

Observability and Manageability in Google Cloud Databases

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Google Cloud

Google Cloud



Google Cloud Databases








Ready for gen AI

In-memory

Relational

Key value

Document

In-memory	Relational			Key value	Document	
						
Memorystore	Oracle DB @ Google Cloud	Cloud SQL	AlloyDB	Spanner	Bigtable	Firestore
Redis Memcached Valkey (NEW!)	Exadata, Autonomous Database and RAC availability (NEW!)	MySQL PostgreSQL SQL Server	PostgreSQL Compatible, Runs anywhere with AlloyDB Omni ScaNN Index (NEW!)	PostgreSQL Interface Multi-model (NEW!) ScaNN Index (NEW!)	GoogleSQL Interface HBase Interface	Document database Interface
<p>ANN & KNN</p> <p>KNN</p> <p>Vector support</p>						



Google Cloud - home for your PostgreSQL workloads



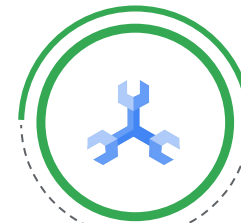
Cloud SQL

Enterprise-ready fully managed relational database service for (Enterprise : **99.95%** Enterprise Plus : **99.99% SLA**)
PostgreSQL, MySQL, SQL Server



AlloyDB AlloyDB Omni

PostgreSQL-compatible database ready for top tier workloads(**99.99% SLA**)
Run AlloyDB anywhere with AlloyDB Omni



Cloud Spanner

Unlimited global scale and **99.999%** availability
PostgreSQL interface

Google Cloud - 2024 PostgreSQL contributions

- **CVE fixes**
 - Co-authored fixes for CVE-2024-10979 and CVE-2025-1094
- **Extensions**
 - Contributed bug fixes to better support **DROP EXTENSION** in **pg_ivm**
 - Contributed multiple bug fixes for **plv8**
 - Improved interrupt handling reliability in **pglocal**
- **Data Integrity**
 - Contributed fixes for **GRANT** corruption issues
- **Code Reviews**
 - Reviewed patches for logical replication, data integrity and Async IO
- **Community Engagement**
 - Hosted Bangalore PostgreSQL meetup in Google offices
 - Reported 11 bugs as part of PostgreSQL 17 beta testing



Manageability - Database Center

Emerging trends demand new ways of managing and operating databases

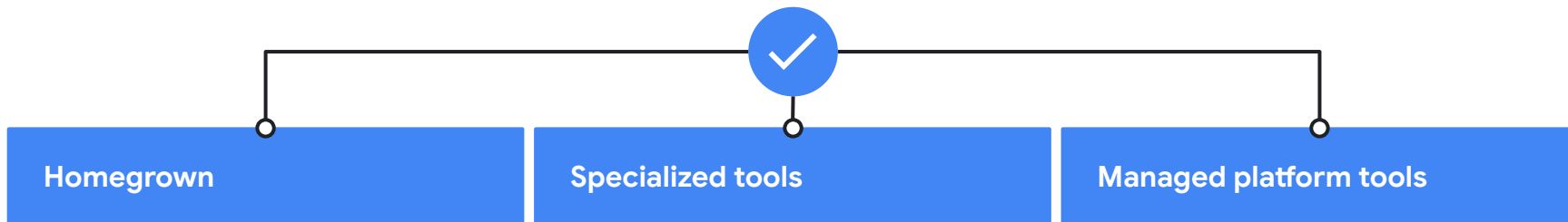
Adoption of **variety** of database engines

Acceleration of databases with **DevOps**

Rising **security** threats to databases



Current solutions



✘ **Proliferation of databases**
Messy situation

✘ **Inefficient processes**
Error prone

✘ **Security threats**
Unprepared for risks

✘ **Poor cost management**
Blindsided

✘ **Fragmented tools**
Low efficiency

✘ **Limited observability**
Running blind

✘ **Multiple personas**
Gaps in skills

✘ **No best practices**
Governance risks

Database Center

Your AI-powered, unified fleet management solution



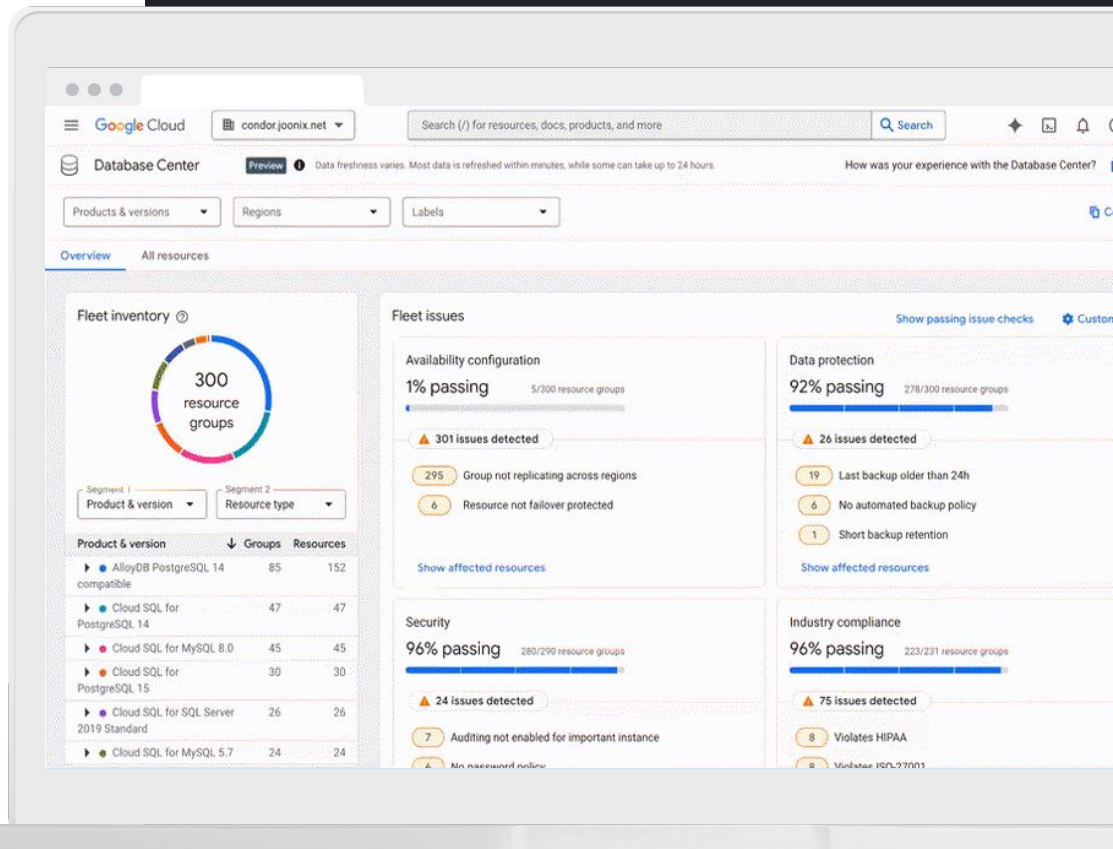
Gain a comprehensive and consistent view of your diverse database fleet.



Proactively de-risk your fleet with intelligent performance, reliability and security recommendations.



AI-powered assistance to optimize your database fleet.





**With [Gemini in Databases](#), we can get answers
on fleet health in seconds and proactively
mitigate potential risks to our applications
more swiftly than ever before.”**

Bogdan Capatina, Technical Expert in Database Technologies, Ford Motor Company



Observability - Database Insights

Why Database Insights

01

Solve database performance issues **faster than ever before**. With richer, near real-time diagnostics, users can easily **analyze query executions and wait events** at a granular level.

02

Be in **complete control** of active query executions. Users get complete visibility into all queries currently running in their system so as to **better manage active queries**.

03

Enhance database performance with **intelligent recommendations**. Users get easy-to-apply workload recommendations such as **Index Advisor**.

04

Leverage **AI-powered insights** to address performance related questions. Users can interact with a **natural language chat interface** to get answers specific to their workload patterns.

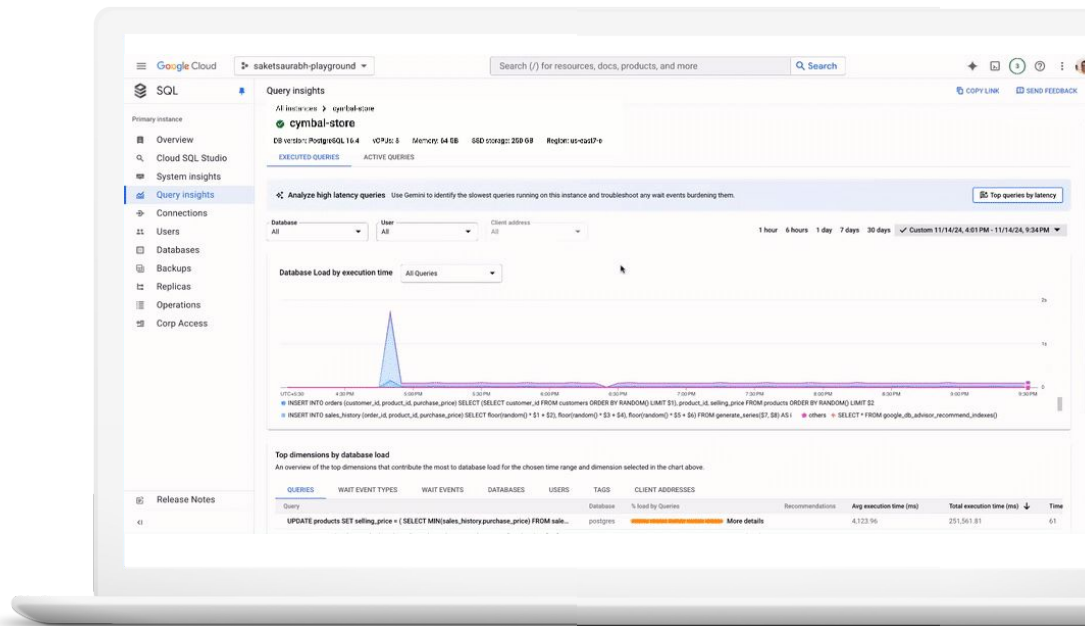
Data Driven Decision **with correlation**

Reduce diagnostic time: Pinpoint the issue in minutes, not hours.

Isolate queries instantly by application, host, or any tag: **Near real-time query status monitoring.**

Correlate performance statistics across multiple dimensions

Fine-grained query plan samples & Full query visibility, **Visualize step-by-step query processing.**

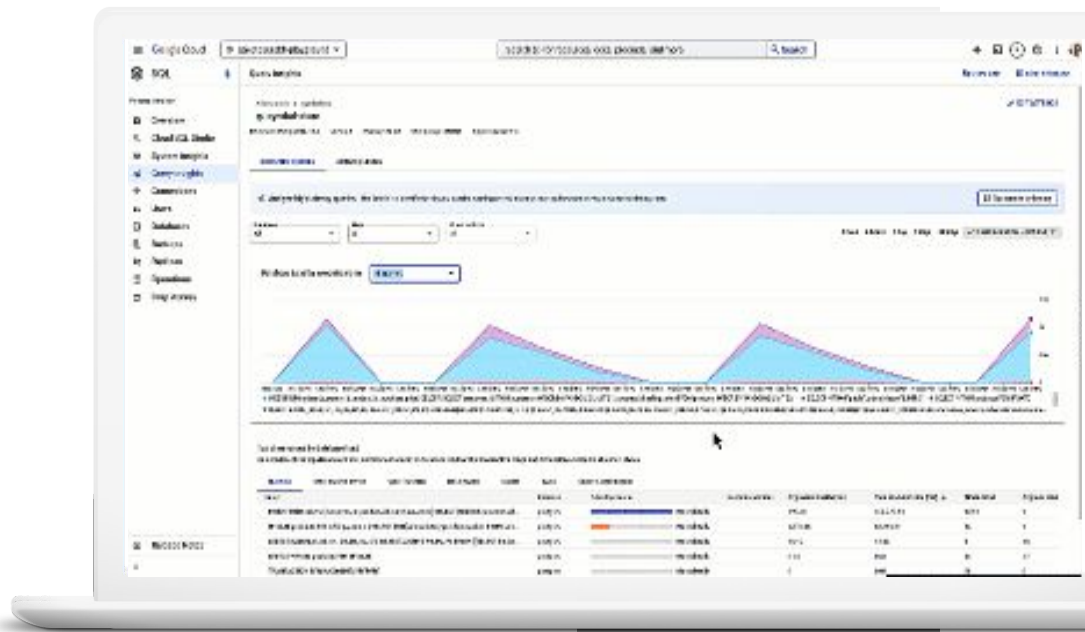


With 30 days of telemetry data, you can analyze long-term trends and identify recurring issues. Visual query execution plans make it easy to comprehend irrespective of engine. Comparing visual query plans over time can pinpoint inefficiencies and easily facilitate data-driven optimizations.

Efficient Troubleshooting with Wait Events

Pinpoint the source of performance issues

Wait events and wait event types:
Identify bottlenecks and resource contention



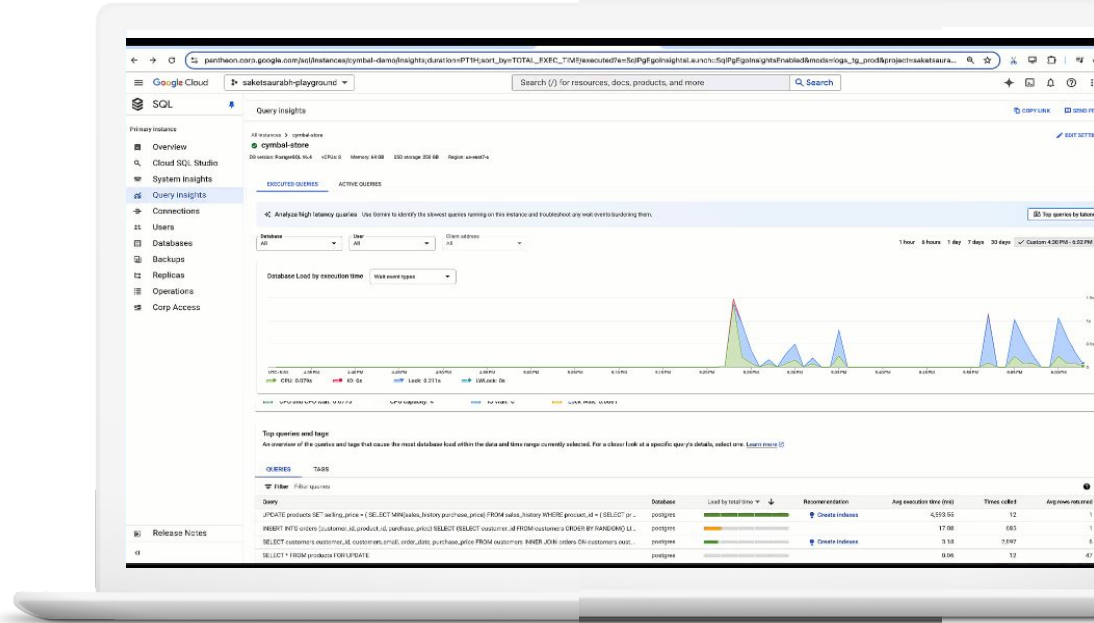
Wait events in Query Insights help identify what the database is waiting on, such as disk I/O or locks, and pinpoint specific issues like lock types. This enables faster diagnosis of performance bottlenecks and smarter resource optimization.

Proactive Detection & Prevention **with recommendations**

Pinpoint the source of performance issues

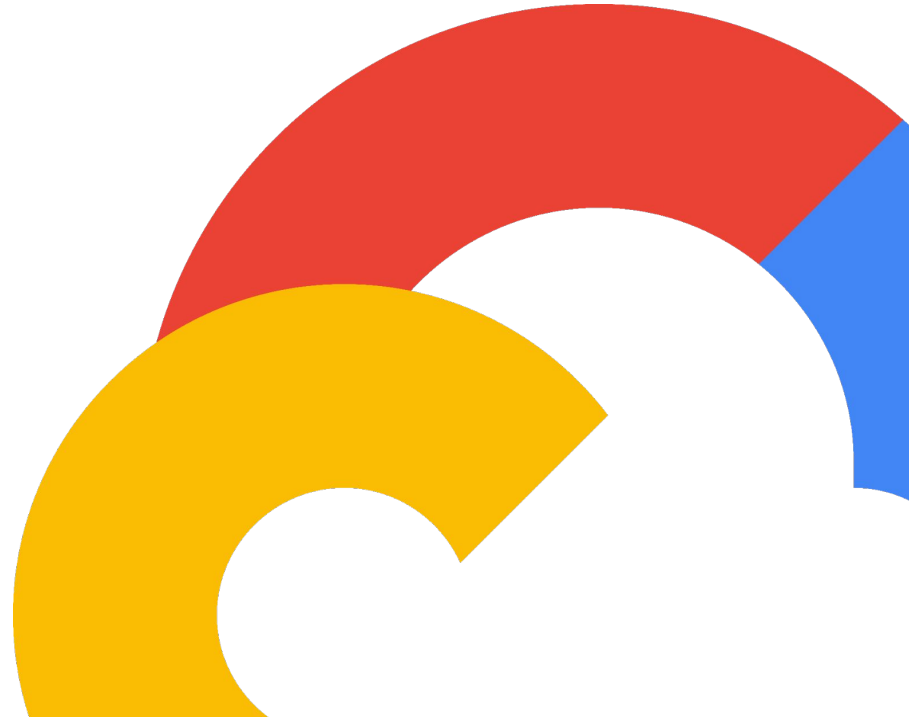
Intelligent Index Advisor proactively identifies missing indexes.

Provides ready-to-implement CREATE INDEX statements.



Index Recommender identifies performance bottlenecks by detecting missing indexes and providing precise, actionable recommendations to improve query efficiency. It offers specific SQL index creation commands, showing potential performance impact, highlighting affected queries, thereby streamlining the process of database performance optimization. Simply paste this SQL in Studio and see the benefits!

Thank you

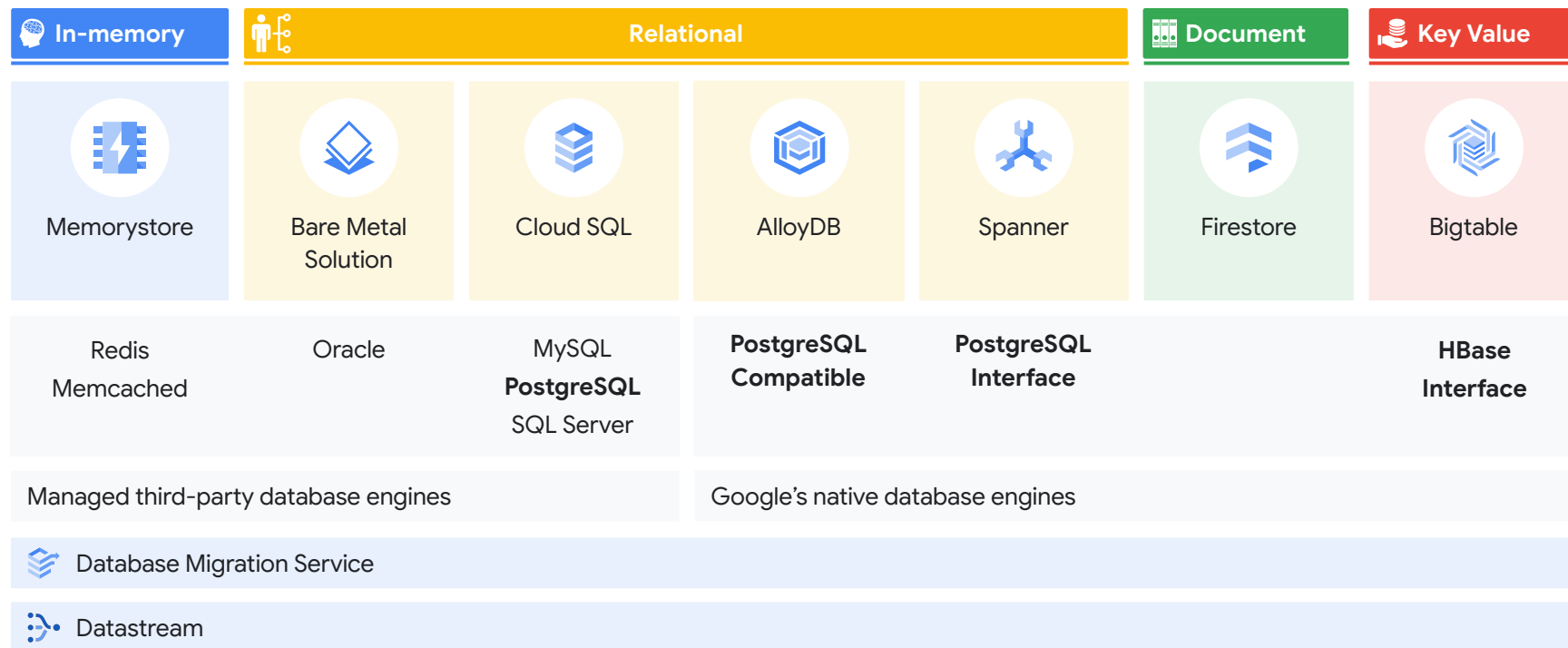


Google Cloud

Thank you



Google Cloud: The destination for your operational database workloads



Database Center Demo

Gain a comprehensive and consistent view of your diverse database fleet, proactively de-risk it with intelligent performance, reliability, and security recommendations, and optimize it with AI-powered assistance.

[Click Here](#)

Early customer experiences

Davita



“ This is exactly what we have been looking for - a single pane of glass is great”

Genuine Parts Company



“After enabling Database Center in Cloud SQL, we found that some production database backups were only retained for 3 days, which didn't meet GPC standards. So it was useful”

Revionics



“It gave us clear view of configuration issues on Cloud SQL (MySQL) instances. Hence we saw clear value of Database Center and want to know more”

How does root cause analysis help?

Root cause analysis on Database Insights

Database Insights helps by:



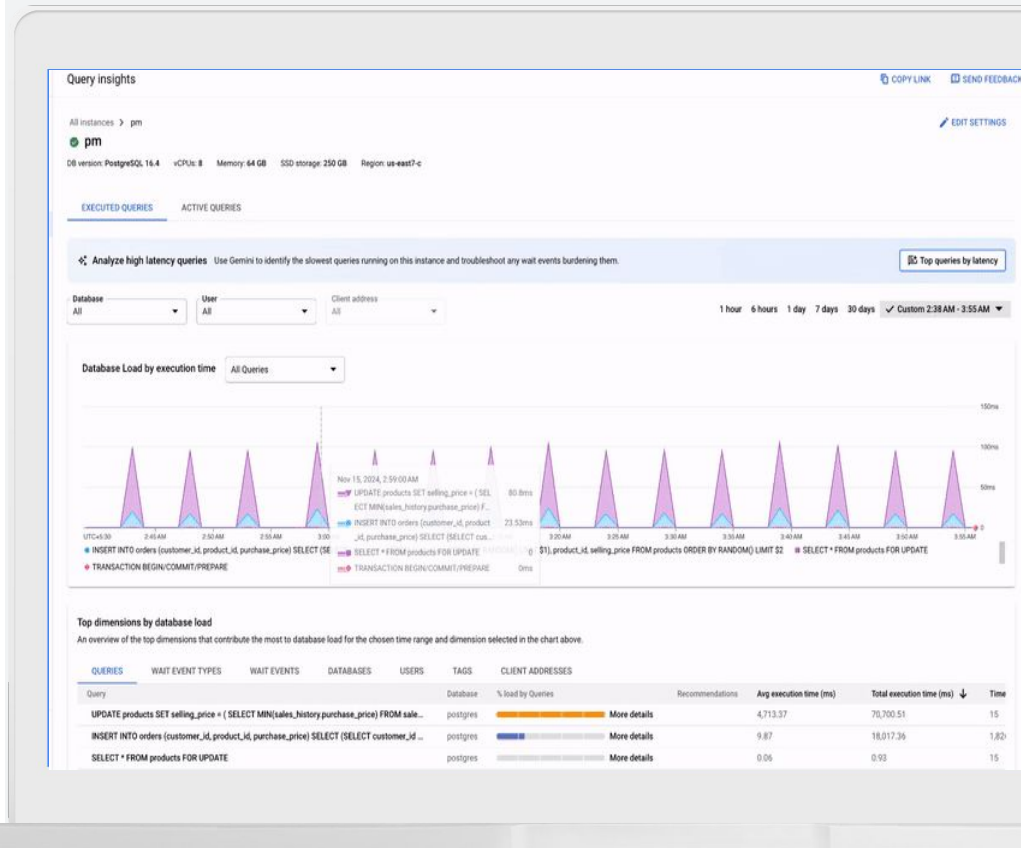
Dissecting the **time spent by queries** on different types of wait events



Correlating these query stats across **multiple dimensions**

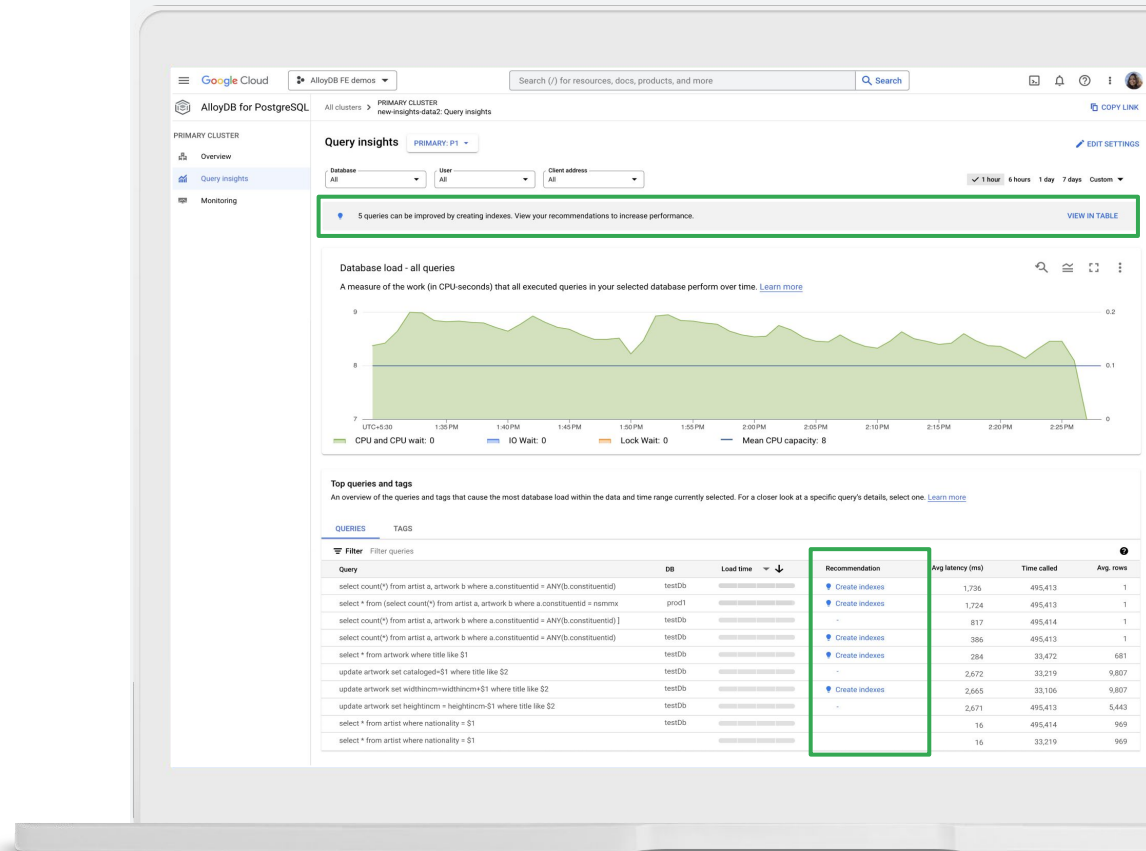


Surfacing an additional layer of **contextual explainability**



How does Index Advisor help?

I can now create the suggested indexes and fix the database performance issues!



How does Index Advisor help?

Index Advisor

Index Advisor for Database Insights helps by:



Recommending **simple, ready-to-apply** indexing opportunities to boost query performance.



Providing performance benefits with **minimal storage overheads**.

How does the Chat Agent help?

Database Insights Chat Agent

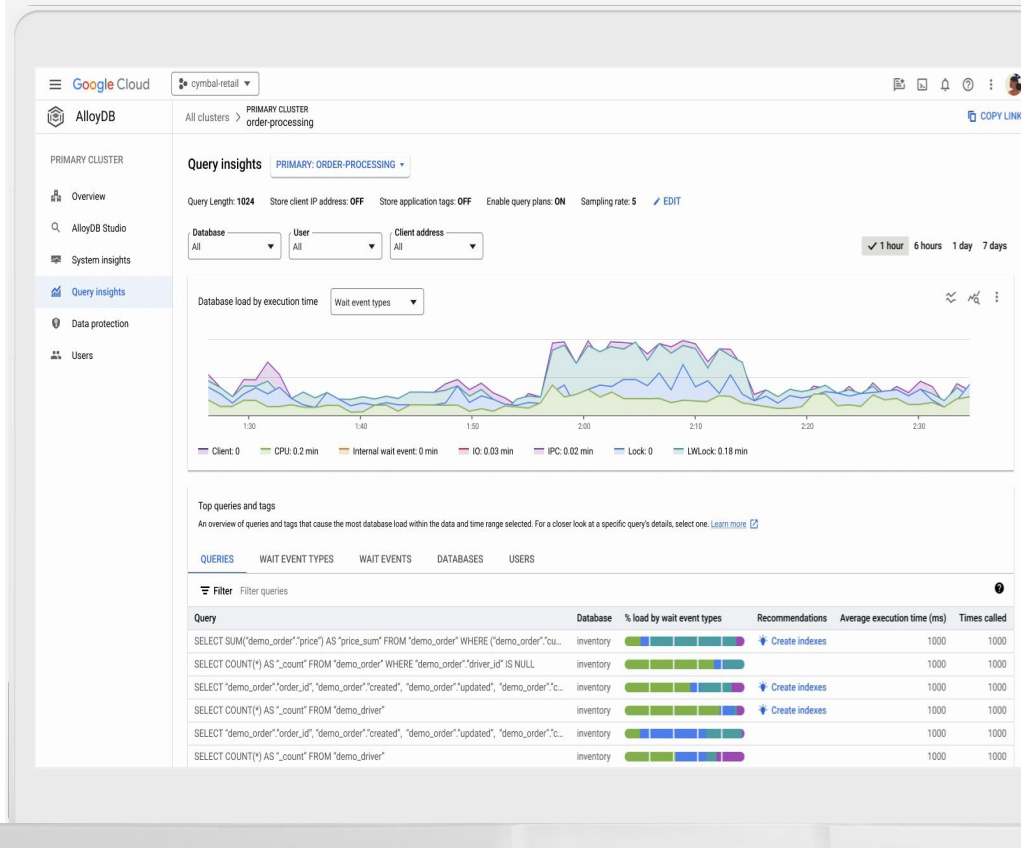
The AI-powered chat experience helps by:



Streamlining performance tuning via **expert-curated responses**



Generating **troubleshooting guidance** specific to the workload



Managing modern day fleet is complex

