



GCP Fundamentals & Resource Hierarchy

Master the foundation of Google Cloud Platform architecture

SESSION 1

GCP Fundamentals & Resource Hierarchy

Platform Structure

Understand GCP's architectural design

Resource Organization

Learn hierarchy and management patterns

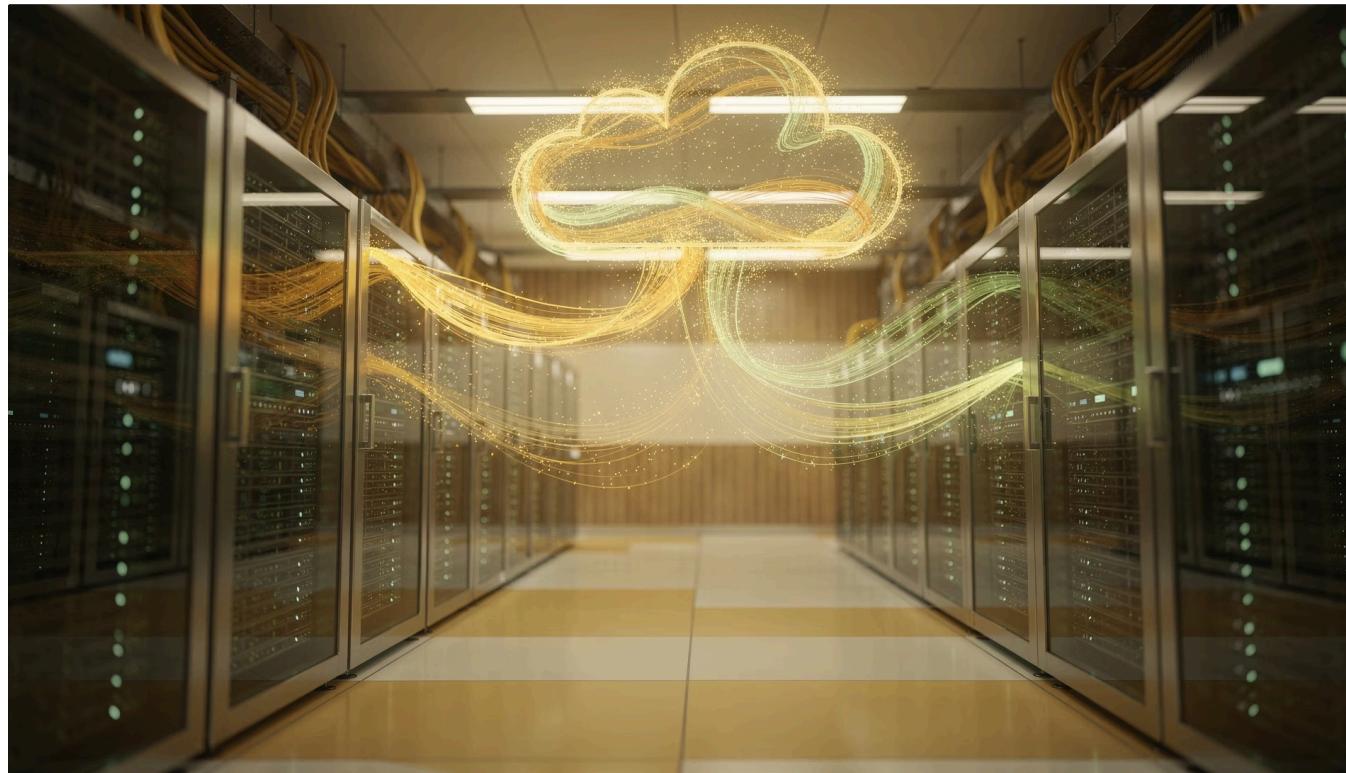
Enterprise Operations

Explore project and environment workflows

Platform Tools

Master GCP interaction interfaces

Session Overview



What You'll Master

- Google Cloud Platform structural fundamentals
- Resource organization and management frameworks
- Enterprise project and environment operations
- GCP interaction tools and interfaces

Build essential cloud architecture knowledge for real-world implementation

What is Google Cloud Platform?



Platform Foundation

Public cloud by Google providing compute, storage, networking, security, and data services



Core Capabilities

Scalability, high availability, global reach, enterprise-grade security



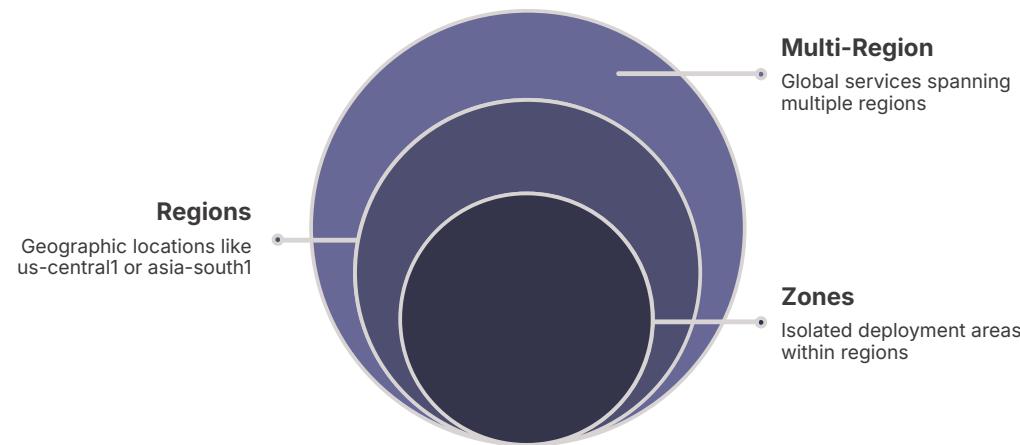
Use Cases

Application hosting, data analytics, AI/ML workloads, infrastructure modernization

Core GCP Service Categories

1	Compute <ul style="list-style-type: none">• Compute Engine (VMs)• Managed instance groups
2	Storage & Databases <ul style="list-style-type: none">• Cloud Storage buckets• Persistent Disks
3	Networking <ul style="list-style-type: none">• Virtual Private Cloud (VPC)• Load balancing, firewall rules
4	Security & Identity <ul style="list-style-type: none">• Identity and Access Management (IAM)• Service Accounts, Cloud KMS
5	Operations <ul style="list-style-type: none">• Monitoring and logging• Alerting and diagnostics

GCP Global Infrastructure



Google's private global network spans continents with strategically distributed data centers

Regions

Geographic locations like asia-south1, us-central1

Zones

Isolated deployment areas within regions

Multi-Region

Global services spanning multiple geographies

Key Benefits

- Ultra-low latency worldwide
- Built-in fault tolerance
- Flexible disaster recovery



Regions vs Zones

Region

Independent geographic area containing multiple isolated zones

Example: us-east1, europe-west2

Zone

Isolated deployment area designed to eliminate single points of failure

Example: us-east1-b, europe-west2-a



Best Practice: Distribute workloads across multiple zones and design for regional or zonal failures

GCP Resource Hierarchy



GCP uses hierarchical structure for governance and access control

Policies applied at higher levels automatically inherit downward



Organization

Represents entire company



Folder

Logical grouping for business units and teams



Project

Primary working unit in GCP



Resources

VMs, storage buckets, networks, services

Why Resource Hierarchy Matters



Centralized Governance

Unified policy management across entire organization



IAM Policy Inheritance

Automatic permission propagation through hierarchy levels



Cost Control

Granular billing tracking and budget management



Environment Separation

Clear boundaries between dev, test, and production

Example: Organization → Engineering Folder → Dev Project → Virtual Machine

GCP Projects Explained



Operational Boundary

Core unit for resource organization



Resource Ownership

Every resource belongs to exactly one project



Billing Isolation

Separate cost tracking per project



IAM Boundaries

Independent access control



API Enablement

Service activation per project



Common Project Types

- Development (experimentation)
- Testing / QA (validation)
- UAT (user acceptance)
- Production (live workloads)

EQUIREMENTS

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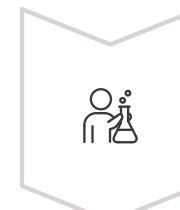
DESIGN

TESTING

MAINTENANCE MONITORING



Project Lifecycle & Environments



Development

Experimentation zone with limited access controls



Testing / QA

Controlled access for pre-production validation



Production

Strict IAM, monitoring, security, and cost controls enabled

- ❑ **Best Practice:** Maintain separate projects per environment to ensure isolation and security

Shared Responsibility Model



Google Manages

- Physical data centers and hardware
- Network infrastructure
- Underlying platform security
- Global connectivity

Customer Manages

- IAM configuration and policies
- Network security rules
- OS and application security
- Data protection and access controls

Security is a **shared responsibility**, not outsourced

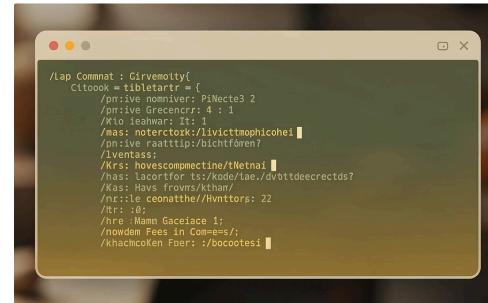
GCP Management Interfaces

Multiple pathways to interact with the platform



GCP Console

Web-based UI for visual resource management and monitoring



Cloud Shell

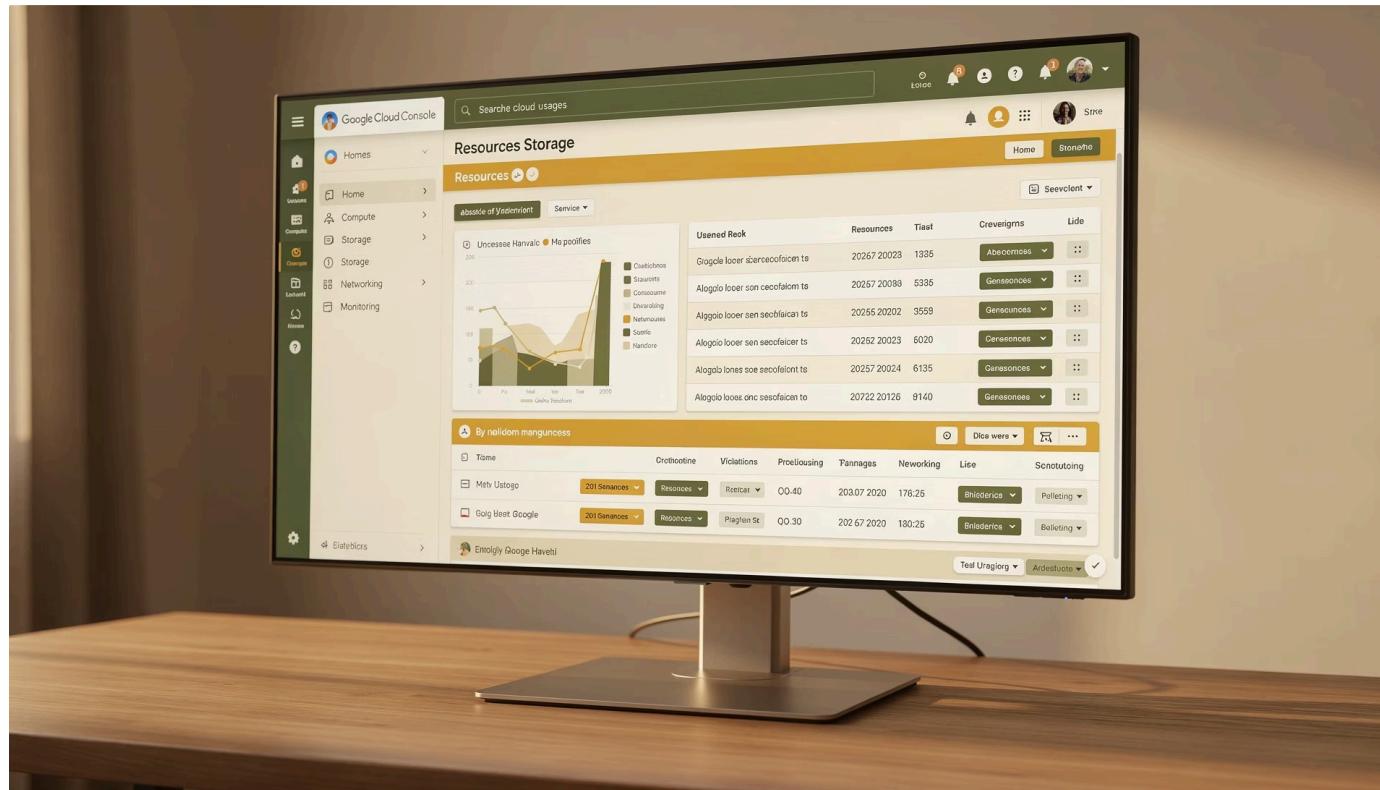
Browser-based terminal with pre-installed gcloud tools



gcloud CLI

Scriptable, automation-friendly infrastructure-as-code workflows

GCP Console Overview



Resource Management

Create, configure, and monitor all GCP resources

Monitoring & Logs

Real-time performance metrics and diagnostic information

Central Command Center Best Suited For

- Learning and skill development
- Quick validation and testing
- Visual resource inspection

IAM & Billing

Access control and cost management in one place

Cloud Shell & gcloud CLI

Cloud Shell

- No local installation required
- Secure, temporary environment
- 5GB persistent storage
- Pre-configured with gcloud

gcloud CLI

- Command-line interface for GCP
- Automation and CI/CD integration
- Scriptable infrastructure management
- Version control friendly

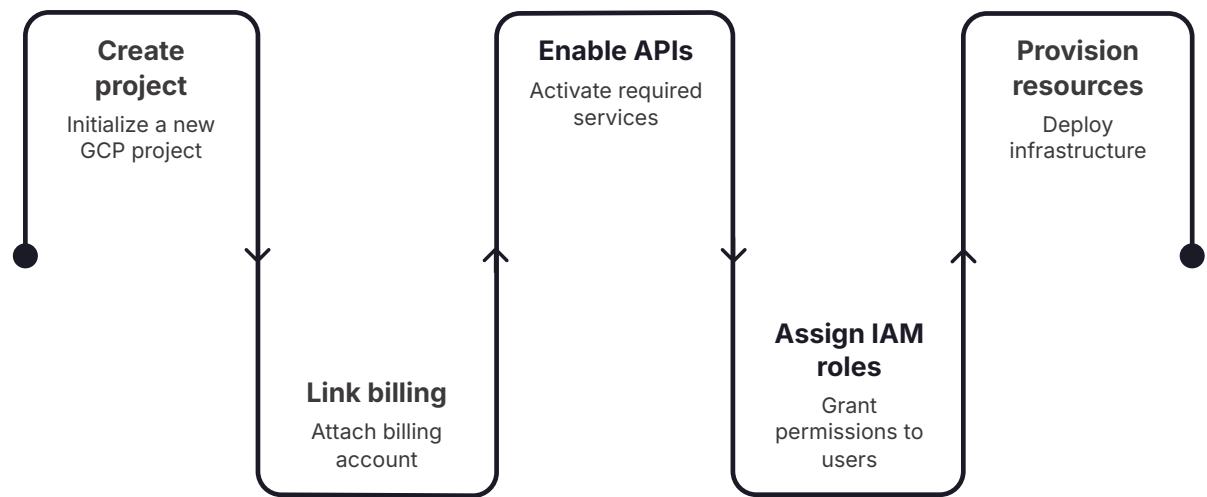
Example Commands

```
gcloud projects list
```

```
gcloud compute instances list
```



Basic Project Setup Flow



This standardized flow applies to **all GCP workloads** and forms the foundation of cloud resource deployment

Session Summary

GCP Structure Platform architecture and service categories	Global Infrastructure Regions, zones, and multi-region capabilities	Resource Hierarchy Organization, folders, projects, resources	Project Management Environment separation and lifecycle
Platform Access Console, Cloud Shell, gcloud CLI			

Session Outcome

You're Ready

✓ Foundation Established

Comprehensive understanding of GCP structure and enterprise-level operations

✓ Next Steps Clear

Prepared to dive into IAM and security design in Session 2



What's Next?



Session 2: IAM & Security

Master identity and access management design patterns



Speaker Notes

Detailed presenter guidance for training delivery



Cheat Sheet

One-page quick reference for session review



Exam Alignment

Content mapped to GCP Associate Cloud Engineer certification

