

# Week - 0

## **Introduction** 00:05

- Alejandra Fetis, a Google Cloud architect, introduces the session on getting started with Google Cloud and building AI agents.
- The session is designed for startups and developers.

## **Agenda** 00:30

- **What is Google Cloud?**
- **Google Cloud Definitions**
- **Cloud Identity Management**
- **Cloud IAM (Identity and Access Management)**
- **Administrative Tools**
- **AI with Google**
- Demos are included between sections.

## **What is Google Cloud?** 01:05

- Google operates over nine services with over 1 billion users each.
- Services like Maps, YouTube, Android, Google Photos, and Chrome run on the same infrastructure as Google Cloud Platform (GCP).
- Google has extensive infrastructure:
  - Over 41 **cloud regions** and 124 **zones** (each region has at least three zones).
  - **Edge locations** for improved networking speed and latency.
  - **CDN locations** and **dedicated interconnect locations**.
  - Over 20 Google data centers.
  - Renewable energy projects within regions.
  - 33 subsea cables connecting continents.
- Google maintains its own subsea cables. 03:33
- Google is a server manufacturer. 03:53

## **Shared Responsibility Matrix** 04:41

- **Software as a Service (SaaS):** Google manages almost everything; users manage access policies and content (e.g., Gmail, Drive).
- **Platform as a Service (PaaS):** Users manage usage, access policies, and content; Google handles deployment (e.g., BigQuery - serverless).
- **Infrastructure as a Service (IaaS):** Provides building blocks for users to build what they need, offering total control over identity and security.

#### Google Cloud Definitions 05:49

- **Resource Manager:** Google Cloud infrastructure is organized into a hierarchy:
  - **Organization Node:** Represents the company (domain name). Manages everything underneath.
  - **Folders:** Represent departments, teams, or products.
  - **Projects:** Where resources (VMs, storage, services) reside.
- Folders can be nested. A simple structure is Organization > Folder > Project.
- **Organizations:** Provide visibility and control over all projects and resources. Each workspace/Cloud Identity account is associated with one organization.
- **Folders:** Grouping mechanism for projects, allowing delegation of administration rights and policy inheritance.
- **Project Resource:** The base organizing entity in GCP, where resources live. Billing, permissions, credentials, and API enablement are managed at the project level.
- **Billing Account:** 10:02 Defines who pays for resources.
  - Includes a payment instrument.
  - Can be set up directly or via invoice (offline) or through a partner.
  - Resource consumption is measured by usage, time, items, or feature use.
  - Free tiers are available for some services.
- Billing accounts are associated with projects, not folders.
- Projects do not correspond to a particular geographic region. 12:21

#### Cloud Identity 12:59

- Manages user authentication and authorization.
- **Authentication:** Verifies the user's identity (e.g., using a Gmail account or an organizational account like blank.io).

- **Authorization:** Determines what the user can do (roles) within GCP, managed by Cloud IAM.
- **User Account Types:**
  - **Consumer Users:** Gmail accounts managed by Google. Not recommended for organizations.
  - **Organization-Managed Users:** Managed by the organization, allowing for auditing, control, and security. Highly recommended.
- **Consoles for User Access Management:**
  - **admin.google.com:** Manages Google Workspace (documents, Gmail) and user accounts within the organization.
  - **console.cloud.google.com:** Manages Google Cloud Platform resources, roles, and authorization.
- Users are created in Google Admin and then added to Cloud IAM on GCP.
- **Groups:** Used to manage users within admin.google.com.
- Google Admin roles manage aspects of Cloud Identity (user/group management), while Cloud IAM roles control access to GCP resources.

### **Cloud IAM (Identity and Access Management) 19:01**

- GCP control panel for authorization.
- Manages access and defines who can access what within the organization.
- Adopts the principle of least privilege.
- Access can be granted to:
  - Google Cloud accounts (users)
  - Service accounts (for applications/VMs)
  - Google Groups
  - Google Workspace domains
  - Cloud Identity domains
- **Service Accounts:** Accounts not managed by a person, used to automate services or processes. Can be impersonated.
- **IAM Roles:** Define what actions a user or service account can perform on GCP resources.

- **Conditions:** Can be set on IAM rules to restrict access based on time or other factors.
- **Types of Roles:** 22:22
  - **Primitive Roles:** Legacy roles (Owner, Editor, Viewer) that span multiple services. Broad and generally not recommended.
  - **Predefined Roles:** Fine-grained access to specific services (e.g., BigQuery User).
  - **Custom Roles:** Created by combining predefined roles.
- **Service Accounts:** Represent applications or VMs. Important for AI agents.

### **Administrative Tools** 25:56

- Mobile app for console access.
- Google Cloud SDK (gcloud commands) for command-line management.
- Cloud Console and Shell (a temporary VM with pre-installed SDK).
- RESTful APIs for programmatic control.
- **Google Cloud Shell:** 27:32
  - Temporary VM with persistent disk (5GB free).
  - Pre-installed with Google Cloud SDK.
  - Web preview functionality.
  - Built-in organization access.

### **AI with Google** 28:41

- AI is built into Google's DNA.
- **Building Blocks:**
  - **Google AI Studio:** 29:01 Fast prototyping with Gemini APIs. Outside of GCP.
  - **Vertex AI Studio:** 29:24 Enterprise-ready AI platform within GCP. Supports custom models, privacy policies, and enterprise features.
- **Vertex AI includes:**
  - Access to Google foundational models (Gemini, Imagen, Chirp, Kodi).
  - Task-specific models (vision, translation, speech-to-text).

- Domain-specific models (Med-PaLM, Sec-PaLM).
- Partner models (Claude, Llama).
- Open-source models (Gemma).
- **Google Family Models:**
  - **Gemini:** Largest and most capable AI model.
  - **Gemma:** Open model that can be downloaded and trained.

#### **Google Cloud Console Tour 31:44**

- **Google Cloud Setup:** Provides guided setup for proof of concept, production, or enhanced security.
- **Creating an Organization:** Important for managing accounts. Can be created through Cloud Identity or Workspace.
- **Billing:** Creating billing groups allows for easy management of billing access.
- **Resource Hierarchy:** Organization > Folder > Project.
- **APIs:** Can be enabled/disabled to control which services are used within a project.
- **Cloud Shell:** A small machine running in GCP for command-line access.
- **Gemini Cloud Assist:** 36:32 Allows asking questions about how to do things in GCP.

#### **Startup Credits 38:03**

- **Formation Tier:** \$2,000 for prototyping.
- **Ecosystem Tier:** \$25,000 for building an MVP and fundraising.
- **Google for Startup Scaleup Program:** \$100,000 (or up to \$250,000 for AI companies) in credits for first-party GCP tools.
- Marketplace purchases are explicitly excluded from the credits.
- Commitment-based contracts offer further discounts.
- QR code provided to apply for the program and connect with the startup success team.