

# APIs Explorer: Create and Update a Cluster

**GSP288**



Google Cloud Self-Paced Labs

# Overview

The [Google APIs Explorer](#) is a tool that helps you explore various Google APIs interactively. With the APIs Explorer, you can:

- Browse quickly through available **APIs** and versions.
- See **methods** available for each API and what **parameters** they support along with inline documentation.
- Execute requests for any method and see responses in **real time**.
- Make **authenticated and authorized** API calls.
- Search across all **services**, **methods**, and your **recent requests** to quickly find what you are looking for.

The APIs Explorer uses its own [API key](#) whenever it makes a request. When you use the APIs Explorer to make a request, it displays the request syntax, which includes a placeholder labeled {YOUR\_API\_KEY}. If you want to make the same request in your application, you need to replace this placeholder with your own API key.

In this lab you'll learn how to use an inline [Google APIs Explorer](#) template to call the Cloud Dataproc API to create a cluster, then run a simple Spark job in the cluster. It also shows you how to use the APIs Explorer template to call the Cloud Dataproc API to update a cluster.

## 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:

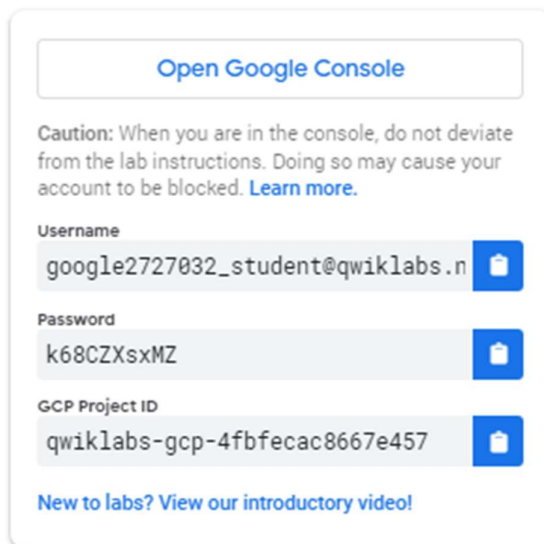
- Access to a standard internet browser (Chrome browser recommended).
- Time to complete the lab.

**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.




[Open Google Console](#)

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.](#)

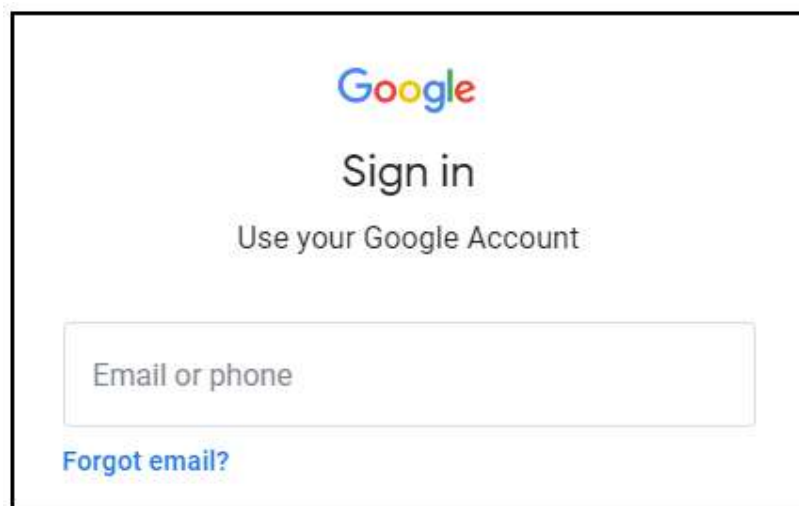
Username  
google2727032\_student@qwiklabs.n 

Password  
k68CZXsxMZ 

GCP Project ID  
qwiklabs-gcp-4fbfecac8667e457 

[New to labs? View our introductory video!](#)

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.**

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.

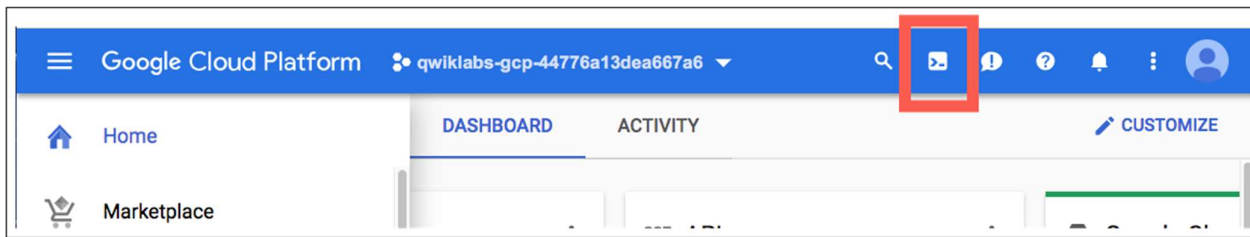
**Note:** You can view the menu with a list of Google Cloud Products and Services by clicking the **Navigation menu** at the top-left.



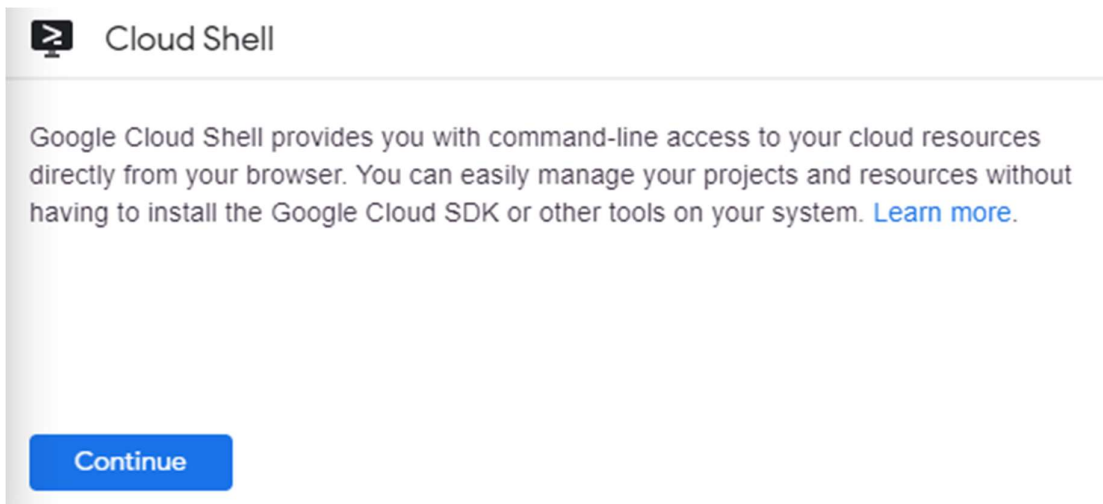
## Activate Cloud Shell

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.

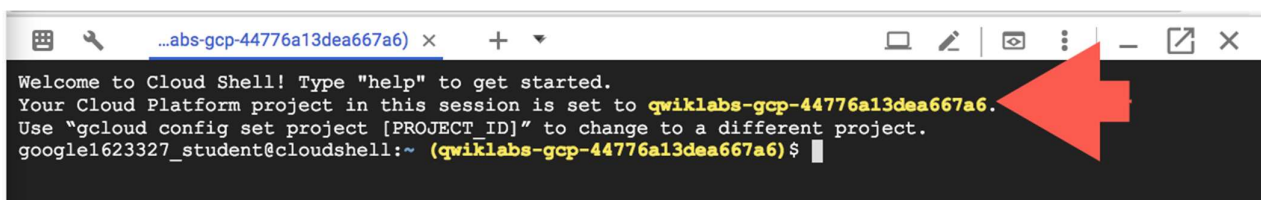
In the Cloud Console, in the top right toolbar, click the **Activate Cloud Shell** button.



Click **Continue**.



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:



`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@gwiklabs.net
```

You can list the project ID with this command:

```
gcloud config list project
```

(Output)

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


(Example output)

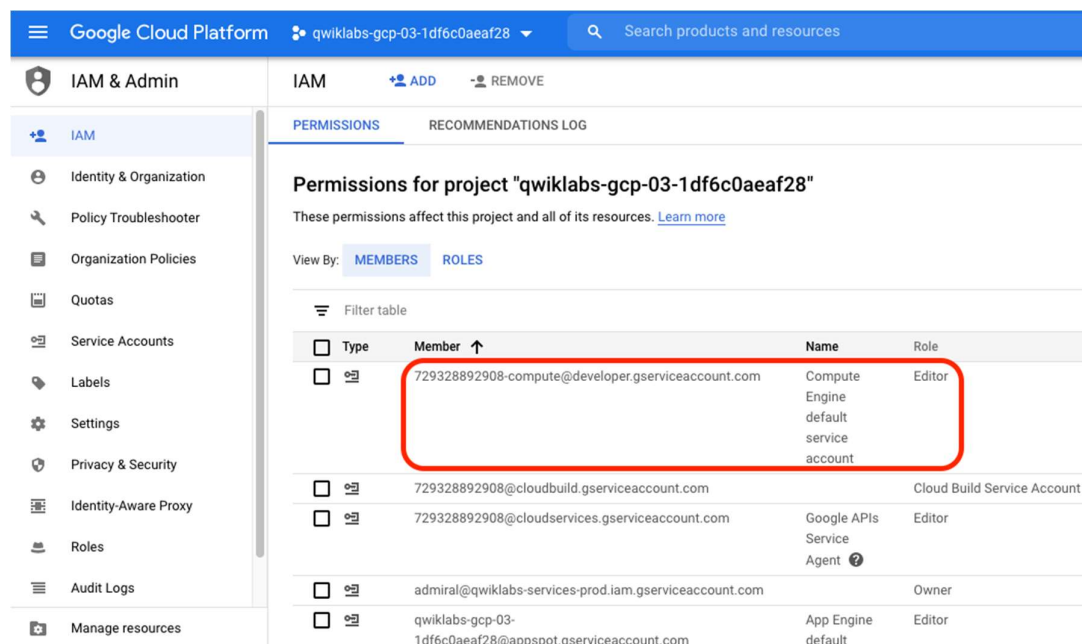
```
[core]
project = qwiklabs-gcp-44776a13dea667a6
```

For full documentation of `gcloud` see the [gcloud command-line tool overview](#).

## Check project permissions

Before you begin your work on Google Cloud, you need to ensure that your project has the correct permissions within Identity and Access Management (IAM).

1. In the Google Cloud console, on the **Navigation menu** () , click **IAM & Admin > IAM**.
2. Confirm that the default compute Service Account `{project-number}-compute@developer.gserviceaccount.com` is present and has the `editor` role assigned. The account prefix is the project number, which you can find on **Navigation menu > Home**.



Google Cloud Platform | qwiklabs-gcp-03-1df6c0aeaf28 | Search products and resources

**IAM & Admin**

**IAM** | PERMISSIONS | RECOMMENDATIONS LOG

Permissions for project "qwiklabs-gcp-03-1df6c0aeaf28"

These permissions affect this project and all of its resources. [Learn more](#)

View By: MEMBERS ROLES

Filter table

Type	Member	Name	Role
<input type="checkbox"/>	729328892908-compute@developer.gserviceaccount.com	Compute Engine default service account	Editor
<input type="checkbox"/>	729328892908@cloudbuild.gserviceaccount.com	Cloud Build Service Account	
<input type="checkbox"/>	729328892908@cloudservices.gserviceaccount.com	Google APIs Service Agent	Editor
<input type="checkbox"/>	admiral@qwiklabs-services-prod.iam.gserviceaccount.com		Owner
<input type="checkbox"/>	qwiklabs-gcp-03-1df6c0aeaf28@appspot.gserviceaccount.com	App Engine default	Editor

If the account is not present in IAM or does not have the `editor` role, follow the steps below to assign the required role.

- In the Google Cloud console, on the **Navigation menu**, click **Home**.
- Copy the project number (e.g. 729328892908).
- On the **Navigation menu**, click **IAM & Admin > IAM**.
- At the top of the **IAM** page, click **Add**.
- For **New members**, type:

```
{project-number}-compute@developer.gserviceaccount.com
```

Replace `{project-number}` with your project number.

- For **Role**, select **Project (or Basic) > Editor**. Click **Save**.

The screenshot shows the Google Cloud Platform IAM & Admin console. The left sidebar contains the navigation menu with options like Identity & Organization, Policy Troubleshooter, Organization Policies, Quotas, Service Accounts, Labels, Settings, Privacy & Security, Identity-Aware Proxy, Roles, Audit Logs, and Manage resources. The main content area is titled 'Permissions for project "qwiklabs-gcp-03-1df6c0aeaf28"'. It shows a table of permissions with columns for Type, Member, and Role. The 'New members' section is active, showing the email address '729328892908-compute@developer.gserviceaccount.com' entered. The 'Role' dropdown is set to 'Editor'. The 'Condition' dropdown is set to 'Add condition'. The 'Send notification email' checkbox is checked. The 'SAVE' button is highlighted.

Google Cloud Platform | qwiklabs-gcp-03-1df6c0aeaf28

IAM & Admin | IAM | ADD | REMOVE

PERMISSIONS | RECOMMENDATIONS

Permissions for project "qwiklabs-gcp-03-1df6c0aeaf28"

These permissions affect this project and its resources.

View By: MEMBERS | ROLES

Filter table

Type	Member	Role
<input type="checkbox"/>	729328892908@clo	
<input type="checkbox"/>	729328892908@clo	
<input type="checkbox"/>	admiral@qwiklabs-s	
<input type="checkbox"/>	qwiklabs-gcp-03-1df6c0aeaf28@app	
<input type="checkbox"/>	qwiklabs-gcp-03-1df6c0aeaf28.iam.g	

Add members to "qwiklabs-gcp-03-1df6c0aeaf28"

Add members, roles to "qwiklabs-gcp-03-1df6c0aeaf28" project

Enter one or more members below. Then select a role for these members to grant them access to your resources. Multiple roles allowed. [Learn more](#)

New members

729328892908-compute@developer.gserviceaccount.com

Role: Editor

Condition: Add condition

+ ADD ANOTHER ROLE

☐ Send notification email

This email will inform members that you've granted them access to this role for "qwiklabs-gcp-03-1df6c0aeaf28"

SAVE | CANCEL

# Open APIs Explorer

Go to **Navigation menu > APIs & Services**.

Scroll down the list until you find **Cloud Dataproc API**, and click on it.

Make sure that API is enabled, if not click **Enable**. Now that you have verified the API's enablement, open [Rest API Reference](#). This will open a new tab with the Rest API Reference page for the Cloud Dataproc API.

## Create a Cluster

From the left APIs & Reference section navigate to **REST reference > v1 > projects.regions.clusters > create** to `projects.regions.clusters.create` method or use [this link](#) to create cluster.

Now you'll fill in the form and execute the APIs Explorer template, below, as follows:

1. Insert your Qwiklabs Project ID in the `projectId` field.
2. Set the region field to **us-central1**.
3. In the **Request body**, click between the curly brackets and add the `clusterName` property. Enter the `clusterName` of your choice. Note, the value of the `clusterName` must not contain any uppercase letters or spaces.
4. From the Add a Property dropdown menu choose `config`.
5. In the Add a Property dropdown, choose `gceClusterConfig`.
6. In this Add a Property dropdown choose `zoneUri` field, then add the following, replacing `my-project-id` with the Project ID for this lab:

```
https://www.googleapis.com/compute/v1/projects/my-project-id/zones/us-central1-a
```

7. In the curly bracket under `config`, select `softwareConfig`
8. In the curly bracket under `softwareConfig`, select `imageVersion` and set it to `2.0-debian10`



9. In the curly bracket under `softwareConfig`, select `optionalComponents`. Under `optionalComponents` click on **ADD ITEM** and select `JUPYTER` from the dropdown.

When you're done your **Request body** should look like this:

**Request body**

```
{
  "clusterName": "my-cluster",
  "config": {
    "gceClusterConfig": {
      "zoneUri": "https://www.googleapis.com/compute/v1/projects/your-project/zones/your-zone"
    },
    "softwareConfig": {
      "imageVersion": "2.0-debian10",
      "optionalComponents": [
        "JUPYTER"
      ]
    }
  }
}
```

Make sure that **Google OAuth 2.0** and **API key** checkboxes are selected under **Credentials** section.

**Credentials** ?

☒ Google OAuth 2.0  
OAuth 2.0 provides authenticated access to an API. [Show scopes](#) v

☒ API key  
An API key is a unique string that lets you access an API.

**Note:** To view **Credentials FAQs**, click on question mark icon next to **Credentials** title. Make sure that there are no trailing spaces in any of the fields.

Now scroll down and click **Execute**.

Select the student account you started the lab with.

On the next screen, click **Allow** to give APIs Explorer access.

The results of the Dataproc API will appear below the Request and will look similar to the following:

```
200
{
  "name": "projects/qwiklabs-gcp-02-4100edaa237e/regions/us-central1/operations/78d29",
  "metadata": {
    "@type": "type.googleapis.com/google.cloud.dataproc.v1.ClusterOperationMetadata",
    "clusterName": "my-cluster",
    "clusterUuid": "93349c78-ffb1-446f-ada4-071950bbb26f",
    "status": {
      "state": "PENDING",
      "innerState": "PENDING",
      "stateStartTime": "2021-02-26T16:48:00.587Z"
    },
    "operationType": "CREATE",
    "description": "Create cluster with 2 workers"
  }
}
```

You can go to **Navigation menu > Dataproc > Clusters** to see the cluster created.

Clusters								
CREATE CLUSTER REFRESH START STOP DELETE REGIONS SHOW INFO PANEL								
Filter Search clusters, press Enter								
<input type="checkbox"/>	Name ↑	Status	Region	Zone	Total worker nodes	Scheduled deletion	Cloud Storage staging bucket	Created
<input type="checkbox"/>	my-cluster	Running	us-central1	us-central1-a	2	Off	dataproc-staging-us-central1-712986133204-w5zoc9x2	Feb 26, 2021, 7:27:11 PM

## Test Completed Task

Click **Check my progress** to verify your performed task. If you successfully created a Dataproc cluster in the us-central1 region, you will see an assessment score.

# Run a Spark job

Next you'll run a simple [Apache Spark](#) job that calculates a rough value for pi in an existing Cloud Dataproc cluster.

From the left APIs & Reference section navigate to **REST**

**reference > v1 > projects.regions.jobs > submit** to `projects.regions.jobs.submit` method or use [this link](#) to submit a job to a cluster.

Now you'll fill in the form and execute the APIs Explorer template, below, as follows:

1. Insert your project ID in the `projectId` field.
  2. Set the region field to **us-central1**.
  3. In the Request body, click between the curly brackets and choose `job`.
  4. Click in the curly brackets below this and choose `placement`.
  5. Click in the curly brackets below this and choose `clusterName` then type the name of your cluster.
  6. In the curly bracket under `job`, select `sparkJob`.
  7. You will now add 3 items under `sparkJob`:
    - In the curly bracket under `sparkjob`, select `args`. Under `args` click on **ADD ITEM** and type `1000`
    - In the Add a Property dropdown, choose `jarFileUri`. Under `jarFileUri` click on **ADD ITEM** and type `file:///usr/lib/spark/examples/jars/spark-examples.jar`
    - In the Add a Property dropdown, choose `mainClass` and type `org.apache.spark.examples.SparkPi`
- When you're done your **Request body** should look like this:

### Request body

```
{
  "job": {
    "placement": {
      "clusterName": "my-cluster"
    },
    "sparkJob": {
      "args": [
        "1000"
      ],
      "jarFileUri": [
        "file:///usr/lib/spark/examples/jars/spark-"
      ],
      "mainClass": "org.apache.spark.examples.Spark"
    }
  }
}
```

For suggestions, press control+space or click one of the blue "add" circles.

Make sure that **Google OAuth 2.0** and **API key** checkboxes are selected under **Credentials** section.

### Credentials ?

☒ Google OAuth 2.0

OAuth 2.0 provides authenticated access to an API. [Show scopes](#) ▾

☒ API key

An API key is a unique string that lets you access an API.

**Note:** To view **Credentials FAQs**, click on question mark icon next to **Credentials** title. Make sure that there are no trailing spaces in any of the fields. Click **EXECUTE**.

The results of the Dataproc API will appear below the Request, and look similar to this:

200

×

```
{
  "reference": {
    "projectId": "qwiklabs-gcp-02-eeec3c332584",
    "jobId": "8ee79942-30ce-4ecf-ab42-4299583dab13"
  },
  "placement": {
    "clusterName": "my-cluster",
    "clusterUuid": "c3d55622-2a41-49de-9ed4-e49ca8043a92"
  },
  "sparkJob": {
    "mainClass": "org.apache.spark.examples.SparkPi",
    "args": [
      "1000"
    ],
    "jarFileUri": [
      "file:///usr/lib/spark/examples/jars/spark-examples.jar"
    ]
  },
}
```

You can find your results by going to **Dataproc > Clusters**. Click on the name of your cluster, then the **Jobs** tab.

Click on the Job ID and select **Line Wrap** to **ON** to bring the lines that exceed the right margin into view.

Job output

LINE WRAP: ON

21/02/26 14:34:29 INFO org.sparkproject.jetty.util.log: Logging initialized @3105ms to org.sparkproject.jetty.util.log.Slf4jLog  
21/02/26 14:34:29 INFO org.sparkproject.jetty.server.Server: jetty-9.4.35.v20201120; built: 2020-11-20T21:17:03.964Z; git: bdc54f03a5e0a7e280fab27f55c3c75ee8da89fb; jvm 1.8.0\_282-b08  
21/02/26 14:34:29 INFO org.sparkproject.jetty.server.Server: Started @3251ms  
21/02/26 14:34:29 INFO org.sparkproject.jetty.server.AbstractConnector: Started ServerConnector@30af7377(HTTP/1.1, (http/1.1)){0.0.0.0:38619}  
21/02/26 14:34:30 INFO org.apache.hadoop.yarn.client.RMPProxy: Connecting to ResourceManager at my-cluster-m/10.128.0.5:8032  
21/02/26 14:34:30 INFO org.apache.hadoop.yarn.client.AHSProxy: Connecting to Application History server at my-cluster-m/10.128.0.5:10200  
21/02/26 14:34:31 INFO org.apache.hadoop.conf.Configuration: resource-types.xml not found  
21/02/26 14:34:31 INFO org.apache.hadoop.yarn.util.resource.ResourceUtils: Unable to find 'resource-types.xml'.  
21/02/26 14:34:32 INFO org.apache.hadoop.yarn.client.api.impl.YarnClientImpl: Submitted application application\_1614347086014\_0001  
21/02/26 14:34:33 INFO org.apache.hadoop.yarn.client.RMPProxy: Connecting to ResourceManager at my-cluster-m/10.128.0.5:8030  
Pi is roughly 3.1414738314147383  
21/02/26 14:34:51 INFO org.sparkproject.jetty.server.AbstractConnector: Stopped Spark@30af7377(HTTP/1.1, (http/1.1)){0.0.0.0:0}  
  
Job output is complete  
  
Equivalent: [command line](#)

## Test Completed Task

Click **Check my progress** to verify your performed task. If you successfully submit a Spark job to a cluster, you will see an assessment score.

# Update a cluster

From the left APIs & Reference section navigate to **REST**

**reference > v1 > projects.regions.clusters > patch** to `projects.regions.clusters.patch` method or use [this link](#) to update a cluster.

Now you'll fill in the form and execute the APIs Explorer template, below, as follows:

1. `projectId` = your project ID
2. `Region` = `us-central1`
3. `clusterName` = enter your cluster name
4. `updateMask` = `config.worker_config.num_instances`
5. Patch body, enter the following:
  - First curly bracket = `config`
  - Click in the curly bracket below this and choose `workerConfig`
  - Click in the curly bracket beneath this, and select `numInstances` , then type in **3**.Your form should look like this:

**Request parameters**

projectId  
qwiklabs-gcp-02-4100edaa237e

region  
us-central1

clusterName  
my-cluster

gracefulDecommissionTimeout  
string

requestId  
string

updateMask  
config.worker\_config.num\_instances

[Show standard parameters ▾](#)

**Request body**

```
{
  "config": {
    "workerConfig": {
      "numInstances": 3
    }
  }
}
```

For suggestions, press control+space or click one of the blue "add" circles.

Make sure that **Google OAuth 2.0** and **API key** checkboxes are selected under **Credentials** section.

**Credentials ?**

☒ **Google OAuth 2.0**  
OAuth 2.0 provides authenticated access to an API. [Show scopes ▾](#)

☒ **API key**  
An API key is a unique string that lets you access an API.

**Note:** To view **Credentials FAQs**, click on question mark icon next to **Credentials** title.  
Make sure that there are no trailing spaces in any of the fields. Click **EXECUTE**.

The results of the Dataproc API will appear below the Request, and look similar to this:

```
200 X
{
  "name": "projects/qwiklabs-gcp-02-4100edaa237e/regions/us-central1/operations/81f03",
  "metadata": {
    "@type": "type.googleapis.com/google.cloud.dataproc.v1.ClusterOperationMetadata",
    "clusterName": "my-cluster",
    "clusterUuid": "58a24305-e8d5-4b02-bde3-c8606937e8ee",
    "status": {
      "state": "PENDING",
      "innerState": "PENDING",
      "stateStartTime": "2021-02-26T15:00:00.428Z"
    },
    "operationType": "UPDATE",
    "description": "Add 1 workers."
  }
}
```

To verify this update, go back to the Dataproc Clusters page. You'll see that you now have 3 total worker nodes.

Clusters								
<div>CREATE CLUSTER REFRESH START STOP DELETE REGIONS SHOW INFO PANEL</div>								
<div>Filter Search clusters, press Enter</div>								
<input type="checkbox"/>	Name ↑	Status	Region	Zone	Total worker nodes	Scheduled deletion	Cloud Storage staging bucket	Created
<input type="checkbox"/>	my-cluster	Running	us-central1	us-central1-a	3	Off	dataproc-staging-us-central1-712986133204-w5zoc9x2	Feb 26, 2021, 10:18:00 PM

## Test Completed Task

Click **Check my progress** to verify your performed task. If you have successfully update a worker config for 3 worker nodes you will see an assessment score.

# Test your Understanding

Below are a multiple choice questions to reinforce your understanding of this lab's concepts. Answer them to the best of your abilities.

The API Explorer provides a way to try out methods in the Dataproc API without having to write any code.  
True

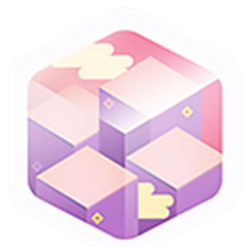
In API Explorer we can only try out Google Cloud APIs.  
False



# Congratulations!

You have used the Cloud Dataproc API through the API Explorer to create a cluster and run a Spark job, and update a cluster.

## Finish Your Quest



This self-paced lab is part of the Qwiklabs [Exploring APIs](#) 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](#).

## Next Steps / Learn More

- Read the [Frequently Asked Questions page for APIs Explorer](#)
- Read more about the [Cloud Dataproc API](#)

## 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 March 01, 2021

Lab Last Tested March 01, 2021

Copyright 2021 Google LLC All rights reserved. Google and the Google logo are trademarks of Google LLC. All other company and product names may be trademarks of the respective companies with which they are associated.