



OPEN
TECHNOLOGY
GROUP

PostgreSQL Administration

PostgreSQL Administration

Version 3.1.1 (08/06/2014) [CG]

11010 Lake Grove Blvd, Ste 100-307 • Morrisville, NC 27560 • Phone: 919.463.0999 • Fax: 866-229-3386

www.opentechnologygroup.com

Copyright ©2004-2014 Open Technology Group, Inc.[®] All rights reserved.
Copying all or part of this manual, or distributing such copies, is strictly prohibited.



Table of Contents

Introduction.....	5	Creating & Managing Views.....	65
What this course is about.....	6	Creating Views.....	66
Installing & Configuring PostgreSQL.....	7	Setting Rules for Views.....	68
Pre-installation Tasks.....	8	Exercises.....	71
Downloading & Installing PostgreSQL Packages.....	10	Creating & Managing Indexes.....	73
Managing PostgreSQL Configurations.....	14	Understanding Indexes.....	74
Downloading and Installing PostgreSQL from Source.....	16	PostgreSQL Index Types.....	76
Using Configure Arguments.....	19	Creating Indexes.....	78
Configuring PostgreSQL to Start on Boot.....	24	Indexes on Expressions.....	80
Configuring PostgreSQL for Network Access.....	26	Partial Indexes.....	81
Exercises.....	31	Exercises.....	82
Configuring Secure Access Using OpenSSL.....	34	Transactions and Concurrency.....	84
OpenSSL Benefits.....	35	Transactions.....	85
Enabling SSL.....	36	Transaction Isolation.....	86
Issuing Certificates.....	37	Managing Database Privileges.....	89
Configuring the postmaster For SSL.....	40	PostgreSQL Roles.....	90
Exercises.....	42	User Roles.....	92
Using the psql Client.....	44	Altering User Roles.....	93
Connecting to PostgreSQL.....	45	Other Role Properties.....	96
psql Meta-Commands.....	51	Role Examples.....	98
Psql Internal Variables.....	59	Assigning Users to Roles.....	99
Exercises.....	62	Understanding Role Access.....	100



Exercises.....	102	Managing Schemas.....	147
Access Control with GRANT.....	104	Managing Schema Views.....	149
The GRANT and REVOKE Statements.....	105	Exercises.....	152
GRANT Options.....	106	PostgreSQL Logging.....	154
Granting Column Level Privileges.....	109	Server Log Files.....	155
Default Privileges.....	110	Using CSV-Format Log Output.....	158
Global Grants on a Schema.....	112	Configuring When to Log Messages.....	160
Exercises.....	113	Configuring What to Log.....	165
PostgreSQL's Data Organization.....	115	Changing Settings.....	170
PostgreSQL Storage.....	116	Exercises.....	172
Managing Table Space Usage.....	119	Backup and Recovery.....	174
PostgreSQL Table Information.....	121	Backup using pg_dump.....	175
PostgreSQL Log Directories.....	123	Using pg_dumpall.....	180
Other Directories.....	124	Restoring Files with pg_restore and psql.....	182
Managing PostgreSQL Clusters.....	128	Performing File-Level Backups.....	184
Exercises.....	130	Using pg_basebackup.....	185
Creating & Managing PostgreSQL Clusters, Tablespaces & Databases.....	132	Exercises.....	188
PostgreSQL Tablespaces.....	133	Upgrading PostgreSQL.....	190
Using CREATE TABLESPACE.....	134	Upgrade Methods.....	191
Where Objects Go.....	136	Using the pg_upgrade Module.....	193
Using CREATE DATABASE.....	138	Continuous Archiving and Point in Time Recovery (PITR).....	196
Exercises.....	142	PostgreSQL Write-Ahead Logs.....	197
PostgreSQL Schemas.....	144	Making a Base Backup.....	201
The Schema.....	145	Recovery Using A Continuous Archive Backup.....	203
		Exercises.....	207



Server Monitoring & Performance Tuning.....	209	Other Configuration Parameters.....	245
Understanding BGWRITER & Shared Buffers.....	210	Creating an Authorization File.....	247
Server Configuration Variables.....	213	Launching & Managing PgBouncer.....	248
Query Optimizer Parameters.....	216	Exercises.....	249
Gathering Performance Statistics.....	220	Enabling Hot Standby (Replication).....	251
Disk Performance Tuning.....	222	About Hot Standby.....	252
Server Information.....	223	Configuring Recovery.conf for Hot Standby.....	253
PostgreSQL Visibility Maps.....	225	Allowing Connections from Standby Nodes.....	255
Using The Auto-Vacuum Daemon.....	226	Enabling Hot Standby Mode on the Secondary.....	256
About Auto-Vacuum.....	227	Starting the Secondary Node.....	257
Exercises.....	232	Configuring Standby Limits.....	258
Improving Network Performance with PgBouncer.....	233	Enabling Synchronous Replication.....	259
About PgBouncer.....	234	Replication Tuning Settings.....	261
Pooling Modes.....	235	About the WAL Sender.....	265
Downloading & Installing PgBouncer.....	236	Other Hot Standby Notes.....	267
Configuring PgBouncer.....	237	Monitoring Replication.....	268
Configuration Database Parameters.....	238	Questions?.....	269
Configuring PgBouncer General Parameters.....	241	Where to Get Help.....	270
Setting Logging Parameters.....	244	The Payroll Database Structure.....	271