Understanding
Google Cloud Platform

Day - 2

Cloud SQL Deep Dive

Agenda

- Recap of Day 1 (Cloud Storage, Projects, gcloud)
- Intro to Cloud SQL
- Setting up MySQL
- Hands-on with database creation
- Scaling Cloud SQL
- Day 1 - Assignment

Recap of various storage services

Cloud Storage	Cloud SQL	Cloud Datastore	Cloud Bigtable	BigQuery	Cloud Spanner
• Object Database • Store binary object data • Good for storing Images, media servings, backup	• Relational database • Managed MySQL, PostgreSQL, or SQL Server service • Suitable for a wide variety of applications, such as blogs, ERP, and CRM	• NoSQL database • Horizontally scalable • Faster than Cloud SQL • Best for simple data and queries, especially key-value pairs • Examples include user profiles and game state	• NoSQL database • Designed to scale in the petabyte range • High throughput and low latency • Not for transaction processing • Best for huge (>1TB) amounts of single-keyed data (e.g. IoT)	• Data warehouse • Used after data is collected • Not a transactional system • Best for aggregating data and searching with SQL queries -- OLAP and business intelligence	• Google's newest database service • Relational database • Horizontally scalable • More expensive

What is Cloud SQL?

Cloud SQL is a **fully managed relational database service** by Google Cloud that lets you run traditional SQL databases in the cloud without worrying about infrastructure.

- Used as remote relational database

- Provides Automatic

  a. Backups

  b. Replication

  c. Patching

- Secure and scalable
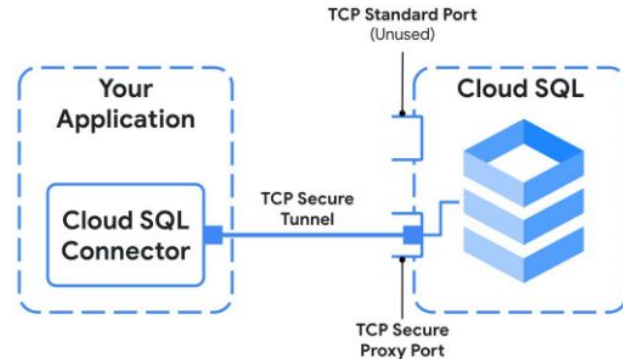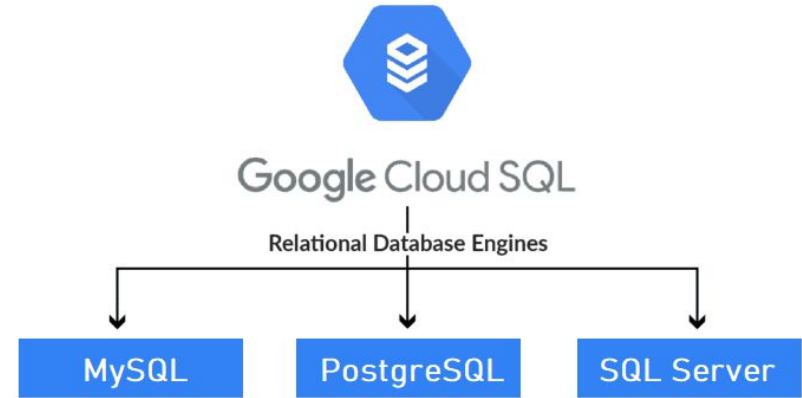

Image by: Google Cloud Platform

What Cloud SQL provides?

Cloud SQL offers many services so you don't have to build and maintain them yourself. You can focus on your data and let Cloud SQL handle the following operations;

- Supports: MySQL, PostgreSQL, SQL Server
- Backups
- [High availability and failover](#)
- Network connectivity
- Export and import
- Maintenance and updates

Uses of Cloud SQL

Some practical, real-world uses of Cloud SQL that demonstrate its versatility and integration with various types of applications:

Web Application Backend - Host databases, Store user data, sessions, and configuration settings

Mobile App Data store - Acts as the central relational database for mobile apps

Data Migration from On-Prem to Cloud - Use Database Migration Service to move data with minimal downtime

SaaS Applications - Multi-tenant SaaS platforms store customer data in separate schemas or DBs
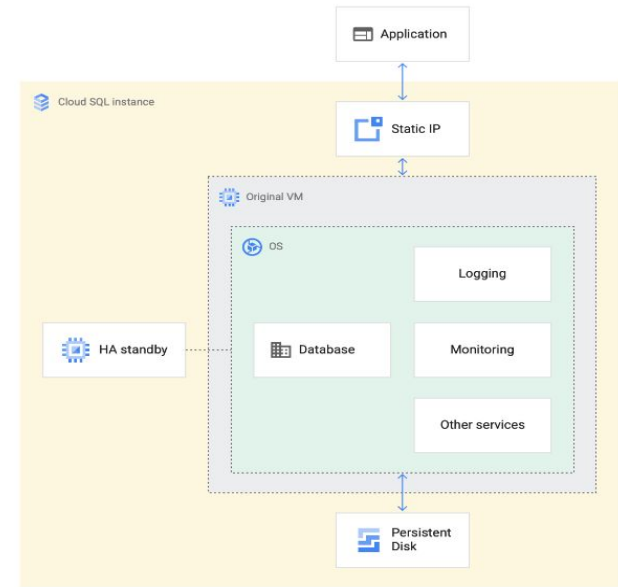
What is a Cloud SQL Instance?

A Cloud SQL instance is a **virtualized database environment** in Google Cloud that runs a fully managed relational database engine—such as MySQL, PostgreSQL, or SQL Server.

A **container** for the databases, where Google manages the infrastructure of the database.

Key components of a Cloud SQL Instance;

1. **Instance ID** - Unique name to identify your Cloud SQL instance
2. **Database Engine** - MySQL / PostgreSQL / SQL Server
3. **Region & Zone** - Location where the instance is hosted (affects latency and availability)
4. **Tier (Machine Type)** - Defines CPU & memory (e.g., db-f1-micro, db-n1-standard-2)
5. **Storage** - SSD or HDD, auto-resizable if enabled
6. **Connection Options** - Public IP, Private IP, Cloud SQL Auth Proxy

Cloud SQL Hands On

The following set of commands give you a hands-on of;

● creating a cloud SQL instance, database, users
● adding query data from the database with the help of Cloud SQL Auth proxy

Steps:

1. Enabling Cloud SQL API

2. Creating a MySQL Instance

3. Creating a Database

4. Connect using Cloud SQL Auth proxy

Connecting using Cloud SQL Auth proxy

The Cloud SQL Auth Proxy is a Cloud SQL connector that provides secure access to your instances without a need for Authorized networks or for configuring SSL.

Local Database → Connect SQL local client → Creates secure tunnel → Server SQL client → connects the Cloud SQL