

GCP Fundamentals: Getting Started with Kubernetes Engine

35 minutesFree★★★★★1Rate Lab

Overview

In this lab, you create a Kubernetes Engine cluster containing several containers, each containing a web server. You place a load balancer in front of the cluster and view its contents.

Objectives

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

- Provision a [Kubernetes](#) cluster using [Kubernetes Engine](#).
- Deploy and manage Docker containers using `kubectl`.

Task 1: Sign in to the Google Cloud Platform (GCP) Console

What you'll need

To complete this lab, you'll need:

- Access to a standard internet browser (Chrome browser recommended).
- Time. Note the lab's **Completion** time in Qwiklabs. This is an estimate of the time it should take to complete all steps. Plan your schedule so you have time to complete the lab. Once you start the lab, you will not be able to pause and return later (you begin at step 1 every time you start a lab).
- The lab's **Access** time is how long your lab resources will be available. If you finish your lab with access time still available, you will be able to explore the Google Cloud Platform or work on any section of the lab that was marked "if you have time". Once the Access time runs out, your lab will end and all resources will terminate.
- You **DO NOT** need a Google Cloud Platform account or project. An account, project and associated resources are provided to you as part of this lab.
- If you already have your own GCP account, make sure you do not use it for this lab.
- If your lab prompts you to log into the console, **use only the student account provided to you by the lab**. This prevents you from incurring charges for lab activities in your personal GCP account.

Start your lab

When you are ready, click **Start Lab**. You can track your lab's progress with the status bar at the top of your screen.

Important What is happening during this time? Your lab is spinning up GCP resources for you behind the scenes, including an account, a project, resources within the project, and permission for you to control the resources needed to run the lab. This means that instead of spending time manually setting up a project and building resources from scratch as part of your lab, you can begin learning more quickly.

Find Your Lab's GCP Username and Password

To access the resources and console for this lab, locate the Connection Details panel in Qwiklabs. Here you will find the account ID and password for the account you will use to log in to the Google Cloud Platform:

CONNECTION DETAILS

OPEN GOOGLE CONSOLE

USERNAME

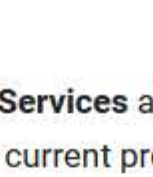
google822-student@wikilabs.net

PASSWORD

TZj84X786

If your lab provides other resource identifiers or connection-related information, it will appear on this panel as well.

Task 2: Confirm that needed APIs are enabled

- Make a note of the name of your GCP project. This value is shown in the top bar of the Google Cloud Platform Console. It will be of the form `qwiklabs-gcp-` followed by hexadecimal numbers.
- In the GCP Console, on the **Navigation menu** () , click **APIs & Services**.
- Scroll down in the list of enabled APIs, and confirm that both of these APIs are enabled:
 - Kubernetes Engine API
 - Container Registry API

If either API is missing, click **Enable APIs and Services** at the top. Search for the above APIs by name and enable each for your current project. (You noted the name of your GCP project above.)

Task 3: Start a Kubernetes Engine cluster

- On the **Google Cloud Platform** menu, click **Activate Cloud Shell** (). If a dialog box appears, click **Start Cloud Shell**.

- For convenience, place the zone that Qwiklabs assigned you to into an environment variable called `MY_ZONE`. At the Cloud Shell prompt, type this partial command:

```
export MY_ZONE=
```

followed by the zone that Qwiklabs assigned to you. Your complete command will look like this:

```
export MY_ZONE=us-central1-a
```

- Start a Kubernetes cluster managed by Kubernetes Engine. Name the cluster **webfrontend** and configure it to run 2 nodes:

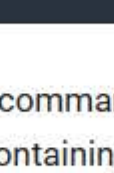
```
gcloud container clusters create webfrontend --zone $MY_ZONE --num-nodes 2
```

It takes several minutes to create a cluster as Kubernetes Engine provisions virtual machines for you.

- After the cluster is created, check your installed version of Kubernetes using the `kubectl version` command:

```
kubectl version
```

The `gcloud container clusters create` command automatically authenticated `kubectl` for you.

- View your running nodes in the GCP Console. On the **Navigation menu** () , click **Compute Engine > VM Instances**.

Your Kubernetes cluster is now ready for use.

Task 4: Run and deploy a container

- From your Cloud Shell prompt, launch a single instance of the `nginx` container. (`nginx` is a popular web server.)

```
kubectl run nginx --image=nginx:1.10.0
```

In Kubernetes, all containers run in pods. This use of the `kubectl run` command caused Kubernetes to create a deployment consisting of a single pod containing the `nginx` container. A Kubernetes deployment keeps a given number of pods up and running even in the event of failures among the nodes on which they run. In this command, you launched the default number of pods, which is 1.

- View the pod running the `nginx` container:

```
kubectl get pods
```

- Expose the `nginx` container to the Internet:

```
kubectl expose deployment nginx --port 80 --type LoadBalancer
```

Kubernetes created a service and an external load balancer with a public IP address attached to it. The IP address remains the same for the life of the service. Any network traffic to that public IP address is routed to pods behind the service: in this case, the `nginx` pod.

- View the new service:

```
kubectl get services
```

You can use the displayed external IP address to test and contact the `nginx` container remotely.

It may take a few seconds before the **ExternalIP** field is populated for your service. This is normal. Just re-run the `kubectl get services` command every few seconds until the field is populated.

- Open a new web browser tab and paste your cluster's external IP address into the address bar. The default home page of the `nginx` browser is displayed.

- Scale up the number of pods running on your service:

```
kubectl scale deployment nginx --replicas 3
```

Scaling up a deployment is useful when you want to increase available resources for an application that is becoming more popular.

- Confirm that Kubernetes has updated the number of pods:

```
kubectl get pods
```

- Confirm that your external IP address has not changed:

```
kubectl get services
```

- Return to the web browser tab in which you viewed your cluster's external IP address. Refresh the page to confirm that the `nginx` web server is still responding.

Congratulations!

In this lab, you configured a Kubernetes cluster in Kubernetes Engine. You populated the cluster with several pods containing an application, exposed the application, and scaled the application.

End your lab

When you have completed your lab, click **End Lab**. Qwiklabs removes the resources you've used and cleans the account for you.

You will be given an opportunity to rate the lab experience. Select the applicable number of stars, type a comment, and then click **Submit**.

The number of stars indicates the following:

- 1 star = Very dissatisfied
- 2 stars = Dissatisfied
- 3 stars = Neutral
- 4 stars = Satisfied
- 5 stars = Very satisfied

You can close the dialog box if you don't want to provide feedback.

For feedback, suggestions, or corrections, please use the **Support** tab.

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More resources

Read the [Google Cloud Platform documentation on Kubernetes Engine](#).

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