

AlloyDB Essentials

This course explores the benefits of AlloyDB, especially compared to PostgreSQL on Cloud SQL. It will walk you through AlloyDB's unique architecture, and explain how to configure deployments on Google Cloud. The course is divided into two parts: AlloyDB Administration Essentials (architecture and configuration) and AlloyDB Optimization Essentials (performance tuning).

**DURATION**

2-3 hours

**LEVEL**

200 - Intermediate

**FORMAT**

Instructor-led

**SCALABLE**

1-50, scaled to 1000

What you'll learn

- Understand the differences between AlloyDB and Cloud SQL.
- Describe AlloyDB's architecture and its advantages for demanding workloads.
- Create and manage an AlloyDB instance.
- Leverage Index Advisor recommendations to improve query performance.
- Use Adaptive Autovacuum to free up database resources.
- Describe and configure the Columnar Engine to speed up analytical queries.

Overview	8 modules
Who this course is for	• Data Engineers and Database Administrators
Products	• AlloyDB AI • AlloyDB Omni • AlloyDB for PostgreSQL
Prerequisites	• Comfortable working in Google Cloud with Cloud Shell and the Google Cloud Console. Basic knowledge of PostgreSQL management. Basic knowledge of Cloud SQL and database administrative tasks is useful.
Not covered	• SQL and RDBMS basics

Module 01 [The Value of AlloyDB](#)

Topics	• Traditional PostgreSQL: Monolithic limitations • Cloud SQL: Monolithic scaling • AlloyDB: Cloud-native design • AlloyDB: Performance advantages • AlloyDB: Intelligent storage
Objectives	• Understand the differences between AlloyDB and Cloud SQL.

Module 02 [Architecture Overview](#)

Topics	• Disaggregated storage • WAL processing • Read pool scaling • Automatic data tiering • Dynamic shard mapping
Objectives	• Describe AlloyDB's architecture and its advantages for demanding workloads.

Module 03

Get Started with AlloyDB

Topics

- Instance configuration
- Network connectivity
- Connection methods
- Scaling instances
- Backup and recovery
- Additional Resources

Objectives

- Create and manage an AlloyDB instance.
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Module 04

AlloyDB Administration Essentials Quiz

Topics

- Knowledge checks re AlloyDB Administration Essentials

Objectives

- Understand the differences between AlloyDB and Cloud SQL.
 - Describe AlloyDB's architecture and its advantages for demanding workloads.
 - Create and manage an AlloyDB instance.
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Module 05

Index advisor

Topics

- DBA tasks
- Indexing challenges
- Database indexes
- Index advisor: Smart recommendations.
- Performance gains

Objectives

- Leverage Index Advisor recommendations to improve query performance.
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Module 06

Adaptive autovacuum

Topics

- MVCC overview
- VACUUM purpose
- Adaptive autovacuum: Dynamic resource management.
- Performance improvement

Objectives

- Use Adaptive Autovacuum to free up database resources.
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Module 07

Columnar Engine

Topics

- Row vs. Columnar: Storage differences.
- Analytical efficiency
- In-memory engine
- Metadata optimization
- Execution modes
- Additional Resources

Objectives

- Describe and configure the Columnar Engine to speed up analytical queries.
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Module 08

AlloyDB Optimization Essentials Quiz

Topics

- Knowledge checks re AlloyDB Optimization Essentials

Objectives

- Understand the differences between AlloyDB and Cloud SQL.
- Leverage Index Advisor recommendations to improve query performance.
- Use Adaptive Autovacuum to free up database resources.
- Describe and configure the Columnar Engine to speed up analytical queries.