

## Hands-on Training on PostgreSQL 10.5

### **About Postgresql Training Course:-**

In this course you will learn the essential details of PostgreSQL Administration including PostgreSQL architecture, configuration, maintenance, monitoring, backup, recovery, and data movement.

This course is designed for people with experience in database administration and who are new to PostgreSQL

### **Target Audience:-**

- Participants with Basic knowledge and experience in Database Administration
- Knowledge of Linux environment

**Title :-PostgreSQL Advanced Development & Administration Training**

**Duration:-10 Days**

DAY 1 & 2	DAY 3 & 4
<p><b>Part 1: Introduction</b></p> <ul style="list-style-type: none"> <li>➤ History of PostgreSQL</li> <li>➤ Major Features</li> <li>➤ New Features of PostgreSQL</li> <li>➤ Multi Version Concurrency Control</li> <li>➤ Write-Ahead Logging</li> <li>➤ Architectural Overview</li> <li>➤ Limits</li> </ul> <p><b>Part 2: PostgreSQL System Architecture</b></p> <ul style="list-style-type: none"> <li>➤ Architectural Summary</li> <li>➤ Shared Memory</li> <li>➤ Statement Processing</li> <li>➤ Utility Processes</li> <li>➤ Disk Read Buffering</li> <li>➤ Write Buffering</li> <li>➤ Background Writer Cleaning Scan</li> <li>➤ Commit &amp; Checkpoint</li> <li>➤ Physical Database Architecture</li> <li>➤ Data Directory Layout</li> <li>➤ Installation Directory Layout</li> <li>➤ Page Layout</li> </ul> <p><b>Part 3: Installation</b></p> <ul style="list-style-type: none"> <li>➤ OS User &amp; Permissions</li> <li>➤ Installation</li> <li>➤ Setting environment variables</li> <li>➤ Clusters</li> <li>➤ Creating a database cluster</li> <li>➤ Starting and Stopping the Server</li> <li>➤ (pg_ctl)</li> <li>➤ Connect to the server using psql</li> </ul>	<p><b>Part 5: Creating and Managing Databases</b></p> <ul style="list-style-type: none"> <li>➤ Object Hierarchy</li> <li>➤ Creating Databases</li> <li>➤ Creating Schemas</li> <li>➤ Schema Search Path</li> <li>➤ Roles, Users &amp; Groups</li> <li>➤ Access Control</li> </ul> <p><b>Part 6: Postgres Data Dictionary</b></p> <ul style="list-style-type: none"> <li>➤ The System Catalog Schema</li> <li>➤ System Information views/tables</li> <li>➤ System Information Functions</li> </ul> <p><b>Part 7: Introduction to PSQL</b></p> <ul style="list-style-type: none"> <li>➤ Introduction</li> <li>➤ Conventions</li> <li>➤ Connecting to PostgreSQL</li> <li>➤ PSQL Command Line Parameters</li> <li>➤ Entering PSQL Commands</li> <li>➤ PSQL Meta-Commands</li> <li>➤ PSQL SET Parameters</li> <li>➤ Information Commands</li> </ul>

#### **Part 4: Configuration**

- Setting PostgreSQL Parameters
- Access Control
- Connection Settings
- Security and Authentication Settings
- Memory Settings
- Query Planner Settings
- WAL Settings
- Log Management
- Background Writer Settings
- Statement Behavior
- Vacuum Cost Settings
- Autovacuum Settings

#### **Part 8: pgAdmin III**

- Registering a server
- Viewing and Editing Data
- Query Tool
- Databases
- Languages
- Schemas
- Domains
- Functions
- Sequences
- Tables
- Columns
- Constraints
- Indexes
- Maintenance
- Rules
- Triggers
- Types
- Views
- Table spaces
- Roles

DAY 5 & 6	DAY 7 & 8
<p><b>Part 9: Security Basics</b></p> <ul style="list-style-type: none"> <li>➤ Authentication</li> <li>➤ Authorization</li> <li>➤ Levels of security</li> <li>➤ pg_hba.conf file</li> <li>➤ Users</li> <li>➤ Object ownership</li> <li>➤ Access control</li> <li>➤ Application access parameters</li> </ul> <p><b>Part 10: SQL</b></p> <ul style="list-style-type: none"> <li>➤ Data Types</li> <li>➤ Tables</li> <li>➤ SQL Queries</li> <li>➤ Quoting</li> <li>➤ Using SQL Functions</li> <li>➤ Constraints</li> <li>➤ Dropping or Removing Database Objects</li> <li>➤ Views</li> <li>➤ Sequences</li> <li>➤ Indexes</li> </ul> <p><b>Part 11: Backup and Recovery &amp; Point-in-Time Recovery</b></p> <ul style="list-style-type: none"> <li>➤ Backup Types</li> <li>➤ SQL Dump</li> <li>➤ Cluster Dump</li> <li>➤ Offline Copy Backup</li> <li>➤ Continuous Archiving</li> <li>➤ pg_basebackup</li> <li>➤ Point-In Time Recovery</li> </ul>	<p><b>Part 14: Transactions and Concurrency</b></p> <ul style="list-style-type: none"> <li>➤ Transaction Definition</li> <li>➤ Effects of Concurrency on Transactions</li> <li>➤ Transaction Isolation Levels</li> <li>➤ Multi-Version Concurrency Control Overview (MVCC)</li> <li>➤ MVCC Example</li> <li>➤ Internal Identifiers</li> <li>➤ Transaction Wraparound</li> <li>➤ MVCC Maintenance</li> <li>➤ MVCC Demo</li> </ul> <p><b>Part 15: Performance Tuning</b></p> <ul style="list-style-type: none"> <li>➤ Hardware Configuration</li> <li>➤ OS Configuration</li> <li>➤ Server Parameter Tuning</li> <li>➤ Connection Settings</li> <li>➤ Memory Parameters</li> <li>➤ Memory settings for Planner</li> <li>➤ WAL Parameters</li> <li>➤ Explain Plan</li> <li>➤ Explain Example</li> <li>➤ Statistics Collection</li> <li>➤ Indexes</li> <li>➤ Examining Index Usage</li> <li>➤ Tips for Inserting Large Amount of Data</li> <li>➤ Some Notes About pg_dump Non-Durable Settings</li> <li>➤ Labs</li> </ul>

**Part 12: Routine Maintenance**

- Explain and Explain Analyze
- Table Statistics
- Updating Planner Statistics
- Scheduling Auto Vacuum
- Preventing Transaction ID Wraparound Failures
- The Visibility Map
  
- Routine Reindexing

**Part 13: PostgreSQL API Connectivity**

- Installing Third-Party Drivers
- Installation & Configuration of JDBC

**Part 16: Replication & Failover**

- Database High Availability
- Causes of Data Loss
- Plan for Common Errors
- Selection Criteria
- High Availability Options
- Hot Streaming Replication, Architecture and Setup
- Streaming Replication Example

**DAY 9 & 10**

### **Part 17: Table Partitioning**

- Partitioning
- Partitioning Methods
- When to Partition
- Partitioning Setup
- Partitioning Example
- Partitioning and Constraint
- Exclusion
- Caveats
- Lab

### **Part 18: Connection Pooling**

- Pgpool-II
- Pgpool-II Features
- Install and Configure pgpool-II
- Pgpool II Modes
- Starting/Stopping pgpool-II
- Pgpool-II Example

### **Part 19: Database Monitoring**

- Database Statistics
- The Statistics Collector
- Database Statistic Tables
- Operating System Process Monitoring
- Current Sessions and Locks
- Log Slow Running Queries
- Disk Usage

### **Part 20: Procedural Languages**

- PostgreSQL Procedural Languages
- Introduction to PL/PGSQL
- How it works
- PL/pgSQL Block Structure
- Declaring Variables
- Writing Executable Statements
- Declaring Function Parameters
- Control Structures
- Exception Handling
- PL/pgSQL Cursors
- Triggers
- Examples & Lab
- Other resources