Getting Started with Cloud Shell & gcloud

Overview

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

In this hands-on lab you will learn how to connect to computing resources hosted on the Google Cloud Platform via Cloud Shell with the `gcloud` command-line.

Students 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 the Google Cloud Platform.

Prerequisites

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

Setup

What you need

To complete this lab, you need:

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

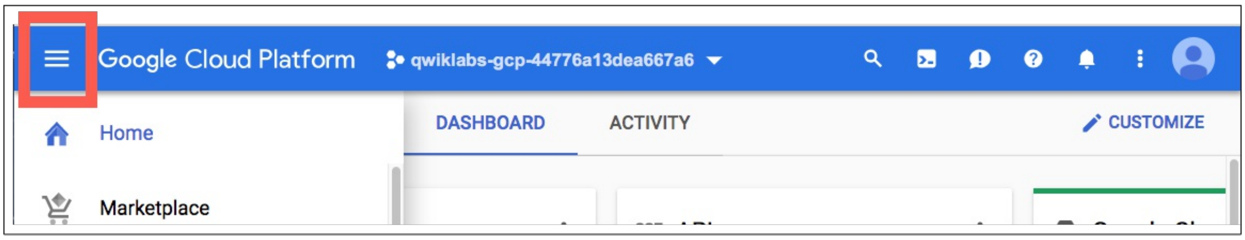
Note: If you already have your own personal GCP account or project, do not use it for this lab.

How to start your lab and sign in to the Console

- Open https://console.cloud.google.com/
- Enter login credentials

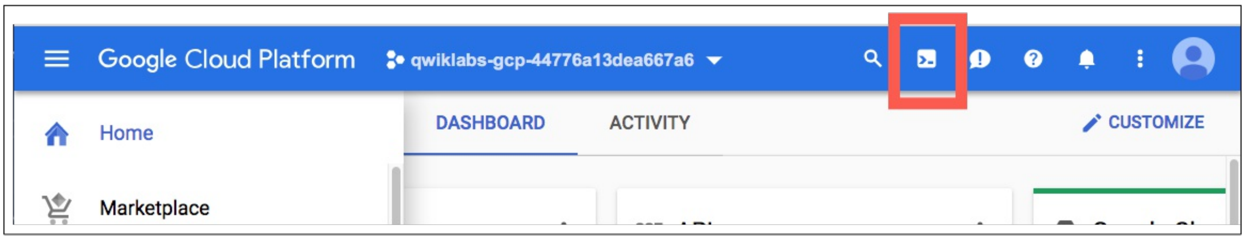
After a few moments, the GCP console opens in this tab.

Note: You can view the menu with a list of GCP Products and Services by clicking the **Navigation menu** at the top-left, next to “Google Cloud Platform”.

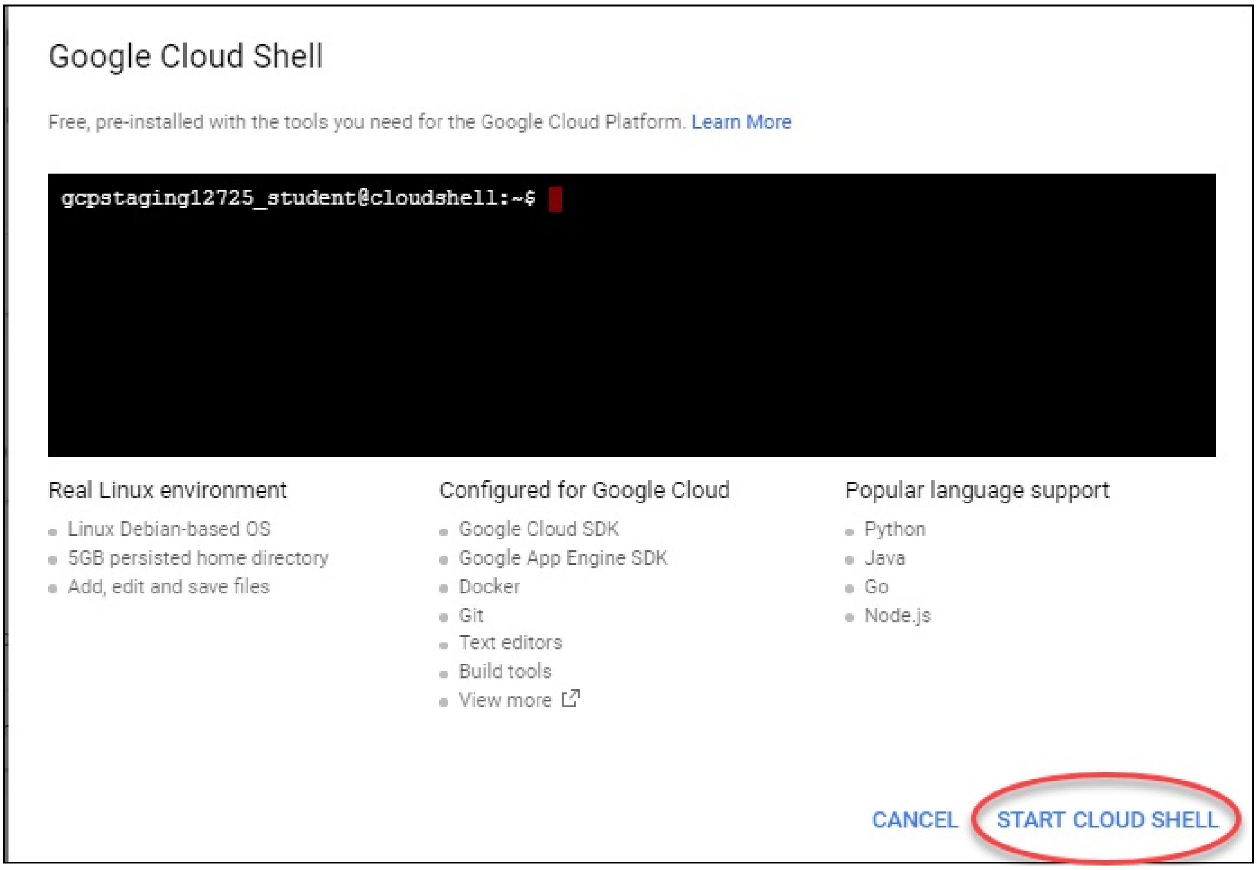


Start Cloud Shell

Open a Cloud Shell session by clicking on the icon in the top right corner of the GCP Console:



Then Start Cloud Shell:



Google Cloud Shell

Free, pre-installed with the tools you need for the Google Cloud Platform. Learn More

```
gcpstaging12725_student@cloudshell:~$
```

Real Linux environment

- Linux Debian-based OS
- 5GB persisted home directory
- Add, edit and save files

Configured for Google Cloud

- Google Cloud SDK
- Google App Engine SDK
- Docker
- Git
- Text editors
- Build tools
- View more

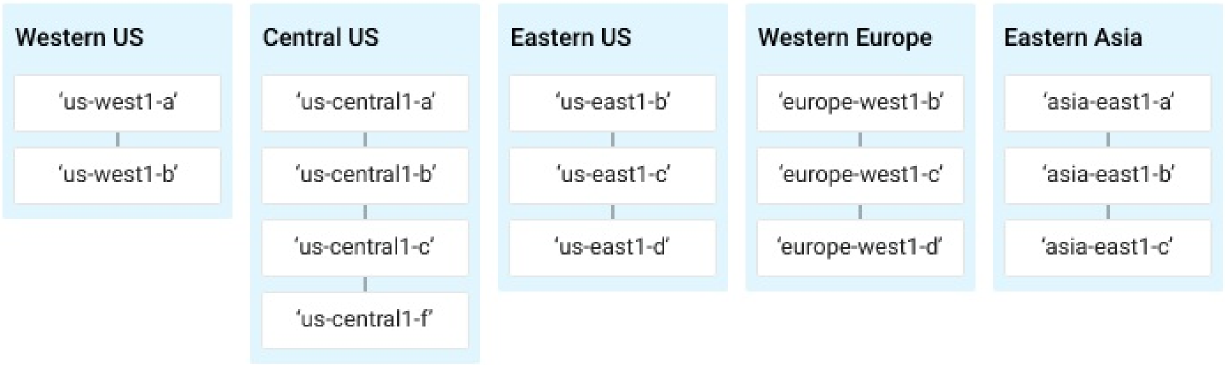
Popular language support

- Python
- Java
- Go
- Node.js

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

Understanding Regions and Zones

Certain Compute Engine resources live in regions or zones. A region is a specific geographical location w here 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` .



Western US	Central US	Eastern US	Western Europe	Eastern Asia
‘us-west1-a’	‘us-central1-a’	‘us-east1-b’	‘europe-west1-b’	‘asia-east1-a’
‘us-west1-b’	‘us-central1-b’	‘us-east1-c’	‘europe-west1-c’	‘asia-east1-b’
	‘us-central1-c’	‘us-east1-d’	‘europe-west1-d’	‘asia-east1-c’
	‘us-central1-f’			

Resources that live in a zone are referred to as zonal resources. Virtual machine Instances and persistent disks live in a zone. 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.

Learn more about regions and zones and see a complete list in Regions & Zones documentation.

Default regions and zones are set by using the following values:

`google-compute-default-zone` `google-compute-default-region`

To see what your default region and zone settings are, run the following `gcloud` command, replacing <your_project_id\> which you can see on the Home page in the Console or look in the Qwiklabs tab where you started this lab, with your Project ID:

```
gcloud compute project-info describe --project <your_project_ID>
```

You'll use the zone (`google-compute-default-zone`) from the output later in this lab.

Look for the default zone and region metadata values in the response. If the `google-compute-default-region` and `google-compute-default-zone` keys and values are missing from the response, that means no default zone or region is set.

Initializing Cloud SDK

The `gcloud` CLI is a part of the Google Cloud SDK. You need to download and install the SDK on your own system and initialize it (by running `gcloud init`) before you can use the `gcloud` command-line tool.

The `gcloud` CLI is automatically available in Cloud Shell. Since you're using Cloud Shell for this lab, you don't need to install `gcloud` manually.

Setting environment variables

Environment variables are variables that define your environment. Define your own variables and save yourself time when writing scripts that contain APIs or executables.

Make a couple of environment variables:

```
export PROJECT_ID=<your_project_ID>
```

Set your ZONE environment variable (use the value for zone from the earlier command):

```
export ZONE=<your_zone>
```

Verify that your variables were set properly:

```
echo $PROJECT_ID
echo $ZONE
```

Create a virtual machine with gcloud

Create a new virtual machine instance using `gcloud`. In the following command you'll use:

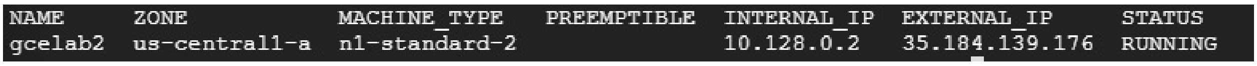
- `gcloud compute` which enables you to easily manage your Google Compute Engine resources in a friendlier format than using the Compute Engine API.
- `instances create` creates a new instance.

Run the following to create your vm:

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

- The name of the vm is "gcelab2",
- You're using the `--machine-type` flag to specify the machine type as "n1-standard-2"
- You're using the `--zone` flag to specify that it gets created in the zone you defined with your environment variable.

(Output)



```
NAME     ZONE           MACHINE_TYPE   PREEMPTIBLE  INTERNAL_IP  EXTERNAL_IP     STATUS
gcelab2  us-central1-a  n1-standard-2               10.128.0.2   35.184.139.176  RUNNING
```

If you omit the `--zone` flag, `gcloud` can infer your desired zone based on your default properties. Other required instance settings, like `machine type` and `image`, if not specified in the create command, are set to default values.

Test Completed Task

Click **Check my progress** to verify your performed task. If you have successfully created a virtual machine with gcloud, you will see an assessment score.

Create a virtual machine with gcloud

You can see the default values by displaying help for the `create` command:

```
gcloud compute instances create --help
```

Using gcloud commands

`gcloud` offers simple usage guidelines that are available by adding the

`-h` flag (for help) onto the end of any `gcloud` invocation.

Run the following command in Cloud Shell:

```
gcloud -h
```

More verbose help can be obtained by appending `--help` flag, or executing `gcloud help` command. Run the following in Cloud Shell:

```
gcloud config --help
```

Use the **Enter** key or the **Spacebar** to scroll through the help content.

Type `q` to exit the content.

Now run the following command:

```
gcloud help config
```

You can see that the `gcloud config --help` and `gcloud help config` commands are equivalent. Both give long, detailed help.

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

View the list of configurations in your environment:

```
gcloud config list
```

To check how other properties are set, see all properties by calling:

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

List your `components`:

```
gcloud components list
```

Here you will see what components are ready for you to use in this lab. Next you'll install a new component.

Auto-completion

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

Static information, like command and sub-command names, and flag names and enumerated flag values, are auto-completed using dropdown menus.

Install the beta components:

```
gcloud components install beta
```

Enter the `gcloud interactive` mode:

```
gcloud beta interactive
```

When using the interactive mode, click on the **Tab** key to complete file path and resource arguments. If a dropdown menu appears, use the **Tab** key to move through the list, and the **Space bar** to select your choice.

Try it out! Start typing the following command, using auto-complete to finish the command:

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

Across the bottom of Cloud Shell you can see the shortcut to toggle this feature. Try out the F2 toggle:

F2:help:STATE Toggles the active help section, ON when enabled, OFF when disabled.

SSH into your vm instance

`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 name to IP address.

Use `gcloud compute ssh` to SSH into your vm:

```
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.
```

Type "Y" to continue:

```
Do you want to continue? (Y/n)
```

Press the **Enter** key through the passphrase section to leave the passphrase empty.

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

You don't need to do anything here, so disconnect from SSH by exiting from the remote shell by typing "exit":

```
exit
```

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

Use the Home directory

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

Change your current working directory:

```
cd $HOME
```

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

```
vi ./.bashrc
```

The editor opens and displays the contents of the file. Press the `ESC` key and then `:wq` to exit the editor.

Test your Understanding

Below is a multiple choice question to reinforce your understanding of this lab's concepts. Answer to the best of your abilities.

Congratulations!

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

Next steps / Learn More

- Cloud Shell Documentation and tutorial video.
- `gcloud` Documentation and tutorial video.