Perform Foundational Infrastructure Tasks in Google Cloud: Challenge Lab

GSP315

Overview

In a challenge lab you're given a scenario and a set of tasks. Instead of following step-by-step instructions, you will use the skills learned from the labs in the quest to figure out how to complete the tasks on your own! An automated scoring system (shown on this page) will provide feedback on whether you have completed your tasks correctly.

When you take a challenge lab, you will not be taught new Google Cloud concepts. You are expected to extend your learned skills, like changing default values and reading and researching error messages to fix your own mistakes.

To score 100% you must successfully complete all tasks within the time period!

This lab is recommended for students who have enrolled in the Foundational Infrastructure Tasks in Google Cloud quest. Are you ready for the challenge?

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 Qwiklabs 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

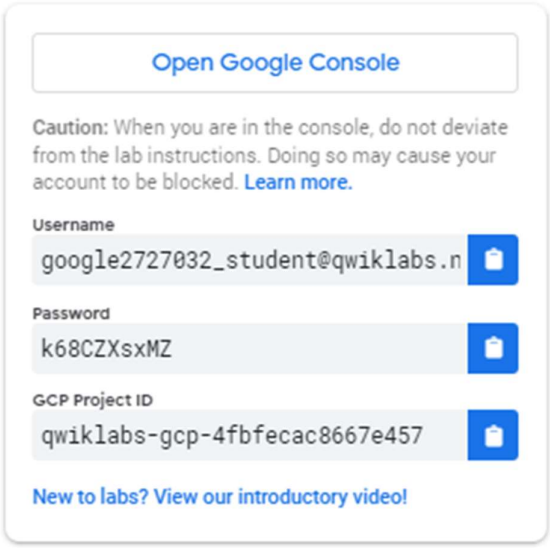
To complete this lab, you need:

- 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.

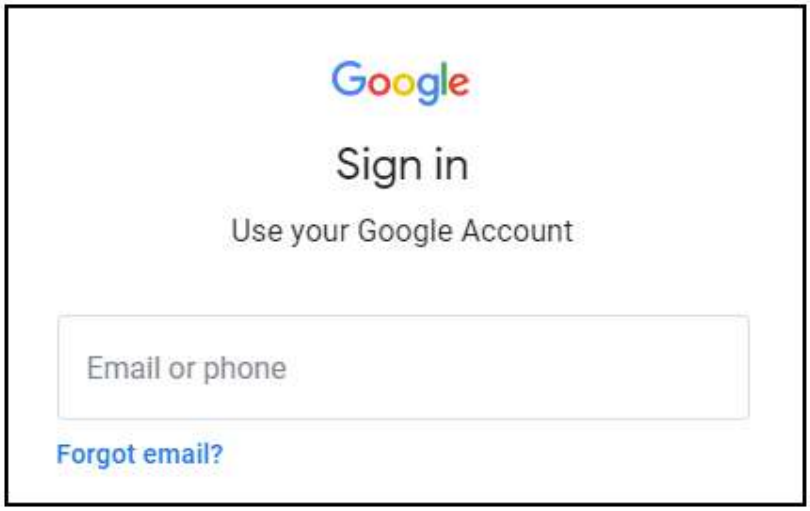
Note: If you are using a Pixelbook, open an Incognito window to run this lab.

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.

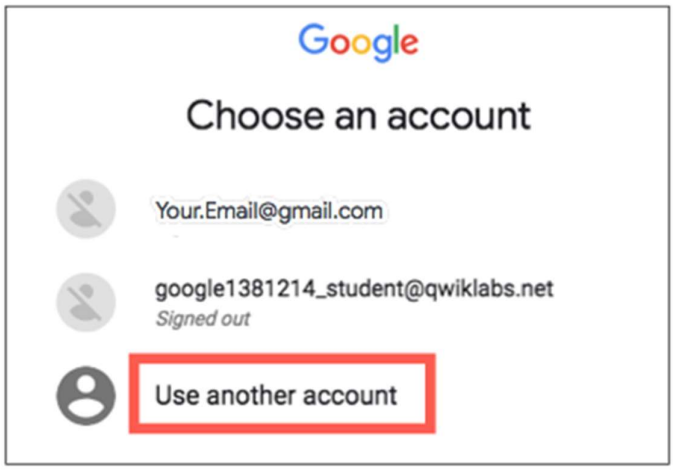


2. Copy the username, and then click **Open Google Console**. The lab spins up resources, and then opens another tab that shows the **Sign in** page.



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 Connection Details panel. Then copy and paste the password.

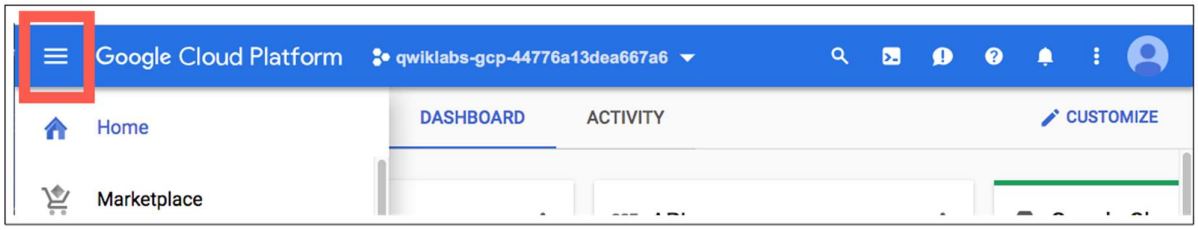
   Important: You must use the credentials from the Connection Details panel. Do not use your Qwiklabs credentials. If you have your own Google Cloud account, do not use it for this lab (avoids incurring charges).

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.



Challenge scenario

You are just starting your junior cloud engineer role with Jooli inc. So far you have been helping teams create and manage Google Cloud resources.

You are expected to have the skills and knowledge for these tasks so don't expect step-by-step guides.

Your challenge

You are now asked to help a newly formed development team with some of their initial work on a new project around storing and organizing photographs, called memories. You have been asked to assist the memories team with initial configuration for their application development environment; you receive the following request to complete the following tasks:

1. Create a bucket for storing the photographs.
2. Create a Pub/Sub topic that will be used by a Cloud Function you create.
3. Create a Cloud Function.
4. Remove the previous cloud engineer's access from the memories project.
   Some Jooli Inc. standards you should follow:

- Create all resources in the **us-east1** region and **us-east1-b** zone, unless otherwise directed.
- Use the project VPCs.
- Naming is normally *team-resource*, e.g. an instance could be named **kraken-webserver1**
- Allocate cost effective resource sizes. Projects are monitored and excessive resource use will result in the containing project's termination (and possibly yours), so beware. This is the guidance the monitoring team is willing to share; unless directed, use **f1-micro** for small Linux VMs and **n1-standard-1** for Windows or other applications such as Kubernetes nodes.
  Each task is described in detail below, good luck!

Task 1: Create a bucket

You need to create a bucket for the storage of the photographs.

Click *Check my progress* to verify the objective.

Create a bucket

Check my progress

If you don't get a green check mark, please click on the Score fly-out on the top right and click Run Step on the relevant step. You will see a hint pop up giving you advice.

Task 2: Create a Pub/Sub topic

Create a Pub/Sub topic for the Cloud Function to send messages.

Click *Check my progress* to verify the objective.

Task 3: Create the thumbnail Cloud Function

Create a Cloud Function that executes every time an object is created in the bucket you created in task 1. The function is written in Node.js 10. Make sure you set the **Entry point** (Function to execute) to `thumbnail` and **Trigger** to `Cloud Storage`.

In line 15 of index.js replace the text **REPLACE_WITH_YOUR_TOPIC ID** with the `Topic ID` you created in task 2.

Your line 15 will look something like: `const topicName = "MyTopic";`
index.js:

```
/* globals exports, require */
//jshint strict: false
//jshint esversion: 6
"use strict";
const crc32 = require("fast-crc32c");
const gcs = require("@google-cloud/storage")();
const PubSub = require("@google-cloud/pubsub");
const imagemagick = require("imagemagick-stream");

exports.thumbnail = (event, context) => {
  const fileName = event.name;
  const bucketName = event.bucket;
  const size = "64x64"
  const bucket = gcs.bucket(bucketName);
  const topicName = "REPLACE_WITH_YOUR_TOPIC ID";
  const pubsub = new PubSub();
  if ( fileName.search("64x64_thumbnail") == -1 ){
    // doesn't have a thumbnail, get the filename extension
    var filename_split = fileName.split('.');
    var filename_ext = filename_split[filename_split.length - 1];
    var filename_without_ext = fileName.substring(0, fileName.length -
filename_ext.length );
    if (filename_ext.toLowerCase() == 'png' || filename_ext.toLowerCase() == 'jpg'){
      // only support png and jpg at this point
      console.log(`Processing Original: gs://${bucketName}/${fileName}`);
      const gcsObject = bucket.file(fileName);
      let newFilename = filename_without_ext + size + '_thumbnail.' + filename_ext;
      let gcsNewObject = bucket.file(newFilename);
      let srcStream = gcsObject.createReadStream();
      let dstStream = gcsNewObject.createWriteStream();
      let resize = imagemagick().resize(size).quality(90);
      srcStream.pipe(resize).pipe(dstStream);
      return new Promise((resolve, reject) => {
        dstStream
          .on("error", (err) => {
            console.log(`Error: ${err}`);
            reject(err);
          })
          .on("finish", () => {
            console.log(`Success: ${fileName} → ${newFilename}`);
              // set the content-type
              gcsNewObject.setMetadata(
              {
```

```
                contentType: 'image/'+ filename_ext.toLowerCase()
              }, function(err, apiResponse) {});
              pubsub
                .topic(topicName)
                .publisher()
                .publish(Buffer.from(newFilename))
                .then(messageId => {
                  console.log(`Message ${messageId} published.`);
                })
                .catch(err => {
                  console.error('ERROR:', err);
                });

          });
      });
    }
    else {
      console.log(`gs://${bucketName}/${fileName} is not an image I can handle`);
    }
  }
  else {
    console.log(`gs://${bucketName}/${fileName} already has a thumbnail`);
  }
};content_copy
```

package.json:

```
{
  "name": "thumbnails",
  "version": "1.0.0",
  "description": "Create Thumbnail of uploaded image",
  "scripts": {
    "start": "node index.js"
  },
  "dependencies": {
    "@google-cloud/storage": "1.5.1",
    "@google-cloud/pubsub": "^0.18.0",
    "fast-crc32c": "1.0.4",
    "imagemagick-stream": "4.1.1"
  },
  "devDependencies": {},
  "engines": {
    "node": ">=4.3.2"
  }
}content_copy
```

You must upload one JPG or PNG image into the bucket, we will verify the thumbnail was created (after creating the function successfully). Use any JPG or PNG image, or use this image `https://storage.googleapis.com/cloud-training/gsp315/map.jpg`; download the image to your machine and then upload that file to your bucket. You will see a thumbnail image appear shortly afterwards (use **REFRESH** in the bucket details).

Click *Check my progress* to verify the objective.

Verify the Cloud Function worked

Check my progress

If you don't get a green check mark, please click on the Score fly-out on the top right and click Run Step on the relevant step. You will see a hint pop up giving you advice.

Task 4: Remove the previous cloud engineer

You will see that there are two users, one is your account (with the role of Owner) and the other is the previous cloud engineer (with the role of Viewer). We like to keep our security tight, so please remove the previous cloud engineer's access to the project.

Click *Check my progress* to verify the objective.

Remove the previous cloud engineer

Check my progress

If you don't get a green check mark, please click on the Score fly-out on the top right and click Run Step on the relevant step. You will see a hint pop up giving you advice.

Congratulations!

Earn Your Next Skill Badge

This self-paced lab is part of the Perform Foundational Infrastructure Tasks in Google Cloud Quest. A Quest is a series of related labs that form a learning path. Completing this skill badge quest earns you the badge above, to recognize your achievement. Share your badge on your resume and social platforms, and announce your accomplishment using #GoogleCloudBadge.
This skill badge quest is part of Google's Cloud Engineer and Cloud Architect learning paths. Continue your learning journey by enrolling in the Set Up and Configure a Cloud Environment in Google Cloud quest.

Google Cloud Training & Certification

...helps you make the most of Google Cloud technologies. Our classes include technical skills and best practices to help you get up to speed quickly and continue your learning journey. We offer fundamental to advanced level training, with on-demand, live, and virtual options to suit your busy schedule. Certifications help you validate and prove your skill and expertise in Google Cloud technologies.
Manual Last Updated February 12, 2021
Lab Last Tested February 11, 2021

Solution:

Task 1: User 1

gsutil mb gs://<YOUR-BUCKET-NAME>

check my progress

Task 2:

gcloud pubsub topics create myTopic

check my progress

Task 3:

1. In the console, click the Navigation menu > Cloud Functions.
2. Click create function
3. In the Create function dialog, enter the following values:
    1. Name : GCFunction
    2. Trigger Type : Cloud Storage
    3. Event Type : Finalize/Create
    4. Browse the bucket you have created and click Save.
    5. Click Save
    6. click Next
    7. Set Runtime as Node.js 10
    8. Entry point : thumbnail
4. replace code for index.js and package.json
5. click **Deploy**

Task 4:

1. Go to IAM & Admin -> IAM
2. Search for Username 2
3. Remove it.
4. check my progress