Start Lab 02:00:00

Streaming Data Processing: Publish Streaming Data into PubSub

2 hours Free

Overview

Google Cloud Pub/Sub is a fully-managed real-time messaging service that allows you to send and receive messages between independent applications. Use Cloud Pub/Sub to publish and subscribe to data from multiple sources, then use Google Cloud Dataflow to understand your data, all in real time.

In this lab, you will use simulate your traffic sensor data into a Pub/Sub topic for later to be processed by Dataflow pipeline before finally ending up in a BigQuery table for further analysis.

> At the time of this writing, streaming pipelines are not available in the DataFlow Python SDK. So the streaming labs are written in Java.

Objectives

In this lab, you will perform the following tasks:

- Create a Pub/Sub topic and subscription
- Simulate your traffic sensor data into Pub/Sub

Setup

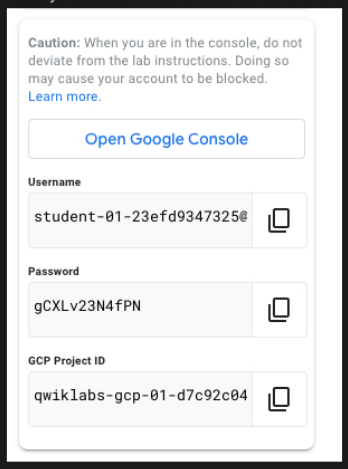
For each lab, you get a new GCP project and set of resources for a fixed time at no cost.

1. Make sure you signed into Qwiklabs using an **incognito window**.
2. Note the lab's access time (for example, 02:00:00 and make sure you can finish in that time block.

There is no pause feature. You can restart if needed, but you have to start at the beginning.

3. When ready, click START LAB.

4. Note your lab credentials. You will use them to sign in to Cloud Platform Console.



5. Click **Open Google Console**.

6. Click **Use another account** and copy/paste credentials for **this** lab into the prompts.

If you use other credentials, you'll get errors or **incur charges**.

7. Accept the terms and skip the recovery resource page.

Do not click **End Lab** unless you are finished with the lab or want to restart it. This clears your work and removes the project.

Task 1: Preparation

You will be running a sensor simulator from the training VM. There are several files and some setup of the environment required.

Open the SSH terminal and connect to the training VM

1. In the Console, on the **Navigation menu** ( ), click **Compute Engine** > **VM instances**.

2. Locate the line with the instance called **training-vm**.

3. On the far right, under **Connect**, click on **SSH** to open a terminal window.

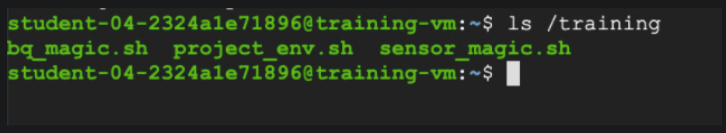
4. In this lab, you will enter CLI commands on the **training-vm**.

Verify initialization is complete

5. The **training-vm** is installing some software in the background. Verify that setup is complete by checking the contents of the new directory.

```
ls /training
```

The setup is complete when the result of your list (ls) command output appears as in the image below. If the full listing does not appear, wait a few minutes and try again. **Note**: It may take 2 to 3 minutes for all background actions to complete.



Download Code Repository

6. Next you will download a code repository for use in this lab.

```
git clone https://github.com/GoogleCloudPlatform/training-data-analyst
```

Identify a project

One environment variable that you will set is **$DEVSHELL_PROJECT_ID** that contains the Google Cloud project ID required to access billable resources.

7. In the Console, on the **Navigation menu** ( ), click **Home**. In the panel with Project Info, the **Project ID** is listed. You can also find this information in the Qwiklabs tab under Connection Details, where it is labeled **GCP Project ID**.

8. On the **training-vm** SSH terminal, set the DEVSHELL_PROJECT_ID environment variable and export it so it will be available to other shells. The following command obtains the active Project ID from the Google Cloud environment.

```
export DEVSHELL_PROJECT_ID=$(gcloud config get-value project)
```

Task 2: Create Pub/Sub topic and subscription

1. On the **training-vm** SSH terminal, navigate to the directory for this lab.

```
cd ~/training-data-analyst/courses/streaming/publish
```

Verify that the Pub/Sub service is accessible and working using the gcloud command.

2. Create your topic and publish a simple message.

```
gcloud pubsub topics create sandiego
```

3. Publish a simple message.

```
gcloud pubsub topics publish sandiego --message "hello"
```

4. Create a subscription for the topic.

```
gcloud pubsub subscriptions create --topic sandiego mySub1
```

5. Pull the first message that was published to your topic.

```
gcloud pubsub subscriptions pull --auto-ack mySub1
```

Do you see any result? If not, why?

6. Try to publish another message and then pull it using the subscription.

```
gcloud pubsub topics publish sandiego --message "hello again"
gcloud pubsub subscriptions pull --auto-ack mySub1
```

Did you get any response this time?

Output:

DATA	MESSAGE_ID	ATTRIBUTES
hello again	38138015771622	

Click *Check my progress* to verify the objective.

Create Pub/Sub topic and subscription

Check my progress

7. In the **training-vm** SSH terminal, cancel your subscription.

```
gcloud pubsub subscriptions delete mySub1
```

Task 3: Simulate traffic sensor data into Pub/Sub

1. Explore the python script to simulate San Diego traffic sensor data. **Do not make any changes to the code.**

```
cd ~/training-data-analyst/courses/streaming/publish
nano send_sensor_data.py
```

Look at the simulate function. This one lets the script behave as if traffic sensors were sending in data in real time to Pub/Sub. The speedFactor parameter determines how fast the simulation will go. Exit the file by pressing **Ctrl+X**.

2. Download the traffic simulation dataset.

```
./download_data.sh
```

Simulate streaming sensor data

3. Run the **send_sensor_data.py**.

```
./send_sensor_data.py --speedFactor=60 --project $DEVSHELL_PROJECT_ID
```

This command simulates sensor data by sending recorded sensor data via Pub/Sub

messages. The script extracts the original time of the sensor data and pauses between sending each message to simulate realistic timing of the sensor data. The value **speedFactor** changes the time between messages proportionally. So a **speedFactor** of 60 means "60 times faster" than the recorded timing. It will send about an hour of data every 60 seconds.

Leave this terminal open and the simulator running.

Task 4: Verify that messages are received

Open a second SSH terminal and connect to the training VM

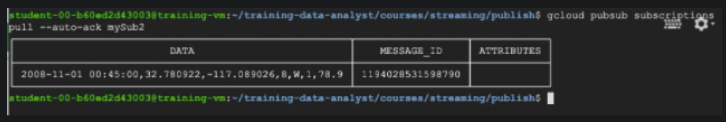
1. In the Console, on the **Navigation menu** ( ), click **Compute Engine** > **VM instances**.
2. Locate the line with the instance called **training-vm**.
3. On the far right, under **Connect**, click on **SSH** to open a second terminal window.
4. Change into the directory you were working in:

```
cd ~/training-data-analyst/courses/streaming/publish
```

5. Create a subscription for the topic and do a pull to confirm that messages are coming in (note: you may need to issue the 'pull' command more than once to start seeing messages):

```
gcloud pubsub subscriptions create --topic sandiego mySub2
gcloud pubsub subscriptions pull --auto-ack mySub2
```

Confirm that you see a message with traffic sensor information.



6. Cancel this subscription.

```
gcloud pubsub subscriptions delete mySub2
```

7. Close the second terminal.

```
exit
```

Stop the sensor simulator

8. Return to the first terminal.
9. Interrupt the publisher by typing **Ctrl+C** to stop it.
10. Close the first terminal.

```
exit
```

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.