Migrating On-premises MySQL Using a Continuous Database Migration Service Job | Google Cloud Skills Boost

Qwiklabs ⠆ 16-20 minutes

Overview

Database Migration Service provides options for one-time and continuous jobs to migrate data to Cloud SQL using different connectivity options, including IP allowlists, VPC peering, and reverse SSH tunnels (see documentation on connectivity options in the Configure connectivity Guide).

In this lab, you migrate an on-premises MySQL database (running on a virtual machine) to Cloud SQL for MySQL using a continuous Database Migration Service job and VPC peering for connectivity.

After you create and run the migration job, you confirm that an initial copy of your database has been successfully migrated to your Cloud SQL for MySQL instance. You also explore how continuous migration jobs apply data updates from your source database to your Cloud SQL instance. To conclude the migration job, you promote the Cloud SQL instance to be a standalone database for reading and writing data.

Objectives

In this lab, you learn how to configure a continuous Database Migration Service job to migrate databases from a MySQL instance to Cloud SQL for MySQL.

- Create a profile for a source connection to a MySQL instance (e.g., on-premises MySQL).
- Configure connectivity between the source and destination database instances using VPC peering.
- Create, run, and verify a continuous migration job using Database Migration Service.
- Promote the destination instance (Cloud SQL for MySQL) to be a standalone database for reading and writing data.
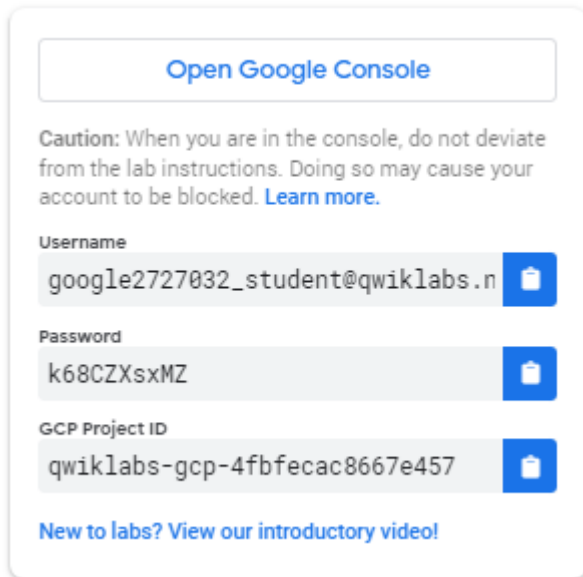
Setup

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

1. Sign in to Qwiklabs using an **incognito window**.

2. Note the lab's access time (for example, `1:15:00`), and make sure you can finish within that time. 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 (**Username** and **Password**). You will use them to sign in to the Google Cloud 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 receive errors or **incur charges**.

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

How to start your lab and sign in to the 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.
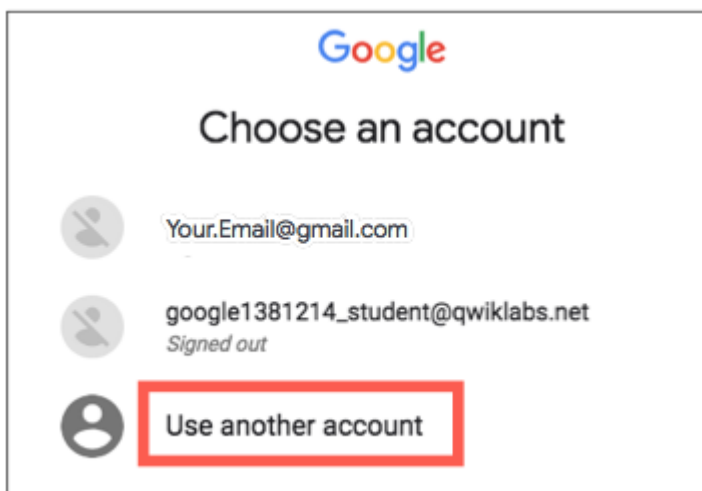
2. Copy the username, and then click **Open Google Console**. The lab spins up resources, and then opens another tab that shows the **Choose an account** page.

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

3. On the Choose an account page, click **Use Another Account**. The Sign in page opens.

4. Paste the username that you copied from the Connection Details panel. Then copy and paste the password.

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

5. 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.
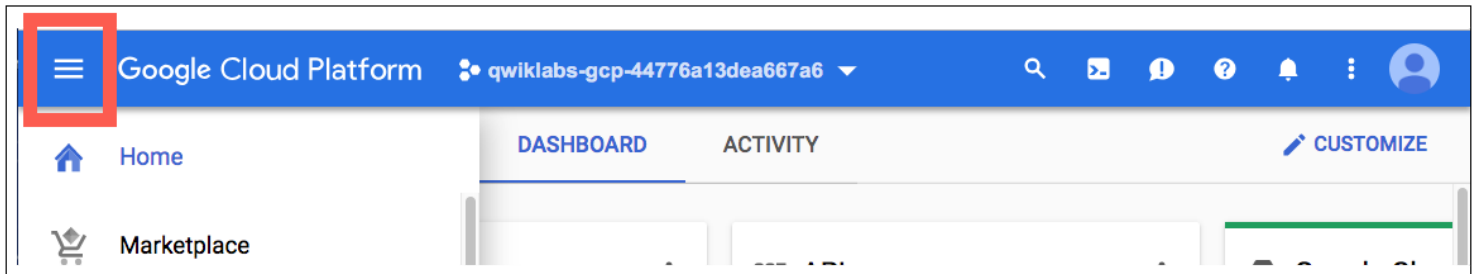
Activate Google Cloud Shell

Google 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.

Google Cloud Shell provides command-line access to your Google Cloud resources.

1. In Cloud console, on the top right toolbar, click the Open Cloud Shell button.
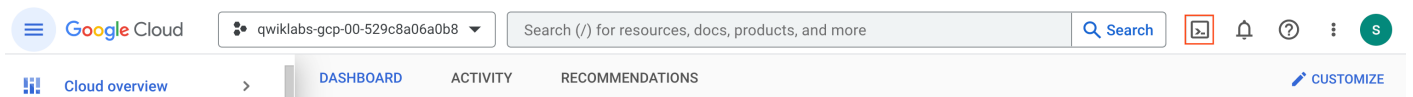
2. Click **Continue**.

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: - @.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 =

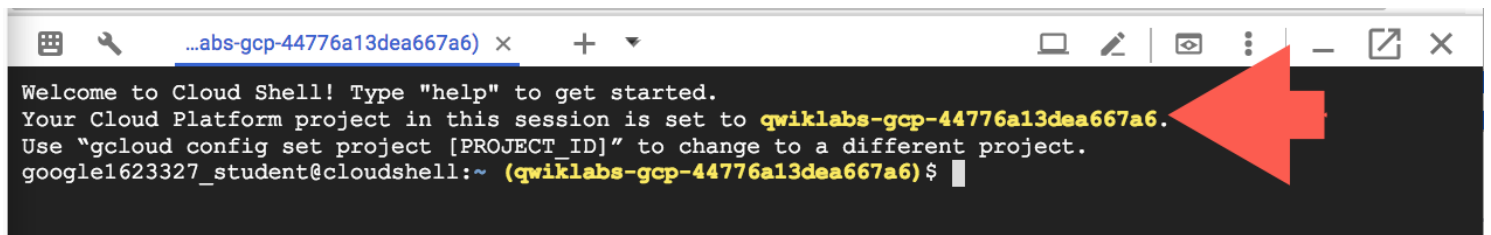**Example output:**

[core] project = qwiklabs-gcp-44776a13dea667a6 **Note:** Full documentation of **gcloud** is available in the gcloud CLI overview guide .

Verify that the Database Migration API is enabled

1. In the Google Cloud Console, enter **Database Migration API** in the top search bar. Click on the result for **Database Migration API**.

This page will either show status information or give you the option to enable the API.

2. If necessary, enable the API.

Verify that the Service Networking API is enabled

1. In the Google Cloud Console, enter **Service Networking API** in the top search bar. Click on the result for **Service Networking API**.

This page will either show status information or give you the option to enable the API.

2. If necessary, enable the API.

Task 1. Get the connectivity information for the MySQL source instance

In this task, you identify the internal IP address of the source database instance that you will migrate to Cloud SQL.

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

2. Locate the line with the instance called **dms-mysql-training-vm-v2**.

3. Copy the value for **Internal IP** (e.g., 10.128.0.2).

Task 2. Create a new connection profile for the MySQL source instance

A connection profile stores information about the source database instance (e.g., on-premises MySQL) and is used by Database Migration Service to migrate data from the source to your destination Cloud SQL database instance. After you create a connection profile, it can be reused across migration jobs.

1. In the Google Cloud Console, on the **Navigation menu** (≡), click **Database Migration > Connection profiles**.

2. Click **Create Profile**.

3. For **Database engine**, select **MySQL**.

4. Enter the required information for a connection profile:

Property	Value
Connection profile name	**mysql-vm**
Connection profile ID	keep the auto-generated value
Hostname or IP address	enter the internal IP for the MySQL source instance that you copied in the previous task (e.g., 10.128.0.2)
Port	**3306**
Username	**admin**
Password	**changeme**

5. For **Connection profile region** select .

6. For the **Encryption Type**, select **None**.

7. Click **Create**.

A new connection profile named **mysql-vm** will appear in the Connections profile list.

Click *Check my progress* to verify the objective. Create a connection profile for the MySQL source instance.

Task 3. Create and start a continuous migration job

When you create a new migration job, you first define the source database instance using a previously created connection profile. Then you create a new destination database instance and configure connectivity between the source and destination instances.

In this task, you use the migration job interface to create a new Cloud SQL for MySQL database instance and set it as the destination for the continuous migration job from the MySQL source instance.

Create a new continuous migration job

1. In the Google Cloud Console, on the **Navigation menu (≡)**, click **Database Migration > Migration jobs**.

2. Click **Create Migration Job**.

3. For **Create a migration job**, on the **Get Started** tab, use the following values:

Property	Value
Migration job name	**vm-to-cloudsql**
Migration job ID	keep the auto-generated value
Source database engine	**MySQL**
Destination region	
Migration job type	**Continuous**

Leave all other settings as default.

4. Click **Save & Continue**.

Define the source instance

1. For **Select source connection profile**, select **mysql-vm**.

2. Leave the defaults for the other settings.

3. Click **Save & Continue**.

Create the destination instance

1. Enter the required information to create the destination instance on Cloud SQL:

Property	Value
Destination Instance ID	**mysql-cloudsql**

Root password	**supersecret!**
Database version	**Cloud SQL for MySQL** 5.7
Zone	

2. In **Connections**, select **Private IP** and **Public IP**.

3. Select **Use an automatically allocated IP range**.

4. Click **Allocate & Connect**.

Note: This step may take a few minutes. If asked to retry the request, click the Retry button to refresh the Service Networking API.

When this step is complete, an updated message notifies you that the instance will use the existing managed service connection.

5. Enter the additional information needed to create the destination instance on Cloud SQL:

Property	Value
Machine shapes	**1 vCPU, 3.75 GB**
Storage type	SSD
Storage capacity	10 GB

6. Click **Create & Continue**.

If prompted to confirm, click **Create Destination & Continue**.

Define the connectivity method

A message will state that your destination database instance is being created. Continue to step 1 while you wait.

> ℹ️ Instance creation in progress. This may take a few minutes. You can begin defining the connectivity method. Configure & Continue is enabled when both are complete.

1. For **Connectivity method**, select **VPC peering**.

2. For **VPC**, select **default**.

VPC peering is configured by Database Migration Service using the information provided for the VPC network (the default network in this example).

When you see an updated message that the destination instance was created, proceed to the next step.

3. Click **Configure & Continue**.

Test and start the continuous migration job

1. Review the details of the migration job.

2. Click **Test Job**.

3. After a successful test, click **Create & Start Job**.

If prompted to confirm, click **Create & Start**.

Task 4. Review the status of the continuous migration job

1. In the Google Cloud Console, on the **Navigation menu (≡)**, click **Database Migration > Migration jobs**.

2. Click the migration job **vm-to-cloudsql** to see the details page.

3. Review the migration job status.

   - If you have not started the job, the status will show as *Not started*. You can choose to start or delete the job.
   - After the job has started, the status will show as *Starting* and then transition to **Running** *Full Dump* to indicate that the initial database dump is in progress.
   - After the initial database dump has been completed, the status will transition to ***Running*** *CDC in progress* to indicate that continuous migration is active.

When the job status changes to ***Running CDC in progress***, proceed to the next task.

Note: Continuous migration jobs remain in a running status to ensure that the destination database continues to receive data updates from the source. A completed status is achieved after the destination database is promoted to be a standalone database for reading and writing data (see task 7).

Click *Check my progress* to verify the objective. Create, start, and review a continuous migration job.

Task 5. Confirm the data in Cloud SQL for MySQL

Check the MySQL databases in Cloud SQL

1. In the Google Cloud Console, on the **Navigation menu (≡)**, click **Databases** > **SQL**.

2. Click on the instance ID called **mysql-cloudsql** (MySQL read replica).

3. In the **Replica Instance** menu, click **Databases**.

Notice that the databases called **customers_data** and **sales_data** have been migrated to Cloud SQL.

Connect to the MySQL instance

1. In the **Replica Instance** menu, click **Overview**.

2. Click **OPEN CLOUD SHELL**.

The command to connect to MySQL will pre-populate in Cloud Shell:

gcloud sql connect mysql-cloudsql --user=root --quiet

3. Run the pre-populated command.

If prompted, click **Authorize** for the API.

4. When prompted for a password, which you previously set, enter:

supersecret!

You have now activated the MySQL interactive console for the destination instance.

Review the data in the Cloud SQL for MySQL instance

1. To select the database in the MySQL interactive console, run the following command:

use customers_data;

2. Query the number of records in the customers table:

select count(*) from customers;

There are 5,030 records in the customers table that were migrated from the MySQL source instance.

3. Sort the records in the customers table by last name and review the first ten records:

select * from customers order by lastName limit 10;

Note that the last name of the first record in the customers table is Accumsan.

In the next task, you will add new records to the customers table in the source database instance. The continuous migration job will migrate the new records from the source instance to the destination instance.

4. Exit the MySQL interactive console:

exit

Click *Check my progress* to verify the objective. Confirm the migrated data in Cloud SQL for MySQL.

Task 6. Test the continuous migration of data from the source to the destination instance

Add new data to the source instance

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

2. Locate the line with the instance called **dms-mysql-training-vm-v2**.

3. For **Connect**, click **SSH** to open a terminal window.

4. To connect to the MySQL interactive console within the terminal window, run the following command:

mysql -u admin -p

5. When prompted for a password, enter:

changeme

6. To select the database in the MySQL interactive console, run the following command:

use customers_data;

7. Add two new data records to the customers table with the following command:

INSERT INTO customers (customerKey, addressKey, title, firstName, lastName, birthdate, gender, maritalStatus, email, creationDate) VALUES ('9365552000000-999', '9999999', 'Ms', 'Magna', 'Ablorem', '1953-07-28 00:00:00', 'FEMALE', 'MARRIED', 'magna.lorem@gmail.com', CURRENT_TIMESTAMP), ('9965552000000-9999', '99999999', 'Mr', 'Arcu', 'Abrisus', '1959-07-28 00:00:00', 'MALE', 'MARRIED', 'arcu.risus@gmail.com', CURRENT_TIMESTAMP);

8. Query the new number of records in the customers table:

select count(*) from customers;

There are now 5,032 records in the customers table in the MySQL source instance.

9. Sort the records in the customers table by last name and review the first ten records:

select * from customers order by lastName limit 10;

Note that the last name of the first record in the customers table has changed to Ablorem.

10. Exit the MySQL interactive console:

exit

11. Exit the terminal session:

exit

Connect to the Cloud SQL for MySQL instance

1. In the Google Cloud Console, on the **Navigation menu** (≡), click **Databases** > **SQL**.

2. Click on the instance ID called **mysql-cloudsql** (MySQL read replica).

3. In the **Replica Instance** menu, click **Overview**.

4. Click **OPEN CLOUD SHELL**.

The command to connect to MySQL will pre-populate in Cloud Shell:

gcloud sql connect mysql-cloudsql --user=root --quiet

5. Run the pre-populated command.

If prompted, click **Authorize** for the API.

6. When prompted for a password, which you previously set, enter:

supersecret!

You have now activated the MySQL interactive console for the destination instance.

Check that the data updates have been applied to the Cloud SQL for MySQL instance

1. To select the database in the MySQL interactive console, run the following command:

use customers_data;

2. Query the number of records in the customers table:

select count(*) from customers;

Notice that the two records added to the MySQL source instance have been migrated. There are now 5,032 records in the customers table in the Cloud SQL destination instance.

3. Sort the records in the customers table by last name and review the first ten records:

select * from customers order by lastName limit 10;

Notice that the last name of the first record in the customers table is now the same across the Cloud SQL destination instance and the MySQL source instance.

4. Exit the MySQL interactive console:

exit

Click *Check my progress* to verify the objective. Test the continuous migration of data from the source to the destination.

Task 7. Promote Cloud SQL to be a standalone instance for reading and writing data

1. In the Google Cloud Console, on the **Navigation menu** (≡), click **Database Migration > Migration jobs**.

2. Click the migration job name **vm-to-cloudsql** to see the details page.

3. Click **Promote**.

If prompted to confirm, click **Promote**.

When the promotion is complete, the status of the job will update to *completed*.

4. In the Google Cloud Console, on the **Navigation menu** (≡), click **Databases** > **SQL**.

Note that **mysql-cloudsql** is now a standalone instance for reading and writing data.

✓	mysql-cloudsql	MySQL 5.7
⊖	mysql-cloudsql-master	MySQL external primary

Click *Check my progress* to verify the objective. Promote Cloud SQL for MySQL to be a standalone instance for reading and writing data.

End your lab

When you have completed your lab, click **End Lab**. Google Cloud Skills Boost 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.