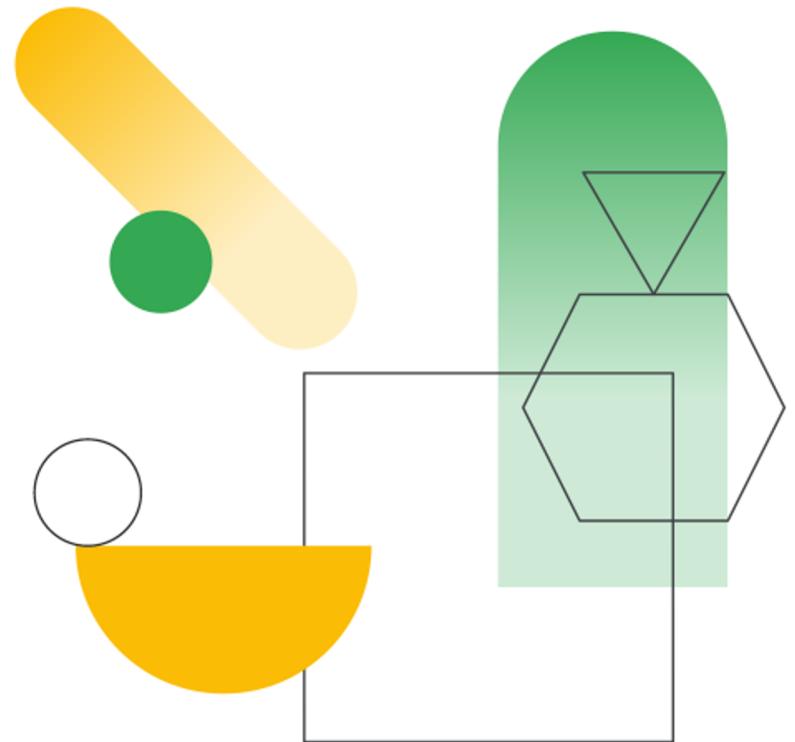
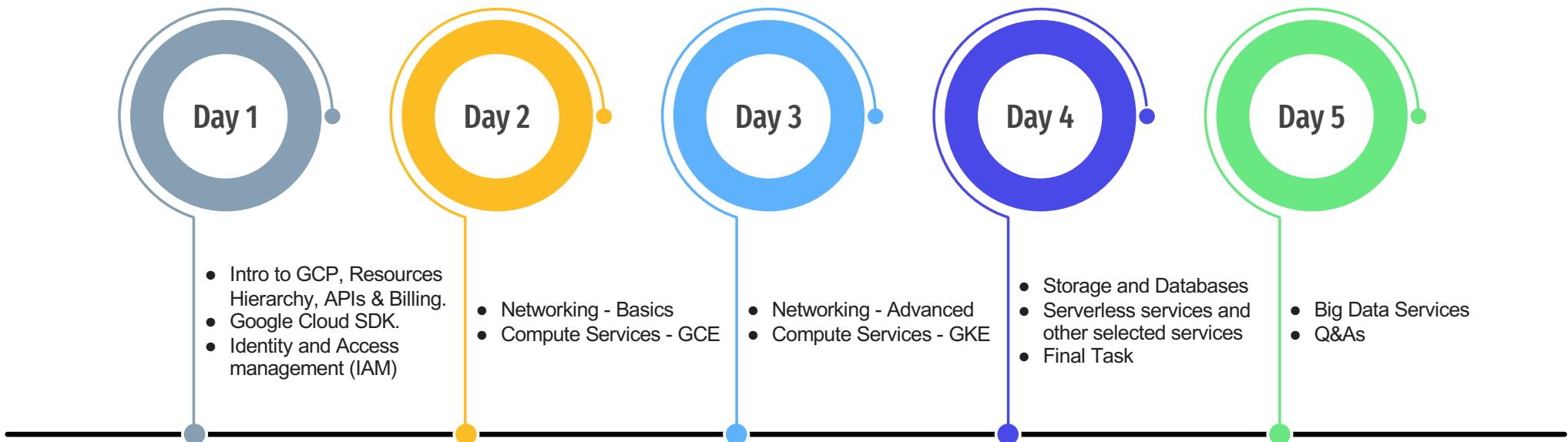
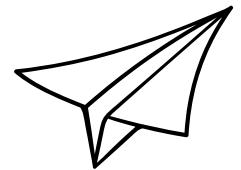


Google CLOUD Platform Crash Course



Course timeline



Course evaluation



30%

Get you hands
dirty and please
don't exhaust
Sarah & Eslam
😢

60%

Do you think you
can get them all?

Well, think again!
because no one
ever did 😈

10%

That's a gift ❤️

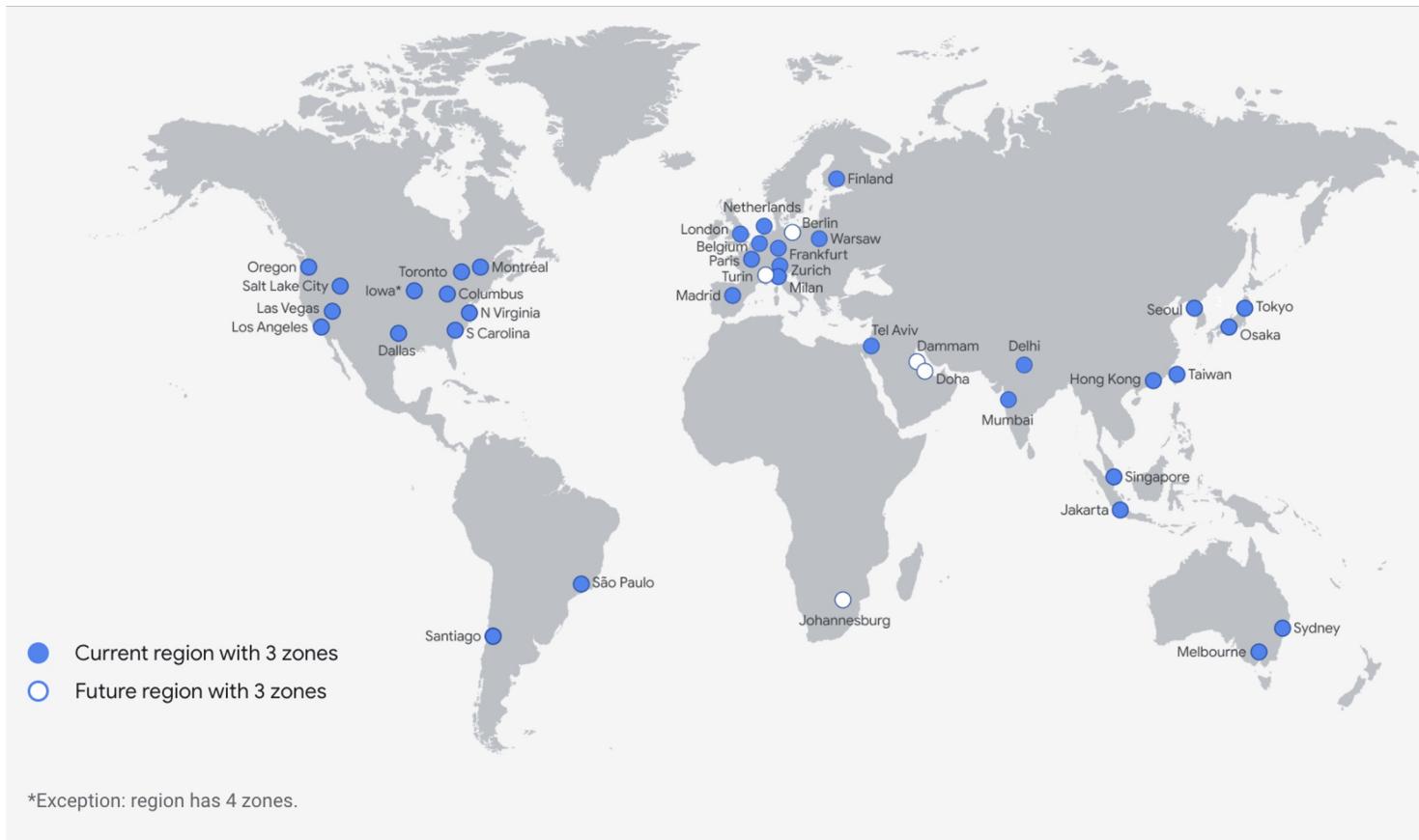
Intro to Google Cloud Platform (GCP)

GCP locations and Network

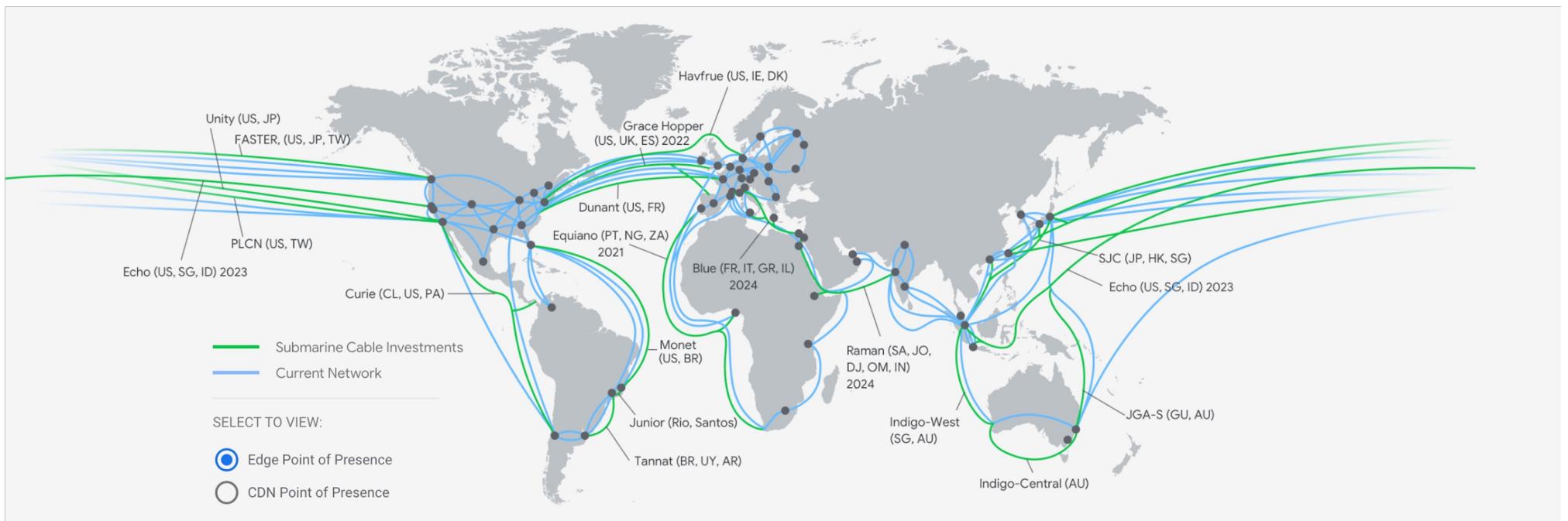


COMING SOON! Google Cloud will continue expanding into the following regions: Doha (Qatar), Turin (Italy), Berlin (Germany), Dammam (Kingdom of Saudi Arabia), Mexico, Malaysia, Thailand, New Zealand, Greece, Norway, South Africa, Austria and Sweden.

GCP locations and Network – cont.



GCP locations and Network – cont.



GCP top services

Compute Services

Serverless (FaaS): Cloud Functions
PaaS: App Engine

Containers: GKE & Cloud Run
VMs: Compute Engine

Storage Services

Object Storage: Google Storage Buckets.
Instance Storage: Persistent Disks.
SQL: Cloud SQL & Cloud Spanner

No-SQL: Cloud Datastore/Firebase & Cloud BigTable
Analytics: Cloud BigQuery

Big Data Services

Cloud Dataproc
Cloud Dataflow
Cloud Composer

Cloud Transfer
Cloud BigQuery

Cloud Pub/Sub
Cloud Data Fusion

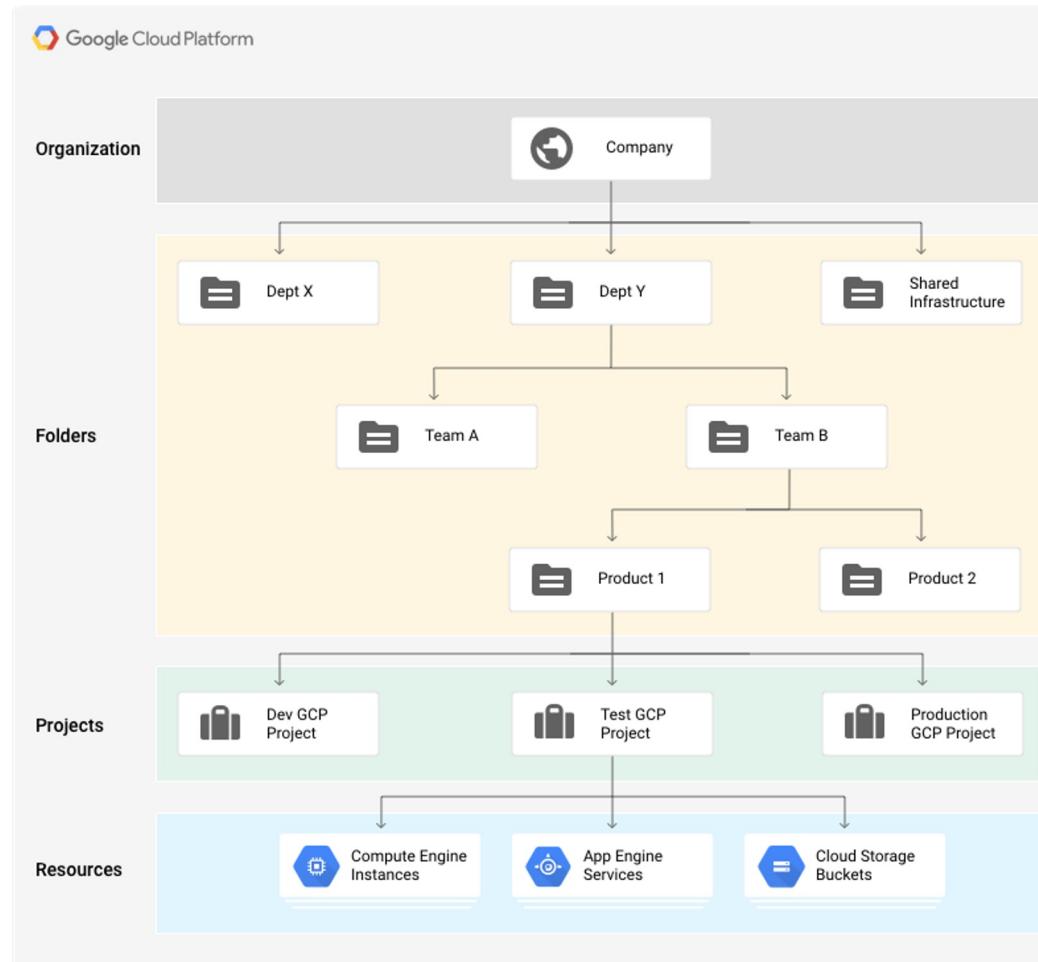
[Google Cloud Platform Services Summary](#)

First look at GCP console

<https://console.cloud.google.com>

GCP Resources Hierarchy, Enabling APIs & Setup Billing

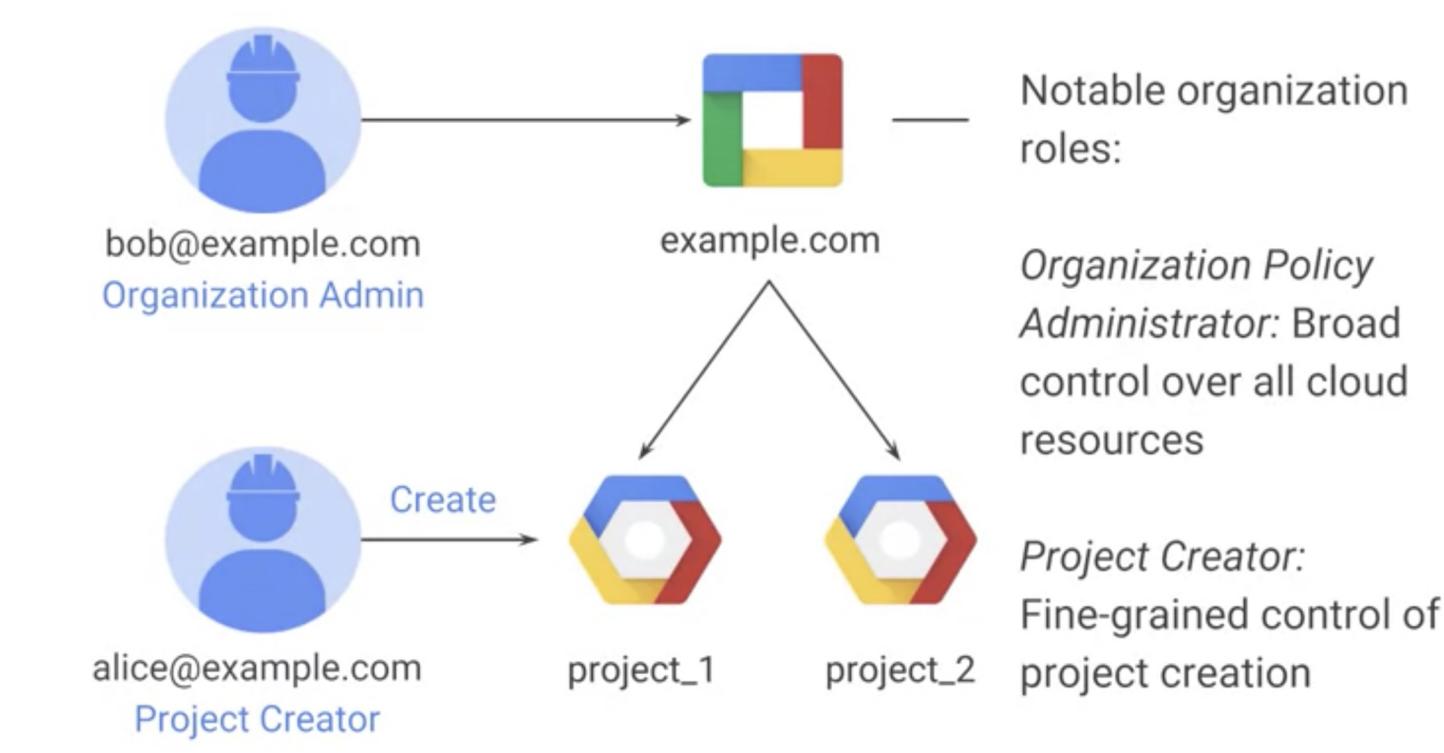
Resources Hierarchy



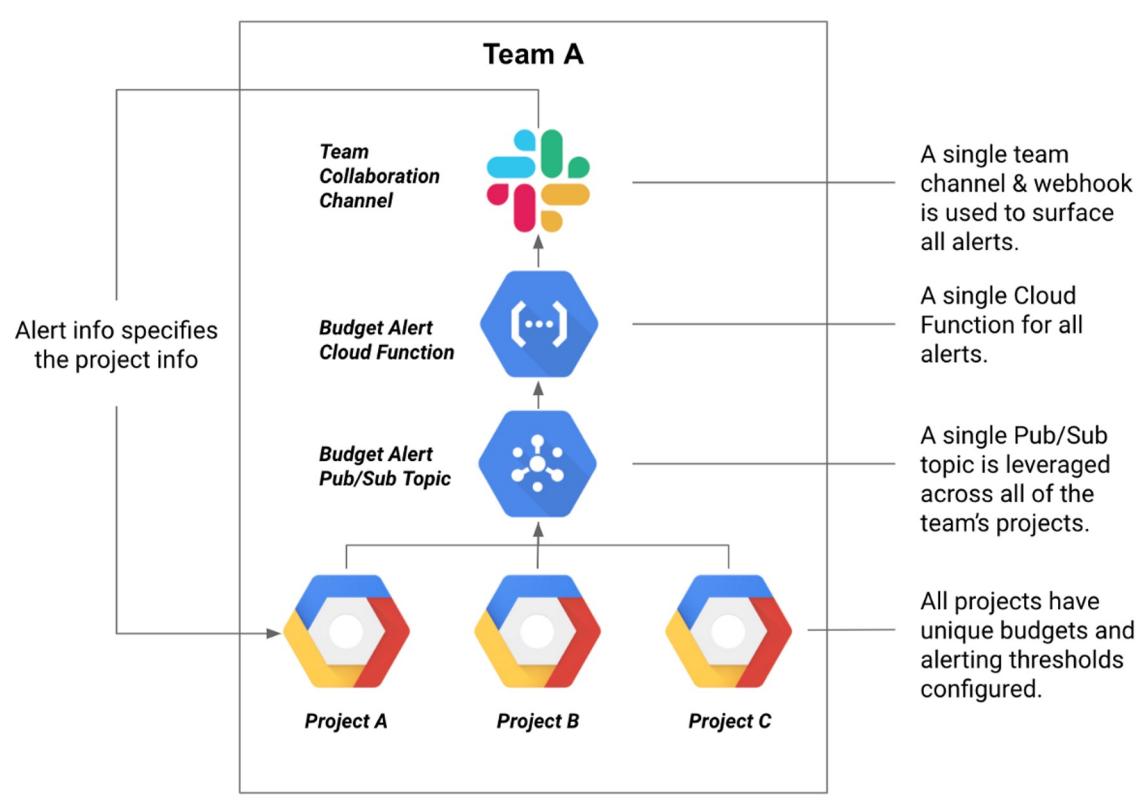
Resources Hierarchy – cont.

Project ID	Globally unique	Chosen by you	Immutable
Project name	Need not be unique	Chosen by you	Mutable
Project number	Globally unique	Assigned by GCP	Immutable

Resources Hierarchy – cont.



Setup billing budgets and billing Alerts



[Create, edit, or delete budgets and budget alerts | Cloud Billing | Google Cloud](#)
[Overview of Cloud Billing access control](#)

Google APIs



Google Cloud APIs
Compute Engine API
BigQuery API
Cloud Storage Service
Cloud Datastore API
Cloud Deployment Manager API
Cloud DNS API
▼ More



Google Maps APIs
Google Maps Android API
Google Maps SDK for iOS
Google Maps JavaScript API
Google Places API for Android
Google Places API for iOS
Google Maps Roads API
▼ More



Google Apps APIs
Drive API
Calendar API
Gmail API
Sheets API
Google Apps Marketplace SDK
Admin SDK
▼ More



Mobile APIs
Google Cloud Messaging
Google Play Game Services
Google Play Developer API
Google Places API for Android



Social APIs
Google+ API
Blogger API
Google+ Pages API
Google+ Domains API



YouTube APIs
YouTube Data API
YouTube Analytics API
YouTube Reporting API



Advertising APIs
AdSense Management API
DCM/DFA Reporting And Trafficking API
Ad Exchange Seller API
Ad Exchange Buyer API
DoubleClick Search API
DoubleClick Bid Manager API

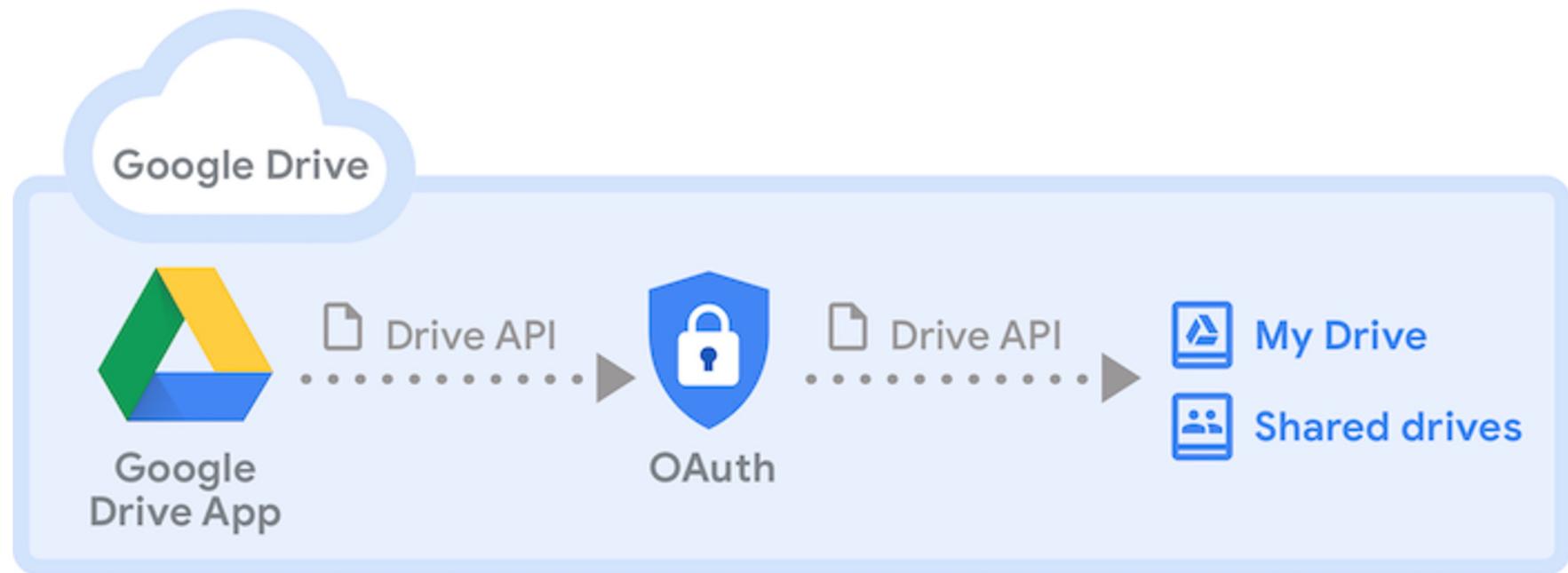


Other popular APIs
Analytics API
Translate API
Custom Search API
URL Shortener API
PageSpeed Insights API
Fusion Tables API
Web Fonts Developer API

<https://cloud.google.com/apis>

<https://developers.google.com/apis-explorer>

Google APIs - Cont.



Cloud Shell & Cloud SDK

Cloud SDK is a set of tools that you can use to manage resources and applications hosted on Google Cloud. These tools include the gcloud, gsutil, and bq command-line tools

[Quickstart: Getting started with Cloud SDK | Cloud SDK Documentation | Google Cloud](#)

[Installing Cloud SDK](#)

<https://shell.cloud.google.com>

The gcloud tool

The `gcloud` command-line tool is the primary CLI tool to create and manage Google Cloud resources. You can use this tool to perform many common platform tasks either from the command line or in scripts and other automations.

The `gcloud` tool and Cloud SDK

The `gcloud` tool is a part of the [Cloud SDK](#). Before you can use the `gcloud` tool, you must [download and install the Cloud SDK](#) on your system and [initialize Cloud SDK](#).

By default, the Cloud SDK installs the `gcloud` tool commands that are at the General Availability level. Additional functionality is available in Cloud SDK [components](#) named `alpha` and `beta`. These components allow you to use the `gcloud` tool to work with Cloud Bigtable, Dataflow and other parts of the Google Cloud at earlier release levels than General Availability.

The `gcloud` tool releases have the same version number as the Cloud SDK. The current Cloud SDK version is 367.0.0. You can download and install previous versions of the Cloud SDK from the [download archive](#).

The gcloud tool - cont.

The `gcloud` tool is a tree; non-leaf nodes are command groups and leaf nodes are commands. (Also, tab completion works for commands and resources!)

Most gcloud commands follow the following format:

```
gcloud + release level (optional) + component + entity + operation + positional args + flags
```

For example: `gcloud + compute + instances + create + example-instance-1 + --zone=us-central1-a`

[The gcloud tool cheat sheet | Cloud SDK Documentation](#)

https://cloud.google.com/sdk/docs/cheatsheet#understanding_commands

The gcloud tool - cont.

SYNOPSIS

```
gcloud GROUP | COMMAND [ --account = ACCOUNT] [ --billing-project = BILLING_PROJECT]
[ --configuration = CONFIGURATION] [ --flags-file = YAML_FILE] [ --flatten =[ KEY,...]]
[ --format = FORMAT] [ --help] [ --project = PROJECT_ID] [ --quiet, -q] [ --verbosity = VERBOSITY;
default="warning"] [ --version, -v] [ -h] [ --access-token-file = ACCESS_TOKEN_FILE]
[ --impersonate-service-account = SERVICE_ACCOUNT_EMAILS] [ --log-http ]
[ --trace-token = TRACE_TOKEN] [ --no-user-output-enabled ]
```

[gcloud | Cloud SDK Documentation](#)

The gcloud tool - cont.

The `gcloud` tool commands have the following release levels:

Release level	Label	Description
General Availability	None	Commands are considered fully stable and available for production use. For advance notice of changes to commands that break current functionality, see the release notes .
Beta	beta	Commands are functionally complete, but could still have some outstanding issues. Breaking changes to these commands can be made without notice.
Alpha	alpha	Commands are in early release and may change without notice.

The `alpha` and `beta` components are not installed by default when you install the Cloud SDK. You must [install these components](#) separately using the `gcloud components install` command. If you try to run an alpha or beta command and the corresponding component is not installed, the `gcloud` tool prompts you to install it.

The gcloud tool - cont.

Managing Cloud SDK properties 🔗

[Send feedback](#)

Properties are settings that govern the behavior of the `gcloud` command-line tool and other Cloud SDK tools.

You can use properties to define a per-product or per-service setting such as the account used by the `gcloud` tool and other Cloud SDK tools for authorization, the default region to use when working with Compute Engine resources, or the option to turn off automatic Cloud SDK component update checks. Properties can also be used to define `gcloud` tool preferences like verbosity level and prompt configuration for `gcloud` tool commands.

The gcloud tool - cont.

Configurations

A [configuration](#) is a named set of Cloud SDK properties. The `gcloud` tool uses a configuration named `default` as the initial active configuration; `default` is suitable for most use cases. However, you can also create additional configurations and switch between them as required.

Listing properties

To list the properties in the active [configuration](#), run `gcloud config list`:

Lab 1.1

1. Explore Google Cloud Console.
2. Setup a billing method on your google account.
3. Create a GCP project.
4. Assign your billing account to your project.
5. Setup project budget.
6. Setup billing alerts.
7. Using cloud shell, list all projects and set default project.
8. Install and configure gcloud SDK on your pc.
9. List all projects using gcloud SDK and set default project

Identity and Access Management (IAM)

What is IAM?



Who



can do what



on which resource

IAM (cont.)



Google account or Cloud Identity user
test@gmail.com test@example.com



Service account
test@project_id.iam.gserviceaccount.com



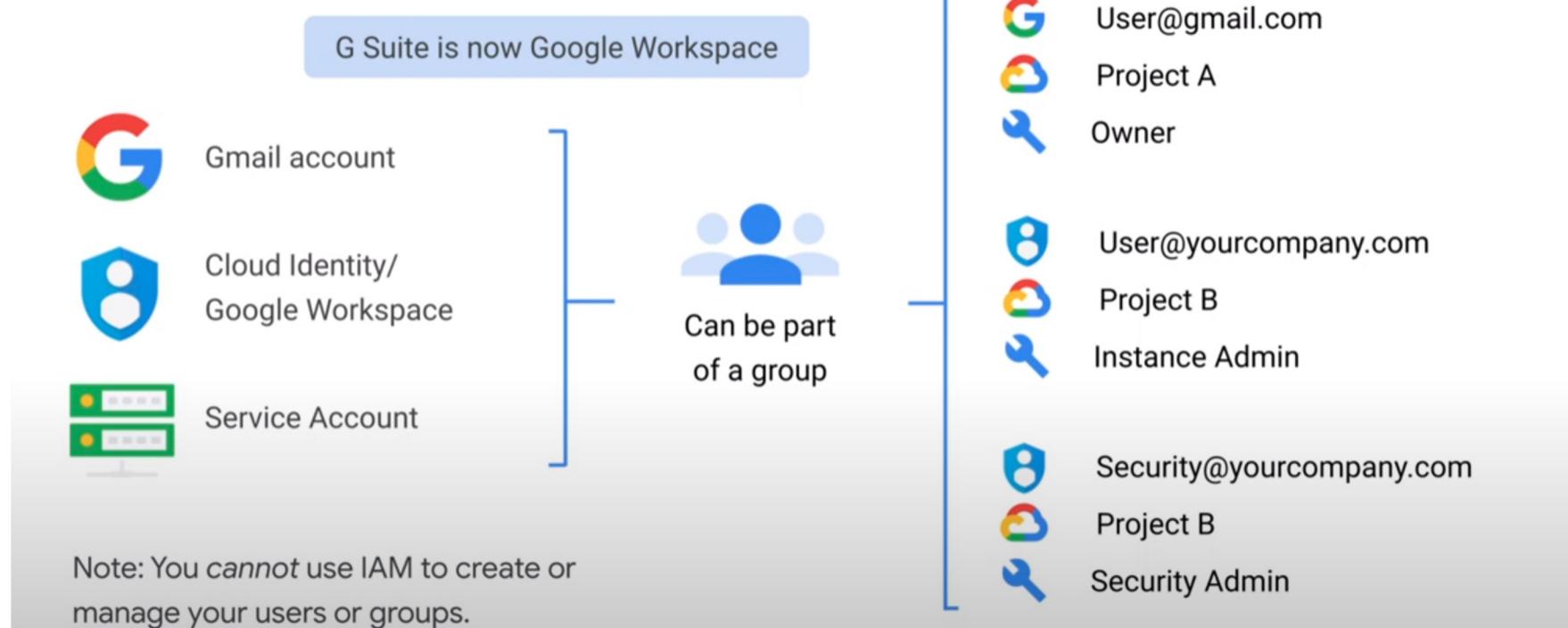
Google group
test@googlegroups.com



Cloud Identity or G Suite domain
example.com

IAM (cont.)

Identity

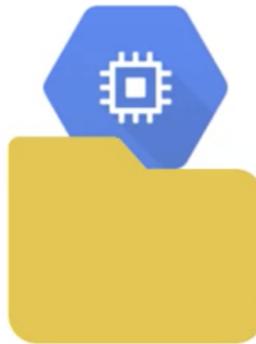


IAM (cont.) – Types of Roles

Primitive



Predefined



Custom



Types of roles (cont.) - Primitive Roles

IAM primitive roles apply across all GCP services in a project



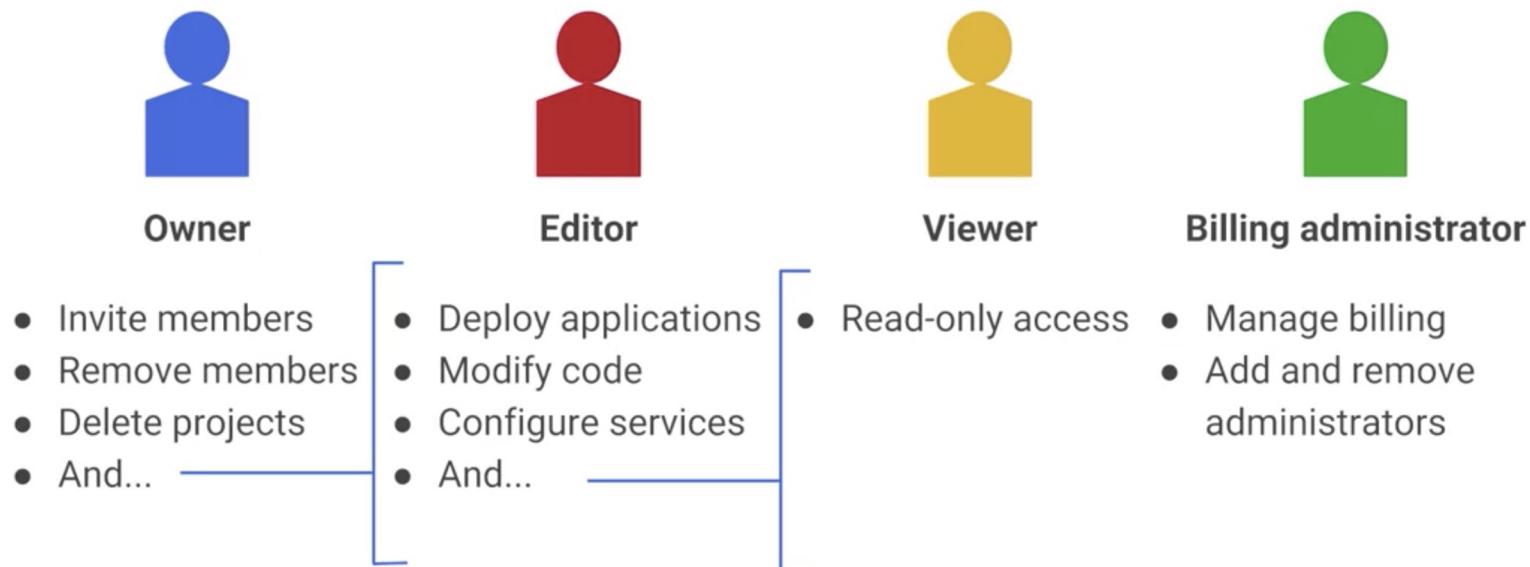
can do what



on all resources

Primitive Roles (cont.)

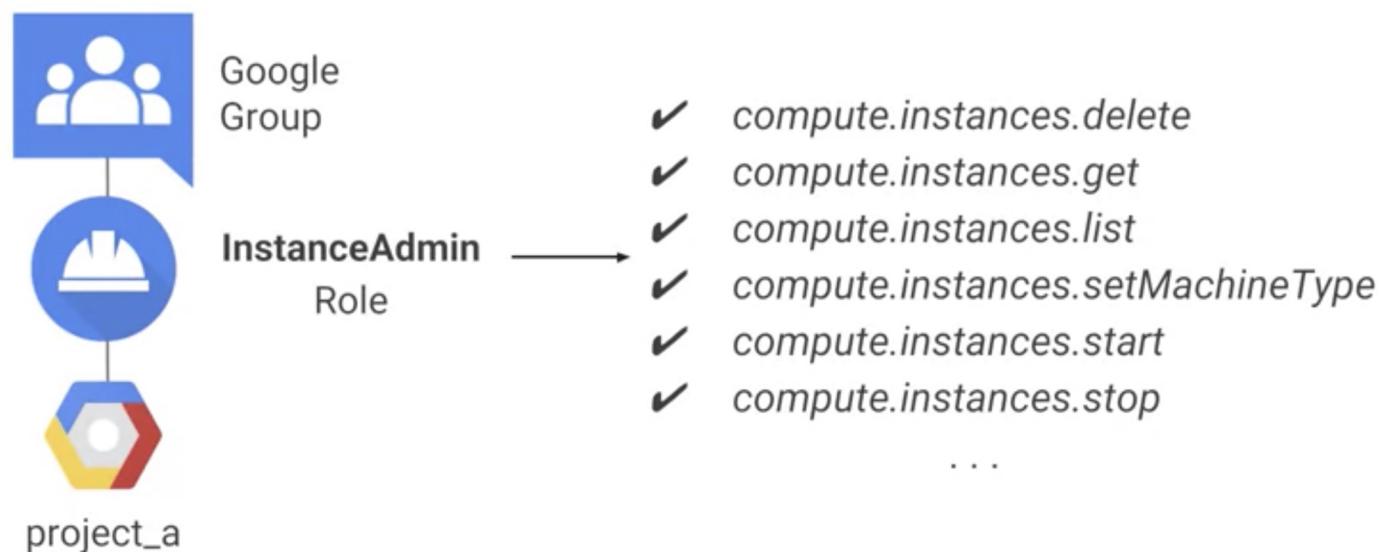
IAM primitive roles offer fixed, coarse-grained levels of access



A project can have multiple owners, editors, viewers, and billing administrators.

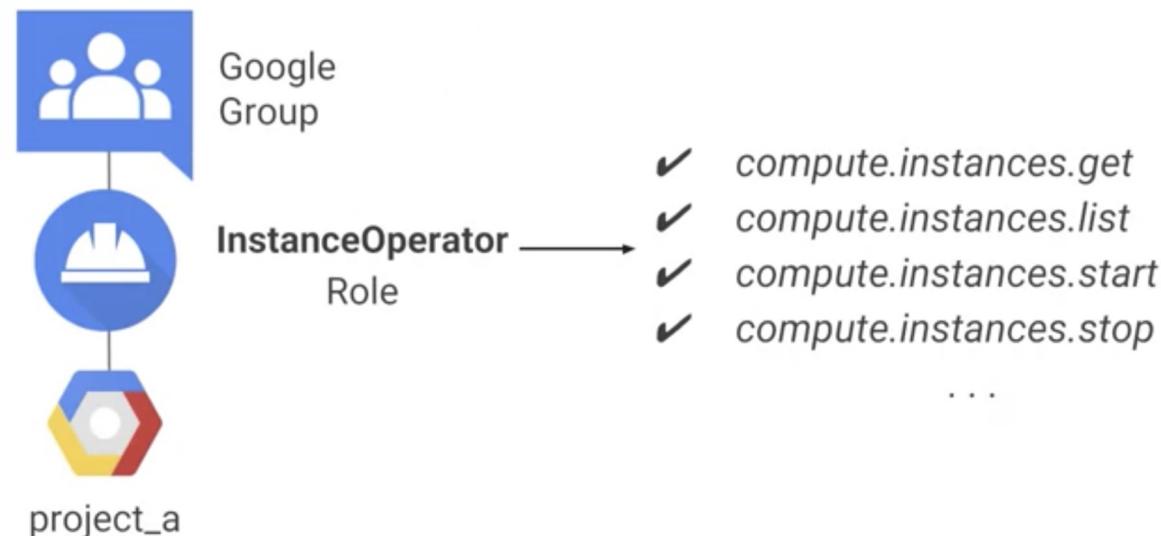
Types of roles (cont.), Pre-defined Roles

IAM predefined roles offer more fine-grained permissions on particular services



Types of roles (cont.), Custom Roles

IAM custom roles let you define a precise set of permissions



Custom Roles (cont.), notes

- Can't be used at folders level.
- Can be used only at project level or at organization level.
- Custom roles are not maintained by google; You completely manage these roles.
- To create custom roles, you need to have the permission "iam.roles.create"

Custom Roles (cont.), Creating custom roles

- To create a custom role at the organization level, execute the following command:

```
gcloud iam roles create role-id \ --organization=organization-id \
--file=yaml-file-path
```

- To create a custom role at the project level, execute the following command:

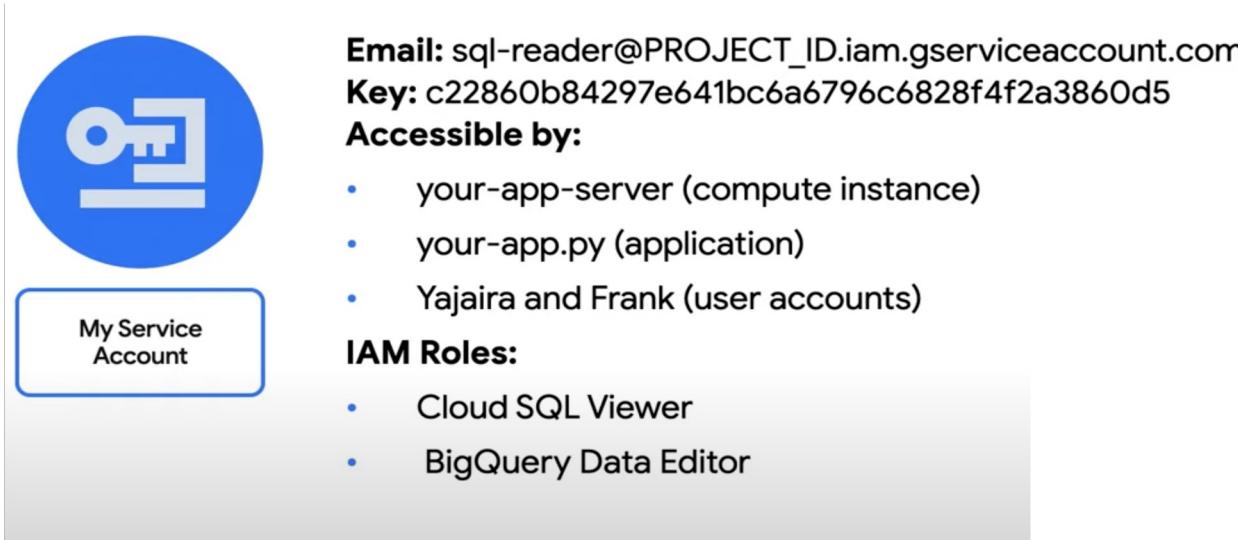
```
gcloud iam roles create role-id \ --project=project-id \
--file=yaml-file-path
```

IAM (cont.) - Service Accounts (SAs)



Service Accounts (Cont.)

- A service account is an identity that an instance or an application can use to run API requests on your behalf.
- Two types of service accounts are available to Compute Engine instances:
 - User-managed service accounts
 - Google-managed service accounts



The image shows a screenshot of a service account details page. On the left, there is a large blue circular icon containing a white key symbol. Below it, a blue button-like box contains the text "My Service Account". To the right of the icon, there is a list of account details:

- Email:** sql-reader@PROJECT_ID.iam.gserviceaccount.com
- Key:** c22860b84297e641bc6a6796c6828f4f2a3860d5
- Accessible by:**
 - your-app-server (compute instance)
 - your-app.py (application)
 - Yajaira and Frank (user accounts)
- IAM Roles:**
 - Cloud SQL Viewer
 - BigQuery Data Editor

IAM (cont.) – Policies

- IAM policies
- [Docs 1](#) & [Docs 2](#)

Policy

[Send feedback](#)

An Identity and Access Management (IAM) policy, which specifies access controls for Google Cloud resources.

A `Policy` is a collection of `bindings`. A `binding` binds one or more `members` to a single `role`. Members can be user accounts, service accounts, Google groups, and domains (such as G Suite). A `role` is a named list of permissions; each `role` can be an IAM predefined role or a user-created custom role.

IAM (cont.) – Best Practices

- Always consider applying the concept of Least Privilege.
- Never use primitive roles unless there is no other way.
- Rotate SAs keys and store them in a safe place like Vault.
- Enable Audit Logs.
- Apply IAM policies as much as needed at the Organization level.
- Resources:
 - [Securely using IAM](#)
 - [Policy Intelligence tools](#)
 - [Video 1](#) & [Video 2](#)

Lab 1.2

1. From Cloud console, do the following:
 - I. Create custom role named "my-custom-role-1" with the following permissions only:
 - iam.roles.get
 - iam.roles.list
2. From Cloud console, Explore primitive and pre-defined roles and their permissions.
3. From Cloud console, Create a service account with id "my-first-serviceaccount".
4. From Cloud console, Assign the custom role "my-custom-role-1" to the service account "my-first-serviceaccount"
5. Using gcloud,
 - I. List all roles on your project.
 - II. Describe the predefined role "roles/compute.viewer" and view its details & permissions
 - III. Describe the custom role "my-custom-role-1" and view its details & permissions.
 - IV. List all authenticated accounts.
 - V. Activate the service account "my-first-serviceaccount".
 - VI. List all authenticated accounts again.
 - VII. Using this service account, try to list all roles on your project.
 - VIII. Try to delete custom role "my-custom-role-1"