

Day 1

Module 1: Setup Training Lab

- PostgreSQL Introduction
- PostgreSQL Page Setup
- PostgreSQL System Requirement
- Installing PostgreSQL v15 on Windows
- Setup PostgreSQL Environment Variable on Windows

Module 2: PostgreSQL Architecture

- Process and Memory Architecture
- Postmaster Process
- Utility Processes
- Memory Segments
- Physical Files in PostgreSQL

Module 3: Database Cluster

- PostgreSQL Cluster (Initdb, Start/Stop/Restart/Reload)
- PostgreSQL Cluster Demo on Windows

Module 4: PostgreSQL Directory Layout

- Database Directory Layout
- Base Directory

Day 2

Module 5: Configuration Files

- PostgreSQL.conf
- PostgreSQL.Auto.conf
- Pg_Ident.conf
- Pg_Hba.conf

Module 6: Create Objects and Privileges

- Create/Drop Database
- Create/Drop User
- Create/Drop Schema and Search Schema Path
- Grant/Revoke Privileges on Database Objects

Module 7: Using Psql Commands

- Psql Commands

Day 3

Module 8: Working with Catalogs

- Pg_Catalog & Time zones in PostgreSQL

Module 9: CRUD Operations in PostgreSQL

- Create Table, Data Types, Constraints, Functions and Operators
- Retrieve Data in PostgreSQL
- Update Records in a Table

- Delete Records in a Table

Module 10: Table Inheritance, Table Partitioning and Copy Table

- Table Inheritance
- Table Partitioning using Inheritance
- Copy Table

Day 4

Module 11: Working with Tablespace

- Tablespace Introduction
- Create Tablespace on Windows and Linux
- Move Objects from Tablespace and Drop a Tablespace
- Temporary Tablespace in PostgreSQL

Module 12: Backup and Restore

- Introduction to PostgreSQL Backups
- Logical Backups on Windows
- How to Compress and Split Dump Files
- Restore Database using Logical Backups through Psql Interface
- Restore Database using Logical Backups through Pg_Restore Utility
- Offline Backups
- Introduction to Online Backups
- Setup Continuous Archiving
- Online Low Level API Backup
- Pg_Basebackup Utility
- Point-In-Time-Recovery(PITR)

Module 13: PostgreSQL Maintenance

- Introduction to Maintenance
- Updating Planner Statistics\Analyze
- How to Calculate Query Cost and Explain Plan

Day 5

Module 14: Data Fragmentation

- Introduction to Vacuum and Vacuum Full
- How to Vacuum a Database and Remove Data Fragmentation
- Transaction ID Wrap Around Failure
- Vacuum Freeze
- Routine Re-Indexing
- How to Cluster a Table
- Auto-Vacuum in PostgreSQL

Module 15: Postgresql Performance Tuning

- Introduction to PostgreSQL Performance Tuning
- PostgreSQL Architecture and Performance
- Benchmarking and Baseline Performance
- Indexing for Performance
- Query Optimization
- Configuration Tuning

- Partitioning and Sharding
- Connection and Concurrency Management
- Maintenance and Monitoring for Long-Term Performance