Introduction to GCP Infrastructure

Architecting with GCP Fundamentals: Infrastructure

GCP CONSOLE, CLOUD SHELL

CONSOLE AND CLOUD SHELL, INFRASTRUCTURE PREVIEW

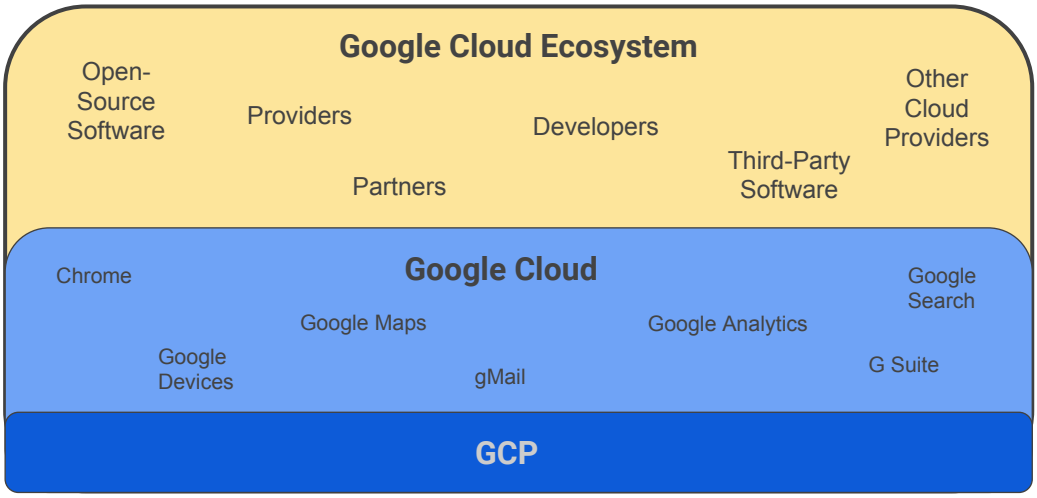
Last modified 2017-11-27

Agenda

- **Google Cloud Platform (GCP) Infrastructure**
- Using GCP
- Labs and Demos

Google Cloud

Google Cloud Platform



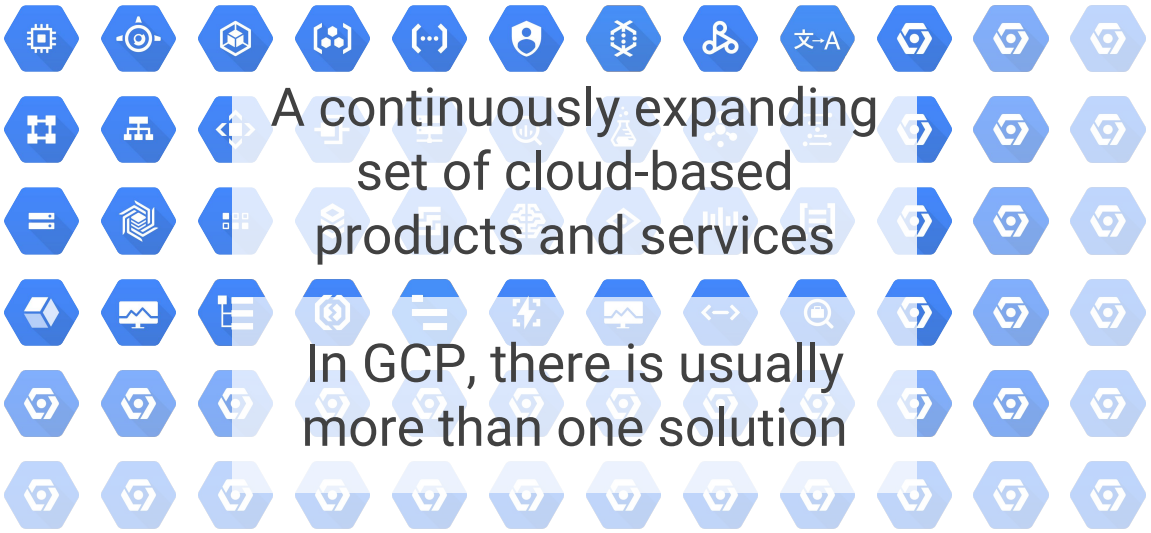
Google Cloud

Google Cloud Platform, GCP, is part of Google Cloud, which includes many products and services.

The Google Cloud itself is part of a much larger ecosystem that consists of partners and providers. Google is a strong supporter of open-source software and participates with a global community of contributors.

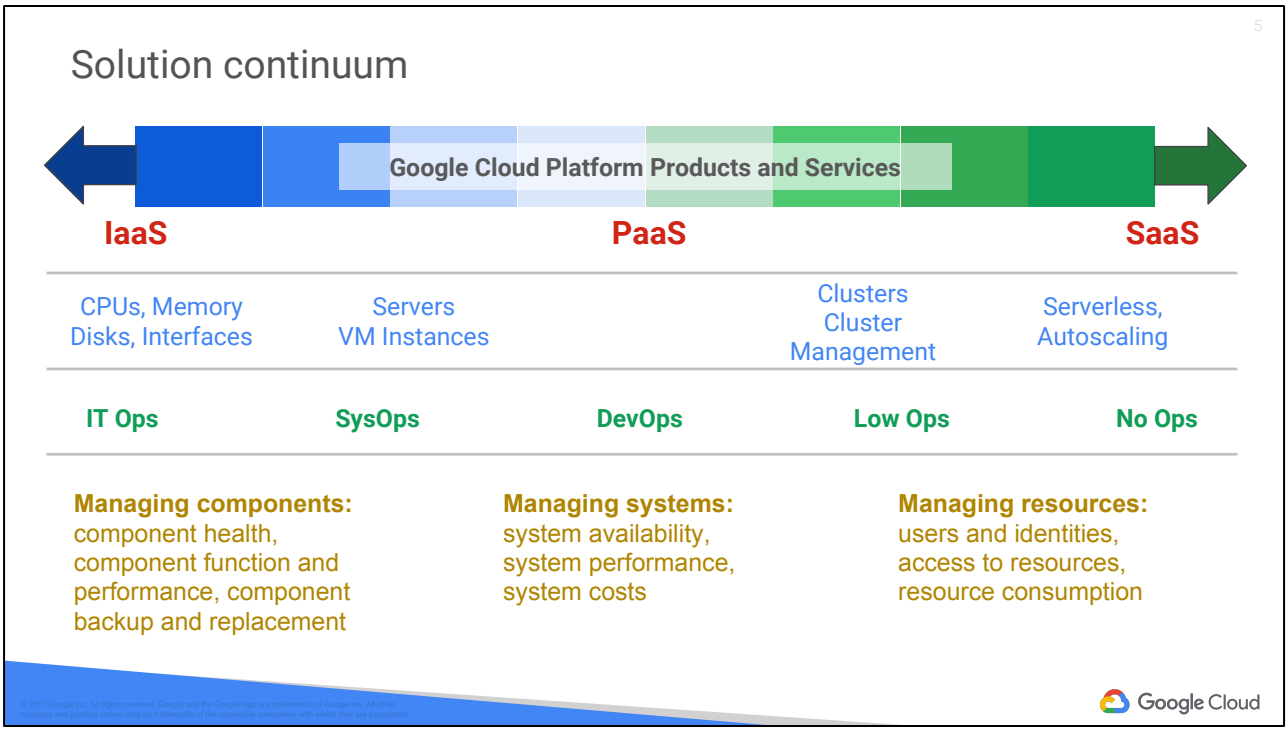
GCP is a computing solution platform that includes Infrastructure, Platform, and Software.

GCP is...



Google Cloud

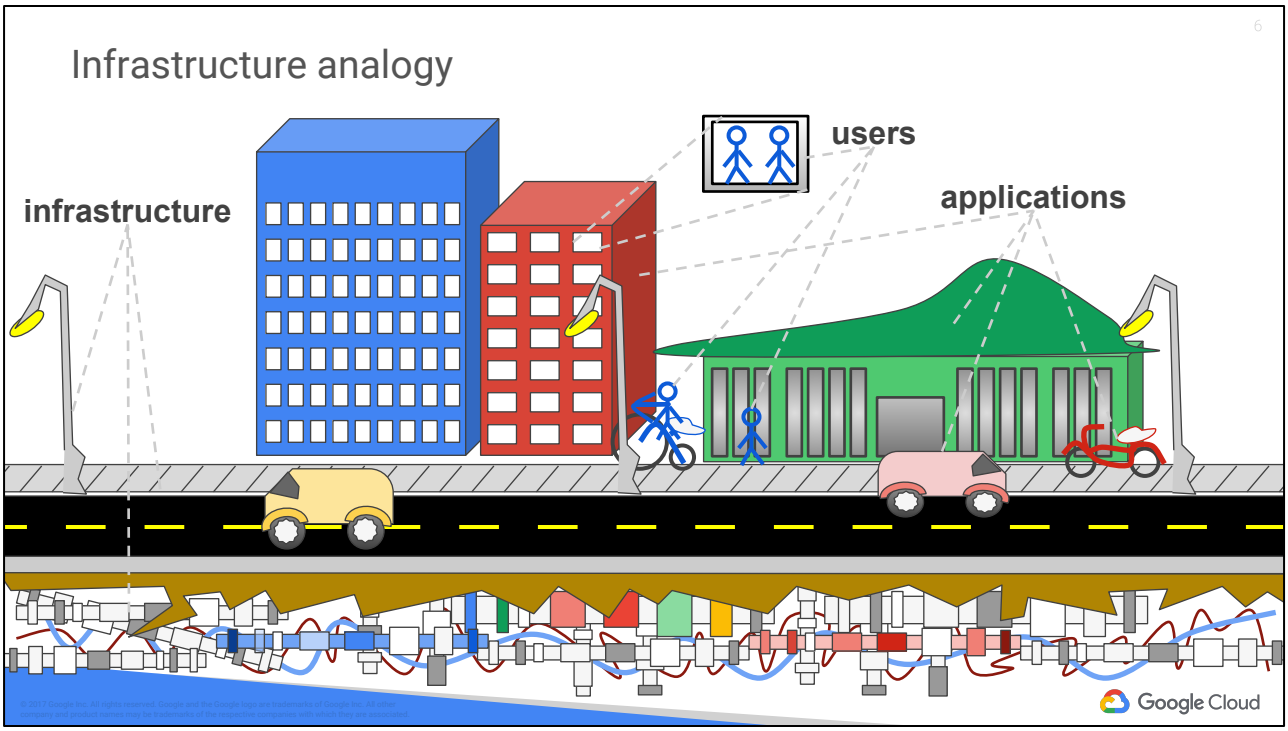
Many GCP products and services have a unique blue hexagonal logo. Products without a unique logo are represented by a generic hexagon logo. There are currently between 50 and 100 products in GCP.



Google Cloud Platform spans from Infrastructure as a Service (IaaS) to Software as a Service (SaaS). You really can build applications on GCP for the web or mobile that are global, autoscaling, and assistive, and that provide services where the infrastructure is completely invisible to the user. It is not just that Google has opened the infrastructure that powers applications like search, gmail, maps, and G Suite. Google has opened all of the services that make these products possible and packaged them up for your use.

Alternative solutions are possible. For example, you could start up your own VM in GCE, install open source MySQL on it, and run it just like a MySQL database on your own computer in a data center. Or, you could use the Cloud SQL service, which provides a MySQL instance and handles rote work like backups and security patching for you, using the same services Google does to automate backups and patches. Or, you could move to a noSQL database that is autoscaling and serverless so that growth no longer requires adding server instances or possible changing the design to handle the new capacity.

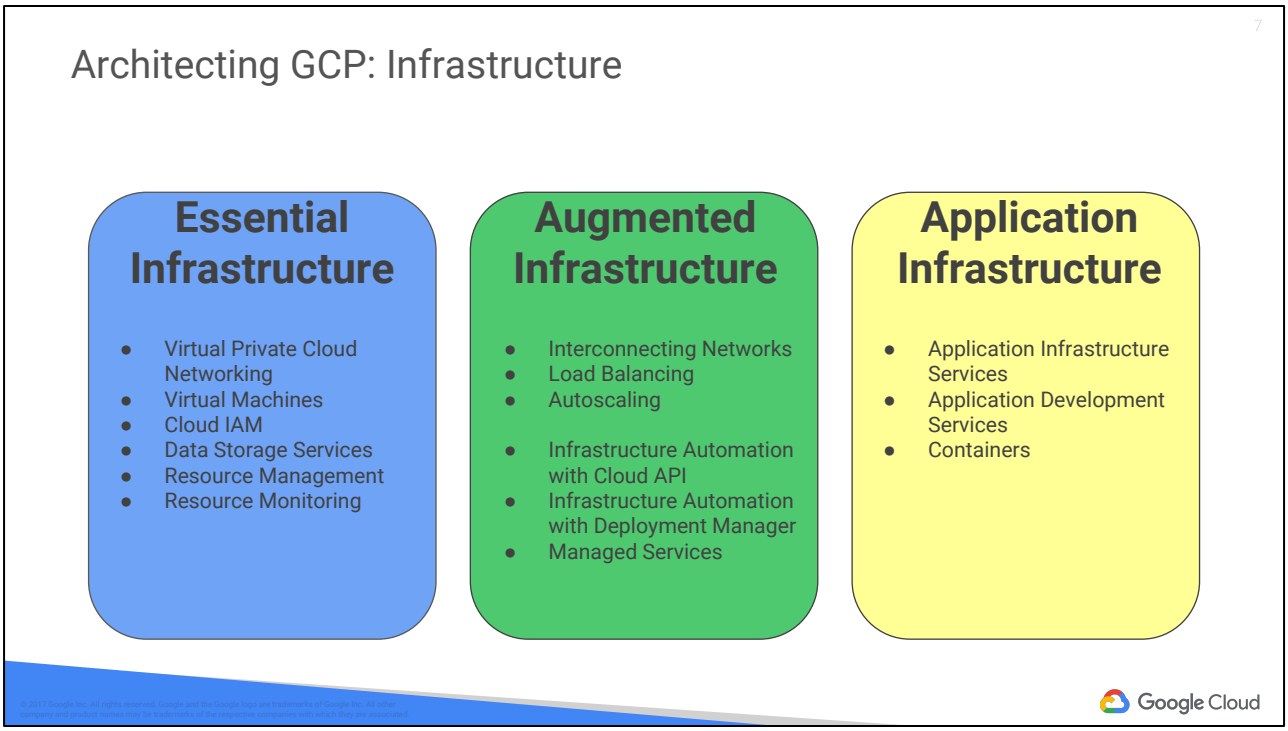
Notice that each alternative solution on the continuum causes concern about different objects, which changes the role of the operations staff and changes the items that are being managed.



An IT infrastructure is like a "city infrastructure." The infrastructure is the basic underlying framework of fundamental facilities and systems such as transport, communications, power, water, fuel and other essential services. The people in the city are like "users," and the cars and bikes and buildings in the city are like "applications." Everything that goes into creating and supporting those applications/buildings for the users/citizens is the infrastructure.

The purpose of this class is to explore, as efficiently and clearly as possible, the infrastructure services provided by GCP. You should become familiar enough with the infrastructure services that you will know what the services do and basically how to use them.

By the end of this class you will be *prepared to learn* anything you need to know to use the Google Cloud Platform.



This class is in three parts:

1. Essential Infrastructure: the basic building blocks
2. Augmented Infrastructure: systems built on top of the basics that multiply their power
3. Application Infrastructure: services specifically provided to make it easier to develop applications for your users

Details:

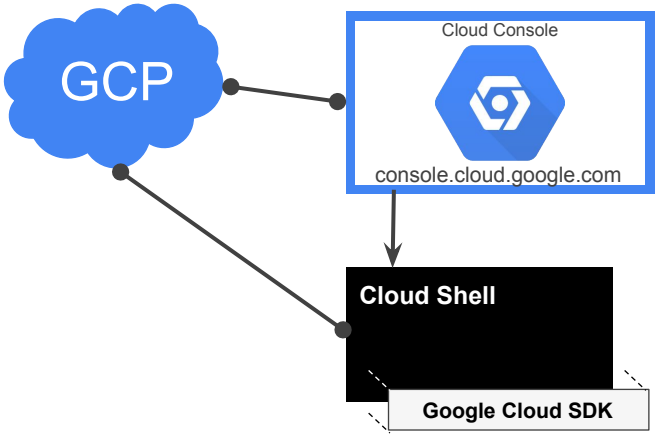
- Essential Infrastructure: the basic technologies and building blocks of all solutions in GCP
- Augmented Infrastructure: building on top of the base infrastructure for leverage, scale, and power
  - Building on top of networking, first connecting networks, then load balancing for high availability
  - Autoscaling is a bridge subject: it creates identical VMs in response to network load…leading to the topic of Automation
  - Building up from autoscaling, there are three kinds of automation:
    - Programmatic automation using the Cloud API to create objects in GCP—programming in a supported language
    - Deployment Manager automation: a template approach using YAML files, python, and jinja to create objects in GCP
    - Managed services with visibility to servers and clusters

        - Managed services without visibility to servers or clusters (serverless or NoOps)
- Application Infrastructure
    - This class doesn't teach software development—there is a track for that—but it does address the infrastructure services available to developers
    - Infrastructure Services: services that help you connect the parts of your application together
    - Development Services: services that help developers create code ("code first" services)
    - Containers: more complexity for greater portability

Agenda

- Google Cloud Platform (GCP) Infrastructure
- **Using GCP**
- Labs and Demos

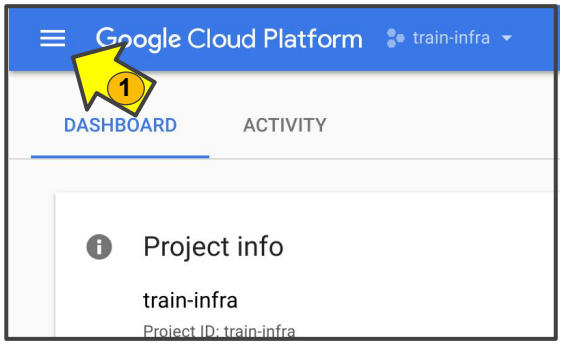
Google Cloud Shell

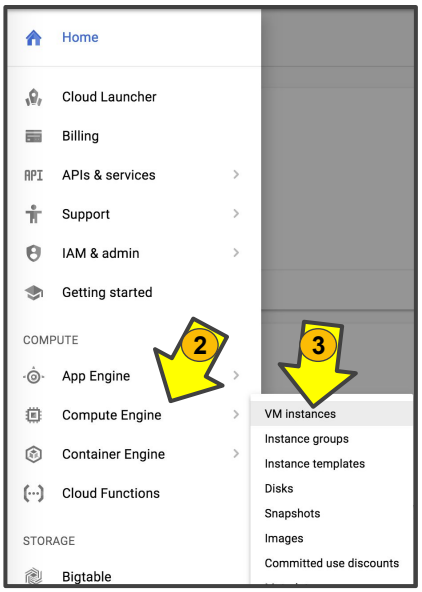


- The Web UI comes with a CLI
- The CLI has Google Cloud SDK pre-installed

- Cloud Shell is…
  - A tiny *ephemeral* VM
  - CLI pre-installed
    - **gcloud**
    - **gsutil**
  - SDK APIs pre-installed
  - 5 GB user data persists
  - OS + SW is reconstituted
    - After 30 minutes
    - If there is a connection interruption

Lab conventions: Console





This is how the instruction will appear in your lab guide:

On the Products & services menu, click **Compute Engine > VM instances**

Google Cloud

You can get to almost any dialog in the GCP Console with three clicks.

(1) The three horizontal lines is the "Products and Services" icon. It opens a menu from the side.

(2) All of the major products and services are listed in the menu. Selecting one usually opens a submenu.

(3) The submenu contains major sections.

In this example you would be instructed navigate to the Products & services menu and click Compute Engine, and then VM instances.

Lab conventions: Cloud Shell

Items in black boxes with white type are command line instructions you enter in Cloud Shell or an SSH terminal:

```
gcloud compute list
```

Usually you can copy and paste these commands if desired.

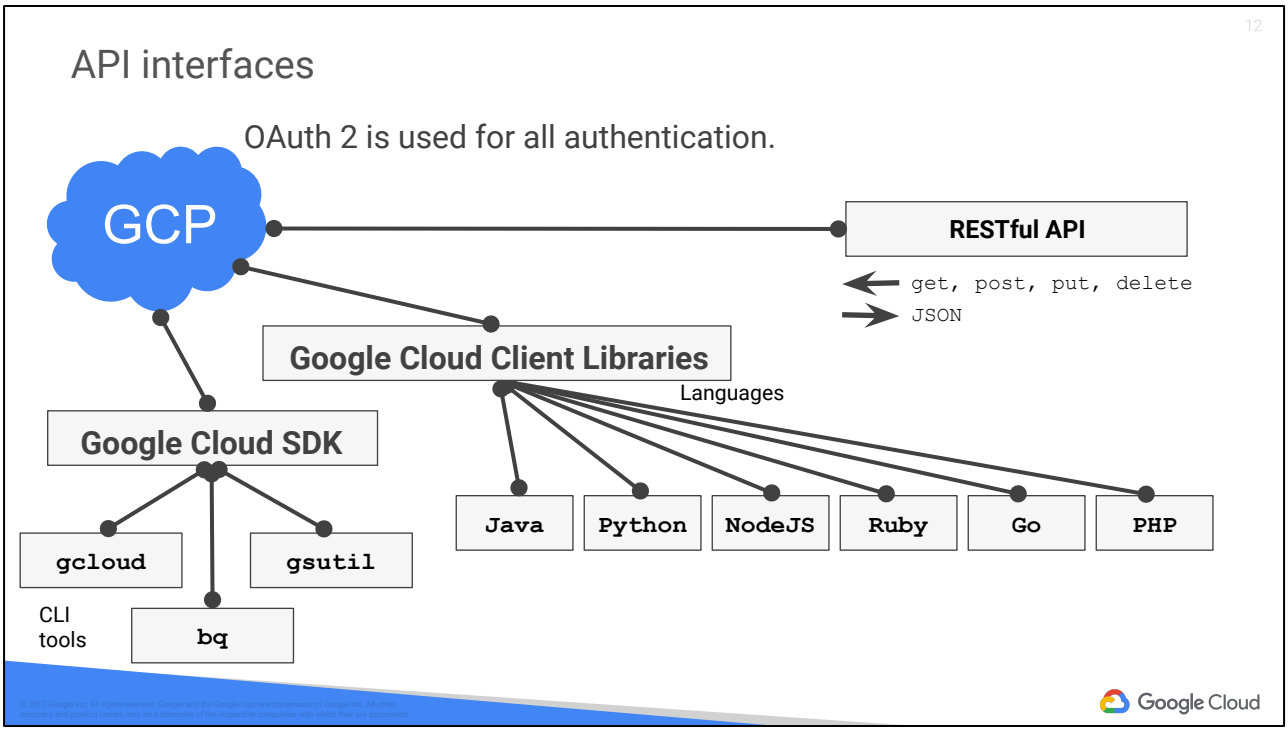
That's often useful for more complex commands.

An example of what the command output should look like:

```
username@train-infra: gcloud compute list

Your active configuration is:
[cloudshell-30772]
[component_manager]
disable_update_check = True
[compute]
gce_metadata_read_timeout_sec = 5
[core]
account = tomstern@google.com
check_gce_metadata = False
disable_usage_reporting = False
project = train-infra
[metrics]
environment = devshell

username@train-infra:~$
```



For historical reasons, gsutil, gcloud, and bq are currently separate. gsutil is a python application that uses the SDK to access Google Cloud Storage (GCS) API.

gcloud is a command line tool that is the home to all the rest of the GCP API.

Agenda

- Google Cloud Platform (GCP) Infrastructure
- Using GCP
- **Labs and Demos**

Google Cloud

Lab: Console and Cloud Shell

Objectives

In this lab, you learn how to perform the following tasks:

- Get access to GCP
- Create a Cloud Storage bucket using the GCP Console
- Create a Cloud Storage bucket using Cloud Shell
- Become familiar with Cloud Shell features

Completion: 20 minutes

Access: 40 minutes

Google Cloud

Lab: Console and Cloud Shell

Demo: Projects

In this demo you will see how to create, delete, and switch contexts between projects.

Google Cloud

Demo: Projects

Lab: Infrastructure Preview

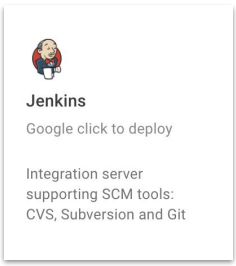
Objectives

In this lab, you learn how to perform the following tasks:

- Use Cloud Launcher to build a Jenkins Continuous Integration environment
- Verify that you can manage the service from the Jenkins UI
- Administer the service from the Virtual Machine host through SSH

Completion: 15 minutes

Access: 30 minutes



Google Cloud

Lab: Infrastructure Preview

More resources

Google Cloud Platform
https://cloud.google.com/

Console
https://console.cloud.google.com/

Documentation
https://cloud.google.com/docs/

Training
https://cloud.google.com/training/

Certification
https://cloud.google.com/certification/

Google Cloud