Configure a Firewall and a Startup Script with Deployment Manager

GSP302

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 only recommended for students who have Compute Engine skills. Are you up for the challenge?

Topics tested

- Configure a deployment template to include a startup script
- Configure a deployment template to add a firewall rule allowing http traffic
- Configure a deployment template to add a networking tag to a compute instance
- Deploy a configuration using Deployment Manager

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

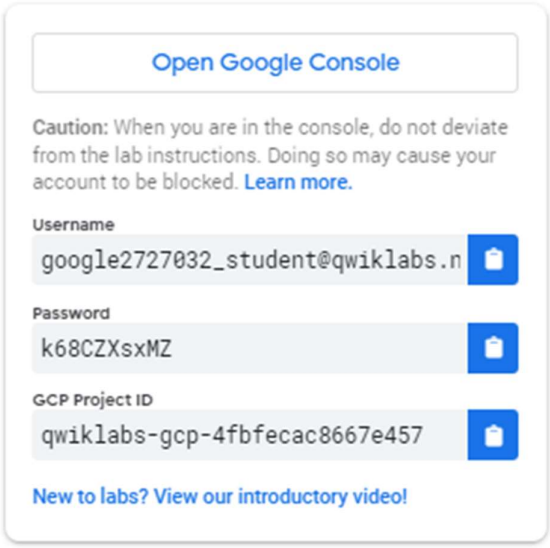
To complete this lab, you need:

- 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.

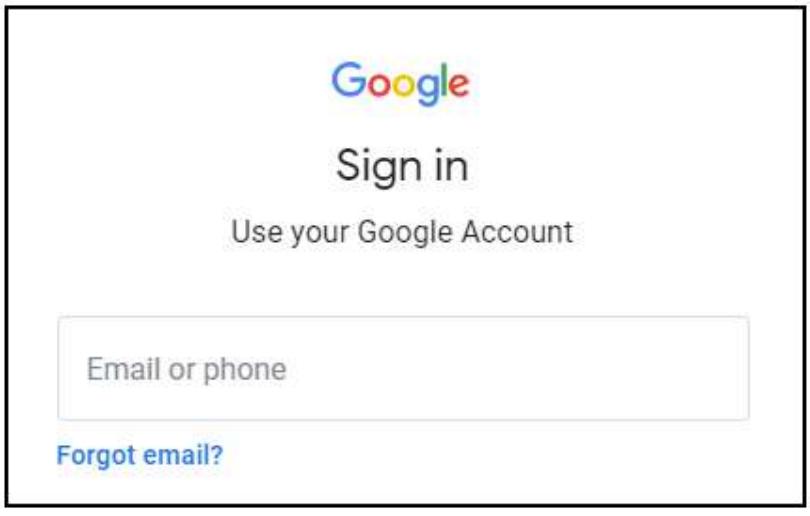
Note: If you are using a Pixelbook, open an Incognito window to run this lab.

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.

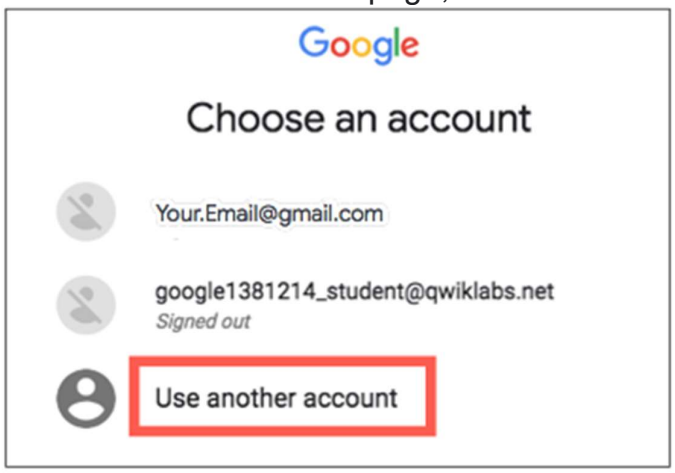


2. Copy the username, and then click **Open Google Console**. The lab spins up resources, and then opens another tab that shows the **Sign in** page.



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.

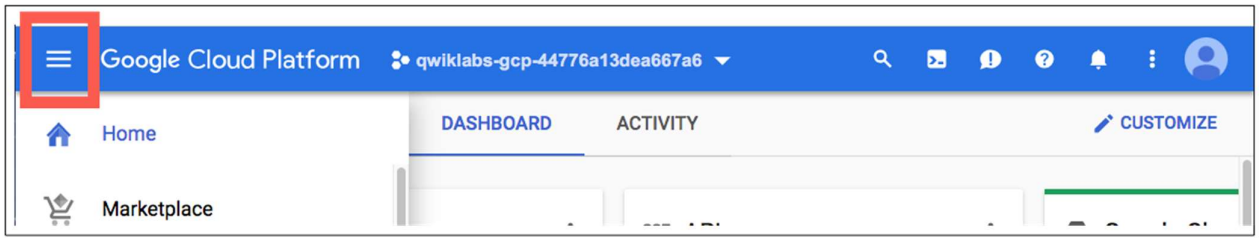
   Important: You must use the credentials from the Connection Details panel. Do not use your Qwiklabs credentials. If you have your own Google Cloud account, do not use it for this lab (avoids incurring charges).

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

Your company is ready to launch a brand new product and you have been asked to develop a Deployment Manager template to deploy and configure the Google Cloud environment that is required to support this product. To start off, you've been given an existing basic deployment manager template that just deploys a single compute instance.

Your challenge

Modify the Deployment Manager template to add a firewall rule to:

- Allow inbound HTTP traffic to tagged instances.
- Include a startup script for the compute instance that installs the Apache web server application.
- Add the firewall tag to the compute instance that is created so that it can be accessed from the internet.

Start your task

Download the baseline Deployment Manager template

A basic Deployment Manager template that just deploys a virtual machine already exists. You can download and unpack the `.jinja`, `.yaml` and `.jinja.schema` files as well as the sample startup script to your Cloud Shell using the following commands:

```
mkdir deployment_manager
cd deployment_manager
gsutil cp gs://spls/gsp302/* .
```
content_copy

Tasks

The key tasks that you need for the challenge are listed below. Good luck!

- Modify the Deployment Manager template to create a tagged firewall rule that allows inbound HTTP traffic.
- Modify the deployment manager template to add the startup script to the compute instance.
- Modify the deployment manager template to add the firewall rule tag that allows inbound HTTP traffic to the instance.
- Deploy the configuration.

Testing the deployments

Test the deployment as many times as you need to, but remember that you must clean up test deployments by deleting the named deployment itself before retrying a deployment with a modified template.

Installing your application

The startup script provided installs the Apache web server software. This serves as a placeholder that allows you to test whether your deployment has successfully completed all tasks.

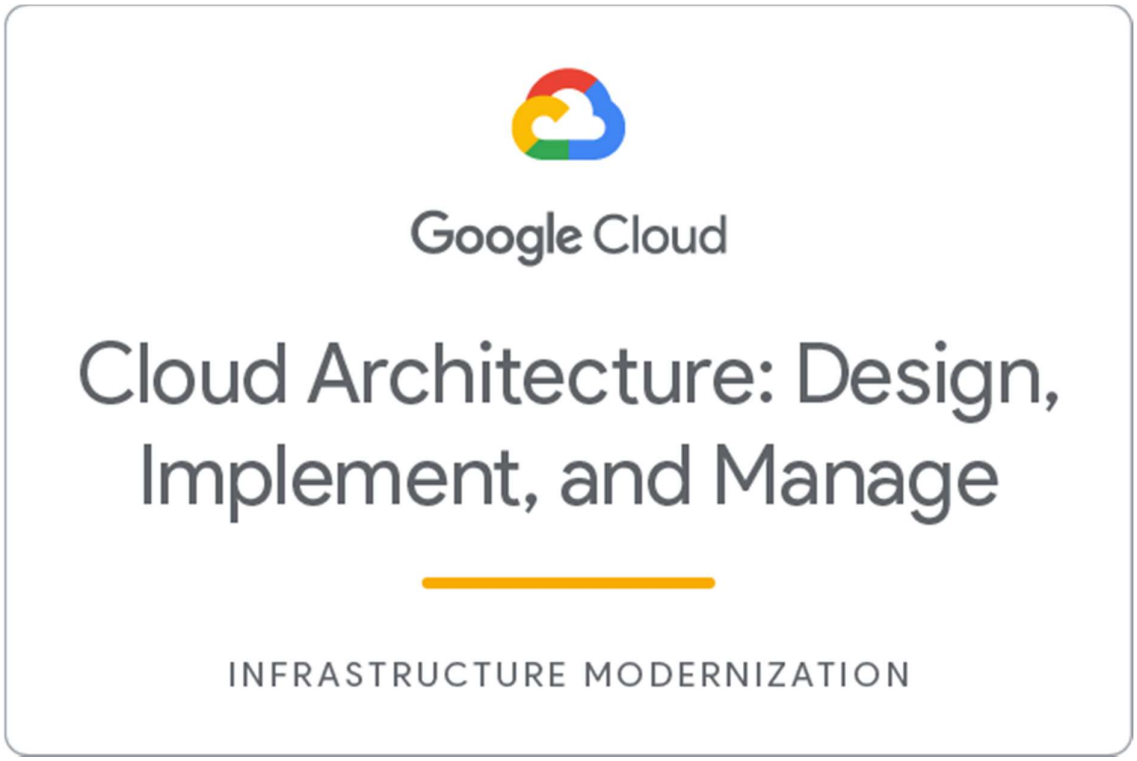
Test your server

If you can reach the "Welcome to Apache" default landing page on your compute instance's external IP address, you have successfully completed all the tasks.

Troubleshooting

- **Receiving a Connection Refused error:**
    - Your VM instance might not be publicly accessible because the instance does not have the proper tag that allows Compute Engine to apply the appropriate firewall rules.
    - Your project does not have the firewall rule that allows traffic to the external IP address of your instance.
    - If you are trying to access the VM using an HTTPS address, or the incorrect IP address, you will not be able to connect. Check that your URL is `http://[EXTERNAL_IP]` and not `https://[EXTERNAL_IP]` or `http://[INTERNAL_IP]`
- **Challenge Scoring is not updated:** Your lab score might not be updated even though you can reach the Apache home page on your compute instance from an external address. The lab checks that you have completed the configuration changes using Deployment Manager. You cannot just manually add the startup script, tags, and firewall rules.

Congratulations!



Finish Your Quest

This self-paced lab is part of the Qwiklabs Cloud Architecture: Design, Implement, and Manage Quest. 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 this Quest and get immediate completion credit if you've taken this lab. See other available Qwiklabs Quests.

Take Your Next Lab

Continue your Quest with Configure Secure RDP Using a Windows Bastion Host, or check out these suggestions:

- Build and Deploy a Docker Image to a Kubernetes Cluster
- Scale Out and Update a Containerized Application on a Kubernetes Cluster

Next Steps / Learn More

Have you checked out the Data Science on the Google Cloud Platform Quest? Students are given the opportunity to practice all aspects of ingestion, preparation, processing, querying, exploring and visualizing data sets using Google Cloud tools and services. The exercises in the quest are taken from book **Data Science on the Google Cloud Platform** by Valliappa Lakshmanan, published by O'Reilly Media, Inc.

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Solution:

1. in cloud shell:

```
mkdir deployment_manager
cd deployment_manager
gsutil cp gs://spls/gsp302/* .
rm qwiklabs.jinja
vi qwiklabs.jinja
```

2. press i
3. paste the following:

```
resources:
- name: vm-created-by-deployment-manager
  type: compute.v1.instance
  properties:
    zone: us-central1-a
    machineType: zones/us-central1-a/machineTypes/n1-standard-1
    tags:
       items: ["http", "web-server"]
    metadata:
      items:
      - key: startup-script
        value: "apt-get update \n apt-get install -y apache2"
    disks:
    - deviceName: boot
      type: PERSISTENT
      boot: true
      autoDelete: true
      initializeParams:
        sourceImage: projects/debian-cloud/global/images/family/debian-9
    networkInterfaces:
    - network: global/networks/default
      accessConfigs:
      - name: External NAT
        type: ONE_TO_ONE_NAT
- name: default-allow-http3
  type: compute.v1.firewall
  properties:
    targetTags: ["http", "web-server"]
    sourceRanges: ["0.0.0.0/0"]
    allowed:
      - IPProtocol: TCP
        ports: ["80"]
```

4. press esc, type :wq, press enter
5. type the following commands in shell:
   rm qwiklabs.yaml
   vi qwiklabs.yaml
6. press i

7. paste the following:

```
# Copyright 2016 Google Inc. All rights reserved.
#
# Licensed under the Apache License, Version 2.0 (the "License");
# you may not use this file except in compliance with the License.
# You may obtain a copy of the License at
#
#     http://www.apache.org/licenses/LICENSE-2.0
#
# Unless required by applicable law or agreed to in writing, software
# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
implied.
# See the License for the specific language governing permissions and
# limitations under the License.

imports:
- path: qwiklabs.jinja

resources:
- name: qwiklabs
  type: qwiklabs.jinja
  properties:
    zone: us-central1-a

# Create the firewall rule
- name: http-firewall-rule
  type: compute.v1.firewall
  properties:
    sourceRanges: ["0.0.0.0/0"]
    targetTags: [ web-server ]
    allowed:
    - IPProtocol: TCP
      ports: [80, 22]
```

8. press esc, type :wq, press enter
9. in cloud console:

```
gcloud deployment-manager deployments create vm-test --config=qwiklabs.yaml
```