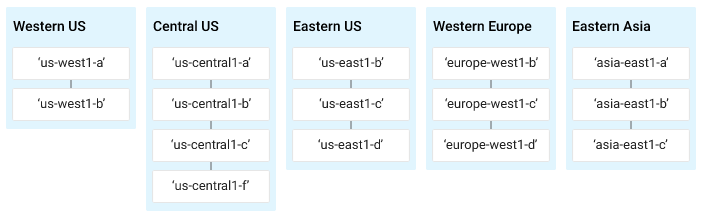
**Understanding Regions and Zones**

Certain 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.



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](https://cloud.google.com/compute/docs/regions-zones/).

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 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 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)



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

Check my progress

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](https://cloud.google.com/sdk/gcloud/reference/) 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:

sudo apt-get install google-cloud-sdk

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.

Three basic ways to interact with the Google Cloud services and resources:

checkCommand-line interface



GLib



GStreamer

checkClient libraries

checkCloud Console

Submit

**Congratulations!**

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

Finish Your Quest

This self-paced lab is part of the Qwiklabs [Google Cloud Essentials](https://google.qwiklabs.com/quests/23) and [Using the Cloud SDK Command Line](https://google.qwiklabs.com/quests/95) 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 if you've taken this lab. [See other available Qwiklabs Quests](https://google.qwiklabs.com/catalog).

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* Cloud Shell [Documentation](https://cloud.google.com/shell/docs/) and [tutorial video](https://www.youtube.com/watch?v=hBMcAKzGt3w).
* gcloud [Documentation](https://cloud.google.com/sdk/gcloud/) and [tutorial video](https://www.youtube.com/watch?v=oTIK9OvQBxQ&list=PLIivdWyY5sqIij_cgINUHZDMnGjVx3rxi&index=15).