Google Cloud SQL

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Topics

1. Google Cloud Platform
2. Intro to Google Cloud SQL
3. Using Cloud SQL

Cloud platforms

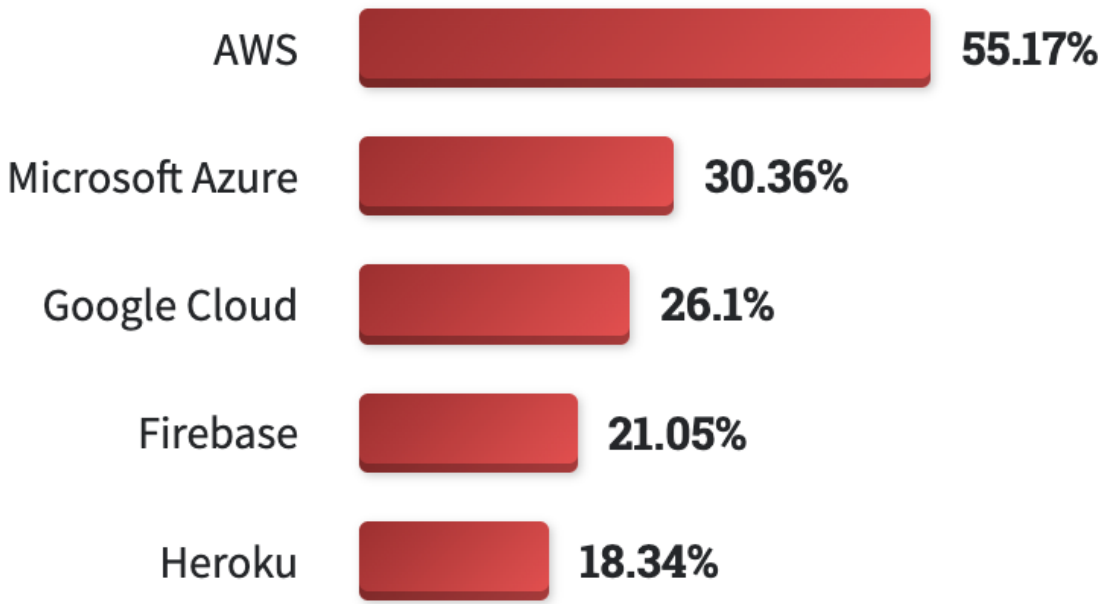
Google Cloud

aws

Logo graphics from Wikipedia: Google GCP, AWS, and Microsoft Azure.

The most used cloud platforms

All Respondents | Professional Developers | 44,106 responses



Stack Overflow developer survey, 2022
https://survey.stackoverflow.co/2022/#section-most-popular-technologies-cloud-platforms

Google Cloud Platform (GCP)

- Suite of cloud computing services and resources.
- Runs on same infrastructure that Google uses for its products.
- Over 100 products and services.
- Launched in 2008.

GCP products – selection

App Engine	Compute Engine	Kubernetes
Cloud Storage	Database services	Cloud CDN
Cloud DNS	Virtual Private Cloud	Big Query
Data Studio	Cloud AutoML	Vision API
Translation API	Cloud IoT Core	Security Scanner. . .

GCP database services

- Cloud Bigtable - NoSQL database service for big data.
- Cloud Datastore & Firestore - NoSQL database for web and mobile applications.
- Cloud Spanner - Scalable, strongly consistent, relational database service.
- Cloud SQL - Relational databases as a service.

Google Cloud SQL

- Fully managed[1] cloud-based MySQL, PostgreSQL and SQL Server databases.
- Key features:
  - High availability: over 99.95 % anywhere in the world.
  - Reliability: configurable replication and backups of data.
  - Integrates easily with apps and other cloud services.

[1] Fully managed means you do not have to set up any machines. Database management, patching and backup are mostly all taken care of for you.

Google Cloud SQL

- Create and manage instances in the GCP console.
- Provision custom machines with up to 624 GB of RAM and 96 CPUs.
- Up to 64 TB of storage, with the ability to automatically increase storage size as needed.

Cloud SQL instance overview

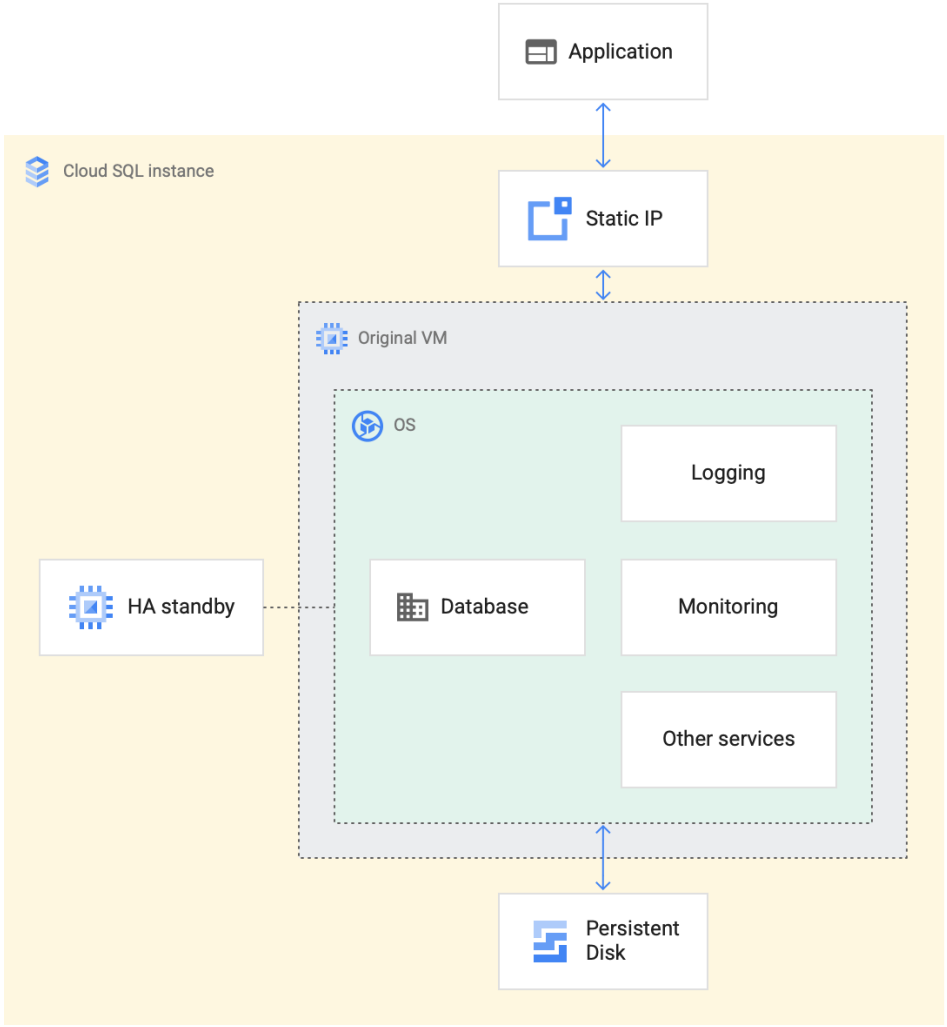


Image credit: https://cloud.google.com/sql/docs/introduction

Management and integration

- Choose DB administration tools depending on database
  e.g., phpMyAdmin, pgAdmin.org, SQL Server Management Studio...
- Programmatic interaction over Cloud Shell or `gcloud`.
- Connectors available for many programming languages:
  e.g., `Java`, `Python`, `Go`, `Node.js`, `C#`...

Pricing considerations

- There is no free-tier – must pay to use.
- Cloud SQL pricing varies by configuration settings.
- Pricing depends e.g., on provisioned storage, number of CPUs, available memory, data hosting location, amount of network traffic, and number of assigned IP addresses.

Getting started

- You will need: a Google account and a billing account.
- All services accessible in the GCP console (GUI), or programmatically using e.g., `gcloud` shell.

`https://console.cloud.google.com/home/dashboard`

Command examples

First, make sure you are accessing the correct project.

```
$ gcloud config set project [PROJECT_ID]
Updated property [core/project].
```

List available cloud SQL instances.

```
$ gcloud sql instances list
NAME: demo-db
DATABASE_VERSION: MYSQL_8_0
LOCATION: us-central1-b
TIER: db-custom-2-8192
PRIMARY_ADDRESS: 255.255.255.255
PRIVATE_ADDRESS: -
STATUS: RUNNABLE
```

Command examples

Connect to a database instance.

```
$ gcloud sql connect [DB_NAME] --user=root
Allowlisting your IP for incoming connection for 5 minutes...
Connecting to database with SQL user [root]. Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 495

Server version: 8.0.26-google (Google)

...

Type 'help;' or '\h' for help. Type '\c' to clear the current
   input statement.

mysql>
```

Command examples

You can now run standard SQL commands.

```
mysql> CREATE DATABASE boxoffice;
Query OK, 1 row affected (0.04 sec)

mysql> use boxoffice;
Database changed

mysql> show tables;
Empty set (0.04 sec)

mysql> CREATE TABLE movies (
       id INT NOT NULL AUTO_INCREMENT,
       Name VARCHAR(100) NOT NULL,
       PRIMARY KEY (id));
Query OK, 0 rows affected (0.10 sec)
```

Command examples

You can now run standard SQL commands.

```
mysql> show tables;
+---------------------+
| Tables_in_movies123 |
+---------------------+
| movies              |
+---------------------+
1 row in set (0.04 sec)

mysql> INSERT INTO movies values
  (1,"Top Gun"),
  (2,"Joker"),
  (3,"Scarface");
Query OK, 3 rows affected (0.04 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

Command examples

You can now run standard SQL commands.

```
mysql> select * from movies;
+----+----------+
| id | name     |
+----+----------+
|  1 | Top Gun  |
|  2 | Joker    |
|  3 | Scarface |
+----+----------+
3 rows in set (0.04 sec)


# When ready to terminate, close the connection:
mysql> exit
Bye
```

References

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- Wikimedia Foundation. (2022, October 7). Google cloud platform. Wikipedia. Retrieved October 15, 2022, from https://en.wikipedia.org/wiki/Google_Cloud_Platform