College of Engineering, Trivandrum

Department of Computer Science and Engineering

CS333 APPLICATION SOFTWARE DEVELOPMENT LAB

LABORATORY REPORT 1

Installation of PostgreSQL

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Submission Date : 29/07/2019

1 Introduction

PostgreSQL is an enterprise-class open source database management system. It supports both SQL for relational and JSON for non-relational queries. It is backed by an experienced community of developers who have made tremendous contribution to make it highly reliable DBMS system.

PostgreSQL supports advanced data types and advance performance optimization, features only available in the expensive commercial database, like Oracle and SQL Server.

Here, are some most prominent features of PostgreSQL:

1. Compatible with various platforms using all major languages and middleware
2. It offers a most sophisticated locking mechanism
3. Support for multi-version concurrency control
4. Mature Server-Side Programming Functionality
5. Compliant with the ANSI SQL standard
6. Full support for client-server network architecture
7. Log-based and trigger-based replication SSL
8. Standby server and high availability
9. Object-oriented and ANSI-SQL2008 compatible
10. Support for JSON allows linking with other data stores like NoSQL which act as a federated hub for polyglot databases.

PostgreSQL manages concurrency through multiversion concurrency control (MVCC), which gives each transaction a "snapshot" of the database, allowing changes to be made without affecting other transactions. This largely eliminates the need for read locks, and ensures the database maintains ACID principles. PostgreSQL offers three levels of transaction isolation: Read Committed, Repeatable Read and Serializable. Because PostgreSQL is immune to dirty reads, requesting a Read Uncommitted transaction isolation level provides read committed instead. PostgreSQL supports full serializability via the serializable snapshot isolation (SSI) method.

Now let us look at how to perform a proper installation of PostgreSQL on Fedora 30.

2 Installation Procedures

1. First we need to include the PostgreSQL to our local dnf library.
   This can be done using the following command:

   ```
   dnf install https://download.postgresql.org/pub/repos/yum/
   reporpms/F-30-x86_64/pgdg-fedora-repo-latest.noarch.rpm
   ```

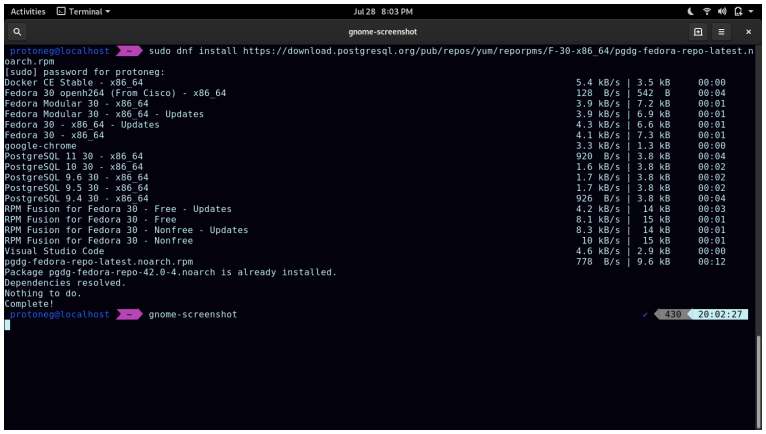

Figure 1: Adding to DNF library of repos

2. Now the client and server packages can be installed using the following dnf commands

   ```
   dnf install postgresql11
   dnf install postgresql11-server
   ```

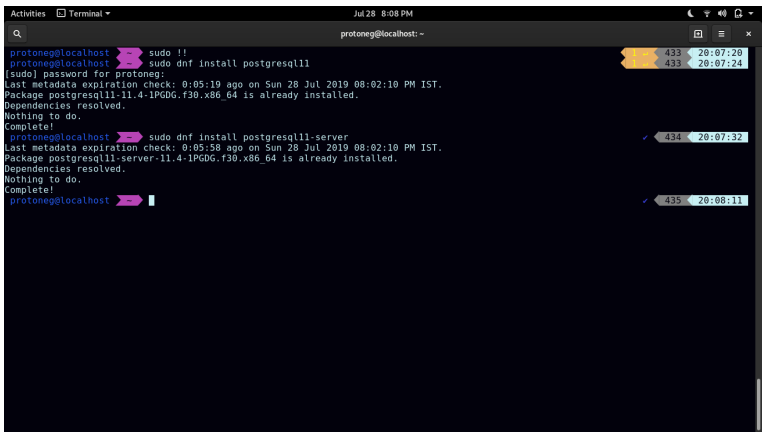

Figure 2: Installing PostgreSQL using DNF

3. The database should be initialized using the following command.

   ```
   /usr/pgsql-11/bin/postgresql-11-setup initdb
   ```

4. Now the database service can be started using the following commands.

   ```
   systemctl enable postgresql-11
   systemctl start postgresql-11
   ```

5. To finally use the database we need to login to the 'postgres' user that has been automatically created during the installation process

```
sudo su -l postgres
```

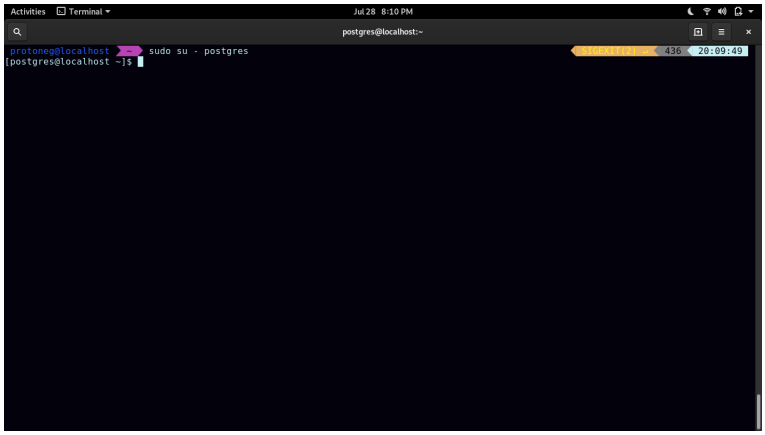

Figure 3: Logging in to 'postgres' user

6. Now we can open the PostgreSQL command line on the terminal using the following command

```
psql postgres
```

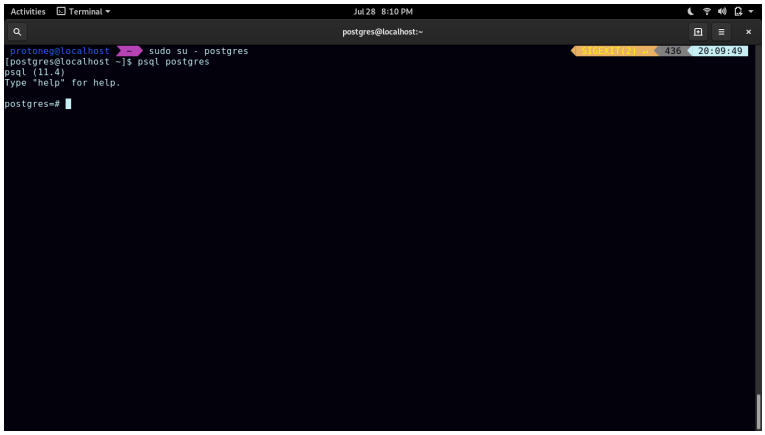

Figure 4: Opening PostgreSQL command line

3 Result

- Learned commands to install a new service.
- Properly installed and configured PostgreSQL on Fedora 30.