# 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.