

## PostgreSQL for Developers

Duration 2 days

### Overview

This course provides programmatic interaction with PostgreSQL databases and writing PostgreSQL extensions.

### Target audience

developers who want to use or extend PostgreSQL, as well as database architects.

### Requirements

A working knowledge of SQL and C

### Course Outline

#### What is PostgreSQL?

- A Brief History of PostgreSQL
- Conventions
- Further Information
- Bug Reporting Guidelines

#### Introduction to PostgreSQL

- Installation from Packages and Creating Database
- Installation from Source Code
- Installation from Source Code on Windows
- The SQL Language
- Advanced Features

#### The SQL Language

- SQL Syntax
- Data Definition
- Data Manipulation
- Queries
- Data Types
- Functions and Operators
- Type Conversion
- Indexes
- Full Text Search
- Concurrency Control
- Performance Tips

#### Client Interfaces

- libpq - C Library
- Large Objects
- Special Considerations for Event Loop Based Programs
- Error Handling
- ECPG - Embedded SQL in C
- The Information Schema
- Bindings in Other Programming Languages, e.g. PHP, Perl, Python, Node.js, Go.
- Special Considerations for Asynchronous Python Frameworks (e.g. gevent, asyncio, Twisted, Tornado)
- Support of PostgreSQL in ORM frameworks

#### Server Programming

- Extending SQL

- Triggers
- The Rule System
- Procedural Languages
- PL/pgSQL - SQL Procedural Language
- PL/Tcl - Tcl Procedural Language
- PL/Perl - Perl Procedural Language
- PL/Python - Python Procedural Language
- Server Programming Interface

**Internals**

- Overview of PostgreSQL Internals
- System Catalogs
- Frontend/Backend Protocol
- PostgreSQL Coding Conventions
- Native Language Support
- Writing A Procedural Language Handler
- Writing A Foreign Data Wrapper
- Genetic Query Optimizer
- Index Access Method Interface Definition
- GiST Indexes
- GIN Indexes
- Database Physical Storage
- BKI Backend Interface
- How the Planner Uses Statistics