PostgreSQL DBA Admin Course content

No. Of Hours: 35 – 40 Hrs.

Demo-Session

- DBA Trainer Introduction.
- Students Introduction with discussion on the Expectations from the training.
- Introduction to the world of PostgreSQL.

Chapter 1: First Steps

- Introduction
- Introducing PostgreSQL 9
- Getting PostgreSQL
- Connecting to PostgreSQL server
- Enabling access for network/remote users
- Using graphical administration tools
- Using psql query and scripting tool
- Changing your password securely
- Avoiding hardcoding your password
- Using a connection service file
- Troubleshooting a failed connection

Chapter 2: Exploring the Database

- Introduction
- What version is the server?
- What is the server uptime?
- Locate the database server files
- Locate the database server message log
- List databases on this database server?
- How many tables in a database?
- How much disk space does a database use?
- How much disk space does a table use?
- Which are my biggest tables?
- How many rows in a table?
- Quick estimate of the number of rows in a table
- Understanding object dependencies

Chapter 3: Configuration

- Introduction
- Reading the Fine Manual (RTFM)
- Planning a new database
- Changing parameters in your programs
- What are the current configuration settings?
- Which parameters are at non-default settings?
- Updating the parameter file
- Setting parameters for particular groups of users
- Basic server configuration checklist
- Adding an external module to PostgreSQL
- Running server in power saving mode

Chapter 4: Server Control

- Introduction
- Starting the database server manually
- Stopping the server safely and quickly
- Stopping the server in an emergency
- Reloading the server configuration files
- Restarting the server quickly
- Preventing new connections
- Restricting users to just one session each
- Pushing users off the system
- Deciding on a design for multi-tenancy
- Using multiple schemas
- Giving users their own private database
- Running multiple servers on one system
- Set up a Connection Pool

Chapter 5: Tables & Data

- Introduction
- Choosing good names for database objects
- Handling objects with quoted names
- Enforcing same name, same column definition
- Identifying and removing duplicates
- Preventing duplicate rows

- Finding a unique key for a set of data
- Generating test data
- Randomly sampling data
- Loading data from a spreadsheet
- Loading data from flat files

Chapter 6: Security

- Introduction
- Revoking user access to a table
- Granting user access to a table
- Creating a new user
- Temporarily preventing a user from connecting
- Removing a user without dropping their data
- Checking all users have a secure password
- Giving limited superuser powers to specific users
- Auditing DDL changes
- Auditing data changes
- Integrating with LDAP
- Connecting using SSL
- Encrypting sensitive data

Chapter 7: Database Administration

- Introduction
- Writing a script that either all succeeds or all fails
- Writing a psql script that exits on first error
- Performing actions on many tables
- Adding/Removing the columns of a table
- Changing datatype of a column
- Adding/Removing schemas
- Moving objects between schemas
- Adding/Removing tablespaces
- Moving objects between tablespaces
- Accessing objects in other PostgreSQL databases
- Making views updateable

Chapter 8: Monitoring and Diagnosis

- Introduction
- Is the user connected?
- What are they running?
- Are they active or blocked?
- Who is blocking them?
- Killing a specific session
- Resolving an in-doubt prepared transaction
- Is anybody using a specific table?
- When did anybody last use it?
- How much disk space is used by temporary data?
- Why are my queries slowing down?
- Investigating and reporting a bug
- Producing a daily summary of log file errors

Chapter 9: Regular Maintenance

- Introduction
- Controlling automatic database maintenance
- Avoiding auto freezing and page corruptions
- Avoiding transaction wraparound
- Removing old prepared transactions
- Actions for heavy users of temporary tables
- Identifying and fixing bloated tables and indexes
- Maintaining indexes
- Finding the unused indexes
- Carefully removing unwanted indexes
- Planning maintenance

Chapter 10: Performance & Concurrency

- Introduction
- Finding slow SQL statements
- Collecting regular statistics from pg_stat* views
- Finding what makes SQL slow
- Reducing the number of rows returned
- Simplifying complex SQL
- Speeding up queries without rewriting them
- Why is my query not using an index?
- How do I force a query to use an index

- Using optimistic locking
- Reporting performance problems

Chapter 11: Backup & Recovery

- Introduction
- Understanding and controlling crash recovery
- Planning backups
- Hot logical backup of one database
- Hot logical backup of all databases
- Hot logical backup of all tables in a tablespace
- Backup of database object definitions
- Standalone hot physical database backup
- Hot physical backup & Continuous Archiving
- Recovery of all databases
- Recovery to a point in time
- Recovery of a dropped/damaged table
- Recovery of a dropped/damaged tablespace
- Recovery of a dropped/damaged database
- Improving performance of backup/restore
- Incremental/Differential backup and restore

Chapter 12: Replication, Upgrades, Migration & Maintenance

- Introduction
- Understanding replication concepts
- Replication best practices
- File-based log-shipping replication
- Setting up streaming log replication
- Managing log shipping replication
- Managing Hot Standby
- Selective replication using Londiste
- Selective replication using Slony 2.0
- Load balancing with pgpool-II 3.0
- Upgrading (minor)
- Major upgrades in-place
- Major upgrades online using replication tools
- Upgrading PostgreSQL.
- Migration from Oracle to Postgres