Faysal Aziz

PostgreSQL Performance Tuning

Unlock the full potential with expert tuning techniques in 1 day

FA-0354 · 1 day

Data & Analytics

Introduction

In today's data-driven world, the performance of your database can make or break your applications. PostgreSQL, a powerful open-source database, offers robust features, but ensuring it operates at peak performance requires specialized knowledge.

This one-day course is designed for database administrators and developers who want to optimize PostgreSQL for high performance, ensuring faster queries, better resource management, and overall system efficiency.

With over 30 years of industry experience, your instructor will guide you through real-world scenarios and practical tuning techniques that are in demand across the tech industry.

Learning outcomes

- Understand PostgreSQL's architecture and its impact on performance.
- Master techniques to optimize queries and indexes.
- Configure PostgreSQL for high performance in various environments.
- Implement advanced tuning strategies for memory, disk, and CPU usage.
- Learn best practices for scaling and replication in PostgreSQL.

Prerequisites

- Basic understanding of PostgreSQL or another relational database.

- Familiarity with SQL queries.
- Experience with Linux command-line interface (CLI) is helpful but not mandatory.

Training outline

1. 1. Introduction to PostgreSQL Performance Tuning

- Overview of PostgreSQL architecture
- Understanding the performance impact of different components
- Identifying common performance bottlenecks

2. 2. Query Optimization Techniques

- Analyzing slow queries with EXPLAIN and EXPLAIN ANALYZE
- Using indexes effectively (B-tree, Hash, GIN, and GiST)
- Techniques for optimizing SELECT, JOIN, and aggregate functions
- Strategies for rewriting queries for better performance

3. 3. Configuring PostgreSQL for High Performance

- Adjusting memory settings: shared_buffers, work_mem, and maintenance_work_mem
- Configuring effective_cache_size and checkpoint settings
- Tuning the autovacuum daemon
- Disk I/O optimization: file system considerations, WAL settings

4. 4. Advanced Tuning Strategies

- Optimizing the planner and execution engine
- Parallel query execution and tuning
- Using partitioning for large tables
- Managing and optimizing long-running queries

5. 5. Performance Monitoring and Maintenance

- Setting up PostgreSQL logging for performance insights
- Using pg_stat_statements and other extensions for monitoring
- Routine maintenance tasks: VACUUM, REINDEX, CLUSTER

- Analyzing and optimizing vacuum performance

This course will equip you with the skills and knowledge to ensure your PostgreSQL database performs at its best, keeping your applications fast and responsive.

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