
Exercise: Data Replication to Google Cloud Platform (GCP)

In this exercise, you will replicate a PostgreSQL database to the Google Cloud Platform. You will create a project, create a storage bucket, upload a database dump to that bucket, create a Cloud SQL instance, and then import the dump into Cloud SQL.

Prerequisites

- A Google Cloud Platform account.
- A PostgreSQL database and a dump of that database.
- The `gcloud` and `gsutil` command-line tools installed on your machine.

Step 1: Create a GCP Project

1. Navigate to the Google Cloud Console.
2. Click on the project drop-down and select `New Project`.
3. Enter a project name and select a billing account. Optionally, you can also select a project ID and organization.
4. Click `Create` to create your new project.
5. For more detailed instructions, refer to the official documentation.

Step 2: Create a Storage Bucket

1. In the Cloud Console, navigate to `Storage > Browser`.
2. Click `Create Bucket`.
3. Enter a name for your bucket, and choose a storage class and location as per your requirements.
4. Click `Create` to create your new bucket.
5. For more detailed instructions, refer to the official documentation on creating buckets.

Step 3: Upload the Database Dump

1. Locate the dump of your PostgreSQL database on your machine.
2. In the Cloud Console, navigate to `Storage > Browser`.
3. Click on the name of the bucket you created in Step 2.
4. Click `Upload files`, navigate to the location of your database dump on your machine, select the file, and click `Open` to upload the dump to your bucket.

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5. Alternatively, you can use the `gsutil cp` command to upload the dump to your bucket:

```
gsutil cp /path/to/your/database.dump gs://your-bucket-name
```

6. For more detailed instructions, refer to the official documentation on uploading objects.

Step 4: Create a Cloud SQL Instance

1. In the Cloud Console, navigate to SQL > Instances.
2. Click `Create instance`.
3. Select the PostgreSQL option and click `Next`.
4. In the “Instance ID” field, enter a unique identifier for your instance.
5. In the “Password” field, enter a password for the `postgres` user.
6. Under the “Configuration options” section, click on “Machine type and storage”.
7. For the “Machine type”, select the smallest available machine type, which is `db-f1-micro`.
8. Leave the “Storage type” and “Storage capacity” at their default values, or adjust as per your requirements.
9. Click `Create` to create the instance. This may take a few minutes.
10. Once the instance is created, you will be redirected to the “Instance details” page.
11. For more detailed instructions, refer to the official documentation on creating a Cloud SQL instance.


Step 5: Import the Database Dump

1. In the “Instance details” page, click on the `Import` button in the button bar at the top.
2. In the “Import database” dialog that appears, click on the `Browse` button.
3. Select the `Cloud Storage` option, and then navigate to the bucket and the database dump file you uploaded earlier.
4. Select the file and click `Select`.
5. Click `Import` to start the import process. This may take some time depending on the size of the database dump.
6. Once the import is completed, you will see a notification in the Cloud Console.
7. For more detailed instructions, refer to the official documentation on importing and exporting SQL data.

Step 6: Connect to the Cloud SQL Instance

1. Make sure your Cloud SQL instance has a public IP address as Cloud Shell doesn’t work with a private IP address.



2. In the Google Cloud console, click the Cloud Shell icon  in the upper right corner.
3. When Cloud Shell finishes initializing, a message will appear with a prompt similar to `username@sample-project:~ (sample-project)$`.
4. If your Cloud Shell session is set to a different project, change it to the project where your Cloud SQL instance is located using the following command:

```
gcloud config set project [PROJECT_ID]
```

Replace `[PROJECT_ID]` with your project ID.
5. At the Cloud Shell prompt, connect to your Cloud SQL instance using the following command:

```
gcloud sql connect your-instance-id --user=postgres
```

Replace `your-instance-id` with the Instance ID you set earlier.
6. Click **Authorize** in the message box that appears to authorize Cloud Shell to make API calls.
7. A message will indicate that your IP is being allowlisted for incoming connections, after which you will be prompted to enter your password.
8. Enter the password you set for the `postgres` user during the instance creation process.
9. Once connected, switch to the `adventureworks` database by executing the following command:

```
\c adventureworks
```
10. You are now connected to the `adventureworks` database in your Cloud SQL instance.
11. For more detailed instructions, refer to the official documentation on connecting to a Cloud SQL instance using Cloud Shell.