PostgreSQL Database Administration – From Fundamentals to Production

Learn PostgreSQL administration, configuration, security, backup & recovery, performance maintenance, replication, and monitoring through practical hands-on training.

DURATION	SESSIONS	TRAINING HOURS
6 weeks	**30 sessions of 90 minutes**	**45 hours**
MODE	LEVEL	INCLUDES
Live online, instructor-led	**Beginner to advanced**	**Hands-on admin exercises**

What you will learn

- PostgreSQL architecture and core components
- PostgreSQL installation and environment configuration
- Database cluster creation and management
- PostgreSQL command-line interface using PSQL
- PostgreSQL configuration and parameter management
- Creating and managing databases, schemas, users, roles, and tablespaces
- PostgreSQL system catalogs and data dictionary
- Log management and PgBadger reporting
- PostgreSQL authentication and authorization
- `pg_hba.conf` configuration
- Backup and recovery using `pg_dump`, `pg_dumpall`, `pg_restore`, and `pg_basebackup`
- WAL archiving and continuous archiving
- Multi-Version Concurrency Control (MVCC)
- VACUUM, ANALYZE, Auto Vacuum, and routine maintenance
- Database and index statistics
- Data import and export using COPY
- PostgreSQL streaming replication
- Synchronous and asynchronous replication
- Standby and cascading replication
- Database and server monitoring

Curriculum

Seventeen modules across 30 sessions of 90 minutes, from PostgreSQL architecture and installation to security, backup and recovery, WAL archiving, maintenance, replication and monitoring. Every module includes practical administration exercises.

Module 1 Introduction

1	PostgreSQL history and major features, architectural overview, database limits and object naming

Module 2 PostgreSQL System Architecture

2 Architectural summary, process architecture and utility processes
3 Memory architecture, connection flow, buffering, background writer, commit and checkpoint
4 Physical database architecture, directory layout, page layout and WAL

Module 3 Installation

5 PostgreSQL installation options and environment setup

Module 4 PostgreSQL Database Cluster

6 Creating and managing a PostgreSQL database cluster

Module 5 Command Line Interface

7 PSQL: connecting to PostgreSQL, commands, meta-commands and conventions

Module 6 PostgreSQL Configuration

8 PostgreSQL parameters and connection settings
9 Memory, query planner, WAL, logging, background writer and session-level settings

Module 7 Managing Databases, Schemas, Users and Tablespaces

10 Object hierarchy, databases, schemas and schema search path
11 Roles, users, groups and tablespace administration

Module 8 PostgreSQL Data Dictionary

12 System catalogs, information views and system information functions

Module 9 Log Management

13 PostgreSQL logging configuration and PgBadger reporting

Module 10 PostgreSQL Security

14 Authentication, authorization and levels of security
15 pg_hba.conf, object ownership and application access

Module 11 Backup and Recovery

16 Backup types, pg_dump and pg_dumpall
17 pg_restore and offline/online backup concepts
18 Physical backup using pg_basebackup and recovery practice

Module 12 WAL Archiving

19 Continuous archiving: archive_mode, archive_command options and use cases

Module 13 MVCC

20 Multi-Version Concurrency Control concepts and examples
21 Transaction wraparound, MVCC maintenance and prevention

Module 14 Routine Maintenance

22 Database maintenance tools, EXPLAIN ANALYZE and optimizer statistics
23 Data fragmentation, visibility map and free space map
24 Autovacuum, VACUUM, ANALYZE and VACUUM FULL

Module 15 Data Movement

25 COPY command for data import and export

Module 16 Streaming Replication

26 Replication concepts, sync/async and log-shipping architecture
27 Streaming, hot standby and cascading replication
28 Primary preparation, base backup, standby setup, synchronous replication and monitoring

Module 17 Database & Server Monitoring

29 Database statistics, statistics collector and statistic tables
30 Operating system process monitoring and disk usage

How you learn

- Live instructor-led sessions
- PostgreSQL installation and configuration
- Practical administrative exercises
- Backup and recovery demonstrations
- Security configuration
- Database maintenance exercises
- Replication setup

- Monitoring and troubleshooting activities
- Regular assignments and practice exercises

Who should enrol

- Students interested in Database Administration
- Database Administrators
- SQL Developers
- System Administrators
- DevOps Engineers
- Application Developers working with PostgreSQL
- IT professionals moving from other databases to PostgreSQL

Prerequisites

Basic knowledge of databases and SQL is recommended. Prior PostgreSQL administration experience is not required.

Course completion

Learners who complete the training and the practical exercises receive a course completion certificate through GeeksArray.

Questions about batch dates, timings, fees or anything else?

Contact the course coordinator, **Kaumodini Kedar** · WhatsApp **+91 91726 23305**

Or see the course page on geeksarray.com.