

**PostgreSQL Administration**

**Course Number:** PSQL-102  
**Duration:** 4 days

**Overview**

Accelebrate's PostgreSQL Administration training class teaches students how to build, query, administer, backup, and secure PostgreSQL.

**Prerequisites**

All PostgreSQL Administration training students should have experience with database administration on another platform (though we can tailor class to attendees without this experience on request). Trainees should also be comfortable with navigating within and editing files in a Linux environment. An understanding of SQL statements is also helpful.

**Materials**

All students receive comprehensive courseware delivered electronically on the first day of class.

**Software Needed on Each Student PC**

* Operating system of your choice
* An ssh terminal or client (such as PuTTY) for connection to lab servers provided by Accelebrate
* Optional: pgAdmin 4
* Sample databases and lab files that Accelebrate provides

**Objectives**

* Learn the fundamentals of working at the Linux command line
* Install PostgreSQL
* Create databases and users
* Write PSQL to query and manage the database
* Perform backup and disaster recovery
* Work with inheritance, partitioning, and tablespaces
* Manage free space
* Secure PostgreSQL
* Create high availability and high-performance solutions

**Outline**

* PostgreSQL Introduction & Architecture
  + Introduction and History
  + The rise of PostgreSQL Popularity
  + Getting support for PostgreSQL
  + The PostgreSQL community
  + Getting started with PostgreSQL
* PostgreSQL Installation
  + Installation options: Binary vs. Source
  + Binary Installation
  + Source Installation
  + Discuss PostgreSQL distributions
  + Discuss cloud and hosted PostgreSQL
* The PostgreSQL Cluster
  + High-level PostgreSQL architecture
  + Definition of a cluster
  + Common PostgreSQL executables
  + Initializing a PostgreSQL Cluster
  + Cluster configuration files
  + Starting and Stopping a PostgreSQL Cluster
* Creating Databases and Users
  + Templates
  + Creating PostgreSQL Databases
  + Users, Groups, and Roles
  + PostgreSQL role inheritance
* Security – Host-Based Authentication
  + The pg\_hba.conf file
* PostgreSQL Configuration
  + The postgresql.conf file
  + Making persistent configuration changes
* Introduction to PSQL
  + Connecting the PSQL  client
  + PSQL  command line parameters
  + PSQL l meta Commands
  + PSQL  input and output
* PostgreSQL Database Objects
  + PostgreSQL data type overview
  + Discussion of PostgreSQL schemas
  + Object names and search path
  + Creating, altering, and dropping tables
  + Creating and dropping views
  + Creating, refreshing, dropping materialized views
  + Notes on COMMIT
  + Notes on case sensitivity
* Copying and Importing Data with PostgreSQL
  + PostgreSQL data import and export methods
  + COPY
  + Copy PSQL meta command
* pgAdmin
  + Overview of basic pgAdmin features and utilities
  + Demonstration of pgAdmin dashboards
* PostgreSQL Encryption
  + Discussion of encryption at rest
  + Discussion of encryption in transit
  + The future of PostgreSQL encryption
  + Basic SSL server setup and configuration
* PostgreSQL Backup and Recovery
  + PostgreSQL logical backup
  + PostgreSQL physical backup
  + Using pg\_dump
  + Using pg\_dumpall
  + Recovery from logical backups
  + Using pg\_restore
  + Performing an offline physical backup
  + Using pg\_basebackup
  + Recovery from a physical backup
* PostgreSQL Streaming Replication
  + Overview
  + Discussion of PostgreSQL replication options
  + Setup a hot-standby configuration
  + Monitoring
  + Replication slots
* PostgreSQL Internals – System Catalogs and Cluster Settings
  + Overview of system catalogs
  + Overview of system views
  + Modifying cluster settings
* Logging and Monitoring Tools
  + Logging SQL queries
  + System log configuration and management
  + Installing and using pg\_stat\_statements
  + PostgreSQL stats views
  + Query analysis with EXPLAIN
  + Visualizing EXPLAIN output
* Upgrading PostgreSQL
  + Minor version upgrades
  + Major version upgrades
  + Discussion of data conversion
  + pg\_upgrade
* Logical Replication
  + Features of PostgreSQL native logical replication
  + Setup a logical replication configuration
* Continuous Archiving and Point In Time Recovery (PITR)
  + Configuring PostgreSQL Point In Time Recovery
  + Recovering from a PITR backup
  + Recovering to a specific point in time
  + Discussion of popular backup utilities
* Conclusion