



AlloyDB Essentials

Course description

Learn how to deploy, administer, and optimize AlloyDB for PostgreSQL on Google Cloud. Explore AlloyDB's cloud-native architecture, performance advantages over traditional PostgreSQL deployments, intelligent storage capabilities, and advanced optimization features such as Index Advisor, Adaptive Autovacuum, and the Columnar Engine for high-performance transactional and analytical workloads.

Participants will learn how AlloyDB differs from PostgreSQL and Cloud SQL, understand its cloud-native architecture, configure and manage AlloyDB instances, and leverage advanced optimization features that improve database performance. The course is divided into two focused learning tracks: AlloyDB Administration Essentials and AlloyDB Optimization Essentials. Through demonstrations, discussions, and real-world scenarios, learners gain practical knowledge for managing enterprise-grade PostgreSQL workloads using AlloyDB.

- Course level: Intermediate
- Duration: 1 day

Activities

This course includes instructor-led training, architecture reviews, technical discussions, database performance workshops, scenario-based learning, optimization walkthroughs, knowledge assessments, and quiz-based validation to reinforce learning.

Course objectives

In this course, you will learn to:

- Understand the differences between AlloyDB and Cloud SQL.
- Explain AlloyDB's cloud-native architecture.
- Describe AlloyDB performance and scalability advantages.
- Create and manage AlloyDB instances.
- Configure networking, backup, and recovery options.
- Leverage Index Advisor recommendations for performance tuning.
- Use Adaptive Autovacuum to improve database efficiency.
- Configure the Columnar Engine for analytical workloads.
- Optimize PostgreSQL workloads using AlloyDB capabilities.

Intended audience

This course is intended for:

- Data Engineers
- Database Administrators (DBAs)
- Cloud Database Administrators
- Database Architects
- PostgreSQL Administrators
- Cloud Engineers
- Infrastructure Engineers
- Technical Professionals Managing Database Platforms

Prerequisites

We recommend that attendees of this course have:

- Comfortable working with Google Cloud Console.
- Experience using Cloud Shell.
- Basic PostgreSQL administration knowledge.
- Familiarity with Cloud SQL concepts is beneficial.
- Understanding of database administration fundamentals.

Products covered

- AlloyDB for PostgreSQL

Course outline

Module 01 - The Value of AlloyDB

- Traditional PostgreSQL Limitations
- Cloud SQL Scaling Challenges
- AlloyDB Cloud-Native Design
- Performance Advantages
- Intelligent Storage Architecture

Module 02 - Architecture Overview

- Disaggregated Storage Architecture
- Write-Ahead Log (WAL) Processing
- Read Pool Scaling
- Automatic Data Tiering
- Dynamic Shard Mapping

Module 03 - Get Started with AlloyDB

- Instance Configuration
- Network Connectivity
- Connection Methods
- Scaling Instances
- Backup and Recovery
- Additional Resources

Module 04 - AlloyDB Administration Essentials Quiz

- Administration Knowledge Review
- Architecture Review
- Deployment Best Practices

Module 05 - Index Advisor

- Database Administration Tasks
- Indexing Challenges

- Database Index Fundamentals
- Index Advisor Recommendations
- Query Performance Improvements

Module 06 - Adaptive Autovacuum

- MVCC Overview
- VACUUM Operations
- Adaptive Autovacuum Architecture
- Dynamic Resource Management
- Performance Optimization

Module 07 - Columnar Engine

- Row vs Columnar Storage
- Analytical Query Optimization
- In-Memory Processing Engine
- Metadata Optimization
- Execution Modes
- Additional Resources

Module 08 - AlloyDB Optimization Essentials Quiz

- Optimization Knowledge Review
- Performance Tuning Concepts
- Advanced AlloyDB Features

Certification details

Participants receive a course completion certificate upon successfully attending the training program.

FAQs

Who should attend this course?

This course is designed for Data Engineers, Database Administrators, PostgreSQL professionals, and cloud engineers responsible for managing database platforms.

What is AlloyDB?

AlloyDB is Google Cloud's fully managed PostgreSQL-compatible database service designed for superior performance, scalability, and availability compared to traditional PostgreSQL deployments.

How is AlloyDB different from Cloud SQL?

- AlloyDB uses a cloud-native architecture with disaggregated storage, intelligent caching, enhanced WAL processing, and advanced performance optimization features that provide significant performance improvements over Cloud SQL for PostgreSQL.

Does the course cover database administration?

Yes. The first half of the course focuses on AlloyDB administration, including architecture, deployment, networking, scaling, backup, and recovery.

What optimization features are covered?

The course covers Index Advisor, Adaptive Autovacuum, and the AlloyDB Columnar Engine for performance optimization and analytics acceleration.

Is PostgreSQL knowledge required?

Yes. Basic PostgreSQL administration knowledge is recommended before attending the course.

How long is the course?

The course is delivered in a 3-hour instructor-led format.

What business benefits can organizations expect?

Organizations can improve database performance, reduce operational overhead, accelerate analytical workloads, modernize PostgreSQL environments, increase scalability, and optimize database resource utilization using AlloyDB.