

Assignment: Working with Managed Databases in Azure and GCP

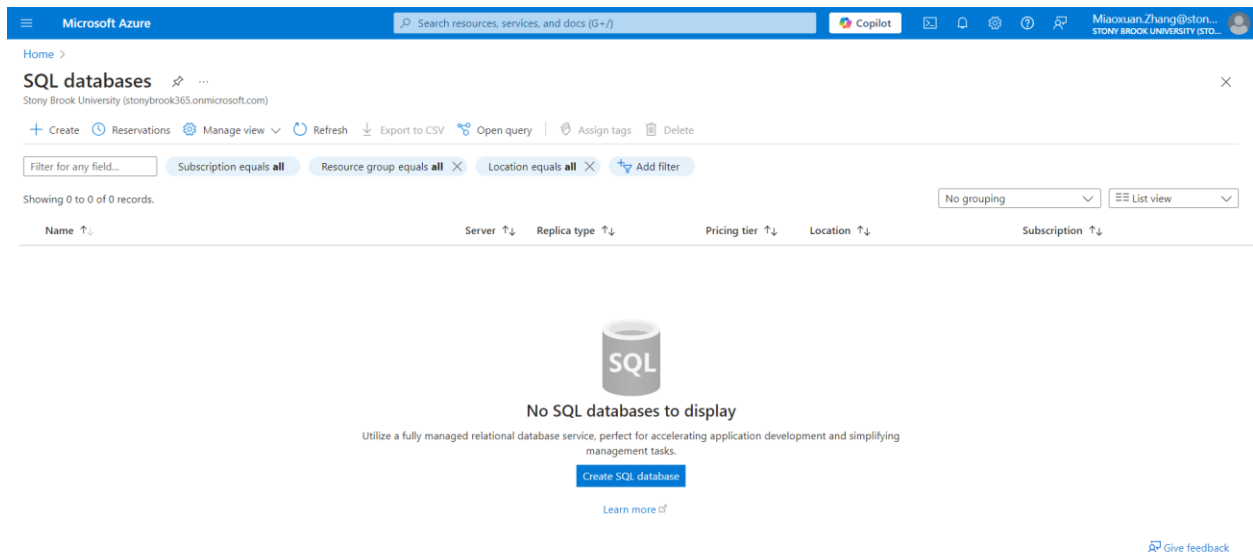
Objective

The objective of this assignment is to introduce you to managed database services in Azure and Google Cloud Platform (GCP). You will learn how to start, stop, and monitor database-related services, including BigQuery and MySQL.

Instructions

1. Start and Configure a Managed Database

- **Azure MySQL:**
 - Navigate to the Azure portal and create an Azure Database for MySQL.
 - Configure the database with basic settings (e.g., compute and storage options).
 - Start the database service and note the connection details.



Microsoft Azure

Search resources, services, and docs (G+J)

Copilot

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STONY BROOK UNIVERSITY (STO...

Home > SQL databases > Create SQL Database >

Create SQL Database

Microsoft
manage all your resources.

Subscription * ⓘ

Azure for Students

Resource group * ⓘ

assignment_504

Create new

Database details

Enter required settings for this database, including picking a logical server and configuring the compute and storage resources

Database name *

504-database-assignment

Server * ⓘ

Select a server

Create new

Want to use SQL elastic pool? ⓘ

☐ Yes

☒ No

Workload environment

☐ Development

☒ Production

Default settings provided for Production workloads. Configurations can

Review + create

Next: Networking >

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Home > SQL databases > Create SQL Database >

Create SQL Database Server

Microsoft

Authentication

Azure Active Directory (Azure AD) is now Microsoft Entra ID. [Learn more](#)

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Microsoft Entra authentication [Learn more](#) or using an existing Microsoft Entra user, group, or application as Microsoft Entra admin [Learn more](#), or select both SQL and Microsoft Entra authentication.

Authentication method

☐ Use Microsoft Entra-only authentication

☐ Use both SQL and Microsoft Entra authentication

☒ Use SQL authentication

Server admin login *

miao

Password *

Confirm password *

OK

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Home > SQL databases >

Configure

Feedback

Service and compute tier

Select from the available tiers based on the needs of your workload. The vCore model provides a wide range of configuration controls and offers Hyperscale and Serverless to automatically scale your database based on your workload needs. Alternately, the DTU model provides set price/performance packages to choose from for easy configuration. [Learn more](#)

SQL Database Hyperscale: Low price, high scalability, and best feature set. [Learn more](#)

General Purpose (Most budget friendly)

Compare service tiers

General Purpose (Most budget friendly)

Provisioned - Compute resources are pre-allocated. Billed per hour based on vCores configured.

Serverless - Compute resources are auto-scaled. Billed per second based on vCores used.

Compute Hardware

Select the hardware configuration based on your workload requirements. Availability of compute optimized, memory optimized, and confidential computing hardware depends on the region, service tier, and compute tier.

Hardware Configuration

Standard-series (Gen5)

Apply

SQL

Cost summary

General Purpose (GP_5_Gen5_1)

Cost per GB (in USD) 0.12

Max storage selected (in GB) x 41.6

ESTIMATED STORAGE COST / MONTH 4.78 USD

COMPUTE COST / VCORE SECOND 0.000145 USD

NOTES

1 Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more about serverless billing](#)

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Home > SQL databases >

Create SQL Database

Microsoft

Network connectivity

Choose an option for configuring connectivity to your server via public endpoint or private endpoint. Choosing no access creates with defaults and you can configure connection method after server creation. [Learn more](#)

Connectivity method *

No access

Public endpoint

Private endpoint

Firewall rules

Setting 'Allow Azure services and resources to access this server' to 'Yes' allows communications from all resources inside the Azure boundary, that may or may not be part of your subscription. [Learn more](#)

Setting 'Add current client IP address' to 'Yes' will add an entry for your client IP address to the server firewall.

Allow Azure services and resources to access this server *

No Yes

Add current client IP address *

No Yes

Connection policy

Configure how clients communicate with your SQL database server. [Learn more](#)

Review + create

< Previous

Next : Security >

SQL

Cost summary

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Home > SQL databases >

Create SQL Database

Microsoft

Basics Networking Security Additional settings Tags Review + create

Tags are name/value pairs that enable you to categorize and view consolidated billing by applying the same tag to multiple resources and resource groups. [Learn more](#)

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name	Value	Resource
delete	delete	2 selected
		2 selected

Cost summary

General Purpose (GP_S_Gen5_1)

Cost per GB (in USD) 0.12

Max storage selected (in GB) x 41.6

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Review + create

< Previous

Next: Review + create >

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STONY BROOK UNIVERSITY (STO...

Home >

Microsoft.SQLDatabase.newDatabaseNewServer_db59aaa78c43493a90925 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

✓ Your deployment is complete

Deployment name : Microsoft.SQLDatabase.newDatabaseNewServer_db5...

Subscription : Azure for Students

Resource group : assignment_504

Start time : 10/17/2024, 11:21:53 AM

Correlation ID : b3405529-1c70-4681-8cd7-123041974124

> Deployment details

> Next steps

Go to resource

Give feedback

Tell us about your experience with deployment

Cost management

Get notified to stay within your budget and prevent unexpected charges on your bill.

Set up cost alerts >

Microsoft Defender for Cloud

Secure your apps and infrastructure

Go to Microsoft Defender for Cloud >

Free Microsoft tutorials

Start learning today >

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.

Find an Azure expert >

Microsoft Azure

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Home > Microsoft.SQLDatabase.newDatabaseNewServer_db59aaa78c43493a90925 | Overview >

SQL database

504-database-assginment (miao-football/504-database-assginment)

Copy Restore Export Set server firewall Delete Connect with... Feedback

Overview

Activity log

Tags

Diagnose and solve problems

Query editor (preview)

Mirror database in Fabric (preview)

Settings

Data management

Integrations

Power Platform

Security

Intelligent performance

Monitoring

Automation

Help

Mirror databases in Microsoft Fabric Easily replicate your existing databases in Fabric, and help your team achieve streamlined ETL and operational analytics goals. Learn more

JSON View

Essentials

Resource group (move) : assignment_504

Status : Online

Location : East US 2

Subscription (move) : Azure for Students

Subscription ID : 821484d2-f1b5-45b0-a2b9-794830ed812e

Tags (edit) : delete : delete

Server name : miao-football.database.windows.net

Connection strings : Show database connection strings

Pricing tier : General Purpose - Serverless: Gen5, 1 vCore

Auto-pause delay : 1 hour

Earliest restore point : 2024-10-17 15:28 UTC

Getting started Monitoring Properties Features Notifications (0) Integrations Tutorials

Start working with your database

Connect to your database and start working with data with a few simple steps. Learn more

Configure access

Connect to application

Start developing

Mirror database in Fabric

Microsoft Azure

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Home > Azure Database for MySQL servers >

Select Azure Database for MySQL deployment option

Microsoft

Feedback

Azure Database for MySQL - Single Server is scheduled for retirement by September 16, 2024. Learn More

How do you plan to use the service?

Flexible server

Best for production workloads that require zone resiliency, predictable performance, maximum control with IOPs scaling, custom maintenance window, cost optimization controls and simplified developer experience.

Create Learn More

Wordpress + MySQL Flexible server

Wordpress is state of the art publishing platform with a focus on aesthetics, web standards and usability. Use this template to create Wordpress on APP Service and Azure Database for MySQL Flexible Server in a Virtual network.

Create Learn More

Microsoft Azure

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Home > Azure Database for MySQL flexible servers > Select Azure Database for MySQL deployment option >

Flexible server

Microsoft

Basics Tags Review

Create an Azure Database for MySQL server.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group * [Create new](#)

Server details

Enter required settings for this server, including picking a location and configuring the compute and storage resources.

Server name * ✓

Region *

Availability zone *

Authentication

[Review + create](#) [Next: Tags >](#)

Estimated costs

Compute Sku USD 12.41/month

Standard_B1ms 12.41

Storage USD 2.30/month

Storage selected 20 GiB (USD 0.115 per GiB) 20 x 0.115

Auto scale IOPS

Auto scale IOPS is billed on usage in per million request increments. [Learn more](#)

Backup Retention

Backup retention is billed based on additional storage used for retaining backups. [Learn more](#)

Bandwidth

For outbound data transfer across

Microsoft Azure

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Home >

MySQLFlexibleServer_ddb217de2d97480c91f336c16711a55f | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

✓ **Your deployment is complete**

Deployment name : MySQLFlexibleServer_ddb217de2d97480c91f336c1671... Start time : 10/17/2024, 6:01:28 PM

Subscription : Azure for Students Correlation ID : 389b0326-ce3a-494e-9ce7-fa9157c4ad8

Resource group : assignment_504

Deployment details

Next steps

[Learn how to manage your server](#) Recommended

[For public access connectivity, setup a firewall rule to connect to the server](#) Recommended

[Learn about private access connectivity method](#) Recommended

[Setup monitoring alerts](#) Recommended

[Go to resource](#)

Cost management

Get notified to stay within your budget and prevent unexpected charges on your bill. [Set up cost alerts >](#)

Get started with MySQL Flexible Server

Free Microsoft tutorials

[Create PHP + MySQL App](#)


• GCP MySQL:

- Access the Google Cloud Console and create a Cloud SQL instance with MySQL.
- Configure the database instance similarly, noting any differences in setup between Azure and GCP.
- Start the database service and document the connection details.

Google Cloud

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Product details



Cloud SQL Admin API

Google Enterprise API

API for Cloud SQL database instance management

[ENABLE](#)[TRY THIS API](#)

OVERVIEW

DOCUMENTATION

RELATED PRODUCTS

Overview

API for Cloud SQL database instance management

Additional details

Type: [SaaS & APIs](#)
Last product update: 3/14/23
Category: [Google Enterprise APIs](#)
Service name: sqladmin.googleapis.com

Tutorials and documentation

[Learn more](#)

Terms of Service

By using this product you agree to the terms and conditions of the following license: [Google Cloud Platform](#)

Google Cloud

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Search

APIs & Services

API/Service Details

DISABLE API


Enabled APIs & services

Library

Credentials

OAuth consent screen

Page usage agreements



Cloud SQL Admin API

API for Cloud SQL database instance management

By Google Enterprise API

Service name	Type	Status	Documentation	Explore
sqladmin.googleapis.com	Public API	Enabled	LEARN MORE	TRY IN API EXPLORER

METRICS

QUOTAS & SYSTEM LIMITS

CREDENTIALS

Select graphs
4 Graphs

1 hour 6 hours 12 hours 1 day 2 days 4 days 7 days 14 days 30 days

Filters: Versions v1 and v1beta4 Credentials App Engine default servic... Methods 135 options selected

Traffic by response code

No data is available for the selected time frame.

UTC-4 Sep 22 Sep 23 Sep 24 Sep 25 Sep 26 Sep 27 Sep 28 Sep 29 Sep 30 Oct 1 Oct 2 Oct 3 Oct 4 Oct 5 Oct 6 Oct 7 Oct 8 Oct 9 Oct 10 Oct 11 Oct 12 Oct 13 Oct 14 Oct 15 Oct 16 Oct 17 Oct 18 Oct 19 Oct 20

Errors by API method

Cloud SQL offers a fully-managed database service for MySQL, PostgreSQL, and SQL Server, reducing your overall cost of operations and freeing up teams to focus on innovation.

CREATE INSTANCE  MIGRATE DATABASE

- 1 Create an **instance**

- Choose your database engine and initial configurations
- 2 Set up networking and connect**
Explore networking security options, like Cloud SQL Proxy. Then, hook up to a cloud service or your local machine.
- 3 Move in data**
Import from Cloud Storage, or use Database Migration



Highly available, protected data

Recover data from any point in time. Safeguard your data with automated backups. Utilize greater than 99.99% availability. Replicate across regions.

Pricing and scalability for any workload

Size your instance to fit your needs, with per-second billing and databases that are easily stopped and restarted. Add up to 128 vCPU and up to 864 GB of RAM and 64 TB of storage. Create read replicas.

Minimize downtime and stay up-to-date

Get notified of upcoming maintenance, and reschedule or deny it. Stay current with automatic minor version upgrades, and in-place major database version upgrades.

 [Cloud SQL overview](#)

[Help document](#)
Learn about Cloud SQL.

 [Cloud SQL features by database engine](#)

[Help document](#)

Learn about the Cloud SQL features for each database engine.

 [Cloud SQL for MySQL features](#)

Learn about Cloud SQL for MySQL features.

[Cloud SQL for PostgreSQL features](#)

[Help document](#)

Learn about Cloud SQL for PostgreSQL features.

 [Cloud SQL for SQL Server features](#)

Learn about Cloud SQL for SQL Server features.

[All Cloud SQL documentation](#)

This image shows three buttons for selecting a database. The first button is for MySQL, with versions 8.4, 8.0, 5.7, and 5.6 listed below it. The second button is for PostgreSQL, with versions 17, 16, 15, 14, 13, 12, 11, 10, and 9.6 listed below it. The third button is for SQL Server, with versions 2022, 2019, and 2017 listed below it. Each button is blue with white text and a small database icon to its left.

Want more context on the Cloud SQL database engines? [Learn more](#)



Introducing AlloyDB for PostgreSQL

PostgreSQL plus the best of the cloud: scale-out storage and compute, intelligent caching, and AI/ML-powered management. Choose AlloyDB for 4x faster transactional workloads, more efficient analytical and vector queries, and an industry-leading 99.99% SLA, inclusive of maintenance.

[CHOOSE ALLOYDB](#) [LEARN MORE](#)

Choose a Cloud SQL edition

A Cloud SQL edition determines foundational characteristics of your instance. Choose the best option for your price and performance needs. [Learn more](#)

Enterprise Plus

- 99.99% availability SLA
- Sub-second planned maintenance downtime
- Near-zero downtime instance scale-up
- Performance optimized machines
- Up to 35 days point-in-time recovery window
- Up to 3x higher read throughput with data cache
- Advanced disaster recovery with easy switchover

Enterprise

- 99.95% availability SLA
- Less than 60 seconds planned maintenance downtime
- General purpose machines
- Up to 7 days point-in-time recovery window

You've made changes that override the selected configuration. [RESET](#)

Edition preset
Production

COMPARE EDITION PRESETS

Instance info

Database version *
MySQL 8.0

SHOW MINOR VERSIONS

Instance ID *

Summary

Cloud SQL Edition	Enterprise
Region	us-central1 (Iowa)
DB Version	MySQL 8.0
vCPUs	1 vCPU
RAM	1.7 GB
Data Cache	Disabled
Storage	10 GB
Connections	Public IP
Backup	Automated
Availability	Single zone
Point-in-time recovery	Enabled
Network throughput (MB/s)	125 of 125
IOPS	Read: 300 of 12,000 Write: 300 of 10,000
Disk throughput (MB/s)	Read: 4.8 of 125.0 Write: 4.8 of 107.8

Pricing estimate (without discounts)

These items represent Cloud SQL compute, memory and storage resources only, and reflect how you configured your instance so far. Discounts not included in estimate. [Learn more](#)

Item	Hourly cost (estimate)
Shared core - 1 vCPU, 1.7 GB	\$0.04
10 GB SSD (\$0.17 per GB/month)	\$0.002
Total without usage discounts	\$0.04

Usage and traffic costs

These costs vary based on your feature usage, traffic, or data location. [Learn more](#)

Google Cloud

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Search

M

SQL

Overview

EDIT

IMPORT

EXPORT

RESTART

STOP

DELETE

CLONE

EXPLORE GEMINI

PRIMARY INSTANCE

Overview

Cloud SQL Studio

System insights

Query insights

Connections

Users

Databases

Backups

Replicas

Operations

All instances > databaseassessment

databaseassessment

MySQL 8.0

Instance is being created. This may take a few minutes. While this operation is running, you may continue to view information about the instance. [VIEW ALL](#)

Chart

CPU utilization

No data is available for the selected time frame.

UTC-4 10:00 PM 11:00 PM Thu 25 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM

Go to Query insights for more in-depth info on queries and performance

Instance Issues (0)

No issues found

Connect to this instance

Connection name

miaoxuan-zhang-hha504-us-central1:databaseassessment

Configuration

vCPUs 1

Memory 1.7 GB

SSD storage 10 GB

Enterprise edition [UPGRADE](#)

Database version is MySQL 8.0.31

Auto storage increase is enabled

Instance is being created

Need help connecting?

Uploads and Miaoxuan-Zhang-hha504 operations

Creating databaseassessment 0 min 14 sec

Google Cloud

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Search

BigQuery

Explorer

BigQuery Studio

Viewing resources.

SHOW STARRED ONLY

miaoxuan-zhang-hha504

Queries

Notebooks

Data canvases

Workflows

External connections

databaseassignmenttest

databaseassignment

1 SELECT * FROM miaoxuan-zhang-hha504.databaseassignmenttest.databaseassignment

2 LIMIT 100;

3

Query results

JOB INFORMATION

RESULTS

CHART

JSON

EXECUTION DETAILS

EXECUTION GRAPH

Row	TOPIC	SUBTOPIC	SUBTOPIC_ID	CLASSIFICATION	CLASSIFICATION_ID	GROU
1	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
2	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
3	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
4	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
5	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
6	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
7	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
8	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total
9	Cholesterol in adults, measured:	Mean serum total cholesterol L.	3	Total		Total

Results per page: 50 1 - 50 of 100

Job history

Welcome to Gemini

Get help where you need it with a conversational assistant that answers your questions about Google Cloud, reviews code snippets, and troubleshoots issues quickly.

Gemini is a work in progress and may display inaccurate information. Your prompts aren't used to train the model.

Learn more

Required API

To use conversational assistance and other Gemini features, enable the Cloud AI Companion API in this project Miaoxuan-Zhang-hha504

Learn more

Gemini for Google Cloud API

Not enabled

ENABLE SEND FEEDBACK

Use of the Cloud AI Companion API is subject to the Google Cloud Terms of Service (2 terms of service and Service Specific Terms (2 applicable to Generative AI Services.

Start chatting Learn more

Google Cloud

Miaoxuan-Zhang-hha504

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Search

BigQuery

Explorer

BigQuery Studio

Viewing resources.

SHOW STARRED ONLY

miaoxuan-zhang-hha504

Queries

Notebooks

Data canvases

Workflows

External connections

databaseassignmenttest

databaseassignment

1 SELECT * FROM miaoxuan-zhang-hha504.databaseassignmenttest.databaseassignment

2 LIMIT 100;

3

4 SELECT TOPIC, ESTIMATE

5 FROM miaoxuan-zhang-hha504.databaseassignmenttest.databaseassignment

6 LIMIT 100;

7

Query results

JOB INFORMATION

RESULTS

CHART

JSON

EXECUTION DETAILS

EXECUTION GRAPH

Row	TOPIC	ESTIMATE
1	Cholesterol in adults, measured:	204.0
2	Cholesterol in adults, measured:	202.0
3	Cholesterol in adults, measured:	198.0
4	Cholesterol in adults, measured:	196.0
5	Cholesterol in adults, measured:	191.0
6	Cholesterol in adults, measured:	187.0
7	Cholesterol in adults, measured:	206.0
8	Cholesterol in adults, measured:	202.0
9	Cholesterol in adults, measured:	198.0
10	Cholesterol in adults, measured:	195.0

Results per page: 50 1 - 50 of 100

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Start chatting Learn more

2. Explore BigQuery (GCP)

- BigQuery:**
 - In GCP, navigate to BigQuery and create a dataset.
 - Load a small sample data file into a table within the dataset (e.g., a CSV file).
 - Run a simple query against the dataset to retrieve specific data.
 - Monitor the usage and cost associated with running the query.

Google Cloud

Miaoxuan-Zhang-hha504

Search (/) for resources, docs, products, and more

Search

BigQuery

Explorer

Analysis

BigQuery Studio

Data transfers

Scheduled queries

Analytics Hub

Dataform

Partner Center

Orchestration

Migration

Assessment

SQL translation

Administration

Monitoring

Jobs explorer

Capacity management

BI Engine

Recommendations

Disaster recovery

Search BigQuery resources

Viewing resources.

SHOW STARRED ONLY

miaoxuan-zhang-hha504

SUMMARY

Nothing currently selected

Welcome to BigQuery Studio!

Create new

SQL QUERY

PYTHON NOTEBOOK

DATA CANVAS

WORKFLOW

Try with sample data

Try the Google Trends Demo Query

Try the Colab Demo Notebook

Add your own data

Local file

Google Drive

Google Cloud Storage

Job history

Instance is being created

Welcome to Gemini

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Learn more

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Learn more

Gemini for Google Cloud API

Not enabled

ENABLE

SEND FEEDBACK

Use of the Cloud AI Companion API is subject to the Google Cloud Terms of Service and Service Specific Terms applicable to Generative AI Services.

Start chatting

Learn more

Uploads and Miaoxuan-Zhang-hha504 operations

Created databasessessment

8:18:02 PM GMT+4

Google Cloud

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BigQuery

Explorer

Analysis

BigQuery Studio

Data transfers

Scheduled queries

Analytics Hub

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Administration

Monitoring

Jobs explorer

Capacity management

BI Engine

Recommendations

Disaster recovery

Policy tags

Search BigQuery resources

Viewing resources.

SHOW STARRED ONLY

miaoxuan-zhang-hha504

SUMMARY

Nothing currently selected

Welcome to BigQuery Studio!

Create new

SQL QUERY

PYTHON NOTEBOOK

DATA CANVAS

Try with sample data

Try the Google Trends Demo Query

Try the Colab Demo Notebook

Add your own data

Local file

Google Drive

Job history

Instance is being created

Add

Source

Search for data sources

Popular sources

Local file

Google Cloud Storage

Connections to external data sources

Additional sources

Viewing all 31 results.

Search for and star a project

Star a project by name

Analytics Hub

Google Drive

Salesforce Data Cloud

Amazon S3 - Data Transfer

Azure Blob Storage (and Azure Data Lake Storage Gen2) - Data Transfer

CLOSE

The screenshot shows the Google Cloud Gemini interface. On the left is the BigQuery Studio navigation sidebar. The main area is titled 'Welcome to Gemini' and includes a 'Create new' section with buttons for 'SQL QUERY', 'PYTHON NOTEBOOK', 'DATA CANVAS', and 'WORKFLOW'. Below this is a 'Recently opened' section showing a database assignment. Further down are two interactive cards: 'Try the Google Trends Demo Query' and 'Try the Colab Demo Notebook'. The right sidebar contains the Gemini logo, a 'Welcome to Gemini' message, and a 'Required API' section indicating that the Cloud AI Companion API is needed and not currently enabled. At the bottom, there are buttons for 'Start chatting', 'Learn more', and 'Uploads and Miaoquan-Zhang-Nha504 operations'.

3. Monitor Database Services

- **Azure:**
 - Use the Azure portal to monitor the performance and cost of the MySQL database. Explore metrics like CPU usage, memory, and query performance.
- **GCP:**
 - Use the GCP Console to monitor the Cloud SQL instance and the BigQuery dataset. Pay attention to similar metrics and note any differences in monitoring tools between the two platforms.

Compared to Azure, GCP is easier to setup