Deployment Manager - Full Production

1 hour 30 minutes9 Credits
Rate Lab

GSP060

Google Cloud Self-Paced Labs

Overview

In this lab, you launch a service using an infrastructure orchestration tool called Deployment Manager and monitor the service using Cloud Monitoring. In Cloud Monitoring, you set up basic black box monitoring with a Cloud Monitoring dashboard and establish an Uptime Check (alert notification) to trigger incident response.

More specifically, you:

1. Install and configure an advanced deployment using Deployment Manager sample templates.
2. Enable Cloud Monitoring.
3. Configure Cloud Monitoring Uptime Checks and notifications.
4. Configure a Cloud Monitoring dashboard with two charts, one showing CPU usage and the other ingress traffic.
5. Perform a load test and simulate a service outage.

Cloud Monitoring provides visibility into the performance, uptime, and overall health of cloud-powered applications.It collects metrics, events, and metadata from Google Cloud, Amazon Web Services, hosted uptime probes, application instrumentation, and a variety of common application components including Cassandra, Nginx, Apache Web Server, Elasticsearch, and many others. Cloud Monitoring ingests that data and generates insights via dashboards, charts, and alerts. Cloud Monitoring alerting helps you collaborate by integrating with Slack, PagerDuty, HipChat, Campfire, and more.

Objectives

In this lab, you learn to:

- Launch a cloud service from a collection of templates.
- Configure basic black box monitoring of an application.
- Create an uptime check to recognize a loss of service.
- Establish an alerting policy to trigger incident response procedures.
- Create and configure a dashboard with dynamically updated charts.
- Test the monitoring and alerting regimen by applying a load to the service.
- Test the monitoring and alerting regimen by simulating a service outage.

Setup and Requirements

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:

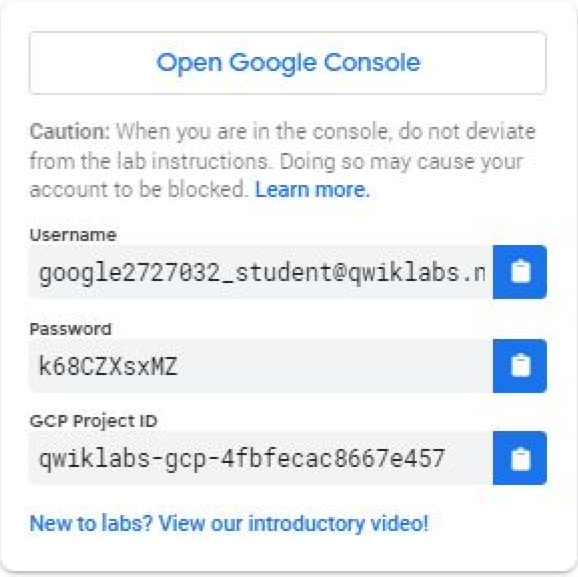
- Access to a standard internet browser (Chrome browser recommended).
- Time to complete the lab.

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.



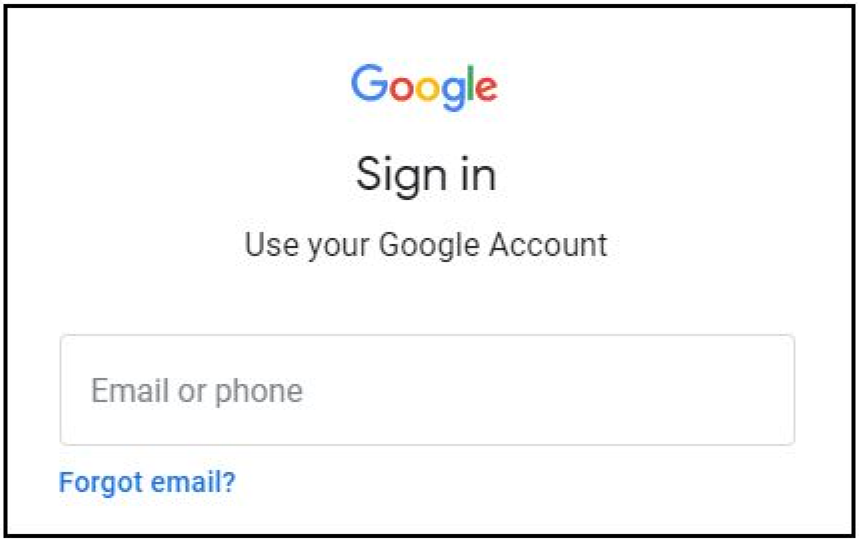
Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked. Learn more.

Username
google2727032_student@qwiklabs.n

Password
k68CZXsxMZ

GCP Project ID
qwiklabs-gcp-4fbfecac8667e457

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.

   Google

   Sign in

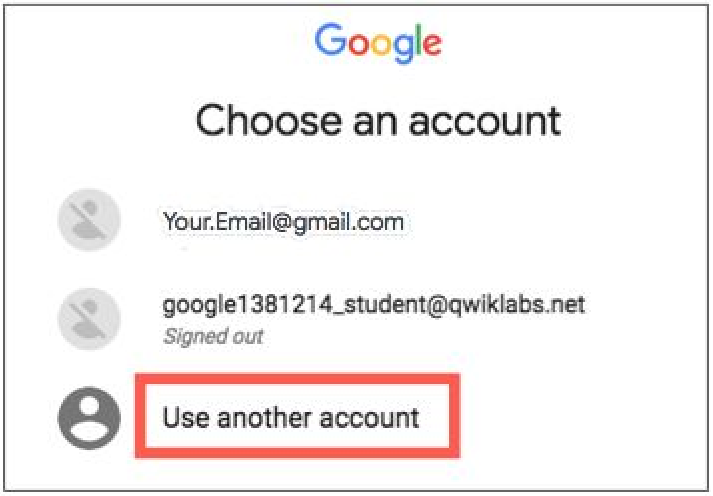
   Use your Google Account

   Email or phone

   Forgot email?

   Tip: Open the tabs in separate windows, side-by-side.

   If you see the **Choose an account** page, click **Use Another Account**.

   Google

   Choose an account

   Your.Email@gmail.com

   google1381214_student@qwiklabs.net
   Signed out

   Use another account

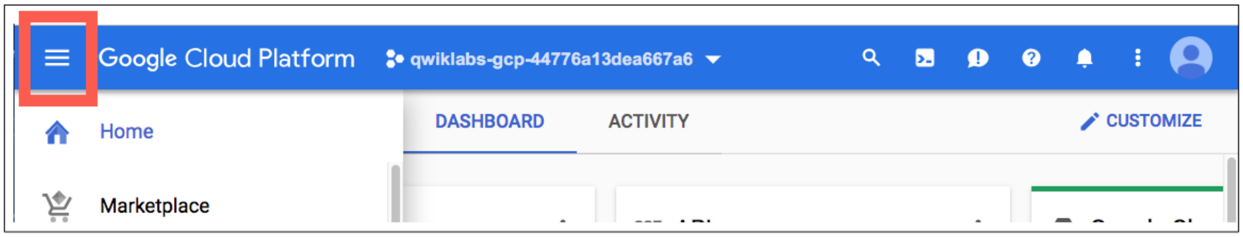
3. In the **Sign in** page, paste the username that you copied from the Connection Details panel. Then copy and paste the password.

   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.

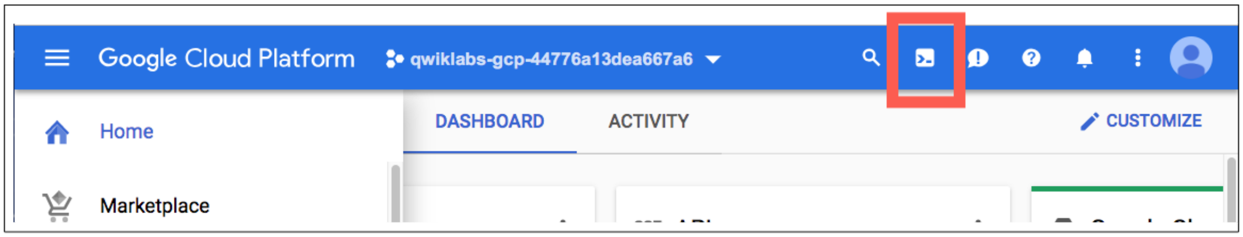
Note: You can view the menu with a list of Google Cloud Products and Services by clicking the **Navigation menu** at the top-left.



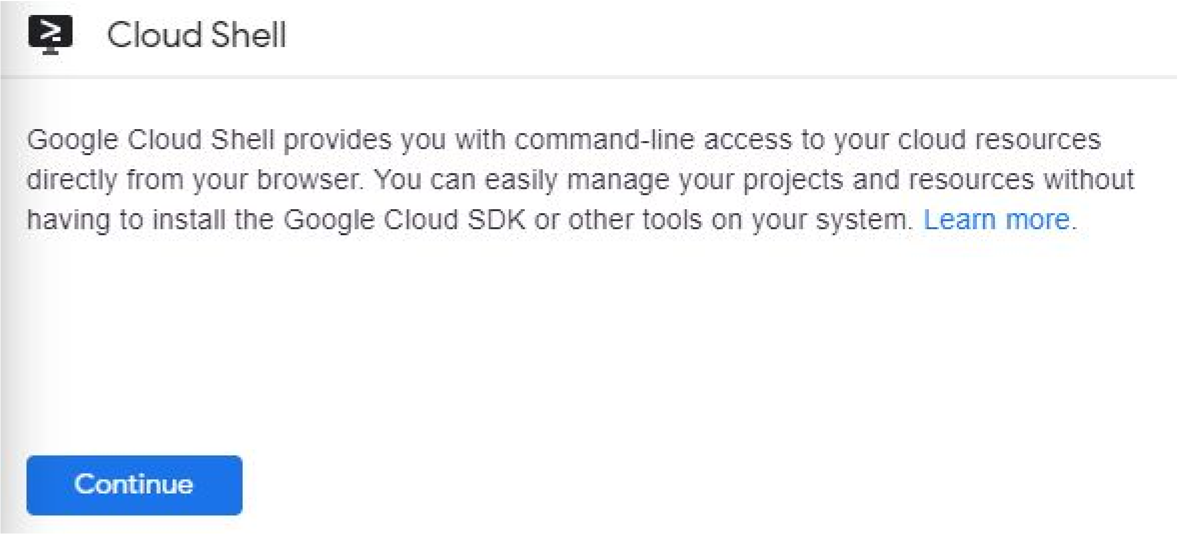
Activate Cloud Shell

Cloud Shell is a virtual machine that is loaded with development tools. It offers a persistent 5GB home directory and runs on the Google Cloud. Cloud Shell provides command-line access to your Google Cloud resources.

In the Cloud Console, in the top right toolbar, click the **Activate Cloud Shell** button.



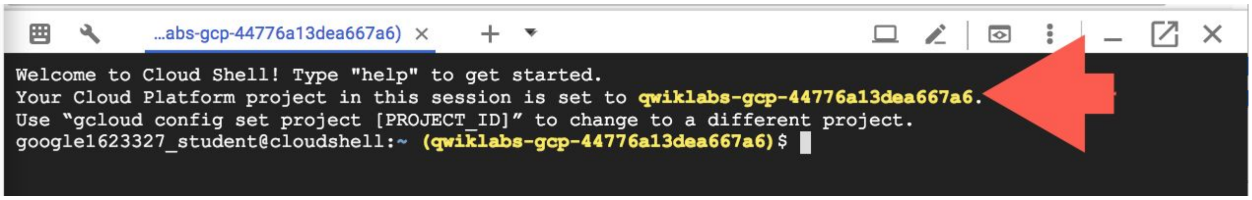
Click **Continue**.



Cloud Shell

Google Cloud Shell provides you with command-line access to your cloud resources directly from your browser. You can easily manage your projects and resources without having to install the Google Cloud SDK or other tools on your system. Learn more.

It takes a few moments to provision and connect to the environment. When you are connected, you are already authenticated, and the project is set to your *PROJECT_ID*. For example:



```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to qwiklabs-gcp-44776a13dea667a6.
Use “gcloud config set project [PROJECT_ID]” to change to a different project.
google1623327_student@cloudshell:~ (qwiklabs-gcp-44776a13dea667a6)$
```

`gcloud` is the command-line tool for Google Cloud. It comes pre-installed on Cloud Shell and supports tab-completion.

You can list the active account name with this command:

```
gcloud auth list
```

(Output)

```
Credentialed accounts:
 - <myaccount>@<mydomain>.com (active)
```

(Example output)

```
Credentialed accounts:
 - google1623327_student@qwiklabs.net
```

You can list the project ID with this command:

```
gcloud config list project
```

(Output)

```
[core]
project = <project_ID>
```

(Example output)

```
[core]
project = qwiklabs-gcp-44776a13dea667a6
```

For full documentation of `gcloud` see the gcloud command-line tool overview.

Create a virtual environment

Execute the following command to download and update the packages list.

```
sudo apt-get update
```

Python virtual environments are used to isolate package installation from the system.

```
sudo apt-get install virtualenv
```

If prompted [Y/n], press Y and then `Enter`.

```
virtualenv -p python3 venv
```

Activate the virtual environment.

```
source venv/bin/activate
```

Clone the Deployment Manager Sample Templates

Google provides a robust set of sample Deployment Manager templates that you can learn from and build upon.

To clone the repository, enter the following commands in Cloud Shell Command Line to create a directory to hold the Deployment Manager sample templates.

```
mkdir ~/dmsamples
```

Go to that directory.

```
cd ~/dmsamples
```

Clone the repository to the directory you just made.

```
git clone https://github.com/GoogleCloudPlatform/deploymentmanager-samples.git
```

Example Output:

```
remote: Counting objects: 1917, done.
remote: Compressing objects: 100% (31/31), done.
remote: Total 1917 (delta 11), reused 29 (delta 7), pack-reused 1874
Receiving objects: 100% (1917/1917), 426.86 KiB | 0 bytes/s, done.
Resolving deltas: 100% (1060/1060), done.
```

Explore the Sample Files

We just downloaded a collection of sample templates to our directory, let's dive in and explore some of them.

List the example templates

Run the following commands to navigate to and list the version2 examples:

```
cd ~/dmsamples/deploymentmanager-samples/examples/v2
```

```
ls
```

You should see something like this:

```
access_context_manager  cloud_functions  common               folder_creation
iam_custom_role  internal_lb_haproxy  quick_start   ssl
vm_with_disks
access_control          cloudkms         container_igm        gke
igm-updater      metadata_from_file   regional_igm  step_by_step_guide
vpn_auto_subnet
bigtable                cloud_router     container_vm         ha-service
image_based_igm  nodejs               saltstack     template_modules    waiter
build_configuration     cloudsql         custom_machine_type  htcondor
instance_pool    nodejs_l7            single_vm     vlan_attachment
cloudbuild              cloudsql_import  dataproc             iam
internal_lb      project_creation     sqladmin      vm_startup_script
```

Not all of the subdirectories are independent projects. For example, the directory named **common** contains templates that are used by several of the other projects. If you are studying independently later, use the `README` files as a guide.

The `nodejs` directory contains everything you need to build this lab. Note that there is a `nodejs` directory and a `nodejs_l7`directory. Use `nodejs`.

List and examine the Nodejs deployment

Navigate to and list the version2 examples:

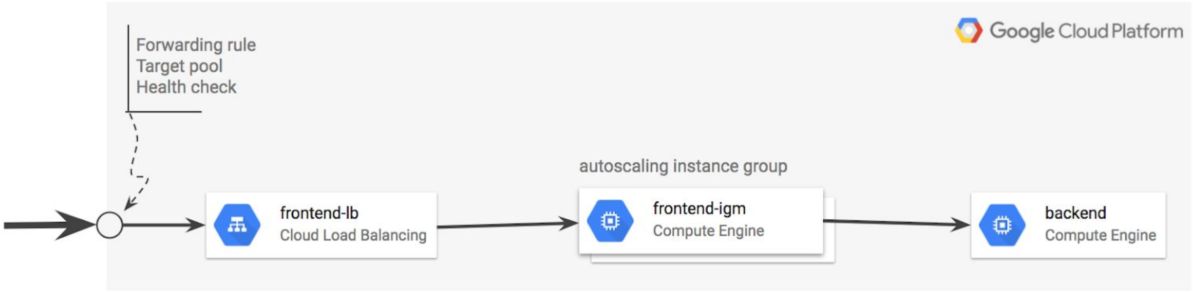
```
cd nodejs/python
```

```
ls
```

Example Output:

```
frontend.py  frontend.py.schema  nodejs.py  nodejs.py.schema  nodejs.yaml
```

The main deployment manager configuration file is `nodejs.yaml`. It makes use of templates to generate infrastructure. The rest of the files are templates. Templates use variables defined in the `nodejs.yaml` configuration file to produce customized results.



frontend.py

`frontend.py` includes `frontend.py.schema`, which creates an instance template based on `container_instance_template.py`. This template is used to create a managed instance group and an autoscaler. The template also creates a network load balancer that has a forwarding rule with a single public IP address. It also creates:

- A target pool that refers to the managed instance group.

- A health check attached to the target pool.

nodejs.py

`nodejs.py` includes `nodejs.py.schema`, which brings the frontend and backend templates together.

- Note that the frontend is `frontend.py`.
- The backend is `/common/python/container_vm.py`.
- This is a VM running a Docker container with MySQL, so it doesn't require a custom template.

Other files

- `/common/python/container_instance_template.py`
- `/common/python/container_vm.py`
- `/common/python/container_helper.py`

Customize the Deployment

Now that you've downloaded and reviewed the `nodejs` Deployment Manager template, let's start customizing the deployment.

Specify the zone

The `nodejs.yaml` file requires a zone, and you'll now add one to the file.

1. Enter the following command to open the list of zones:

```
gcloud compute zones list
```

Copy the name of a zone for the configuration file to use.

2. Open `nodejs.yaml` in `nano` so you can edit the `zone` value:

```
nano nodejs.yaml
```

The `nodejs.yaml` file contents:

```
resources:
- name: nodejs
  type: nodejs.py
  properties:
    zone: ZONE_TO_RUN
```

3. Replace `ZONE_TO_RUN` with a zone name that's near you, then exit nano and save the file.

This example shows `ZONE_TO_RUN` set to `us-east1-d`

```
resources:
```

```
- name: nodejs
  type: nodejs.py
  properties:
    zone: us-east1-d
```

Modify the maximum number of instances in the instance group

Edit the `nodejs.py` file.

1. Enter this command to open `nodejs.py` in `nano`:

```
nano nodejs.py
```

2. Verify current scaling limit for frontend in `nodejs.py`

```
{
     'name': frontend,
     'type': 'frontend.py',
     'properties': {
         'zone': context.properties['zone'],
         'dockerImage': 'gcr.io/deployment-manager-examples/nodejsservice',
         'port': application_port,
         # Define the variables that are exposed to container as env
variables.
         'dockerEnv': {
             'SEVEN_SERVICE_MYSQL_PORT': mysql_port,
             'SEVEN_SERVICE_PROXY_HOST': '$(ref.' + backend
                                         + '.networkInterfaces[0].networkIP)'
         },
         # If left out will default to 1
         'size': 2,
         # If left out will default to 1
         'maxSize': 20
     }
```

```
 },
```

Current scaling limit is 20 (refer maxSize).

3. Modify the `maxSize` and set it to 4:

```
{
     'name': frontend,
     'type': 'frontend.py',
     'properties': {
         'zone': context.properties['zone'],
         'dockerImage': 'gcr.io/deployment-manager-examples/nodejsservice',
         'port': application_port,
         # Define the variables that are exposed to container as env
variables.
         'dockerEnv': {
             'SEVEN_SERVICE_MYSQL_PORT': mysql_port,
             'SEVEN_SERVICE_PROXY_HOST': '$(ref.' + backend
                                         + '.networkInterfaces[0].networkIP)'
         },
         # If left out will default to 1
         'size': 2,
         # If left out will default to 1
         'maxSize': 4
     }
 },
```

Save the file and exit nano when you're done.

Run the Application

Now you'll use Deployment Manager to deploy the application and make it operational. This builds the infrastructure, but it won't allow traffic. After Deployment Manager sets up the infrastructure, you can apply service labels.

Deploy the application

Enter this command to name the application `advanced-configuration` and pass Deployment Manager the configuration file (`nodejs.yaml`).

```
gcloud deployment-manager deployments create advanced-configuration --config
nodejs.yaml
```

Output:

```
The fingerprint of the deployment is PiYc6OsIFkWzQpCDklHvaA==
Waiting for create
[operation-1529913842103-56f72d31872d9-90070017-aec5761d]...done.
Create operation operation-1529913842103-56f72d31872d9-90070017-aec5761d
completed successfully.
NAME                                   TYPE                             STATE
ERRORS  INTENT
advanced-configuration-application-fw  compute.v1.firewall
COMPLETED  []
advanced-configuration-backend         compute.v1.instance
COMPLETED  []
advanced-configuration-frontend-as     compute.v1.autoscaler
COMPLETED  []
advanced-configuration-frontend-hc     compute.v1.httpHealthCheck
COMPLETED  []
advanced-configuration-frontend-igm    compute.v1.instanceGroupManager
COMPLETED  []
advanced-configuration-frontend-it     compute.v1.instanceTemplate
COMPLETED  []
advanced-configuration-frontend-lb     compute.v1.forwardingRule
COMPLETED  []
```

```
advanced-configuration-frontend-tp     compute.v1.targetPool
COMPLETED  []
```

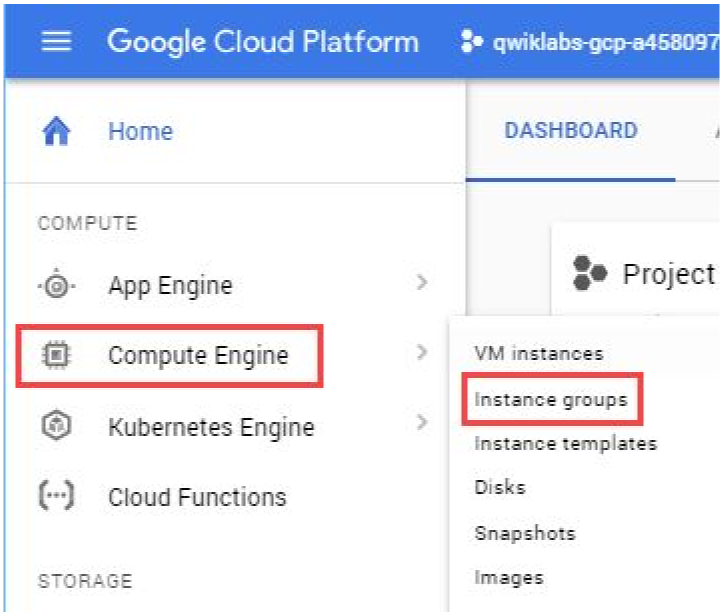
Click **Check my progress** below to check your lab progress.

Deploy the application

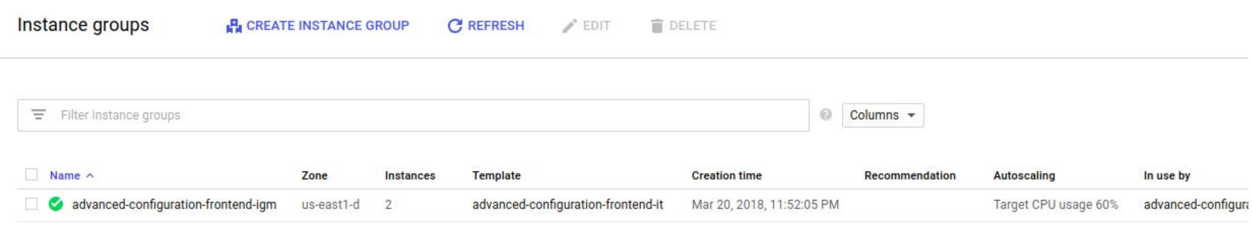
Check my progress

Confirm the limit for the maximum number of instances:

1. Go to **Compute Engine** > **Instance groups**.

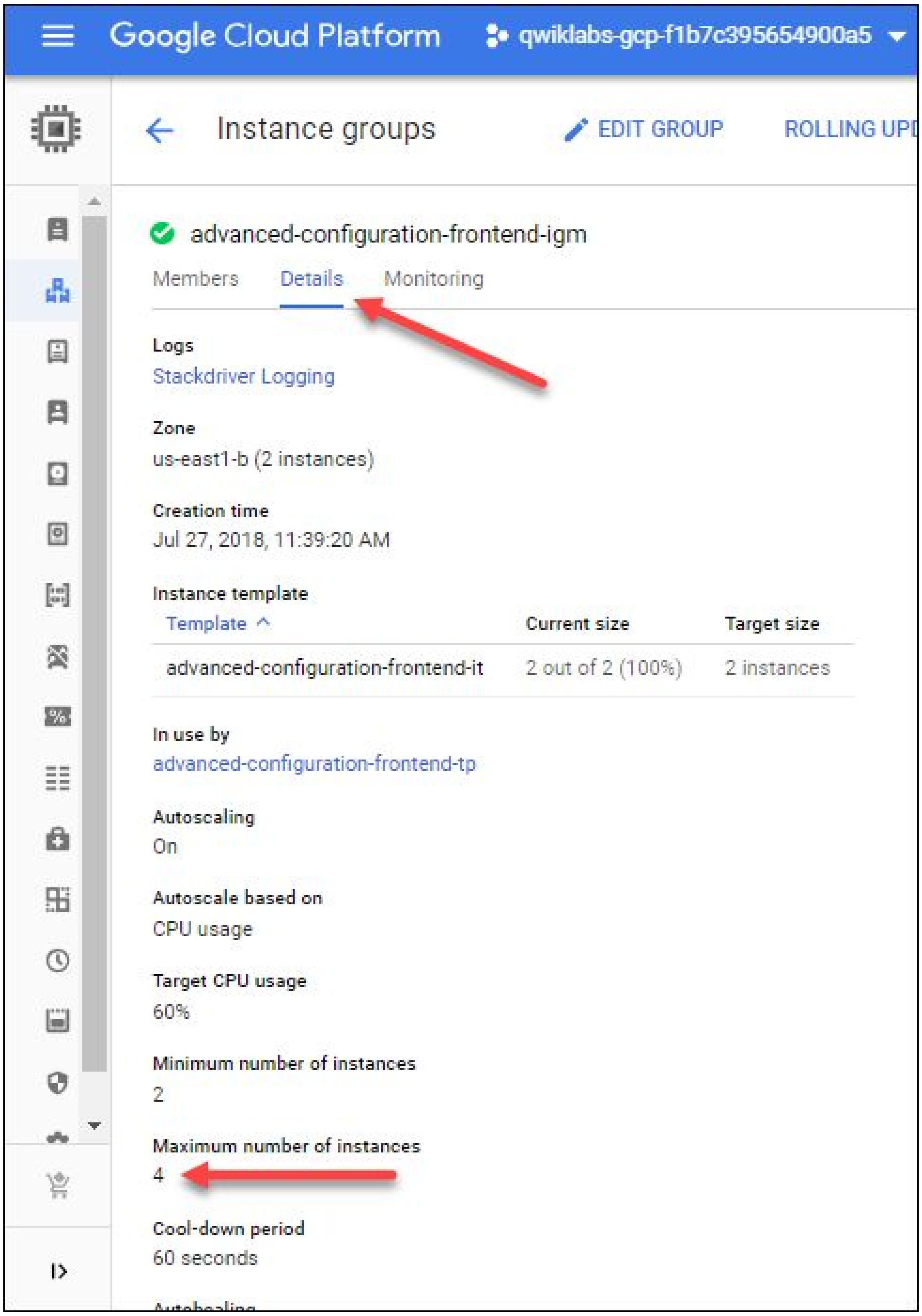


2. Click on **advanced-configuration-frontend-igm**.



	Name	Zone	Instances	Template	Creation time	Recommendation	Autoscaling	In use by
□	✓ advanced-configuration-frontend-igm	us-east1-d	2	advanced-configuration-frontend-it	Mar 20, 2018, 11:52:05 PM		Target CPU usage 60%	advanced-configura

3. Click on the Details tab, then verify the maximum number of instances.



advanced-configuration-frontend-igm

Logs
Stackdriver Logging

Zone
us-east1-b (2 instances)

Creation time
Jul 27, 2018, 11:39:20 AM

Instance template

Template ^	Current size	Target size
advanced-configuration-frontend-it	2 out of 2 (100%)	2 instances

In use by
advanced-configuration-frontend-tp

Autoscaling
On

Autoscale based on
CPU usage

Target CPU usage
60%

Minimum number of instances
2

Maximum number of instances
4

Cool-down period
60 seconds

Autohealing

You'll see it has been set to 4.

Verify that the application is operational

The application takes a few minutes to start. You can view it in the Deployment Manager part of Cloud Console (**Navigation menu** > **Deployment Manager**), or you can see the instances in the Compute Engine part of Console (**Navigation menu** > **Compute Engine** > **VM**).

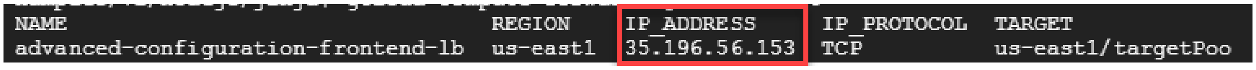
To verify that the application is running, open a browser to access `port 8080` and view the service. Since the IP address was established dynamically when the Deployment Manager implemented the global forwarding rule (specified in the template), you'll need to find that address to test the application.

Find the global load balancer forwarding rule IP address

1. Enter the following command in the Cloud Command Line to find your forwarding IP address.

```
gcloud compute forwarding-rules list
```

Example output:



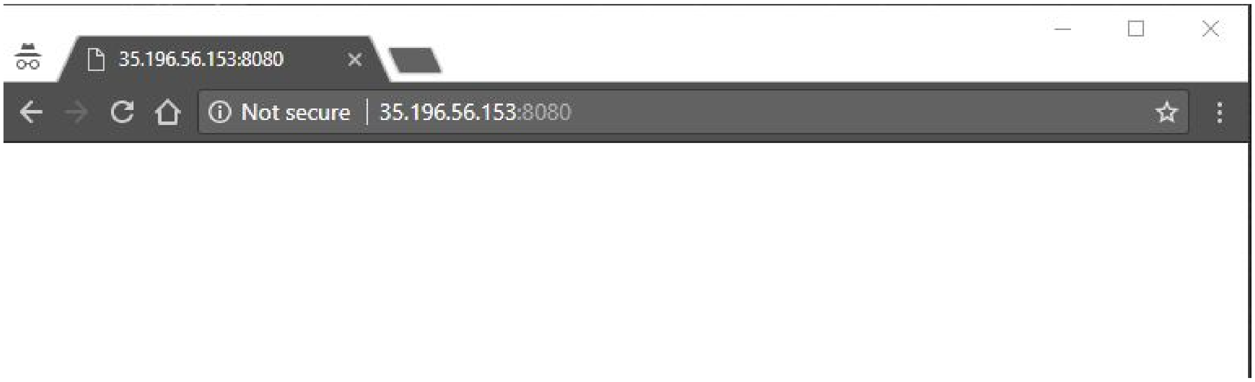
```
NAME                                 REGION     IP_ADDRESS     IP_PROTOCOL  TARGET
advanced-configuration-frontend-lb  us-east1  35.196.56.153  TCP          us-east1/targetPoo
```

Your forwarding IP address is the IP_ADDRESS listed in your output. Be sure to record it; you'll use it a few times in this lab.

2. Open a new window in your browser. In the address field, enter the following URL, replacing `<your IP address>` with your forwarding IP address:

```
http://<your IP address>:8080
```

You see a blank page, similar to below, with your own IP address:



It may take up to 10 minutes for the service to become operational. If you get an error, such as a 404, or a time out, wait about two minutes and try again.

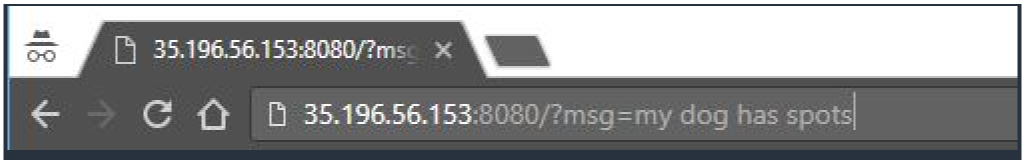
3. Now enter log information by entering a log message in your browser address line.

```
http://<your forwarding IP address>:8080/?msg=<enter_a_message>
```

Replace `enter_a_message` with any kind of message.

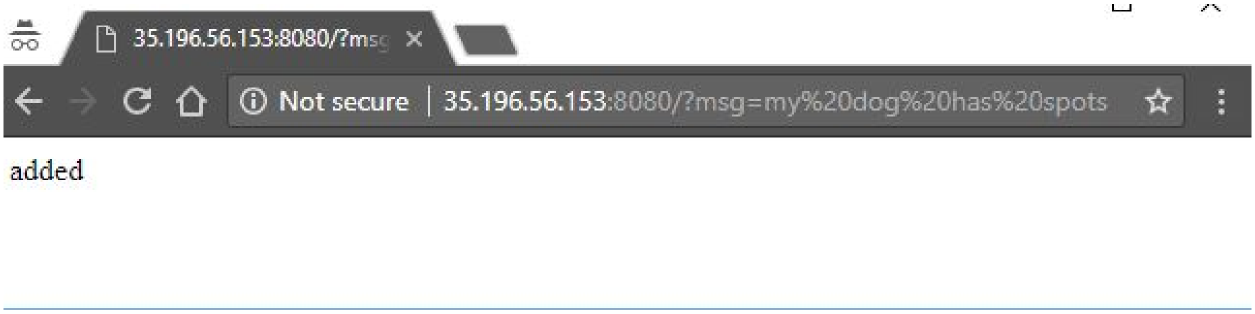
These are log message examples - you have a different IP address:

```
http://35.196.56.153:8080/?msg=my dog has spots
```



35.196.56.153:8080/?msg=my dog has spots

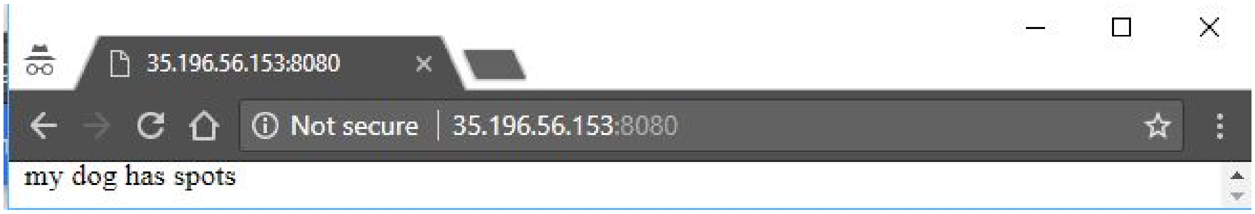
After you enter the log, the browser returns `added`.



35.196.56.153:8080/?msg=my%20dog%20has%20spots

```
added
```

4. View the log by going to `http://<your IP address>:8080`. For example:



35.196.56.153:8080

```
my dog has spots
```

Go ahead and create more logs and see them at `http://<your IP address>:8080`.

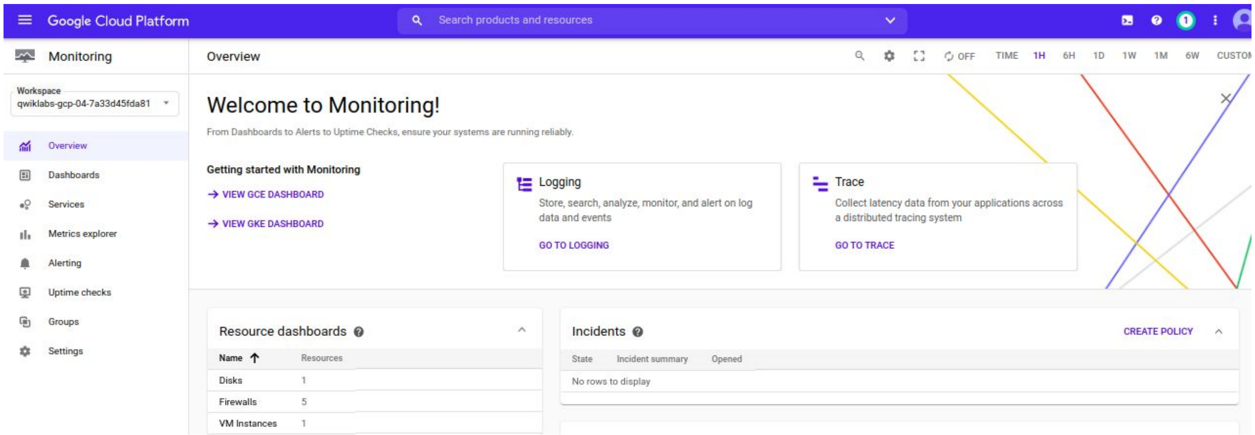
Configure an uptime check and alert policy in Cloud Monitoring

Create a Monitoring workspace

Now set up a Monitoring workspace that's tied to your Google Cloud Project. The following steps create a new account that has a free trial of Monitoring.

1. In the Cloud Console, click **Navigation menu** > **Monitoring**.
2. Wait for your workspace to be provisioned.

When the Monitoring dashboard opens, your workspace is ready.



Workspace: qwiklabs-gcp-04-7a33d45fda81

Welcome to Monitoring!

From Dashboards to Alerts to Uptime Checks, ensure your systems are running reliably.

Logging: Store, search, analyze, monitor, and alert on log data and events

Trace: Collect latency data from your applications across a distributed tracing system

Resource dashboards

Name	Resources
Disks	1
Firewalls	5
VM Instances	1

Incidents

State	Incident summary	Opened
No rows to display		

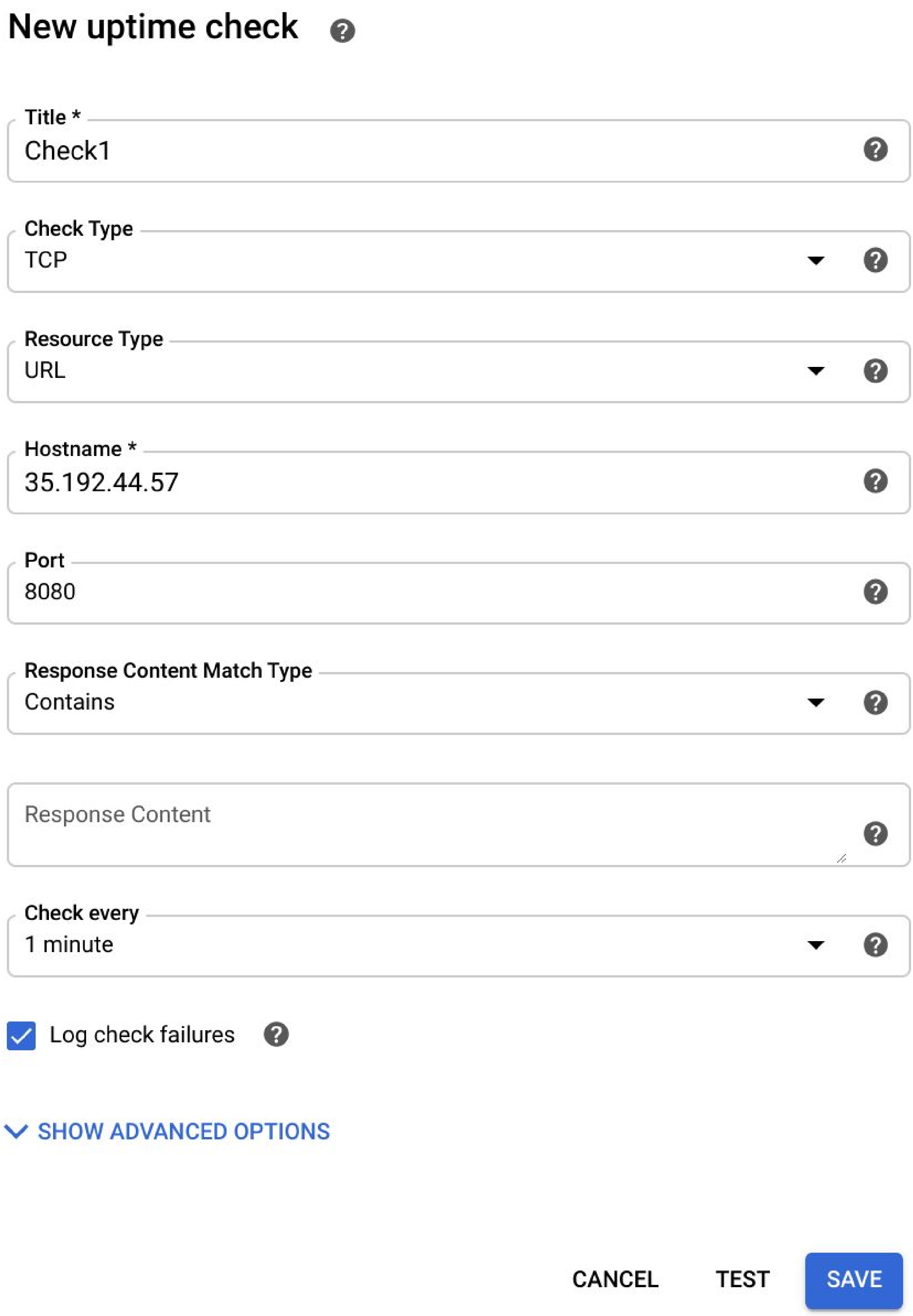
Configure an uptime check

The Cloud Monitoring window opens.

1. In the Cloud Monitoring tab, click on **Uptime Checks**
2. Click **Create Uptime Check**.
3. In the **New uptime check** page Specify the following:

Property	**Value**
Title	Check1
Check Type	TCP
Resource Type	URL
Hostname	`<your forwarding address>` (you previously recorded)
Port	8080
Response content contains the text	`<leave blank>`
Check every	1 minute

4. Click **Test** to test the check:



New uptime check

Title *
Check1

Check Type
TCP

Resource Type
URL

Hostname *
35.192.44.57

Port
8080

Response Content Match Type
Contains

Response Content

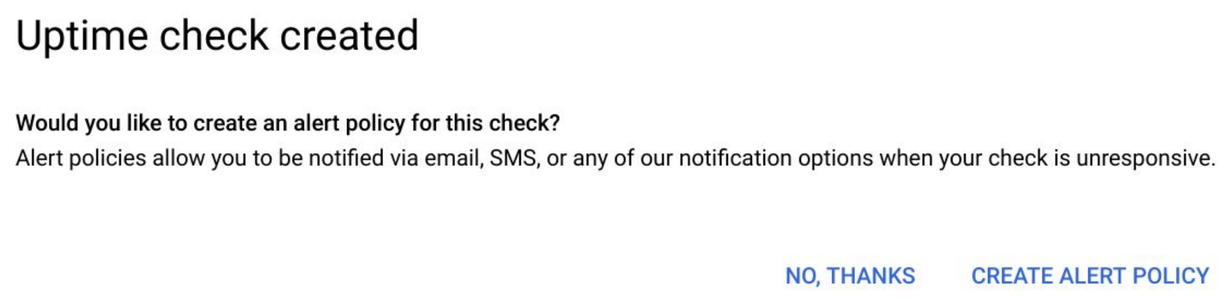
Check every
1 minute

☑ Log check failures

If the test fails, make sure that the service is still working. Also check to see that the firewall rule exists and is correct.

5. After the test succeeds, click **Save**.

After the Uptime Check is saved, Cloud Monitoring offers to create an alerting policy. Click **No, Thanks**.



Uptime check created

Would you like to create an alert policy for this check?

Alert policies allow you to be notified via email, SMS, or any of our notification options when your check is unresponsive.

Configure an alerting policy and notification

1. Click on **Alerting** > **Create Policy**.
2. Name the policy **Test**.
3. Click **Add Condition**.
4. For **Find resource type and metric**, select **Compute Engine VM Instance**.

5. For **Metrics**, select a metric you are interested in evaluating, such as **CPU usage** or **CPU utilization**.
6. For **Condition**, select **is above**.
7. Specify the threshold value and for how long the metric must cross this set value before the alert is triggered. For example, for **THRESHOLD**, type **20** and set **FOR** to **1 minute**.
8. Click **Add**.
9. In **Notifications**, click on **Add Notification Channel** select Notification Channel type as "Email" and add your personal email. Then Click **Add**.
   In a later step, you trigger an event that notify you via email.
10. Click **Save**.

Click **Check my progress** below to check your lab progress.

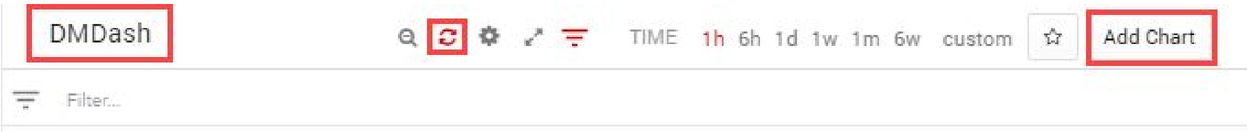
Configure an Uptime Check and Alert Policy in Cloud Monitoring

Check my progress

Configure a Dashboard with a Couple of Useful Charts

Configure a dashboard

1. In the left menu, click **Dashboards** > **Create Dashboard**
2. Name the New Dashboard **DMDash**. and then Click **Confirm**.
3. Click **Add Chart** in the top right.



4. Set the following properties:

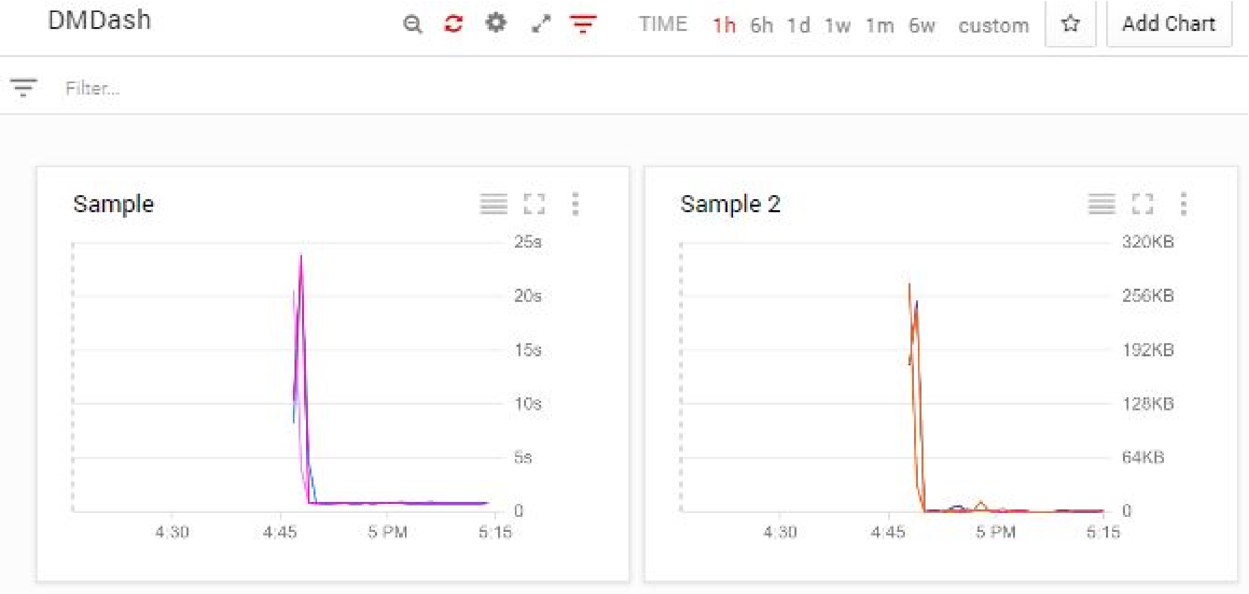
Property	Value
Title	Sample
Resource type	Compute Engine VM Instance
Metric Type	CPU Usage

5. Click **Save**.
6. Click on **Add Chart** to add another chart to the dashboard with the following properties:

Property	Value
Title	Sample 2
Resource type	Compute Engine VM Instance
Metric Type	Sent bytes

7.

Click **Save** DMDash should look like this:

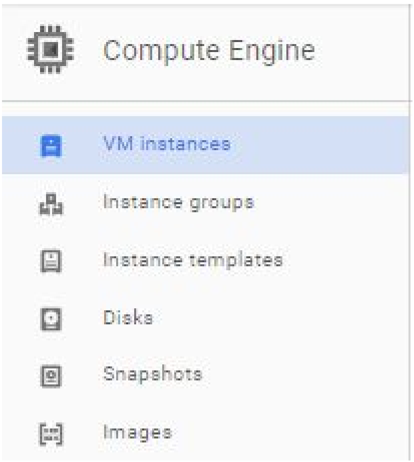


Create a test VM with ApacheBench

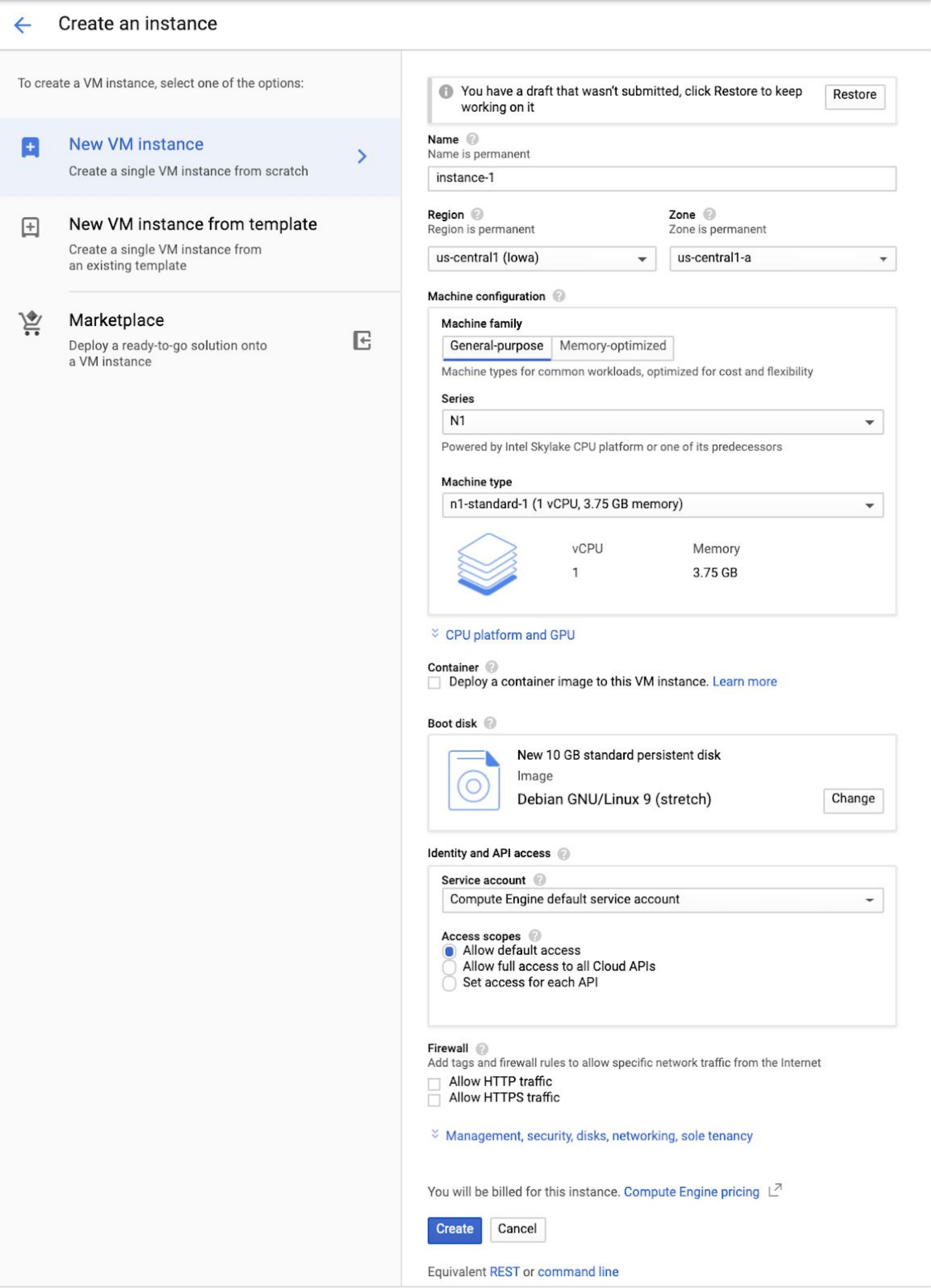
Now that you've configured monitoring for traffic in a specified region, see if it works. You'll install and use ApacheBench to apply 3 levels of load to the service and then view the Cloud Monitoring Dashboard you've set up.

Create a VM

1. In the Cloud Console, click **Compute Engine** > **VM instances**.



2. Click **Create instance**, use all the default settings in the **Create an instance** dialog.



Create an instance

To create a VM instance, select one of the options:

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

Marketplace
Deploy a ready-to-go solution onto a VM instance

You have a draft that wasn't submitted, click Restore to keep working on it

Name
Name is permanent
instance-1

Region
Region is permanent
us-central1 (Iowa)

Zone
Zone is permanent
us-central1-a

Machine configuration

Machine family
General-purpose | Memory-optimized
Machine types for common workloads, optimized for cost and flexibility

Series
N1
Powered by Intel Skylake CPU platform or one of its predecessors

Machine type
n1-standard-1 (1 vCPU, 3.75 GB memory)

vCPU	Memory
1	3.75 GB

CPU platform and GPU

Container
□ Deploy a container image to this VM instance. Learn more

Boot disk
New 10 GB standard persistent disk
Image
Debian GNU/Linux 9 (stretch)

Identity and API access

Service account
Compute Engine default service account

Access scopes
● Allow default access
○ Allow full access to all Cloud APIs
○ Set access for each API

Firewall
Add tags and firewall rules to allow specific network traffic from the Internet
□ Allow HTTP traffic
□ Allow HTTPS traffic

Management, security, disks, networking, sole tenancy

You will be billed for this instance. Compute Engine pricing

Equivalent REST or command line

3. Click **Create**.

Install ApacheBench

1. Still in the VM Instances window, click the instance-1 **SSH** button to SSH into the VM you just created.
2. Enter the following commands to install the latest ApacheBench:

```
sudo apt-get update
```

```
sudo apt-get -y install apache2-utils
```

Click **Check my progress** below to check your lab progress.

Create a Test VM with ApacheBench.

Check my progress

Apply and monitor load

Now you'll use ApacheBench to apply load to the service. Watch the DMDash dashboard in Cloud Monitoring to monitor the CPU usage and the Network Inbound Traffic. You'll also be able to track the number of instances in Cloud Monitoring by mousing over the lines, or by viewing the instances in the Cloud Console (**Navigation menu** > **Compute Engine** > **VM**).

1. In the SSH window, enter this command for ApacheBench to apply load to the service. Replace your forwarding IP for `Your_IP` (you previously recorded). Run the following command two or three times to create traffic.

```
ab -n 1000 -c 100 http://<Your_IP>:8080/
```

Sample output:

```
This is ApacheBench, Version 2.3 <$Revision: 1757674 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 35.196.195.26 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests

Server Software:
Server Hostname:        35.196.195.26
Server Port:            8080

Document Path:          /
Document Length:        40 bytes

Concurrency Level:      100
Time taken for tests:   0.824 seconds
Complete requests:      1000
Failed requests:        0
Total transferred:      140000 bytes
HTML transferred:       40000 bytes
Requests per second:    1213.57 [#/sec] (mean)
```

```
Time per request:       82.402 [ms] (mean)
Time per request:       0.824 [ms] (mean, across all concurrent requests)
Transfer rate:          165.92 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:       36   37   0.5     37      40
Processing:    36   43   8.7     38      73
Waiting:       36   43   8.7     38      73
Total:         73   80   9.1     75     112

Percentage of the requests served within a certain time (ms)
  50%     75
  66%     78
  75%     81
  80%     84
  90%     95
  95%    101
  98%    106
  99%    110
 100%    112 (longest request)
```

Wait a few minutes, then increase the load to 5000.

2. Run this command two or three times to create traffic:

```
ab -n 5000 -c 100 http://<Your_IP>:8080/
```

Wait a few minutes, then increase the load to 10000.

3. Run this command two or three times to create traffic:

```
ab -n 10000 -c 100 http://<Your_IP>:8080/
```

Now see what happens when you lower the CPU usage per instance.

1. In the cloud console, click **Navigation menu** > **Compute Engine** > **Instance groups**.
2. Click on the name of your instance group, click on the Details tab, and then click **Edit Group**.
3. Change the CPU utilization. Click **CPU utilization**, change **Target CPU utilization** to **20**, and then click **Done**.
4. Click **Save**.

The target CPU usage is the total value of the CPU usage for all VMs in the instance group. This controls when autoscaling occurs. In production you would usually have this set to at least 60%. For this exercise you set it temporarily to 20% to make it quicker to examine autoscaling.
Run this command two or three times to create traffic:

```
ab -n 10000 -c 100 http://<Your_IP>:8080/
```

Expected behavior: The load consumed more than 20% of the cumulative CPU in the group, triggering autoscaling. A new instance was started.

Now see what happens when you turn autoscaling off.

1. Go to **Compute Engine** > **Instance groups**.
2. Click the name of your instance group, then **Edit Group**.
3. Change **Autoscaling mode** to **Don't autoscale**.
4. Click **Save**.

Wait a few minutes, then run this command two or three times to create traffic:

```
ab -n 10000 -c 100 http://<Your_IP>:8080/
```

Expected behavior: With autoscaling off, no new instances are created, cumulative CPU usage increases.

Results

There is a lag time of around 5 minutes before you see changes in the Cloud Monitoring Dashboard.

Simulate a Service Outage

To simulate an outage, remove the firewall.

1. Click **Navigation menu** > **VPC Network** > **Firewall**.
2. Check the box next to the firewall rule which contains **tcp:8080**, then click **Delete** at the top of the page. Click **Delete** again to confirm.
3. You will receive a notification email in 15 to 30 minutes.

Test your knowledge

Test your knowledge about Google cloud Platform by taking our quiz.

Cloud Monitoring collects metrics, events, and metadata from Google Cloud, Amazon Web Services, hosted uptime probes, application instrumentation, and a variety of common application components including Cassandra, Nginx, Apache Web Server, Elasticsearch, and many others.

True

False