

PostgreSQL Performance Tuning

Learn to tune PostgreSQL performance by managing vacuuming, indexing, statistics, connection pooling and query optimisation.

10

MODULES

46

TOPICS

COURSE OVERVIEW

This course covers PostgreSQL server architecture, installation and client access, including the psql command-line tool, pgAdmin, and remote client connections. It then addresses vacuuming to manage bloated tables, indexing strategies such as partial indexes and index-only scans, and the use of statistics views to monitor sessions and blocking PIDs. The course also covers connection pooling with pgBouncer and concludes with practical tips for improving query performance, such as handling joins and tuning shared_buffers.

WHO THIS COURSE IS FOR

Database Administrators

PostgreSQL Developers

System Administrators

Performance Engineers

Database Architects

LEARNING OBJECTIVES

- Describe PostgreSQL server architecture and core features
- Install and configure a PostgreSQL server and cluster
- Connect to PostgreSQL using psql and pgAdmin
- Configure remote client access with host-based authentication
- Identify bloated tables and apply vacuuming to resolve them
- Create and assess indexes, including partial and foreign key indexes
- Interpret statistics views to identify and handle blocking sessions
- Configure pgBouncer for connection pooling

10 Modules, 46 Topics

01

Introduction to PostgreSQL Server

TOPICS

Introduction to PostgreSQL server · Features of PostgreSQL server

02

Postgres Client Server Architecture

TOPICS

Client Server Architecture · Utility Processes · Shared Memory

03

Installation of PostgreSQL Server

TOPICS

Install the PostgreSQL Server · Setting Environment Variables · Creating a Cluster · Running Server

04

PostgreSQL Client

TOPICS

Introduction To PSQL · Meta Commands, SQL queries and Parameters · Using graphical administration tool – pgAdmin

05

Remote Client Connection

TOPICS

Postgres hosed based access configuration · Remote client connection using pgAdmin

06

Vacuuming

TOPICS

Introduction to vacuum

FINDING BLOATED TABLES / DEAD TUPLES

Using pg_stat_user_tables · Using pgstattuple extension

Vacuuming to solve bloating issues · Autovacuum feature

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Indexing

TOPICS

- Creating an index
- Checking performance with and without indexes
- Checking performance using index only scans
- Indexing foreign keys
- Partial Indexes
- Checking index bloating using pgstatindex
- Reindexing to address index bloating
- Fill factor of the table

08

Making Use of Statistics

TOPICS

- Knowing the statistics information using Pg_stat_activity, pg_stat_database, pg_stat_user_tables
- Checking active user connections
- Knowing active and blocked sessions
- Listing blocking PIDs

HANDLING BLOCKING PIDS

- Waiting for session to complete
- Killing a PID to release locks
- Pg_stat_statements extension

09

pgBouncer

TOPICS

Introduction to connection Pooling · Building pgBouncer setup · Installing and configuring pgBouncer · Connecting to pgBouncer · Advanced settings for performance

10

Tips for Performance Improvement

TOPICS

- Setting min and max time limit for query execution
- Finding slow running queries
- Logging statements
- Setting shared_buffers
- Parallel Queries
- Handling Joins, order by and distinct clauses
- Reducing number of SQL statements

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

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