

POSTGRESQL 12 Administration DBA Curriculum.

PostgreSQL Database Administration-DBA online training curriculum

Introduction and Architectural Overview	<ul style="list-style-type: none">• History of PostgreSQL• Major Features• PPAS Features• Architectural Overview• General Database Limits• Common Database Object Name
PostgreSQL System Architecture	<ul style="list-style-type: none">• Architectural Summary• Process & Memory Architecture• Utility Processes• Connection Request-Response• Disk Read Buffering Disk• Write Buffering• Background Writer Cleaning Scan• Commit & Checkpoint• Statement Processing• Physical Database Architecture• Data Directory Layout• Installation Directory Layout• Page Layout
Installation	<ul style="list-style-type: none">• OS User & Permissions• Installation Options• Installation of PostgreSQL• Stack Builder• Setting Environmental Variables• OS User & Permissions• Installation Options• Installation of PostgreSQL• Stack Builder• Setting Environmental Variables
Database Clusters	<ul style="list-style-type: none">• Database Cluster• Creating a Database Cluster• Starting and Stopping the Server (pg_ctl)• Connect to the Server Using psql

Configuration	<ul style="list-style-type: none"> • Setting PostgreSQL Parameters • Access Control • Connection Settings • Security and Authentication Settings • Memory Settings • Query Planner Settings • WAL Settings
Log management	<ul style="list-style-type: none"> • Background Writer Settings • Statement Behaviour • Configuration File Includes
Creating and Managing Databases	<ul style="list-style-type: none"> • Object Hierarchy • Creating Databases
Users	<ul style="list-style-type: none"> • Access Control • Creating Schemas • Schema Search Path
User Tools: Command-Line Interfaces	<ul style="list-style-type: none"> • Introduction to PSQL and EDB-PSQL
Conventions	<ul style="list-style-type: none"> • Connecting to Database • PSQL Command Line Parameters • Entering PSQL Commands • PSQL Meta-Commands • PSQL SET Parameters • Information Commands
GUI Tools - Intro to PGADMIN4	<ul style="list-style-type: none"> • Introduction to PEM Client • Registering a server • Viewing and Editing Data • Query Tool • Databases • Languages • Schemas • Database Objects • Maintenance • Table spaces • Roles
Security	<ul style="list-style-type: none"> • Authentication and Authorization • Levels of Security • Pg_hba.conf File • Object Ownership

	<ul style="list-style-type: none"> • Application Access Parameters • Protecting Against Injection Attacks with SQL/Protect • Source Code Protection for Functions
PG/SQL	<ul style="list-style-type: none"> • Data Types • Structured Query Language (SQL) • Tables and Constraints • Manipulating Data using INSERT, UPDATE and DELETE • Creating Other Database Objects: Sequences, Views, and Domains • Table Partitioning • Partitioning • Partitioning Methods • When to Partition • Partitioning Setup • Partitioning Example • Partitioning and Constraint Exclusion • Caveats
Introduction to various SQL functionalities	<ul style="list-style-type: none"> • Quoting • SQL Functions • Concatenation • Nested Queries • Joins • Materialized Views • Updatable Views o Indexes
Backup and Recovery & Point-in-Time Recovery	<ul style="list-style-type: none"> • Backup Types • SQL Dump Backups • SQL Dump Options • Handling Large Databases • Restoring SQL Dumps • Cluster Dump • Offline Backups • Recovering a Database using Offline
Backups	<ul style="list-style-type: none"> • Online Directory Backups • Continuous Archiving • Backup with Low-level API • How to use pg_base backup for Online Backups • Point-In-Time Recovery Concepts • Recovery Example • Backup and Recovery Tool (BART)
Routine Maintenance	<ul style="list-style-type: none"> • Database Maintenance • Maintenance Tools • Optimizer Statistics • Data Fragmentation • Routine Vacuuming • Vacuuming Commands

	<ul style="list-style-type: none"> • Preventing Transaction ID Wraparound Failures • Vacuum Freeze • The Visibility Map
Data Dictionary	<ul style="list-style-type: none"> • The System Catalogue Schema • System Information Tables • System Information Functions • System Administration Functions • System Information Views • Oracle-like Dictionaries
Moving Data	<ul style="list-style-type: none"> • Loading flat files • Import and export data using COPY • Examples of COPY Command • Using COPY FREEZE for performance • Introduction to EDB*Loader for PPAS
SQL Tuning	<ul style="list-style-type: none"> • Statement Processing • Common Query Performance Issues • SQL Tuning Goals • SQL Tuning Steps • Identify slow queries • Review the query execution plan • Optimizer statistics and behaviour • Restructure SQL statements • Indexes
SQL Tuning continues...	Review Final Execution Plan
Performance Tuning	<ul style="list-style-type: none"> • Performance Tuning - Overview • Performance Monitoring using PEM • A-Tuning Technique • Operating System Considerations • Server Parameter Tuning • Memory Parameters • Temporary File Parameters • WAL Parameters
Streaming Replication	<ul style="list-style-type: none"> • Data Replication • Data Replication in PostgreSQL
Sync or ASync	Log-Shipping Standby Servers
Log-Shipping Architecture	Streaming Replication
Hot Streaming Architecture	<ul style="list-style-type: none"> • Cascading Replication • Setup Replication Using Archive • Setup Streaming Replication • Prepare the Primary Server • Synchronous Streaming Replication Setup • Configure Authentication • Take a Full Backup of Primary Server • Setting up the Standby Server • Adding Cascading Replicated Standby Server

	<ul style="list-style-type: none"> • Monitoring Hot Standby • Recovery Control Functions
Connection Pooling	<p>Connection Pooling Overview</p> <ul style="list-style-type: none"> • Pgpool-II – Features • Connection pooling • Replication • Load balance • Limiting exceeding connections • Automatic failover • Pgpool II - Installation and Configuration • Configuring pcp.conf, pgpool.conf • Setting up pool_hba.conf for Client Authentication (HBA) • Starting/Stopping pgpool-II
Extension Modules	<ul style="list-style-type: none"> • What are Extension Modules? • Installing Extension Modules • Module Index • Monitoring • Database Monitoring • Database Statistics • The Statistics Collector • Database Statistic Tables • Operating System Process Monitoring • Current Sessions and Locks • Log Slow Running Queries • Disk Usage • PostgreSQL Enterprise Manager • PEM – Features • PEM – Architecture
Upgrading Best Practices	<ul style="list-style-type: none"> • Version Change and Upgrade • Need to Upgrade • Upgrade Plan • Upgrade Using pg_upgrade • Upgrading Best Practices