



Google Cloud SQL Use Case



Use Case: Streamlining Database Management with Google Cloud SQL

GENERAL CHARACTERISTICS

Intent	To streamline and modernize database management for a client using Google Cloud SQL.
Scope	Migration and management of relational databases on a fully managed cloud platform.
Level	System-level.
Client	Confidential (Healthcare Service Provider).
Last Update	03/12/2024
Status	Finalized.
Stage	Implementation and Optimization.

ACTORS

Primary Actor	Database Administrator.
Secondary Actors	Application Developers, IT Operations Team, Compliance Officers.

PREREQUISITES

Static Preconditions	<ul style="list-style-type: none"> - Google Cloud Project set up with Cloud SQL API enabled. - Existing on-premise databases identified for migration.
Dynamic Preconditions	<ul style="list-style-type: none"> - Data migration strategy designed and validated. - Access and security policies configured.
Assumptions	<ul style="list-style-type: none"> - Client requires high availability and disaster recovery. - Sensitive data must comply with HIPAA regulations for healthcare.

TRIGGERS

Trigger Event	The client experienced inefficiencies and high maintenance costs with their on-premise relational databases.
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EXPECTED OUTCOME

Success Postcondition	<ul style="list-style-type: none"> - Databases are hosted on Google Cloud SQL with minimal downtime. - Operational costs are reduced, and performance is optimized.
Failed Postcondition	- Migration delays or misconfigurations





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lead to system disruptions.

OPERATIONS AND CONCEPTS

Operations	<ol style="list-style-type: none"> 1. Analyzed the client’s existing database architecture and requirements. 2. Designed a migration strategy using Database Migration Service. 3. Set up highly available Cloud SQL instances with automatic backups. 4. Configured read replicas to enhance query performance. 5. Enabled VPC and IAM roles to ensure secure database access. 6. Monitored database performance using Cloud Monitoring and Logs Explorer.
Concepts	<ul style="list-style-type: none"> - Cloud SQL: A fully managed relational database service for MySQL, PostgreSQL, and SQL Server. - Database Migration Service: Simplifies the migration process with minimal downtime. - High Availability: Ensures resilience with failover replicas and automatic backups.

MAIN SUCCESS SCENARIO

Step 1	Assessed the client’s existing on-premise databases for migration feasibility.
Step 2	Configured Cloud SQL instances to meet compliance and performance requirements.
Step 3	Migrated data using Database Migration Service with near-zero downtime.
Step 4	Enabled high availability and automatic failover for critical workloads.
Step 5	Implemented IAM policies to restrict access based on roles.
Step 6	Set up monitoring dashboards to track performance and optimize query execution.
Step 7	Reduced operational overhead by automating backups and maintenance tasks.

