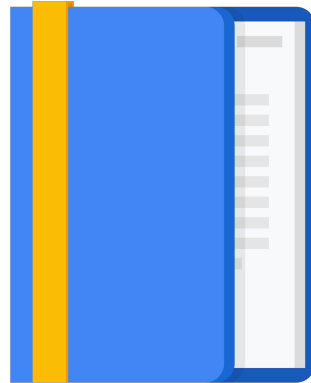# Google Cloud

Introduction to GCP

Philipp Maier

In this module, we will provide you with an introduction to GCP by building on what you learned about the GCP infrastructure from the course introduction.

Agenda

Using GCP

Labs and Demo

This module is focused on how to interact with GCP.

In the labs of this module, you will explore both GCP's graphical user interface and its command-line interface. You will also deploy a solution from the GCP Marketplace without having to manually configure the software, virtual machine instances, storage, or network settings.

To complete your learning experience, I will provide a quick demo of projects.

Let's get started!

There are four ways to interact with GCP

Google Cloud Platform Console

Web user interface

Cloud Shell and Cloud SDK

Command-line interface

REST-based API

For custom applications

Cloud Mobile App

For iOS and Android

Google Cloud

There are four ways you can interact with GCP, and we'll talk about each in turn.

There's the Google Cloud Platform Console (or GCP Console), Cloud Shell and the Cloud SDK, the APIs, and the Cloud Mobile App.

GCP Console, Cloud SDK and Cloud Shell

GCP Console

console.cloud.google.com

	Name ∧	Zone	Internal IP	External IP	Connect	
☐ ✅	nginxstack-1	us-central1-f	10.128.0.3 (nic0)	35.238.84.245	SSH ▾	⋮
☐ ✅	nginxstack-2	us-central1-f	10.128.0.4 (nic0)	35.225.177.18	SSH ▾	⋮
☐ ✅	nginxstack-3	us-central1-f	10.128.0.2 (nic0)	35.239.250.238	SSH ▾	⋮

Cloud Shell

Google Cloud SDK

```
$ gcloud compute instances list
NAME          ZONE           INTERNAL_IP  EXTERNAL_IP
nginxstack-1  us-central1-f  10.128.0.3   35.238.84.245
nginxstack-2  us-central1-f  10.128.0.4   35.225.177.18
nginxstack-3  us-central1-f  10.128.0.2   35.239.250.238
```

Google Cloud

The GCP Console provides a web-based, graphical user interface that you access through Console.cloud.google.com. For example, you can view your virtual machines and their details, as shown on the top.

If you prefer to work in a terminal window, the Cloud SDK provides the gcloud command-line tool. For example, you can list your virtual machines and their details as shown on the bottom with the "gcloud compute instances list" command.

GCP also provides Cloud Shell, which is a browser-based, interactive shell environment for GCP that you can access from the GCP Console. Cloud Shell is a temporary virtual machine with 5 GB of persistent disk storage that has the Cloud SDK pre-installed.
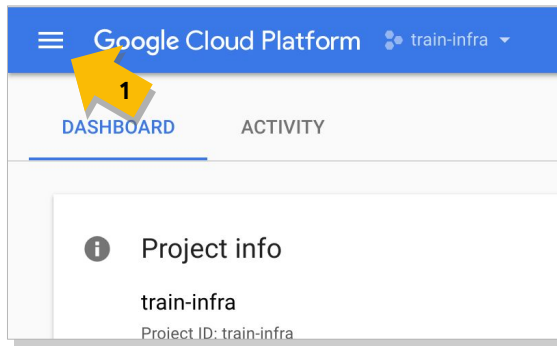
How to interpret lab instructions

"On the Navigation menu, click **Compute Engine > VM instances"**

Throughout this course, you will apply what you learn in different labs. These labs will have instructions to use the GCP Console, such as, "On the Navigation menu, click Compute Engine > VM instances." Let me dissect these instructions.
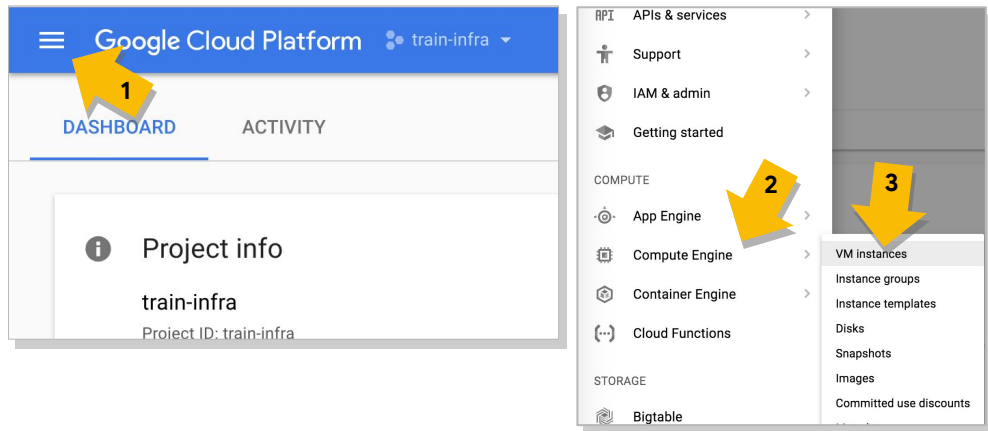
How to interpret lab instructions

"On the Navigation menu, click **Compute Engine > VM instances**"

First, within the GCP Console you will click on the icon with the three horizontal lines, which is the Navigation menu, as shown on the left.

How to interpret lab instructions

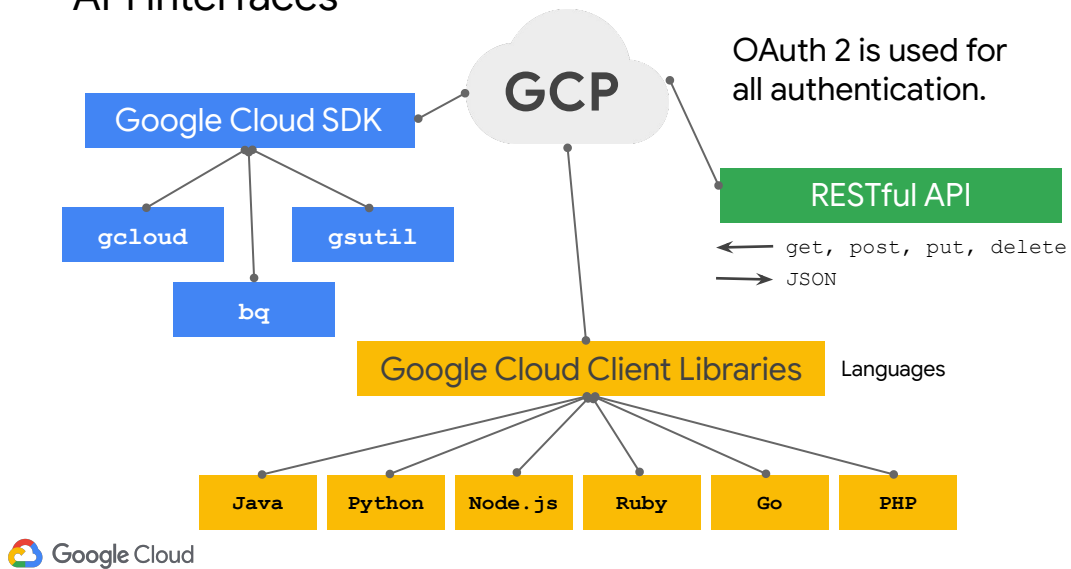"On the Navigation menu, click **Compute Engine > VM instances**"

This opens a menu, as shown on the right. All of the major products and services are listed on this menu.

Then, within the menu, hover over "Compute Engine" to open a submenu.
Finally, click on "VM instances" on the submenu.

You will get more comfortable with these instructions and the GCP Console as you work on labs.

Now, labs will also use command-line instructions. You will enter these instructions either in Cloud Shell or an SSH terminal by simply copying and pasting them. In some cases, you will have to modify these commands, for example, when choosing a globally unique name for a Cloud Storage bucket.

API interfaces

Google Cloud SDK

GCP

OAuth 2 is used for all authentication.

gcloud   gsutil

bq

RESTful API

get, post, put, delete
JSON

Google Cloud Client Libraries   Languages

Java   Python   Node.js   Ruby   Go   PHP

Google Cloud

In addition to the Cloud SDK, you can also use client libraries that enable you to easily create and manage resources. GCP client libraries expose APIs for two main purposes:

- App APIs provide access to services, and they are optimized for supported languages, such as Node.js or Python.
- Admin APIs offer functionality for resource management. For example, you can use admin APIs if you want to build your own automated tools.

Cloud Mobile App

- Manage virtual machines and database instances.
- Manage apps in App Engine.
- Manage your billing.
- Visualize your projects with a customizable dashboard.

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App Store

Google Cloud
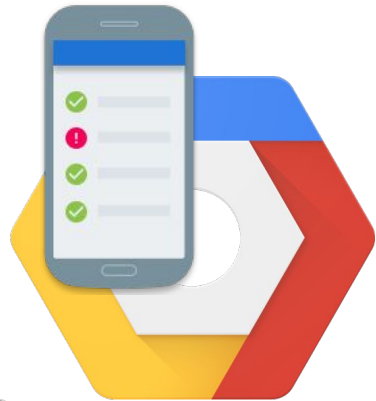
The Cloud Mobile App is another way to interact with GCP. It allows you to manage GCP services from your Android or iOS device. For example, you can start, stop, and SSH into Compute Engine instances and see logs from each instance. You can also set up customizable graphs showing key metrics such as CPU usage, network usage, requests per second, and server errors. The app even offers alerts and incident management and allows you to get up-to-date billing information for your projects and get billing alerts for projects that are going over budget.

You can download the Cloud Mobile App from Google Play or from the App Store.

Lab

Console and Cloud Shell

Slides are great for explaining concepts, but let's apply what we just talked about.

In this first lab, you'll explore the GCP interface and the entry point of the graphical user interface that's called the GCP Console. Within the GCP Console, you will create a storage bucket in Cloud Storage, which is Google's unified object storage. Then you will repeat the same task using Cloud Shell, which is the command-line interface in GCP.

I encourage you to develop familiarity with both the GCP Console and Cloud Shell and to become comfortable moving back and forth between them.

Lab review

Console and Cloud Shell

In this lab, you created a Cloud Storage bucket using both the GCP Console and Cloud Shell within GCP. The GCP Console can do things Cloud Shell can't do, and vice versa. For example, the GCP Console can keep track of the context of your configuration activities; it can use the Cloud API to determine from current system state what options are valid; and it can perform repetitive and more leveraged activities on your behalf.

Cloud Shell, in contrast, offers detailed and precise control and—through its commands—a way to script and automate activities. However, don't think of the Console and Cloud Shell as alternatives: think of them as one extremely flexible and powerful interface.

You can stick around for a lab walkthrough, but remember that GCP's user interface can change, so your environment might look slightly different.

Lab

Infrastructure Preview

In this lab, you're going to experience the power of GCP automation by setting up a complete Jenkins continuous integration environment using the GCP Marketplace. You will then verify that you can manage the service from the Jenkins UI and administer the service from the VM host through SSH.

Now, you could accomplish a very similar result through manual configuration in a couple of hours or days. But in this lab, you'll see it set up in only a few minutes.

Lab review

Infrastructure Preview

In this lab, you were able to launch a complete continuous integration solution in a few minutes.

You demonstrated that you had user access through the Jenkins UI, and that you had administrative control over Jenkins by using SSH to connect to the VM where the service is hosted and by stopping and then restarting the services.

Many of the activities that occurred in that lab were nearly transparent, and they used resources and methods that you'll learn about in the rest of this course. Examples of this include the acquisition and configuration of a network IP address; the provisioning of a virtual machine instance along with the installation of software on that machine; and the passing of default state information from the environment during the setup process.

You can stick around for a lab walkthrough, but remember that GCP's user interface can change, so your environment might look slightly different.

Demo

Projects

Google Cloud

Let's explore projects, which are the key organizer of infrastructure resources and relate these resources to billing accounts. Resources can only be created and consumed within projects, in a way that projects isolate related resources from one another.

I will demonstrate how to create and delete projects and switch contexts between projects. Some of these actions cannot be performed in the Qwiklabs environment due to security restrictions; therefore, I am going to demonstrate them in my environment.

[Screencast of GCP Console]

That's how easy it is to create and delete projects and switch contexts between projects.

Review

Introduction to GCP

Google Cloud

In this module, we looked at how to use GCP, which you got to experience first-hand in two short labs. I also gave a demonstration of how to use projects, which are the key organizer of infrastructure resources.

Now that you can interact with GCP, it's time to explore two of the foundational components of GCP's infrastructure: virtual networks and virtual machines. So what are you waiting for? Move on to the next module to learn more.