxy (IAP)

---

5. DEVOPS & CI/CD ★ ★ ★

- Cloud Build
- Cloud Source Repositories
- Artifact Registry
- CI/CD pipelines
- GitHub / GitLab integration
- Deployment strategies
  - Blue-Green
  - Canary

---

6. CONTAINERS & KUBERNETES

- Docker basics
- Container images
- Google Kubernetes Engine (GKE)
- Pods, Services, Deployments
- Ingress & Load Balancing
- Auto-scaling (HPA)
- Rolling updates
- Helm (overview)

---

7. MONITORING & MANAGEMENT

- Cloud Monitoring
- Cloud Logging
- Error Reporting
- Trace & Debugger
- Alerting
- Cloud Operations (Ops Suite)

---

8. INTEGRATION & MESSAGING

- Pub/Sub
- Eventarc
- API Gateway
- Apigee (overview)
- Workflows

---

9. DATA, AI & ML (OVERVIEW)

- BigQuery ML
- Vertex AI
- AutoML
- Vision API
- Speech-to-Text
- Natural Language API
- Generative AI (Gemini overview)

---

10. INFRASTRUCTURE AS CODE (IaC)

- Deployment Manager
- Terraform with GCP
- Best practices

---

11. GOVERNANCE & COST MANAGEMENT

- Resource Manager
- Organization policies
- Quotas
- Budgets & alerts
- Cost optimization strategies

---

12. MIGRATION & HYBRID

- Migration Center
- Migrate for Compute Engine
- Database Migration Service
- Hybrid connectivity
- Anthos (overview)

---

13. ARCHITECTURE & BEST PRACTICES

- GCP Well-Architected Framework
- High availability
- Disaster recovery
- Scalability & performance
- Security best practices

---

14. GCP CERTIFICATION PATH

- Cloud Digital Leader
- Associate Cloud Engineer
- Professional Cloud Architect
- Professional Data Engineer
- Professional DevOps Engineer

---

15. REAL-TIME & INTERVIEW TOPICS ★

- Compute Engine vs App Engine vs Cloud Run
- Cloud SQL vs Spanner
- VPC vs Subnet
- Pub/Sub vs Kafka
- GKE vs AKS/EKS
- Cost optimization in GCP
- Zero-downtime deployment