Getting Started with Cloud Shell and gcloud

partner.cloudskillsboost.google/focuses/11603

GSP002

Overview

Cloud Shell provides you with command-line access to computing resources hosted on Google Cloud. Cloud Shell is a Debian-based virtual machine with a persistent 5-GB home directory, which makes it easy for you to manage your Google Cloud projects and resources. The `gcloud` command-line tool and other utilities you need are pre-installed in Cloud Shell, which allows you to get up and running quickly.

In this hands-on lab, you learn how to connect to computing resources hosted on Google Cloud via Cloud Shell with the `gcloud` tool.

You are encouraged to type the commands themselves, which reinforces the core concepts. Many labs will include a code block that contains the required commands. You can easily copy and paste the commands from the code block into the appropriate places during the lab.

What you'll do

- Practice using `gcloud` commands.
- Connect to compute services hosted on Google Cloud.

Prerequisites

Familiarity with standard Linux text editors such as `vim`, `emacs`, or `nano`.

Setup

Before you click the Start Lab button

Read these instructions. Labs are timed and you cannot pause them. The timer, which starts when you click **Start Lab**, shows how long Google Cloud resources will be made available to you.

This hands-on lab lets you do the lab activities yourself in a real cloud environment, not in a simulation or demo environment. It does so by giving you new, temporary credentials that you use to sign in and access Google Cloud for the duration of the lab.

What you need

To complete this lab, you need:

- Access to a standard internet browser (Chrome browser recommended).
- Time to complete the lab.

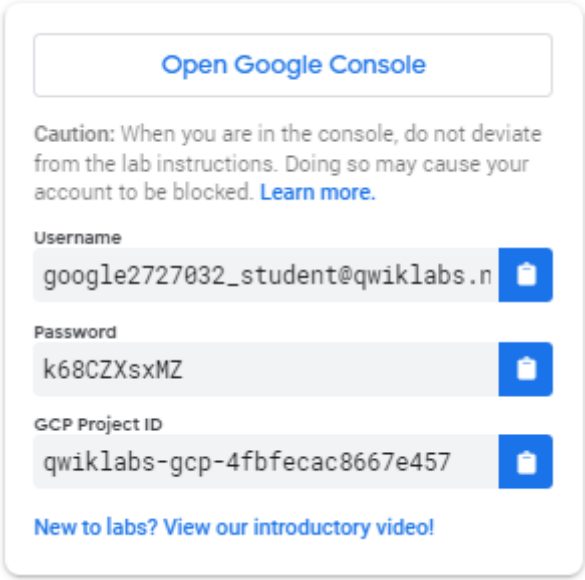
Note: If you already have your own personal Google Cloud account or project, do not use it for this lab.

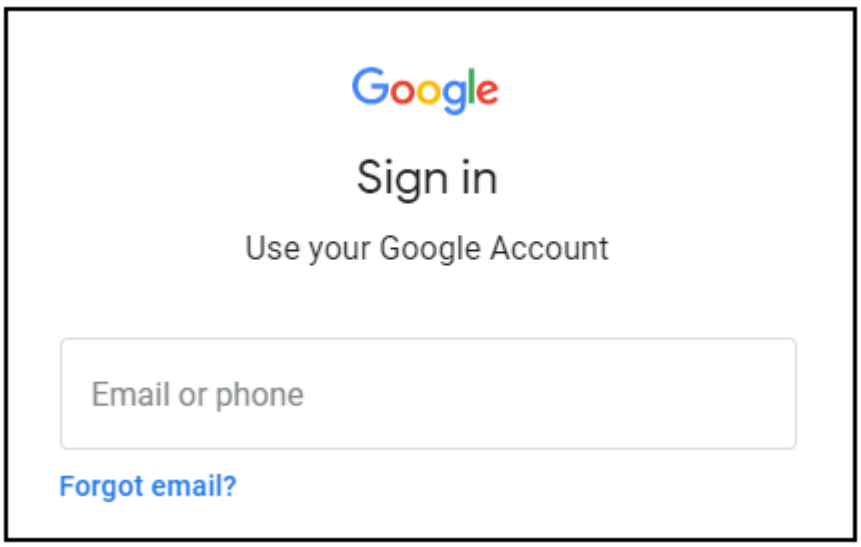
Note: If you are using a Chrome OS device, open an Incognito window to run this lab.

How to start your lab and sign in to the Google Cloud Console

1. Click the **Start Lab** button. If you need to pay for the lab, a pop-up opens for you to select your payment method. On the left is a panel populated with the temporary credentials that you must use for this lab.

2. Copy the username, and then click **Open Google Console**. The lab spins up resources, and then opens another tab that shows the **Sign in** page.



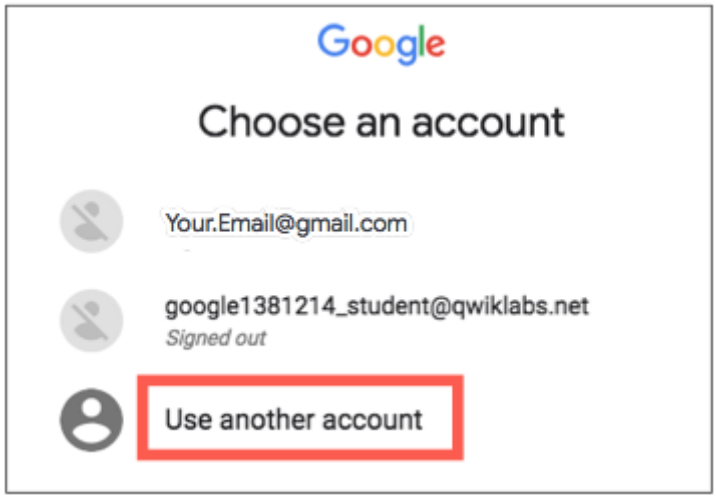


Tip: Open the tabs in separate windows, side-by-side.

If you see the **Choose an account** page, click **Use Another Account**.

3. In the **Sign in** page, paste the username that you copied from the left panel. Then copy and paste the password.

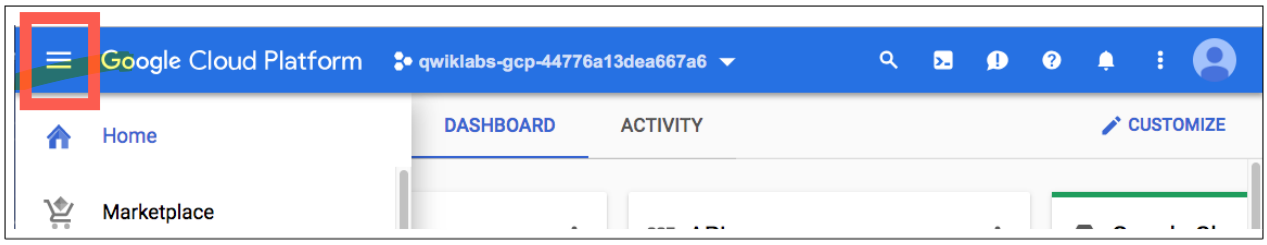
   Important: You must use the credentials from the left panel. Do not use your Google Cloud Training credentials. If you have your own Google Cloud account, do not use it for this lab (avoids incurring charges).



4. Click through the subsequent pages:
   - Accept the terms and conditions.
   - Do not add recovery options or two-factor authentication (because this is a temporary account).
   - Do not sign up for free trials.

After a few moments, the Cloud Console opens in this tab.

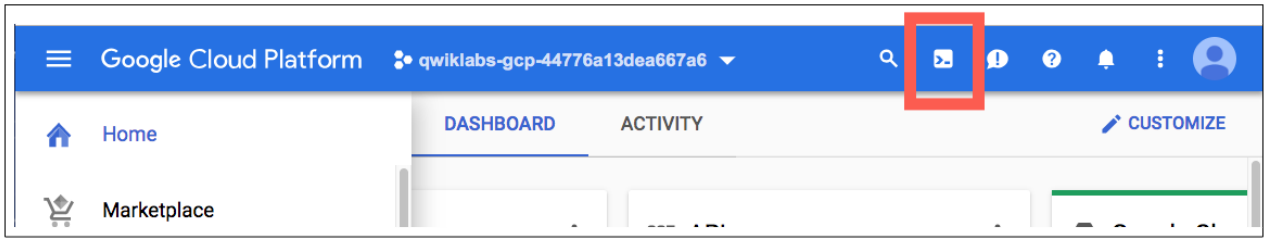
Note: You can view the menu with a list of Google Cloud Products and Services by clicking the **Navigation menu** at the top-left.



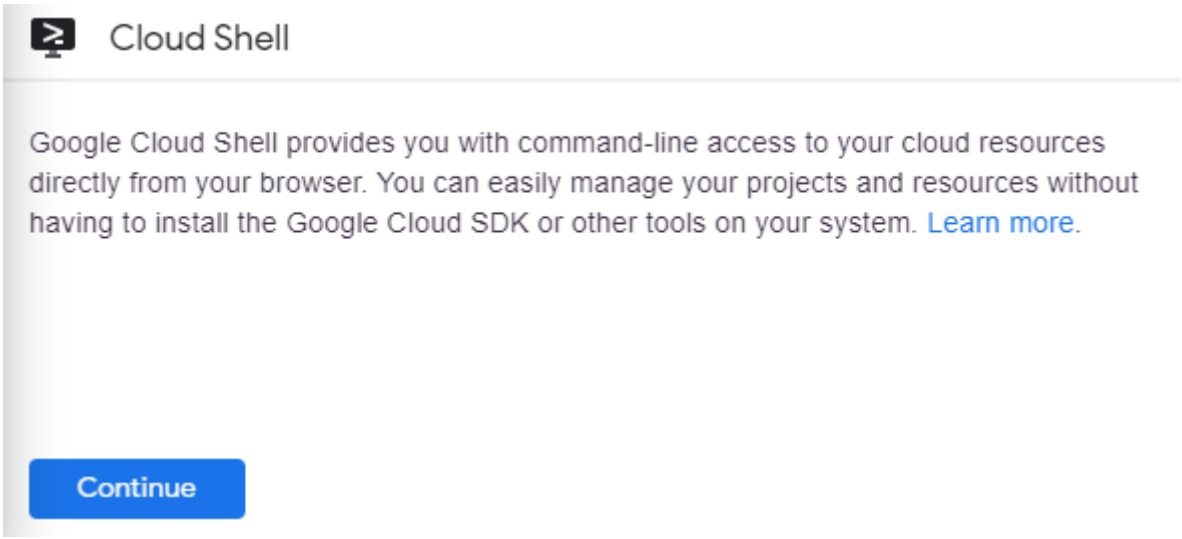
Activate Cloud Shell

Cloud Shell is a virtual machine that is loaded with development tools. It offers a persistent 5GB home directory and runs on the Google Cloud. Cloud Shell provides command-line access to your Google Cloud resources.

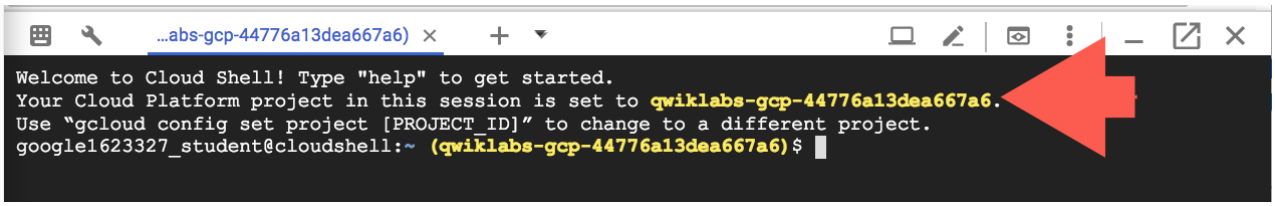
In the Cloud Console, in the top right toolbar, click the **Activate Cloud Shell** button.



Click **Continue**.



It takes a few moments to provision and connect to the environment. When you are connected, you are already authenticated, and the project is set to your *PROJECT_ID*. For example:



`gcloud` is the command-line tool for Google Cloud. It comes pre-installed on Cloud Shell and supports tab-completion.

You can list the active account name with this command:

gcloud auth list
(Output)

Credentialed accounts: - <myaccount>@<mydomain>.com (active)
(Example output)

Credentialed accounts: - google1623327_student@qwiklabs.net
You can list the project ID with this command:

gcloud config list project
(Output)

[core] project = <project_ID>
(Example output)

[core] project = qwiklabs-gcp-44776a13dea667a6
For full documentation of `gcloud` see the gcloud command-line tool overview.

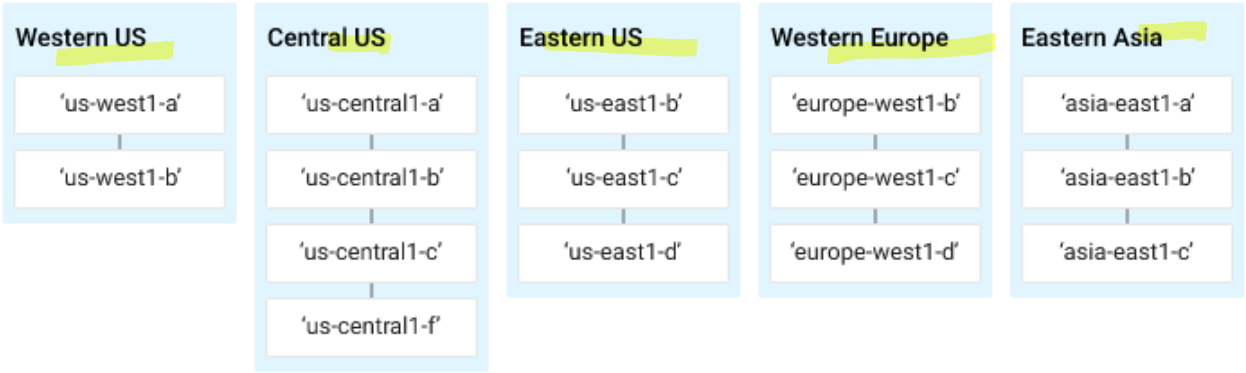
After Cloud Shell is activated, you can use the command line to invoke the Cloud SDK `gcloud` tool or other tools available on the virtual machine instance. Later in the lab, you will use your `$HOME` directory, which is used in persistent disk storage to store files across projects and between Cloud Shell sessions. Your `$HOME` directory is private to you and cannot be accessed by other users.

Task 1: Configure your environment

In this section, you'll learn about aspects of the development environment that you can adjust.

Understanding regions and zones

Certain Google Compute Engine resources live in regions or zones. A region is a specific geographical location where you can run your resources. Each region has one or more zones. For example, the `us-central1` region denotes a region in the Central United States that has zones `us-central1-a`, `us-central1-b`, `us-central1-c`, and `us-central1-f`. The following image shows zones in their respective regions:



Resources that live in a zone are referred to as *zonal* resources. Virtual machine instances and persistent disks live in a zone. If you want to attach a persistent disk to a virtual machine instance, both resources must be in the same zone. Similarly, if you want to assign a static IP address to an instance, the instance must be in the same region as the static IP address.

Learn more about regions and zones and see a complete list in Regions and Zones documentation.
To see what your default region and zone settings are, run the following commands:

gcloud config get-value compute/zone gcloud config get-value compute/region If the `google-compute-default-region` or `google-compute-default-zone` responses are (unset), that means no default zone or region is set.

Identify your default region and zone

1. Copy your project ID to your clipboard or text editor. The project ID is listed in 2 places:

- In the Google Cloud Console, on the Dashboard, under **Project info**. (Click **Navigation menu** (☰), and then click **Home > Dashboard**.)
- On the Qwiklabs tab near your username and password.

2. In Cloud Shell, run the following `gcloud` command, replacing `<your_project_ID>` with the project ID you copied:

gcloud compute project-info describe --project <your_project_ID>
Find the default zone and region metadata values in the output. You'll use the zone (`google-compute-default-zone`) from the output later in this lab.

If the `google-compute-default-region` and `google-compute-default-zone` keys and values are missing from the output, no default zone or region is set.

Set environment variables

Environment variables define your environment and help save time when you write scripts that contain APIs or executables.

1. Create an environment variable to store your Project ID, replacing `<your_project_ID>` with the value for *name* from the `gcloud compute project-info describe` command you ran earlier:

export PROJECT_ID=<your_project_ID>

2. Create an environment variable to store your Zone, replacing `<your_zone>` with the value for *zone* from the `gcloud compute project-info describe` command you ran earlier:

export ZONE=<your_zone>

3. To verify that your variables were set properly, run the following commands:

echo $PROJECT_ID echo $ZONE
If the variables were set correctly, the echo commands will output your Project ID and Zone.

Create a virtual machine with the gcloud tool

Use the `gcloud` tool to create a new virtual machine (VM) instance.

1. To create your VM, run the following command:

gcloud compute instances create gcelab2 --machine-type n1-standard-2 --zone $ZONE
Output:

```
Created [https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-04-a626314cdf97/zones/us-central1-a/instances/gcelab2].
NAME: gcelab2
ZONE: us-central1-a
MACHINE_TYPE: n1-standard-2
PREEMPTIBLE:
INTERNAL_IP: 10.128.0.2
EXTERNAL_IP: 34.72.120.247
STATUS: RUNNING
```

Command details

- `gcloud compute` allows you to manage your Compute Engine resources in a format that's simpler than the Compute Engine API.
- `instances create` creates a new instance.
- `gcelab2` is the name of the VM.
- The `--machine-type` flag specifies the machine type as *n1-standard-2*.
- The `--zone` flag specifies where the VM is created.
- If you omit the `--zone` flag, the `gcloud` tool can infer your desired zone based on your default properties. Other required instance settings, such as `machine type` and `image`, are set to default values if not specified in the `create` command.

Test completed task

Click **Check my progress** to verify your performed task. If you have successfully created a virtual machine with the `gcloud` tool, an assessment score is displayed.

Create a virtual machine with gcloud

To open help for the `create` command, run the following command:

gcloud compute instances create --help **Note:** Press ENTER or the spacebar to scroll through the help content. To exit the content, type **Q**.

Explore gcloud commands

The `gcloud` tool offers simple usage guidelines that are available by adding the `-h` flag (for help) onto the end of any `gcloud` command.

1. Run the following command:

gcloud -h

You can access more verbose help by appending the `--help` flag onto a command or running the `gcloud help` command.

2. Run the following command:

gcloud config --help **Note:** Press ENTER or the spacebar to scroll through the help content. To exit the content, type **Q**.

3. Run the following command:

gcloud help config

The results of the `gcloud config --help` and `gcloud help config` commands are equivalent. Both return long, detailed help.

Note: Press ENTER or the spacebar to scroll through the help content. To exit the content, type **Q**.

`gcloud` Global Flags govern the behavior of commands on a per-invocation level. Flags override any values set in SDK properties.

4. View the list of configurations in your environment:

```
gcloud config list
```

5. To see all properties and their settings:

```
gcloud config list --all
```

6. List your components:

```
gcloud components list
```

This command displays the gcloud components that are ready for you to use in this lab.

Task 2: Install a new component

Next, you'll install a gcloud component that makes working in the `gcloud` tool easier.

Auto-complete mode

`gcloud interactive` has auto prompting for commands and flags and displays inline help snippets in the lower section of the pane as the command is typed.

You can use dropdown menus to auto-complete static information, such as command and sub-command names, flag names, and enumerated flag values.

1. Install the beta components:

```
sudo apt-get install google-cloud-sdk
```

2. Enable the `gcloud interactive` mode:

```
gcloud beta interactive
```

When using the interactive mode, press TAB to complete file path and resource arguments. If a dropdown menu appears, press TAB to move through the list, and press the spacebar to select your choice.

3. To try this feature, start typing the following command, and use auto-complete to replace <your_vm> with an existing VM in your project:

```
gcloud compute instances describe <your_vm>
```

A list of commands is displayed below the Cloud Shell pane. Pressing F2 toggles the active help section to ON or OFF.

4. To exit from the interactive mode, run the following command:

```
exit
```

Task 3: Connect to your VM instance with SSH

`gcloud compute` makes connecting to your instances easy. The `gcloud compute ssh` command provides a wrapper around SSH, which takes care of authentication and the mapping of instance names to IP addresses.

1. To connect to your VM with SSH, run the following command:

gcloud compute ssh gcelab2 --zone $ZONE
Output:

WARNING: The public SSH key file for gcloud does not exist. WARNING: The private SSH key file for gcloud does not exist. WARNING: You do not have an SSH key for gcloud. WARNING: [/usr/bin/ssh-keygen] will be executed to generate a key. This tool needs to create the directory [/home/gcpstaging306_student/.ssh] before being able to generate SSH Keys. Do you want to continue? (Y/n)

2. To continue, type **Y**.

Generating public/private rsa key pair. Enter passphrase (empty for no passphrase)

3. To leave the passphrase empty, press **ENTER** twice.

4. You don't need to do anything here, so to disconnect from SSH and exit the remote shell, run the following command:

exit
You should be back at your project's command prompt.

Task 4: Use the Home directory

Now try out your Home directory. The contents of your Cloud Shell Home directory persist across projects between all Cloud Shell sessions, even after the virtual machine is terminated and restarted.

1. Change your current working directory:

cd $HOME

2. Open your `.bashrc` configuration file by using the `vi` text editor:

vi ./.bashrc
The editor opens and displays the contents of the file.

3. To exit the editor, press **ESC**, then type `:wq`, and then press **Enter**.

Test your understanding

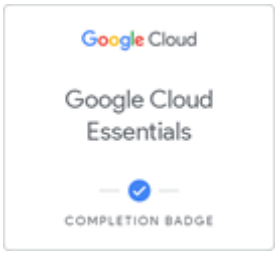
The following multiple-choice question should reinforce your understanding of this lab's concepts.

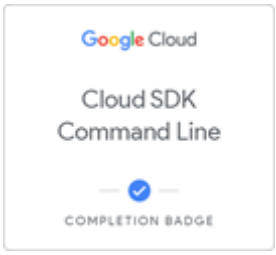
Congratulations!

You learned how to launch Cloud Shell and run some sample `gcloud` commands.

Finish your Quest

This self-paced lab is part of the Qwiklabs Google Cloud Essentials and Using the Cloud SDK Command Line Quests. A Quest is a series of related labs that form a learning path. Completing this Quest earns you the badge above to recognize your achievement. You can make your badge (or badges) public and link to them in your online resume or social media account. Enroll in a Quest and get immediate completion credit for taking this lab. See other available Qwiklabs Quests.





Take your next lab

Continue your Quest with Provision Services with Google Cloud Marketplace, or check out these suggestions:

- Creating a Persistent Disk
- Configuring Networks via gcloud

Next steps/learn more

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Lab Last Tested November 30, 2021

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