

# Securing a Cloud SQL for PostgreSQL Instance

GSP920



- Cloud SQL CMEK uses customer-managed KMS keys for data-at-rest encryption control on PostgreSQL instances.
- Lab secures PostgreSQL instance with CMEK, configures pgAudit for SQL operation logging, and sets up IAM database authentication.
- **Security Layers**
  - CMEK Setup: Create KMS keyring/key, service account, deploy Cloud SQL instance using custom encryption key.
  - pgAudit: Enable PostgreSQL audit extension to track SELECT/INSERT/UPDATE/DELETE operations selectively.
- **Authentication**
  - Configure Cloud SQL IAM database auth mapping GCP identities to PostgreSQL roles for passwordless access.
  - Targeted at PostgreSQL DBAs - combines encryption, auditing, and modern IAM auth best practices.

Create and Manage Cloud SQL for PostgreSQL Instances

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## Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled

In this task, you create a Cloud SQL for PostgreSQL instance with CMEK enabled. It is imperative that you keep the keys safe as you cannot manage your database without them.

### Create a per-product, per-project service account for Cloud SQL

You can create the service account you require for Cloud SQL CMEK using the `gcloud beta services identity create` command.

1. In Cloud Shell, run the following to create the service account:

```
export PROJECT_ID=$(gcloud config list --format='value(core.project)')  
gcloud beta services identity create \  
--service=sqladmin.googleapis.com \  
--project=$PROJECT_ID
```

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Time limit

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.](#)

[Open Cloud Cloud console](#)

Username: student-00-c29980749c30e  
Password: 6IRehOs7IGAG  
Project ID: qwiklabs-gcp-04-97c131cf

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Create a per-product, per-project service account for Cloud SQL

You can create the service account you require for Cloud SQL CMEK using the `gcloud beta services identity create` command.

1. In Cloud Shell, run the following to create the service account:

```
export PROJECT_ID=$(gcloud config list --format 'value(core.project)')  
gcloud beta services identity create \  
--service=sqladmin.googleapis.com \  
--project=$PROJECT_ID
```

2. Click the **Authorize** button if prompted.

This creates the service account that you will bind to the CMEK in a later step.

Create a Cloud Key Management Service keyring and key

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

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## Create a Cloud Key Management Service keyring and key

In this section, you create a Cloud KMS keyring and key to use with CMEK.

1. In Cloud Shell, run the following command to create the Cloud KMS keyring:

```
export KMS_KEYRING_ID=cloud-sql-keyring
export ZONE=$(gcloud compute instances list --filter="NAME=bastion-vm" --format=json | jq -r '.[].zone' | awk -F "/zones/" '{print $NF}')
export REGION=${ZONE: -2}
gcloud kms keyrings create $KMS_KEYRING_ID \
    --location=$REGION
```

2. In Cloud Shell, run the following command to create the Cloud KMS key:

```
export KMS_KEY_ID=cloud-sql-key
gcloud kms keys create $KMS_KEY_ID \
    --location=$REGION \
    --keyring=$KMS_KEYRING_ID \
    --purpose=encryption
```

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

2. In Cloud Shell, run the following command to create the Cloud KMS key:

```
export KMS_KEY_ID=cloud-sql-key
gcloud kms keys create $KMS_KEY_ID \
--location=$REGION \
--keyring=$KMS_KEYRING_ID \
--purpose=encryption
```

3. In Cloud Shell, run the following command to bind the key to the service account:

```
export PROJECT_NUMBER=$(gcloud projects describe ${PROJECT_ID} \
--format 'value(projectNumber)')
gcloud kms keys add-iam-policy-binding $KMS_KEY_ID \
--location=$REGION \
--keyring=$KMS_KEYRING_ID \
--member=serviceAccount:service-${PROJECT_NUMBER}@gcp-sa-cloud-
--role=roles/cloudkms.cryptoKeyEncrypterDecrypter
```

The service account name is the same name that was returned by the gcloud beta

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRhOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Securing a Cloud SQL for PostgreSQL Instance

You therefore need to know the external IP address of that instance. You also add the external IP address of the Cloud Shell to the allowlist to make it easier to complete tasks later in the lab.

1. In Cloud Shell, run the following command to find the external IP address of the bastion-vm VM instance:

```
export AUTHORIZED_IP=$(gcloud compute instances describe bastion-vm \
    --zone=$ZONE \
    --format 'value(networkInterfaces[0].accessConfigs.natIP)')
echo Authorized IP: $AUTHORIZED_IP
```

2. In Cloud Shell, run the following command to find the external IP address of the Cloud Shell:

```
export CLOUD_SHELL_IP=$(curl ifconfig.me)
echo Cloud Shell IP: $CLOUD_SHELL_IP
```

3. In Cloud Shell, run the following command to create your Cloud SQL for PostgreSQL instance with:

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Open Cloud Cloud console

Username: student-00-c29980749c30e2f  
Password: 6IRehOs7IGAG  
Project ID: qwiklabs-gcp-04-97c131cf

Securing a Cloud SQL for PostgreSQL Instance

--format 'value(networkInterfaces[0].accessConfigs.natIP)'  
echo Authorized IP: \$AUTHORIZED\_IP

2. In Cloud Shell, run the following command to find the external IP address of the Cloud Shell:

export CLOUD\_SHELL\_IP=\$(curl ifconfig.me)  
echo Cloud Shell IP: \$CLOUD\_SHELL\_IP

3. In Cloud Shell, run the following command to create your Cloud SQL for PostgreSQL instance with:

export KEY\_NAME=\$(gcloud kms keys describe \$KMS\_KEY\_ID \  
--keyring=\$KMS\_KEYRING\_ID --location=\$REGION \  
--format 'value(name)')  
  
export CLOUDSQL\_INSTANCE=postgres-orders  
gcloud sql instances create \$CLOUDSQL\_INSTANCE \  
--project=\$PROJECT\_ID \  
--authorized-networks=\${AUTHORIZED\_IP}/32,\$CLOUD\_SHELL\_IP/32  
\  
disk\_encryption\_key:\$KEY\_NAME

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

3. In Cloud Shell, run the following command to create your Cloud SQL for PostgreSQL instance with:

```
export KEY_NAME=$(gcloud kms keys describe $KMS_KEY_ID \
    --keyring=$KMS_KEYRING_ID --location=$REGION \
    --format 'value(name)')

export CLOUDSQL_INSTANCE=postgres-orders
gcloud sql instances create $CLOUDSQL_INSTANCE \
    --project=$PROJECT_ID \
    --authorized-networks=${AUTHORIZED_IP}/32,$CLOUD_SHELL_IP/32
    \
    --disk-encryption-key=$KEY_NAME \
    --database-version=POSTGRES_13 \
    --cpu=1 \
    --memory=3840MB \
    --region=$REGION \
    --root-password=supersecret!
```

4. Enter 'y' if prompted after entering the command.

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CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) x + Open Editor

Welcome to Cloud Shell! Type "help" to get started, or type "gemini" to try prompting with Gemini CLI.  
Your Cloud Platform project in this session is set to **qwiklabs-gcp-04-97c131c67b81**.  
Use `gcloud config set project [PROJECT\_ID]` to change to a different project.  
student\_00\_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)\$ export PROJECT\_ID=\$(gcloud config list --format 'value(core.project)')  
gcloud beta services identity create \  
--service=sqladmin.googleapis.com \  
--project=\$PROJECT\_ID  
Service identity created: service-15588554522@gcp-sa-cloud-sql.iam.gserviceaccount.com  
student\_00\_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)\$

Air: Severe Sunday 4

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CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) x + Open Editor

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export KMS_KEYRING_ID=cloud-sql-keyring
export ZONE=$(gcloud compute instances list --filter="NAME=bastion-vm" --format=json | jq -r .[].zone | awk -F "/zones/" '{print $NF}')
export REGION=${ZONE::2}
gcloud kms keyrings create $KMS_KEYRING_ID \
    --location=$REGION
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export KMS_KEY_ID=cloud-sql-key
gcloud kms keys create $KMS_KEY_ID \
    --location=$REGION \
    --keyring=$KMS_KEYRING_ID \
    --purpose=encryption
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export PROJECT_NUMBER=$(gcloud projects describe ${PROJECT_ID} \
    --format 'value(projectNumber)')
gcloud kms keys add-iam-policy-binding $KMS_KEY_ID \
    --location=$REGION \
    --keyring=$KMS_KEYRING_ID \
    --member=serviceAccount:service-${PROJECT_NUMBER}@gcp-sa-cloud-sql.iam.gserviceaccount.com \
    --role=roles/cloudkms.cryptoKeyEncrypterDecrypter
Updated IAM policy for key [cloud-sql-key].
bindings:
- members:
  - serviceAccount:service-15588554522@gcp-sa-cloud-sql.iam.gserviceaccount.com
    role: roles/cloudkms.cryptoKeyEncrypterDecrypter
etag: BwZIbFUCu_s=
version: 1
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

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```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export AUTHORIZED_IP=$(gcloud compute instances describe bastion-vm \
--zone=$ZONE \
--format 'value(networkInterfaces[0].accessConfigs.natIP)')
echo Authorized IP: $AUTHORIZED_IP
Authorized IP: 34.77.80.131
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export CLOUD_SHELL_IP=$(curl ifconfig.me)
echo Cloud Shell IP: $CLOUD_SHELL_IP
    % Total      % Received % Xferd  Average Speed   Time     Time      Time  Current
                                         Dload  Upload   Total   Spent    Left  Speed
100    12  100    12     0      0   57      0  --::--  --::--  --::-- 57
Cloud Shell IP: 34.142.240.8
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export KEY_NAME=$(gcloud kms keys describe $KMS_KEY_ID \
--keyring=$KMS_KEYRING_ID --location=$REGION \
--format 'value(name)')
export CLOUDSQL_INSTANCE=postgres-orders
gcloud sql instances create $CLOUDSQL_INSTANCE \
--project=$PROJECT_ID \
--authorized-networks=${AUTHORIZED_IP}/32,$CLOUD_SHELL_IP/32 \
--disk-encryption-key=$KEY_NAME \
--database-version=POSTGRES_13 \
--cpu=1 \
--memory=3840MB \
--region=$REGION \
--root-password=supersecret!
WARNING: You are creating a Cloud SQL instance encrypted with a customer-managed key. If anyone destroys a customer-managed key, all data encrypted with it
will be permanently lost.
Do you want to continue (Y/n)? Y
```

Dashboard - qwiklabs-gcp-04-97c131c67b81 x +

https://console.cloud.google.com/home/dashboard?project=qwiklabs-gcp-04-97c131c67b81&pli=1&cloudshell=true

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CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) x + Open Editor

```
Cloud Shell IP: 34.142.240.8
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export KEY_NAME=$(gcloud kms keys describe $KMS_KEY_ID \
--keyring=$KMS_KEYRING_ID --location=$REGION \
--format 'value(name)')
export CLOUDSQL_INSTANCE=postgres-orders
gcloud sql instances create $CLOUDSQL_INSTANCE \
--project=$PROJECT_ID \
--authorized-networks=${AUTHORIZED_IP}/32,$CLOUD_SHELL_IP/32 \
--disk-encryption-key=$KEY_NAME \
--database-version=POSTGRES_13 \
--cpu=1 \
--memory=3840MB \
--region=$REGION \
--root-password=supersecret!
WARNING: You are creating a Cloud SQL instance encrypted with a customer-managed key. If anyone destroys a customer-managed key, all data encrypted with it
will be permanently lost.
Do you want to continue (Y/n)? Y
Creating Cloud SQL instance for POSTGRES_13...done.
Created [https://sqladmin.googleapis.com/sql/v1beta4/projects/qwiklabs-gcp-04-97c131c67b81/instances/postgres-orders].
NAME: postgres-orders
DATABASE_VERSION: POSTGRES_13
LOCATION: europe-west1-d
TIER: db-custom-1-3840
PRIMARY_ADDRESS: 35.187.163.24
PRIVATE_ADDRESS: -
STATUS: RUNNABLE
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

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End Lab

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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.](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IRehOs7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



## Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database

In this task, you enable and configure the pgAudit database extension which enables fine-grained control of logging of all types of database activity.

1. In Cloud Shell, run the following command to add the pgAudit database flags to your Cloud SQL instance:

```
gcloud sql instances patch $CLOUDSQL_INSTANCE \
    --database-flags cloudsql.enable_pgaudit=on,pgaudit.log=all
```

2. Enter 'y' if prompted to confirm and continue.

**Note:** Wait for the patch command to complete before continuing. When you see the message that `Patching Cloud SQL instance...done`, you can proceed to the next step.

3. In Cloud Console, on the **Navigation menu** (≡), click **SQL**.

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Congratulations!

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Message: Patching Cloud SQL instance... done, you can proceed to the next step.

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRhOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

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3. In Cloud Console, on the **Navigation menu** (≡), click **SQL**.

4. Click on the Cloud SQL instance named **postgres-orders**.

5. In the Cloud SQL **Overview** panel, top menu, click **Restart** to restart the instance after the patch that you ran in step 1.

If prompted again, click **Restart** again in the pop-up dialog.

**Note:** It can take a few minutes to restart your Cloud SQL for PostgreSQL instance. When you see the message that the instance has been successfully restarted (`Restarted postgres-orders`), you can proceed to the next step.

6. In Cloud console, in the **Connect to this instance** section, click **Open Cloud Shell**.

**Note:** If you receive an error message and are not able to connect, wait a few minutes to provide some time after restart for the instance to be accessible again, and then repeat step 6.

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(Restarted `postgres-orders`), you can proceed to the next step.

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End Lab 01:20:10 Time limit

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Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

6. In Cloud console, in the **Connect to this instance** section, click **Open Cloud Shell**.

**Note:** If you receive an error message and are not able to connect, wait a few minutes to provide some time after restart for the instance to be accessible again, and then repeat step 6.

A command to connect to the instance will auto-populate in Cloud Shell.

7. Run that command as is, and enter the password `supersecret!` when prompted.

A `psql` session will start in Cloud Shell.

8. In `psql`, run the following command to create the `orders` database and enable the `pgAudit` extension to log all reads and writes:

```
CREATE DATABASE orders;
\c orders;
```

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A **psql** session will start in Cloud Shell.

8. In **psql**, run the following command to create the `orders` database and enable the pgAudit extension to log all reads and writes:

```
CREATE DATABASE orders;
\c orders;
```

9. Enter the password `supersecret!` again.

10. In **psql**, run the following command to create and configure the database extension:

```
CREATE EXTENSION pgaudit;
ALTER DATABASE orders SET pgaudit.log = 'read,write';
```

Enable Audit Logging in Cloud Console

In this section, you enable Audit Logging in Cloud Console.

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9. Enter the password `supersecret!` again.

10. In `psql`, run the following command to create and configure the database extension:

```
CREATE EXTENSION pgaudit;
ALTER DATABASE orders SET pgaudit.log = 'read,write';
```

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.](#)

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Lab setup instructions and requirements

End Lab 01:19:57 Time limit

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

Enable Audit Logging in Cloud Console

In this section, you enable Audit Logging in Cloud Console.

1. In Cloud Console, on the **Navigation menu** (≡), click **IAM & Admin > Audit Logs**.

**Note:** If you see a message at the top of the page that states you don't have permission to view inherited audit logs configuration data for one or more parent resources, you can safely ignore the message and continue to the next step.

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Create and Manage Cloud SQL for PostgreSQL Instances

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Contents Securing a Cloud SQL for PostgreSQL Instance

Dashboard Catalog Paths

Lab setup instructions and requirements

End Lab 01:19:52 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Enable Audit Logging in Cloud Console

In this section, you enable Audit Logging in Cloud Console.

1. In Cloud Console, on the **Navigation menu** (≡), click **IAM & Admin > Audit Logs**.

**Note:** If you see a message at the top of the page that states `you don't have permission to view inherited audit logs configuration data for one or more parent resources`, you can safely ignore the message and continue to the next step.

2. In the **Filter** box under **Data access audit logs configuration**, type `Cloud SQL`, and select the entry in the drop-down list.

3. Enable the checkbox for `Cloud SQL` on the left, and then enable the following checkboxes in the **Info Panel** on the right:

- Admin read
- Data read
- Data write

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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Contents Securing a Cloud SQL for PostgreSQL Instance

Dashboard Catalog Paths

Lab setup instructions and requirements

End Lab 01:19:46 Time limit

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.](#)

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IReh0s7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

permission to view inherited audit logs configuration data for one or more parent resources, you can safely ignore the message and continue to the next step.

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

Securing a Cloud SQL for PostgreSQL Instance

2. In the **Filter** box under **Data access audit logs configuration**, type `Cloud SQL`, and select the entry in the drop-down list.

3. Enable the checkbox for `Cloud SQL` on the left, and then enable the following checkboxes in the **Info Panel** on the right:

- `Admin read`
- `Data read`
- `Data write`

4. Click **Save** in the **Info Panel**.

## Populate a database on Cloud SQL for PostgreSQL

In this section, you populate the `orders` database with data provided to you.

1. Click the + icon on the Cloud Shell title bar to open a new tab in the Cloud Shell.

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Create and Manage Cloud SQL for PostgreSQL Instances

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Contents Securing a Cloud SQL for PostgreSQL Instance

Lab setup instructions and requirements

End Lab 01:19:41 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRhOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Admin read  
Data read  
Data write

4. Click Save in the Info Panel.

Populate a database on Cloud SQL for PostgreSQL

In this section, you populate the `orders` database with data provided to you.

1. Click the + icon on the Cloud Shell title bar to open a new tab in the Cloud Shell.
2. In the new tab, run the following to download the data and database population scripts:

```
export SOURCE_BUCKET=gs://splts/gsp920
gsutil -m cp ${SOURCE_BUCKET}/create_orders_db.sql .
gsutil -m cp ${SOURCE_BUCKET}/DDL/distribution_centers_data.csv
.
gsutil -m cp ${SOURCE_BUCKET}/DDL/inventory_items_data.csv .
gsutil -m cp ${SOURCE_BUCKET}/DDL/order_items_data.csv .
```

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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Create and Manage Cloud SQL for PostgreSQL Instances

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Contents Securing a Cloud SQL for PostgreSQL Instance

Dashboard Catalog Paths

Lab setup instructions and requirements

End Lab 01:19:31 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Populate a database on Cloud SQL for PostgreSQL

In this section, you populate the `orders` database with data provided to you.

1. Click the + icon on the Cloud Shell title bar to open a new tab in the Cloud Shell.  
2. In the new tab, run the following to download the data and database population scripts:

```
export SOURCE_BUCKET=gs://spl/gsp920
gsutil -m cp ${SOURCE_BUCKET}/create_orders_db.sql .
gsutil -m cp ${SOURCE_BUCKET}/DDL/distribution_centers_data.csv .
.
gsutil -m cp ${SOURCE_BUCKET}/DDL/inventory_items_data.csv .
gsutil -m cp ${SOURCE_BUCKET}/DDL/order_items_data.csv .
gsutil -m cp ${SOURCE_BUCKET}/DDL/products_data.csv .
gsutil -m cp ${SOURCE_BUCKET}/DDL/users_data.csv .
```

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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Contents Securing a Cloud SQL for PostgreSQL Instance

2. Continue in the new tab, and run the following to create and populate the database:

```
export CLOUDSQL_INSTANCE=postgres-orders
export POSTGRESQL_IP=$(gcloud sql instances describe $CLOUDSQL_INSTANCE)
export PGPASSWORD=supersecret!
psql "sslmode=disable user=postgres hostaddr=${POSTGRESQL_IP}" \
    -c "\i create_orders_db.sql"
```

3. Exit the terminal session in the new tab:

```
exit
```

4. Return to your **psql** session in the original Cloud Shell tab, and run the following to further log all `SELECT` operations on a particular relation (such as the `order_items` table):

```
CREATE ROLE auditor WITH NOLOGIN;
ALTER DATABASE orders SET pgaudit.role = 'auditor';
GRANT SELECT ON order_items TO auditor;
```

Dashboard Catalog Paths

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.](#)

Open Cloud Cloud console

Username: student-00-c29980749c30e2f2  
Password: 6IRehOs7IGAG  
Project ID: qwiklabs-gcp-04-97c131cf

End Lab 01:19:25 Time limit

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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## Securing a Cloud SQL for PostgreSQL Instance

Lab setup instructions and requirements

01:19:19

Time limit

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](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IRhOs7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



3. Exit the terminal session in the new tab:

exit

4. Return to your `psql` session in the original Cloud Shell tab, and run the following to further log all `SELECT` operations on a particular relation (such as the `order_items` table):

```
CREATE ROLE auditor WITH NOLOGIN;
ALTER DATABASE orders SET pgaudit.role = 'auditor';
GRANT SELECT ON order_items TO auditor;
```

5. Run the first `SELECT` query below :

Summary of orders by users	Summary by individual product	Orders by distribution center
----------------------------	-------------------------------	-------------------------------

```
SELECT
    users.id AS users_id,
    users.first_name AS users_first_name,
    users.last_name AS users_last_name,
```

Lab instructions and tasks

GSP920

Overview

Setup and requirements

Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled

Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database

Task 3. Configure Cloud SQL IAM database authentication

Congratulations!

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Create and Manage Cloud SQL for PostgreSQL Instances

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Contents Securing a Cloud SQL for PostgreSQL Instance

Dashboard Catalog Paths

Lab setup instructions and requirements  
End Lab 01:19:07 Time limit

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. Open Cloud Cloud console

Username: student-00-c29980749c30e Project ID: qwiklabs-gcp-04-97c131cf

Summary of orders by users Summary by individual product Orders by distribution center

5. Run the first `SELECT` query below:

```
SELECT
    users.id AS users_id,
    users.first_name AS users_first_name,
    users.last_name AS users_last_name,
    COUNT(DISTINCT order_items.order_id) AS
    order_items_order_count,
    COALESCE(SUM(order_items.sale_price), 0) AS
    order_items_total_revenue
FROM order_items
LEFT JOIN users ON order_items.user_id = users.id
GROUP BY 1, 2, 3
ORDER BY 4 DESC
LIMIT 500;
```

6. The output is 500 rows long, so you can enter `q` to close the results and return to the `orders=>` prompt.

7. Repeat the steps 5-6 for the other two query tabs in the code block.

40/100 Lab instructions and tasks

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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## Securing a Cloud SQL for PostgreSQL Instance

Dashboard

Catalog

Paths

Lab setup instructions and requirements

01:19:01

End Lab

?

Time limit

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.](#)

Open Cloud Cloud console

Username

student-00-c29980749c30



Password

6IRehOs7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



```
order_items_order_count,
    COALESCE(SUM(order_items.sale_price ), 0) AS
order_items_total_revenue
FROM order_items
LEFT JOIN users ON order_items.user_id = users.id
GROUP BY 1, 2, 3
ORDER BY 4 DESC
LIMIT 500;
```

6. The output is 500 rows long, so you can enter `q` to close the results and return to the `orders=>` prompt.

7. Repeat the steps 5-6 for the other two query tabs in the code block.

8. Run the following to exit `psql`:

\q

## View pgAudit logs

In this step you will view the logging of your database updates and queries in the

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Next &gt;

40/100

Lab instructions and tasks

GSP920

Overview

Setup and requirements

Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled

Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database

Task 3. Configure Cloud SQL IAM database authentication

Congratulations!

Create and Manage Cloud SQL for PostgreSQL Instances

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Contents Securing a Cloud SQL for PostgreSQL Instance

Dashboard Catalog Paths

Lab setup instructions and requirements

End Lab 01:18:55 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131c67b81

View pgAudit logs

In this step you will view the logging of your database updates and queries in the pgAudit logs.

1. In Cloud Console, on the **Navigation menu** (≡), click **View all products**. Under **Observability**, click **Logging** to open the **Logs Explorer** page.
2. In the **Query** tab of the **Logs Explorer**, paste the following, and click **Run query**:

```
resource.type="cloudsql_database"
logName="projects/qwiklabs-gcp-04-97c131c67b81/logs/cloudaudit.googleapis.com%2Fsql
protoPayload.request.@type="type.googleapis.com/google.cloud.sql.v1.QueryRequest"
```

3. In the histogram displayed, you can see the audit activity associated with your DDL inserts and the `SELECT` queries you ran earlier.

Histogram

40/100

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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Dashboard – qwiklabs-gcp-04-97c... Cloud Shell

https://shell.cloud.google.com/?hl=en\_US&theme=system&authuser=0&fromcloudshell=true&show=terminal

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Cloud Shell Editor

(qwiklabs-gcp-04-97c131c67b81)

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql instances patch $CLOUDSQL_INSTANCE \
--database-flags cloudsqli.enable_pgaudit=on,pgaudit.log=all
The following message will be used for the patch API method.
{"name": "postgres-orders", "project": "qwiklabs-gcp-04-97c131c67b81", "settings": {"databaseFlags": [{"name": "cloudsql.enable_pgaudit", "value": "on"}, {"name": "pgaudit.log", "value": "all"}]}}
WARNING: This patch modifies database flag values, which may require your instance to be restarted. Check the list of supported flags -
https://cloud.google.com/sql/docs/postgres/flags - to see if your instance will be restarted when this patch is submitted.

Do you want to continue (Y/n) ? Y

Patching Cloud SQL instance...done.
Updated [https://sqladmin.googleapis.com/sql/v1beta4/projects/qwiklabs-gcp-04-97c131c67b81/instances/postgres-orders].
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

5 14°C Clear

Search

Cloud Shell Editor

ENG IN

06:04 PM 15-01-2026

Instances – Cloud SQL – qwiklab X Cloud Shell +

https://console.cloud.google.com/sql/instances?referrer=search&project=qwiklabs-gcp-04-97c131c67b81

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Google Cloud Cloud SQL Instances + Create Instance Migrate Database X Search Hide info panel Learn

Cloud SQL Instances Instances

Get Started Instances Backups

Starting Feb 1, 2025, all instances running community end-of-life versions of PostgreSQL and MySQL are under extended support. These instances will be charged for extended support from May 1, 2025. Upgrade your instances running end-of-life versions before May 1, 2025 to prevent additional charges. [Learn more](#)

View affected instances Dismiss

Filter Enter property name or value

Status	Instance ID	Issues	Cloud SQL edition	Type	Public IP address	Actions
<input checked="" type="checkbox"/>	postgres-orders		Enterprise	PostgreSQL 13	35.187.163.24	⋮

Runnable

No instances selected

Monitoring Labels

No instances selected.

14°C Clear

Search

Cloud SQL Instances Instances

Get Started Instances Backups

Starting Feb 1, 2025, all instances running community end-of-life versions of PostgreSQL and MySQL are under extended support. These instances will be charged for extended support from May 1, 2025. Upgrade your instances running end-of-life versions before May 1, 2025 to prevent additional charges. [Learn more](#)

View affected instances Dismiss

Filter Enter property name or value

Status	Instance ID	Issues	Cloud SQL edition	Type	Public IP address	Actions
<input checked="" type="checkbox"/>	postgres-orders		Enterprise	PostgreSQL 13	35.187.163.24	⋮

Runnable

No instances selected

Monitoring Labels

No instances selected.

ENG IN 06:05 PM 15-01-2026

postgres-orders - Overview - Cloud Shell | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81 | 3

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Google Cloud Cloud SQL Cloud SQL Overview Edit Import Export Restart Stop Delete Clone Migrate to AlloyDB

Cloud SQL Primary instance Overview All instances > postgres-orders postgres-orders PostgreSQL 13

This instance's backups settings don't follow your organization policy "Resource Location Restriction" Edit Settings

Learn the basics of Cloud SQL 0 of 3 completed

1 Import data With your Cloud SQL instance now running, the next step is to import data. You can import CSV and SQL files from your local file system or from a GCS bucket.

2 Query and explore data If you don't have existing data, you can [create a database](#), then create a table in Cloud SQL Studio in the next step.

3 Connect source application Import data Mark as complete

1 hour 6 hours 1 day 7 days 30 days Custom

Chart CPU utilization 40% 20%

14°C Clear Search ENG IN 06:05 PM 15-01-2026

postgres-orders - Overview - Cloud Shell | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81

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Google Cloud Cloud SQL Cloud SQL Overview Edit Import Export Restart Stop Delete Clone Migrate to AlloyDB

Cloud SQL Overview Primary instance Overview Cloud SQL Studio System insights Query insights Connections Users Databases Backups Replicas Operations Release Notes

All instances > postgres-orders

postgres-orders PostgreSQL 13

This instance's backup

Learn the basics of Cloud SQL

- 1 Import data
- 2 Query and explore
- 3 Connect source application

Restart database instance?

This action will shut down the database instance, along with all its connections, open files, and running operations. The instance will then automatically start up again, and its activation policy will be set to "always": it will keep running until you stop it manually.

Avoid restarts if possible. Instead, try manually stopping queries that have issues. Also, if you recently restarted your instance, wait for it to finish restarting before you attempt to restart again. Otherwise, your instance may take longer to start running again.

Cancel Restart

1 hour 6 hours 1 day 7 days 30 days Custom

Chart CPU utilization

40% 20%

14°C Clear

Search

Cloud Shell

ENG IN 06:05 PM 15-01-2026

postgres-orders - Overview - Cloud Shell | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81

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Google Cloud Cloud SQL Cloud SQL Cloud SQL Overview Edit Import Export Restart Stop Delete Clone Migrate to AlloyDB

Cloud SQL Primary instance Overview All instances > postgres-orders postgres-orders PostgreSQL 13

This instance's backups settings don't follow your organization policy "Resource Location Restriction" Edit Settings

Learn the basics of Cloud SQL 0 of 3 completed

1 Import data With your Cloud SQL instance now running, the next step is to import data. You can import CSV and SQL files from your local file system or from a GCS bucket.

2 Query and explore data If you don't have existing data, you can [create a database](#), then create a table in Cloud SQL Studio in the next step.

3 Connect source application Import data Mark as complete

1 hour 6 hours 1 day 7 days 30 days Custom

Chart CPU utilization 40%

Uploads and qwiklabs-gcp-04-97c1... operations

Restarted postgres-orders 6:06:17 PM GMT+5

5 14°C Clear Search

ENG IN 06:06 PM 15-01-2026

postgres-orders - Overview - Cloud Shell | + https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81 | 3 | ☰ | ☰ | ☰ | ☰

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Google Cloud Cloud SQL Cloud SQL Cloud SQL Overview Edit Import Export Restart Stop Delete Clone Migrate to AlloyDB

Cloud SQL Primary instance Overview Need help connecting? Default TCP database port number 5432 ⓘ Not highly available (zonal) Encrypted with a customer-managed key cloud-sql-key | Version 1 projects/qwiklabs-gcp-04-97c131c67b81/locations/europe-west1/keyRings/cloud-sql-keyring/cryptoKeys/cloud-sql-key/cryptoKeyVersions/1 Re-encrypt Instance Database flags and parameters cloudsqli.enable\_pgaudit on pgaudit.log all Vertex AI Integration is disabled No labels set Edit configuration Suggested actions Create a backup Enable high availability Service account p15588554522-kkyggq@gcp-sa-cloud-sql.iam.gserviceaccount.com Maintenance Maintenance timing Cloud SQL chooses the maintenance timing Maintenance window Updates may occur at Restarted postgres-orders 6:06:17 PM GMT+5

14°C Clear

Search

ENG IN 06:07 PM 15-01-2026

**i** Gemini CLI is available in Cloud Shell terminal! Type gemini to try it. [Learn more](#)

student\_00\_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)\$ gcloud sql instances patch \$CLOUDSQL\_INSTANCE \  
--database-flags cloudsql.enable\_pgaudit=on,pgaudit.log=all  
The following message will be used for the patch API method.  
{ "name": "postgres-orders", "project": "qwiklabs-gcp-04-97c131c67b81", "settings": { "databaseFlags": [ { "name": "cloudsql.enable\_pgaudit", "value": "on" }, { "name": "pgaudit.log", "value": "all" } ] } }  
WARNING: This patch modifies database flag values, which may require your instance to be restarted. Check the list of supported flags - <https://cloud.google.com/sql/docs/postgres/flags> - to see if your instance will be restarted when this patch is submitted.  
  
Do you want to continue (Y/n) ? Y  
  
Patching Cloud SQL instance...done.  
Updated [<https://sqladmin.googleapis.com/sql/v1beta4/projects/qwiklabs-gcp-04-97c131c67b81/instances/postgres-orders>].  
student\_00\_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)\$ gcloud sql connect postgres-orders --user=postgres --quiet  
Allowlisting your IP for incoming connection for 5 minutes...done.  
Connecting to database with SQL user [postgres].Password:  
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)  
SSL connection (protocol: TLSv1.3, cipher: TLS\_AES\_256\_GCM\_SHA384, compression: off)  
Type "help" for help.  
  
postgres=>  
postgres=> CREATE DATABASE orders;  
\c orders;  
CREATE DATABASE  
Password:  
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)  
SSL connection (protocol: TLSv1.3, cipher: TLS\_AES\_256\_GCM\_SHA384, compression: off)  
You are now connected to database "orders" as user "postgres".  
orders=>

```
Do you want to continue (Y/n)? Y

Patching Cloud SQL instance...done.
Updated [https://sqladmin.googleapis.com/sql/v1beta4/projects/qwiklabs-gcp-04-97c131c67b81/instances/postgres-orders].
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql connect postgres-orders --user=postgres --quiet
Allowlisting your IP for incoming connection for 5 minutes...done.
Connecting to database with SQL user [postgres].Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

postgres=>
postgres=> CREATE DATABASE orders;
\c orders;
CREATE DATABASE
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=>
orders=>
orders=>
orders=> CREATE EXTENSION pgaudit;
ALTER DATABASE orders SET pgaudit.log = 'read,write';
CREATE EXTENSION
ALTER DATABASE
orders=>
```

postgres-orders - Overview - Cloud S IAM - IAM & Admin - qwiklabs- +

https://console.cloud.google.com/iam-admin/iam?project=qwiklabs-gcp-04-97c131c67b81

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Google Cloud qwiklabs-gcp-04-97c131c67b81 Search (/) for resources, docs, products, and more Search

IAM & Admin / IAM

Service Accounts Workload Identity Fede... Workforce Identity Fed... Labels Tags Settings Privacy & Security Identity-Aware Proxy Roles Audit logs Asset Inventory Quotas & System Limits Essential Contacts Groups Manage Resources Release Notes

IAM

Allow Deny Recommendations history

Permissions for project "qwiklabs-gcp-04-97c131c67b81"

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

Include Google-provided role grants

View by principals View by roles

Grant access Remove access

Filter Enter property name or value

Type	Principal ↑	Name	Role	Security insights
<input type="checkbox"/>	15588554522-compute@developer.gserviceaccount.com	Compute Engine default service account	Editor	<a href="#">Edit</a>
<input type="checkbox"/>	admiral@qwiklabs-services-prod.iam.gserviceaccount.com		Owner	<a href="#">Edit</a>
<input type="checkbox"/>	qwiklabs-gcp-04-97c131c67b81@qwiklabs-gcp-04-97c131c67b81.iam.gserviceaccount.com	Qwiklabs User Service Account	BigQuery Admin	<a href="#">Edit</a>
			Owner	<a href="#">Edit</a>
			Storage Admin	<a href="#">Edit</a>
		student f2bdc1a4	Owner	<a href="#">Edit</a>

https://console.cloud.google.com/iam-admin/audit?project=qwiklabs-gcp-04-97c131c67b81 80749c30@qwiklabs.net student f2bdc1a4 Owner

5 14°C Clear Search

ENG IN 06:11 PM 15-01-2026

postgres-orders - Overview - Cloud S Audit logs - IAM & Admin - qwil +

https://console.cloud.google.com/iam-admin/audit?project=qwiklabs-gcp-04-97c131c67b81

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- Service Accounts
- Workload Identity Fede...
- Workforce Identity Fed...
- Labels
- Tags
- Settings
- Privacy & Security
- Identity-Aware Proxy
- Roles
- Audit logs
- Asset Inventory
- Quotas & System Limits
- Essential Contacts
- Groups
- Manage Resources
- Release Notes

Audit logs Set default configuration

You don't have permission to view inherited audit logs configuration data for one or more parent resources. Information below may be incomplete until access is granted. Missing permission: resourcemanager.folders.getIamPolicy

Default configuration ② 0 exempted principals

Admin read:	Data read:	Data write:
Disabled	Disabled	Disabled

Data access audit logs configuration

The effective data access configuration below combines the configuration for the currently selected resource and the data access configurations set on all parent resources.

Filter Cloud SQL Enter property name or value

Service	Admin read	Data read	Data write	Exempted principals	Inheri
Cloud SQL	<input checked="" type="checkbox"/>			0	

Cloud SQL

Permission types Exempted principals

You can configure what types of operations are recorded in your data access audit logs for the selected services. There are several subtypes of data access audit logs:

- Admin read Records operations that read metadata or configuration information.
- Data read Records operations that read user-provided data.
- Data write Records operations that write user-provided data.

Save

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postgres-orders – Overview – Clo ✎ Audit logs – IAM & Admin – qwiklabs +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud qwiklabs-gcp-04-97c131c67b81 Cloud SQL X Search

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) X (qwiklabs-gcp-04-97c131c67b81) X + Open Editor | ☰ ⚙️ 📸 🖥️ ⋮ – ⌂ ⌃ ⌄ ⌅ ⌆ ⌇ ⌈ ⌉ ⌊ ⌋

ⓘ Gemini CLI is available in Cloud Shell terminal! Type gemini to try it. [Learn more](#) Don't show again Dismiss

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export SOURCE_BUCKET=gs://spl$gsutil -m cp ${SOURCE_BUCKET}/create_orders_db.sql .  
gsutil -m cp ${SOURCE_BUCKET}/DDL/distribution_centers_data.csv .  
gsutil -m cp ${SOURCE_BUCKET}/DDL/inventory_items_data.csv .  
gsutil -m cp ${SOURCE_BUCKET}/DDL/order_items_data.csv .  
gsutil -m cp ${SOURCE_BUCKET}/DDL/products_data.csv .  
gsutil -m cp ${SOURCE_BUCKET}/DDL/users_data.csv .  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/create_orders_db.sql...  
/ [1/1 files] [ 1.6 KiB/ 1.6 KiB] 100% Done  
Operation completed over 1 objects/1.6 KiB.  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/DDL/distribution_centers_data.csv...  
/ [1/1 files] [ 371.0 B/ 371.0 B] 100% Done  
Operation completed over 1 objects/371.0 B.  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/DDL/inventory_items_data.csv...  
\ [1/1 files] [ 61.6 MiB/ 61.6 MiB] 100% Done  
Operation completed over 1 objects/61.6 MiB.  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/DDL/order_items_data.csv...  
| [1/1 files] [ 17.8 MiB/ 17.8 MiB] 100% Done  
Operation completed over 1 objects/17.8 MiB.  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/DDL/products_data.csv...  
\ [1/1 files] [ 3.5 MiB/ 3.5 MiB] 100% Done  
Operation completed over 1 objects/3.5 MiB.  
Copying gs://spl$gsutil -m cp ${SOURCE_BUCKET}/DDL/users_data.csv...  
| [1/1 files] [ 18.5 MiB/ 18.5 MiB] 100% Done  
Operation completed over 1 objects/18.5 MiB.  
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

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Search

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postgres-orders – Overview – Cloud Shell    Audit logs – IAM & Admin – qwiklabs

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud    Terminal    Cloud SQL    Search

CLOUD SHELL    Terminal    (qwiklabs-gcp-04-97c131c67b81)    (qwiklabs-gcp-04-97c131c67b81)    +    X    Open Editor    Settings    View    Help    More

```
Copying gs://spls/gsp920/DDL/inventory_items_data.csv...
\ [1/1 files] [ 61.6 MiB/ 61.6 MiB] 100% Done
Operation completed over 1 objects/61.6 MiB.
Copying gs://spls/gsp920/DDL/order_items_data.csv...
| [1/1 files] [ 17.8 MiB/ 17.8 MiB] 100% Done
Operation completed over 1 objects/17.8 MiB.
Copying gs://spls/gsp920/DDL/products_data.csv...
\ [1/1 files] [ 3.5 MiB/ 3.5 MiB] 100% Done
Operation completed over 1 objects/3.5 MiB.
Copying gs://spls/gsp920/DDL/users_data.csv...
| [1/1 files] [ 18.5 MiB/ 18.5 MiB] 100% Done
Operation completed over 1 objects/18.5 MiB.
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export CLOUDSQL_INSTANCE=postgres-orders
export POSTGRESQL_IP=$(gcloud sql instances describe $CLOUDSQL_INSTANCE --format="value(ipAddresses[0].ipAddress)")
export PGPASSWORD=supersecret!
psql "sslmode=disable user=postgres hostaddr=${POSTGRESQL_IP}" \
      -c "\i create_orders_db.sql"
psql:create_orders_db.sql:1: ERROR:  database "orders" already exists
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
You are now connected to database "orders" as user "postgres".
CREATE TABLE
CREATE TABLE
CREATE TABLE
CREATE TABLE
CREATE TABLE
COPY 415647
COPY 11
COPY 198553
COPY 29120
COPY 126019
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

5 14°C Clear    Search    Home    File    Chat    Folder    Chrome    Firefox    Brave    Microsoft Edge    Powerpoint    Camera    Video    IN    ENG    06:14 PM    15-01-2026

postgres-orders - Overview - Cloud Shell    Audit logs - IAM & Admin - qwiklabs

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud    Terminal (qwiklabs-gcp-04-97c131c67b81)    Cloud SQL    Search

CLOUD SHELL    Open Editor    Terminal (qwiklabs-gcp-04-97c131c67b81)    +   

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql connect postgres-orders --user=postgres --quiet
Allowlisting your IP for incoming connection for 5 minutes...done.
Connecting to database with SQL user [postgres].Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

postgres=>
postgres=> CREATE DATABASE orders;
\c orders;
CREATE DATABASE
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=>
orders=>
orders=>
orders=> CREATE EXTENSION pgaudit;
ALTER DATABASE orders SET pgaudit.log = 'read,write';
CREATE EXTENSION
ALTER DATABASE
orders=>
orders=> CREATE ROLE auditor WITH NOLOGIN;
ALTER DATABASE orders SET pgaudit.role = 'auditor';
GRANT SELECT ON order_items TO auditor;
CREATE ROLE
ALTER DATABASE
GRANT
orders=>
```

5 14°C Clear    Search   

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postgres-orders - Overview - Cloud SQL | Audit logs - IAM & Admin - qwiklabs | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL Search

CLOUD SHELL

users_id	users_first_name	users_last_name	order_items_order_count	order_items_total_revenue
9368	Samuel	Patrick	14	592.3400020599365
1242	Aaron	Montgomery	13	571.6500034332275
3538	John	Stephen	13	717.3600034713745
112988	Emma	Kline	13	413.95000171661377
6889	Clara	Haley	13	440.1700038909912
15502	Vilma	Berg	13	405.82999992370605
15570	Amber	Parker	12	540.8099994659424
9167	Jack	Tina	12	538.4299983978271
111864	Fred	Andersen	12	545.2500057220459
6007	Jerry	Charles	12	568.9400005340576
4601	Sandi	Odom	12	641.6199989318848
3489	Eulalia	Patrick	12	430.280002117157
17721	Helen	Holland	12	697.1600027084351
1184	Henriette	Arellano	12	654.0400018692017
12209	Ella	Samuel	11	340.1300001144409
27956	Maragaret	Marcus	11	514.0300049781799
3446	Mattie	Mackenzie	11	485.790002822876
9655	Betty	Strickland	11	534.1400032043457
35603	James	Sanchez	11	587.2599983215332
111300	Charlotte	Williams	11	398.31999921798706
8632	Kathleen	Price	11	536.1199970245361
10688	Bryant	Jeremy	11	477.3700008392334
111979	Nicki	Garrison	11	460.8800039291382
18180	Karl	Jacobson	11	331.9700040817261
5718	Sergio	Fred	11	380.8500051498413
76	Mary	Estrada	11	346.54000091552734
6862	Sarah	Wong	11	554.3500070571899
2737	Quentin	Huffman	11	468.4700050354004

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postgres-orders - Overview - Cloud Shell | Logs Explorer - Logging - qwiklabs-gcp

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL Search

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) + Open Editor | ☰ ⚙️ 📹 🖥️ ⋮

```
distribution_centers.name AS distribution_centers_name,
distribution_centers.latitude AS distribution_centers_latitude,
distribution_centers.longitude AS distribution_centers_longitude
FROM order_items
LEFT JOIN inventory_items ON order_items.inventory_item_id = inventory_items.id
LEFT JOIN products ON inventory_items.product_id = products.id
LEFT JOIN distribution_centers ON products.distribution_center_id = distribution_centers.id
GROUP BY 1, 2, 3, 4, 5
ORDER BY 2
LIMIT 500;
orders=>
orders=>
orders=>
orders=>
orders=>
orders=>
orders=>
orders=> SELECT
products.id AS products_id,
products.name AS products_name,
products.sku AS products_sku,
products.cost AS products_cost,
products.retail_price AS products_retail_price,
products.distribution_center_id AS products_distribution_center_id,
COUNT(DISTINCT order_items.order_id ) AS order_items_order_count,
COALESCE(SUM(order_items.sale_price ), 0) AS order_items_total_revenue
FROM order_items
LEFT JOIN inventory_items ON order_items.inventory_item_id = inventory_items.id
LEFT JOIN products ON inventory_items.product_id = products.id
GROUP BY 1, 2, 3, 4, 5, 6
ORDER BY 7 DESC
LIMIT 500;
```

6 13°C Clear | Search | 🌐 | 📁 | 🚗 | 📱 | 🎥 | 📺 | 📲 | 📺 | 📺 | ENG IN | 06:30 PM | 15-01-2026

postgres-orders - Overview - Cloud SQL | Logs Explorer - Logging - qwiklabs-gcp-04-97c131c67b81 | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

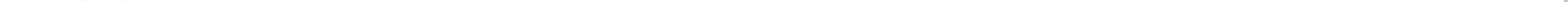
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Google Cloud Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL X Search

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) + Open Editor | ☰ ⚙️ 📺 🖥️ ⋮ - ⌂ ⌃ ⌄ ⌅ ⌆ ⌇ ⌈ ⌉ ⌊ ⌋

products_id	products_name	products_sku	products_cost	products_retail_price	products_distribution_center_id	order_items_order_count	order_items_total_revenue
20552	Example Product 6286	20552   53A9B0066E62E00E66877CABE09D7268	30.784000039100647	64	4	1	405632
28305	Example Product 4018	28305   8D57C03206C460F9E9637E46B8337713	26.36361019856423	75.11000061035156	2	1	303744.8424682617
13596	Example Product 3671	13596   31AB328E47C4EA3FE3015EB7EAA59AF9	27.490259972681997	75.11000061035156	2	1	277456.3422546387
23641	Example Product 3349	23641   09C1279B01289FA282367675519325A1	25.77850042186305	59.95000076293945	6	1	202750.90258026123
20547	Example Product 3168	20547   592B1F6887C30E03AB96C13144E15DFB	36.78799995034933	68	4	1	216512
22699	Example Product 2037	22699   07DFC1BA2A5E4395D243D0A619619F5B	28.728000082075596	54	4	1	110484
20542	Example Product 1996	20542   3F7B5208B016E1F6D2EF81964B1FB065	34.747999995946884	68	4	1	136204
8263	Example Product 1939	8263   854F1FB6F65734D9E49F708D6CD84AD6	29.700000062584877	60	6	1	117780
21659	Example Product 1747	21659   DC3F973A721454C7CA263F9B70BFD7A5	19.63509083962053	39.9900016784668	7	1	69902.52293395996
17082	Example Product 1505	17082   73D9AF291FE22CB9F226BBD9A6DF781B	37.808000054210424	68	3	1	102612
13595	Example Product 1463	13595   E30C5701E13A4E6E137D71EB71C416B4	6.194999981671572	15	10	1	22005
22700	Example Product 1423	22700   36AB2A6162713CC28168F2CCD171CAAЕ	17.460010835892994	34.9900016784668	4	1	50000.71239852905
16109	Example Product 1230	16109   E53DA0660D5D695870B49AEE039F9148	23.221200717318055	44.400001525878906	2	1	54700.80187988281
28302	Example Product 28302	28302   B806521AC395B5B8474A8E3E81AB50F9	2.458350059799477	6.070000171661377	5	1	

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A screenshot of the Google Cloud Shell interface. It features a top navigation bar with 'CLOUD SHELL' and 'Terminal' tabs, a search bar containing '(qwiklabs-gcp-04-97c131c67b81)', and a toolbar with icons for 'Open Editor', 'Keyboard', 'Settings', 'Help', 'File', 'More', and 'Exit'. The main workspace shows a terminal window with a command prompt, a file browser listing 'index.html' and 'index.htm', and several status indicators like '1 file 1 folder' and '1 file 1 folder'.

```
LEFT JOIN products ON inventory_items.product_id = products.id
GROUP BY 1, 2, 3, 4, 5, 6
ORDER BY 7 DESC
LIMIT 500;
orders=>
orders=>
orders=>
orders=>
orders=> SELECT
    order_items.order_id AS order_id,
    distribution_centers.id AS distribution_centers_id,
    distribution_centers.name AS distribution_centers_name,
    distribution_centers.latitude AS distribution_centers_latitude,
    distribution_centers.longitude AS distribution_centers_longitude
FROM order_items
LEFT JOIN inventory_items ON order_items.inventory_item_id = inventory_items.id
LEFT JOIN products ON inventory_items.product_id = products.id
LEFT JOIN distribution_centers ON products.distribution_center_id = distribution_centers.id
GROUP BY 1, 2, 3, 4, 5
ORDER BY 2
LIMIT 500;
orders=>
orders=>
orders=>
orders=>
orders=>
orders=>
orders=> SELECT
    products.id AS products_id,
    products.name AS products_name,
    products.sku AS products_sku,
```

postgres-orders - Overview - Cloud Shell | Logs Explorer - Logging - qwiklabs-gcp-04-97c131c67b81 | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?project=qwiklabs-gcp-04-97c131c67b81&cloudshell=true

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Google Cloud Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL Search

CLOUD SHELL

Terminal (qwiklabs-gcp-04-97c131c67b81) + Open Editor | ☰ ⚙️ 📺 🖥️ ⋮

order_id	distribution_centers_id	distribution_centers_name	distribution_centers_latitude	distribution_centers_longitude
13	1	Memphis TN	35.1174	-89.9711
20	1	Memphis TN	35.1174	-89.9711
25	1	Memphis TN	35.1174	-89.9711
33	1	Memphis TN	35.1174	-89.9711
37	1	Memphis TN	35.1174	-89.9711
50	1	Memphis TN	35.1174	-89.9711
77	1	Memphis TN	35.1174	-89.9711
90	1	Memphis TN	35.1174	-89.9711
115	1	Memphis TN	35.1174	-89.9711
127	1	Memphis TN	35.1174	-89.9711
147	1	Memphis TN	35.1174	-89.9711
153	1	Memphis TN	35.1174	-89.9711
163	1	Memphis TN	35.1174	-89.9711
185	1	Memphis TN	35.1174	-89.9711
205	1	Memphis TN	35.1174	-89.9711
215	1	Memphis TN	35.1174	-89.9711
239	1	Memphis TN	35.1174	-89.9711
243	1	Memphis TN	35.1174	-89.9711
271	1	Memphis TN	35.1174	-89.9711
279	1	Memphis TN	35.1174	-89.9711
293	1	Memphis TN	35.1174	-89.9711
301	1	Memphis TN	35.1174	-89.9711
313	1	Memphis TN	35.1174	-89.9711
330	1	Memphis TN	35.1174	-89.9711
362	1	Memphis TN	35.1174	-89.9711
374	1	Memphis TN	35.1174	-89.9711
402	1	Memphis TN	35.1174	-89.9711
416	1	Memphis TN	35.1174	-89.9711
418	1	Memphis TN	35.1174	-89.9711

6 13°C Clear | Search | 🌳 📲 🎙️ 📁 🚗 🚧 📺 📱 📲 ENG IN 06:29 PM 15-01-2026



postgres-orders - Overview - Cloud S Logs Explorer - Logging - qwikla + https://console.cloud.google.com/logs/query;query=resource.type%3D"cloudsql\_database"%0D%0AlogName%3D"projects%2Fqwiklabs-gcp-04-97c131c67b81%2Flogs%2Fcloudaudit.googleapis.com%2Fdata\_access%2FprotoPayload.request%2Ftype%3D"type.googleapis.com/google.cloud.sql.audit.v1.PgAuditEntry" | 1

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Google Cloud qwiklabs-gcp-04-97c131c67b81 Search (/) for resources, docs, products, and more Search

Observability Logging

Logs Explorer

Project logs Search all fields

Cloud SQL Database data\_access All severities Correlate by +1 filter Run query Show query

1 resource.type="cloudsql\_database"  
2 logName="projects/qwiklabs-gcp-04-97c131c67b81/logs/cloudaudit.googleapis.com%2Fdata\_access"  
3 protoPayload.request.@type="type.googleapis.com/google.cloud.sql.audit.v1.PgAuditEntry"

Example queries Query language guide Language: LQL

Fields Search fields and values

System Metadata Severity 9  
Showing top 1 of 1 value Info 9

Log name Log name 9  
Showing top 1 of 1 value cloudataudit.googleapis.com/dat...

Resource type Resource type 9  
Showing top 1 of 1 value Cloud SQL Database

DATABASE ID DATABASE ID 9

Timeline 18:12:55.000 18:13:30 18:14:00 18:14:30 18:15:00 18:15:30 18:16:00 18:16:30 18:17:00 18:17:45.000

9 results Actions

SEVERITY	TIME	SUMMARY
Info	2026-01-15 18:14:24.891	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:31.135	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:31.467	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:33.832	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:34.498	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:55.920	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:56.085	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...
Info	2026-01-15 18:14:56.255	Cloud SQL query instances/postgres-orders audit_log, method: "cloudsql.instances.query", principal_em...

5 14°C Clear

Search

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Contents

Securing a Cloud SQL for PostgreSQL Instance

Dashboard

Catalog

Paths

Lab setup instructions and requirements

00:50:53

? Time limit

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.](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IRehOs7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



## Task 3. Configure Cloud SQL IAM database authentication

In this task, you configure Cloud SQL IAM database authentication. All of the database access and update tasks you have performed so far have used built-in PostgreSQL user accounts. You can also create Cloud SQL for PostgreSQL users using Cloud IAM accounts. Database users can authenticate to Cloud SQL using Cloud IAM instead of using built-in database accounts and fine-grained permissions at the database level can be granted to those users.

In this task, you configure the lab user account as a Cloud SQL IAM user, grant that user access to the `orders.order_items` database table using the `postgres` administrator account, and then test access to the `orders.order_items` database table from the command line using the `psql` command line utility.

The authentication process that is used in this task is explained in detail in the [IAM authentication documentation for Cloud SQL for PostgreSQL](#).

Test database access using a Cloud IAM user before Cloud SQL IAM authentication is configured.

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Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database

Task 3. Configure Cloud SQL IAM database authentication

Congratulations!

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Create and Manage Cloud SQL for PostgreSQL Instances

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End Lab 00:50:37 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e2f2  
Password: 6IReh0s7IGAG  
Project ID: qwiklabs-gcp-04-97c131cf

Test database access using a Cloud IAM user before Cloud SQL IAM authentication is configured.

You attempt to access the database using a Cloud IAM user before Cloud SQL IAM authentication has been enabled in order to establish that the Cloud IAM user cannot initially access the data. You will see this connection attempt fail before you proceed to the next section to address the issue.

- In Cloud Shell, test access to the `orders` database using the lab student account as the username:

```
export USERNAME=$(gcloud config list --format="value(core.account)"  
export CLOUDSQL_INSTANCE=postgres-orders  
export POSTGRESQL_IP=$(gcloud sql instances describe $CLOUDSQL_INSTANCE)  
export PGPASSWORD=$(gcloud auth print-access-token)  
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders
```

This connection attempt fails, and you see an authentication failed message similar to the following because the Cloud SQL IAM user has not been created yet:

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```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export USERNAME=$(gcloud config list --format="value(core.account)")  
export CLOUDSQL_INSTANCE=postgres-orders  
export POSTGRESQL_IP=$(gcloud sql instances describe $CLOUDSQL_INSTANCE --format="value(ipAddresses[0].ipAddress)")  
export PGPASSWORD=$(gcloud auth print-access-token)  
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders  
psql: error: connection to server at "35.187.163.24", port 5432 failed: FATAL: password authentication failed for user "student-00-c29980749c30@qwiklabs.net"  
connection to server at "35.187.163.24", port 5432 failed: FATAL: password authentication failed for user "student-00-c29980749c30@qwiklabs.net"  
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ █
```

Create and Manage Cloud SQL for PostgreSQL Instances

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Lab setup instructions and requirements

End Lab 00:49:26 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30@qwiklabs.net

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

Create a Cloud SQL IAM user

In this section, you create a Cloud SQL IAM user and confirm that Cloud SQL IAM user authentication has been enabled.

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

2. Click on the Cloud SQL instance named `postgres-orders`.

In the **Configuration** panel on the right, note that the **Database flags and parameters** list includes `pgAudit.log` and `cloudsql.enable_pgaudit` only.

3. In the **SQL menu** (left panel) under **Primary instance**, click **Users** to open the **Users** panel.

4. Click **Add user account**.

5. Select **Cloud IAM**.

6. In the **Principal** box enter the lab student name: `student-00-c29980749c30@qwiklabs.net`

7. Click **Add**.

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00:49:16

? Time limit

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.](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IRhOs7IGAG



Project ID

qwiklabs-gcp-04-97c131cf

1. In Cloud Console, on the **Navigation menu** (≡), click **SQL**2. Click on the Cloud SQL instance named `postgres-orders`.

In the **Configuration** panel on the right, note that the **Database flags and parameters** list includes `pgAudit.log` and `cloudsql.enable_pgaudit` only.

3. In the **SQL menu** (left panel) under **Primary instance**, click **Users** to open the **Users** panel.4. Click **Add user account**.5. Select **Cloud IAM**.6. In the **Principal** box enter the lab student name: `student-00-c29980749c30@qwiklabs.net`7. Click **Add**.

Wait for the new user to be successfully added.

On the main overview page for instance, in the **Configuration** panel on the right, note `cloudsql.iam_authentication` has been added to the **Database flags and parameters**

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postgres-orders – Users – Cloud    Logs Explorer – Logging – qwiklabs-gcp-04-97c131c67b81

https://console.cloud.google.com/sql/instances/postgres-orders/users?cloudshell=true&project=qwiklabs-gcp-04-97c131c67b81

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Cloud SQL    Users

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- Replicas
- Operations
- Release Notes

All instances > postgres-orders

**postgres-orders** PostgreSQL 13

User accounts enable users and applications to connect to your instance. [Learn more](#)

**Add user account**

**Added users**    Authenticated IAM group members

These are accounts that you have granted instance access to, using either built-in or IAM authentication.

User name	Authentication	Password status
postgres	Built-in	N/A

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) Open Editor

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Google Cloud    Cloud SQL

Cloud SQL    Users

All instances > postgres-orders

PostgreSQL 13

User accounts enable users and applications to connect to your instance. [Learn more](#)

+ Add user account

Added users    Authenticated IAM group members

These are accounts that you have granted instance access to, using either built-in or IAM authentication.

User name	Authentication	Password status
postgres	Built-in	N/A

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) (qwiklabs-gcp-04-97c131c67b81)

Add a user account to instance postgres-orders

Choose how to authenticate

You can manage access to this instance using Cloud IAM or PostgreSQL built-in authentication. [Learn more](#)

Built-in authentication  
Creates a new username and password specific to this instance. User account will have cloudsqlsuperuser root access, but you can customize that later as needed. [Learn more](#)

User name \*

! Required

Password \*  [Generate](#)

Users created with built-in authentication are granted the cloudsqlsuperuser role, and have the same set of attributes as the postgres user. [Learn more](#)

Cloud IAM  
Adds an existing IAM principal as a user account on this instance. The IAM principal can be an IAM user, Service Account, or a Group. The IAM principal must have cloudsql.instances.login permission using the predefined Cloud SQL Instance User IAM role or custom IAM role in the IAM policy of the instance's project.

Add    Cancel

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User accounts enable users and applications to connect to your instance. [Learn more](#)

+ Add user account

Added users    Authenticated IAM group members

These are accounts that you have granted instance access to, using either built-in or IAM authentication.

User name	Authentication	Password status	⋮
postgres	Built-in	N/A	⋮

Add a user account to instance postgres-orders

Choose how to authenticate

You can manage access to this instance using Cloud IAM or PostgreSQL built-in authentication. [Learn more](#)

Built-in authentication  
Creates a new username and password specific to this instance. User account will have cloudsqlsuperuser root access, but you can customize that later as needed. [Learn more](#)

Cloud IAM  
Adds an existing IAM principal as a user account on this instance. The IAM principal can be an IAM user, Service Account, or a Group. The IAM principal must have cloudsql.instances.login permission using the predefined Cloud SQL Instance User IAM role or custom IAM role in the IAM policy of the instance's project.

IAM principal \*  
student-00-c29980749c30@qwiklabs.net

After you create a user account with Cloud IAM authentication, it will not have database privileges by default, so make sure to grant required database privileges using the GRANT statement. [Learn more](#)

Add    Cancel

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) (qwiklabs-gcp-04-97c131c67b81)

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User accounts enable users and applications to connect to your instance. [Learn more](#)

+ Add user account

Added users    Authenticated IAM group members

These are accounts that you have granted instance access to, using either built-in or IAM authentication.

User name	Authentication	Password status
postgres	Built-in	N/A
student-00-c29980749c30@qwiklabs.net	IAM (user)	N/A

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) (qwiklabs-gcp-04-97c131c67b81)

IAM role added successfully

Open Editor

Uploads and qwiklabs-gcp-04-97c131c67b81 operations

- Editing postgres-orders 0 min 8 sec
- Restarted postgres-orders 6:06:17 PM GMT+5

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## Securing a Cloud SQL for PostgreSQL Instance

Lab setup instructions and requirements

00:46:00

Time limit

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.](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IReh0s7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



## Grant the Cloud IAM user access to a Cloud SQL database table

You now connect to the `postgres-orders` instance using the built in `postgres` administrator account and grant access to the `orders.order_items` table to the Cloud IAM user.

1. On the main overview page for instance, in the **Connect to this instance** section, click **Open Cloud Shell**.

A command to connect to the instance will auto-populate in Cloud Shell.

2. Run that command as is, and enter the password `supersecret!` when prompted.
3. Enter the following SQL command to switch to the `orders` database:

\c orders

When prompted for a password enter `supersecret!` again.

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Congratulations!

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## Securing a Cloud SQL for PostgreSQL Instance

Lab setup instructions and requirements

00:45:46

Time limit

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](#)

Open Cloud Cloud console

Username  
student-00-c29980749c30Password  
6IRhOs7IGAGProject ID  
qwiklabs-gcp-04-97c131cf

\c orders

When prompted for a password enter supersecret! again.

4. Enter the following SQL command to grant the lab user all permissions on the order\_items table. The Cloud IAM username for the lab has been inserted into this query for you.

GRANT ALL PRIVILEGES ON TABLE order\_items TO "student-00-c29980749c30"

\q

## Test database access using a Cloud IAM user after Cloud SQL IAM authentication is configured.

You now repeat the attempt to access the database using a Cloud IAM user after Cloud SQL IAM authentication has been enabled in order to establish that the Cloud IAM user can now access the data.

You can now test access to the database again using the Cloud IAM user instead of the

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00:45:38

Time limit

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.](#)[Open Cloud Cloud console](#)

Username

student-00-c29980749c30



Password

6IReh0s7IGAG



Project ID

qwiklabs-gcp-04-97c131cf



## Test database access using a Cloud IAM user after Cloud SQL IAM authentication is configured.

You now repeat the attempt to access the database using a Cloud IAM user after Cloud SQL IAM authentication has been enabled in order to establish that the Cloud IAM user can now access the data.

You can now test access to the database again using the Cloud IAM user instead of the built-in `postgres` user:

1. In the Cloud Shell, run the following command to connect to the database using the Cloud IAM database user:

```
export PGPASSWORD=$(gcloud auth print-access-token)  
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders
```

This connection succeeds, and you are now connected to the instance using Cloud IAM user authentication.

2. Test your access permission by running this query:

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Create and Manage Cloud SQL for PostgreSQL Instances

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Lab setup instructions and requirements

End Lab 00:45:10 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRhOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

export PGPASSWORD=\$(`gcloud auth print-access-token)`  
`psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders`

This connection succeeds, and you are now connected to the instance using Cloud IAM user authentication.

2. Test your access permission by running this query:

`SELECT COUNT(*) FROM order_items;`

This now returns a successful result:

orders=> `SELECT COUNT(*) FROM order_items;`  
count  
-----  
198553  
(1 row)

3. Confirm that you do not have access to one of the other tables by running this query:

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End Lab 00:41:36 Time limit

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.

Open Cloud Cloud console

Username: student-00-c29980749c30e

Password: 6IRehOs7IGAG

Project ID: qwiklabs-gcp-04-97c131cf

This now returns a successful result:

```
orders=> SELECT COUNT(*) FROM order_items;
count
-----
198553
(1 row)
```

3. Confirm that you do not have access to one of the other tables by running this query:

```
SELECT COUNT(*) FROM users;
```

This query does not return a successful result:

```
orders=> SELECT COUNT(*) FROM users;
ERROR: permission denied for table users
```

100/100

GSP920 Overview Setup and requirements Task 1. Create a Cloud SQL for PostgreSQL instance with CMEK enabled Task 2. Enable and configure pgAudit on a Cloud SQL for PostgreSQL database Task 3. Configure Cloud SQL IAM database authentication Congratulations!

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```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql connect postgres-orders --user=postgres --quiet
Allowlisting your IP for incoming connection for 5 minutes...done.
Connecting to database with SQL user [postgres].Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

postgres=>
postgres=> \c orders
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=> GRANT ALL PRIVILEGES ON TABLE order_items TO "student-00-c29980749c30@qwiklabs.net";
\q
GRANT
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
```

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql connect postgres-orders --user=postgres --quiet
Allowlisting your IP for incoming connection for 5 minutes...done.
Connecting to database with SQL user [postgres].Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

postgres=>
postgres=> \c orders
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=> GRANT ALL PRIVILEGES ON TABLE order_items TO "student-00-c29980749c30@qwiklabs.net";
\q
GRANT
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export PGPASSWORD=$(gcloud auth print-access-token)
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

orders=> █
```

```
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ gcloud sql connect postgres-orders --user=postgres --quiet
Allowlisting your IP for incoming connection for 5 minutes...done.
Connecting to database with SQL user [postgres].Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

postgres=>
postgres=> \c orders
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=> GRANT ALL PRIVILEGES ON TABLE order_items TO "student-00-c29980749c30@qwiklabs.net";
\q
GRANT
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export PGPASSWORD=$(gcloud auth print-access-token)
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

orders=> SELECT COUNT(*) FROM order_items;
 count
-----
 198553
(1 row)

orders=>
```

postgres-orders - Overview - Cloud Shell | Logs Explorer - Logging - qwiklabs-gcp-04-97c131c67b81 | +

https://console.cloud.google.com/sql/instances/postgres-orders/overview?cloudshell=true&project=qwiklabs-gcp-04-97c131c67b81

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Google Cloud Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL Search

CLOUD SHELL Terminal (qwiklabs-gcp-04-97c131c67b81) + Open Editor |

Allowlisting your IP for incoming connection for 5 minutes...done.  
Connecting to database with SQL user [postgres].Password:  
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)  
SSL connection (protocol: TLSv1.3, cipher: TLS\_AES\_256\_GCM\_SHA384, compression: off)  
Type "help" for help.

```
postgres=>
postgres=> \c orders
Password:
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
You are now connected to database "orders" as user "postgres".
orders=>
orders=> GRANT ALL PRIVILEGES ON TABLE order_items TO "student-00-c29980749c30@qwiklabs.net";
\q
GRANT
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$
student_00_c29980749c30@cloudshell:~ (qwiklabs-gcp-04-97c131c67b81)$ export PGPASSWORD=$(gcloud auth print-access-token)
psql --host=$POSTGRESQL_IP $USERNAME --dbname=orders
psql (16.11 (Ubuntu 16.11-1.pgdg24.04+1), server 13.23)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression: off)
Type "help" for help.

orders=> SELECT COUNT(*) FROM order_items;
 count
-----
 198553
(1 row)

orders=> SELECT COUNT(*) FROM users;
ERROR: permission denied for table users
orders=>
```

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Cloud Shell Terminal (qwiklabs-gcp-04-97c131c67b81) Cloud SQL Search

Open Editor |

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