PostgreSQL 11 Administration CookBook

Chapter-3: Configuration

Upcode Software
Engineer Team

-2024-

CONTENT

Introduction(1/1)

- **Reading the fine manual (RTFM)** is often (rudely) used to mean don't bother me; I'm busy, or it is used as a stronger form of abuse.

- The PostgreSQL documents are written in **Standard Generalized Markup Language (SGML)**, which is similar to, but not the same as, XML..

```
psql -U postgres -c 'SHOW config_file'
Or
 sudo -u postgres psql -c 'SHOW config_file'
```

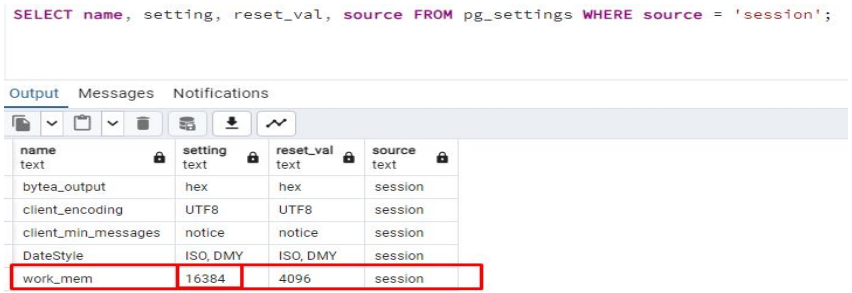
```
# Database administrative login by Unix domain socket
local   all             postgres                                peer

# TYPE  DATABASE        USER            ADDRESS                 METHOD
host    all             all             0.0.0.0/0               md5
host    all             all             :/0                     md5
# "local" is for Unix domain socket connections only
local   all             all                                     peer
```

Changing parameters in your programs(1/2)

- You can change the value of a setting during your session, like this:

```
SET work_mem = '16MB';
```


```
select name, setting, reset_val, source from pg_settings where
source = 'session'
```



Changing parameters in your programs(2/2)

- This value will then be used for every future transaction. You can also change it only for the duration of the current transaction:

```
BEGIN;
SET LOCAL work_mem = '16MB';
```

- The setting will last until you issue this command:

```
RESET work_mem;
```

```
postgres=# SELECT name, setting, reset_val, source FROM pg_settings WHERE
source = 'session';
   name   | setting | reset_val | source
----------+---------+-----------+---------
 work_mem |  4096   | 4096      | session
```

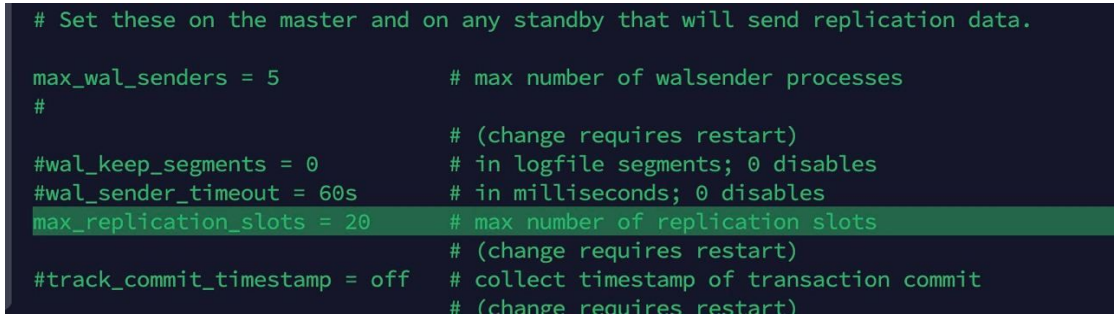
- Alternatively, you can issue the following command:

```
RESET ALL;
```

Updating the parameter file(3/n)

- **postgresql.conf**: One of the most important configuration files for the PostgreSQL database is postgresql.conf file.
- **pg_hba.conf**: The pg_hba.conf file is used for client authentication in PostgreSQL.
- **pg_ident.conf**: The pg_ident.conf file is an essential component in PostgreSQL's ident authentication process.
- **postgresql.auto.conf**: The postgresql.auto.conf file has the same structure as the postgresql.conf file. The **ALTER SYSTEM** command is used to change parameters in the auto.conf file.

  `postgresql\{version}\data\`



Updating the parameter file(3/n)

- Follow these steps to set parameters at various levels as per the requirements:

  1. For all users in the saas database, use the following commands:

```
ALTER DATABASE saas SET configuration_parameter =
value1;
```

  2. For a user named simon connected to any database, use the following commands:

```
ALTER ROLE simon SET configuration_parameter = value2;
```

  3. Alternatively, you can set a parameter for a user only when they're connected to a specific database, as follows:

```
ALTER ROLE simon IN DATABASE saas SET
configuration_parameter = value3;
```

The simple server configuration example(1/4)

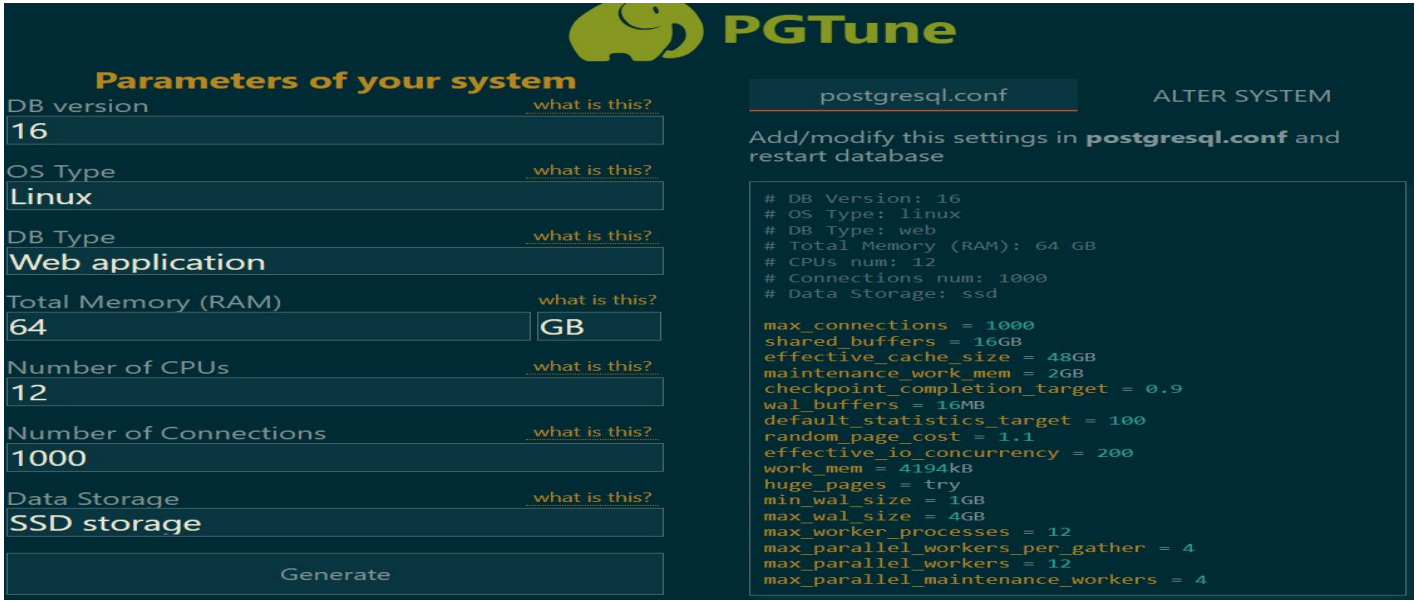
- PostgreSQL configuratsiyasi qanday bo`lgani maqul?
- Qanday bo`lsa eng optimal yechim bo`ladi degan savollar katta ko`pchilik programmistlarni qiynaydi. Ayrimlar bor umuman bu narsaga qiziqib ham ko`rmay bazani o`rnatgan paytidagi konfiguratsiya bilan tiklab qo`yaveradi va faqat application tomondan optimizatsiya bilan shugullanadi.
- Lekin, server hardware va clientlar bazasi oqimidan va sizga qo`yilgan talablardan kelib chiqib, asosiy bo`lgan konfiguratsiyalarni sozlash mumkin.
- Buning uchun sizga open source PgTune (***https://github.com/le0pard/pgtune***) bor.
- Hohlasangiz shu open sourceni ko`tarib o`zingiz tekshiring yoki tayyor ko`tarilganlardan foydalaning 👇. (https://t.me/postgresqluz_community)

The simple server configuration example (2/4)

1. PGTune
2. PG Tuning-guide
3. PG Configurator
4. PG Configuration Builder
5. GitHub Gist

The simple server configuration example(3/4)

[PGTune]



The simple server configuration example(4/4)

PGTune

More information about "**DB Type**" setting:

- Web Application (web)
  - Typically CPU-bound
  - DB much smaller than RAM
  - 90% or more simple queries
- Online Transaction Processing (oltp)
  - Typically CPU- or I/O-bound
  - DB slightly larger than RAM to 1TB
  - 20-40% small data write queries
  - Some long transactions and complex read queries

The simple server configuration example(5/4)

PGTune

- Data Warehouse (dw)
  - Typically I/O- or RAM-bound
  - Large bulk loads of data
  - Large complex reporting queries
  - Also called "Decision Support" or "Business Intelligence"
- Desktop application
  - Not a dedicated database
  - A general workstation, perhaps for a developer
- Mixed type of application
  - Mixed DW and OLTP characteristics
  - A wide mixture of queries

Installing modules from PGXN (1/5)

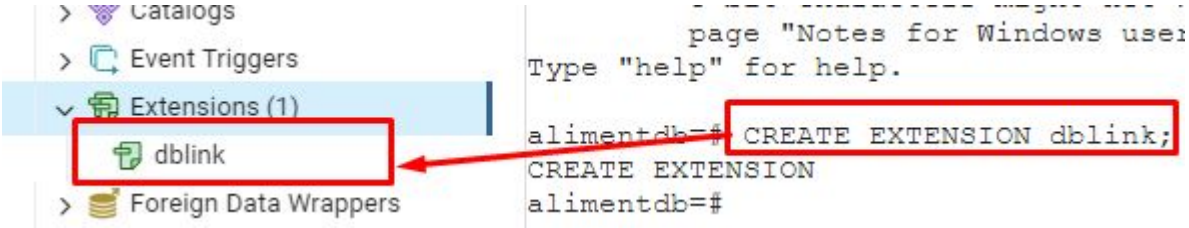
The **PostgreSQL Extension Network, PGXN** for short, is a website (http://pgxn.org) that was launched in late 2010 with the purpose of providing a central distribution system for open source PostgreSQL extension libraries.

Installing modules from PGXN (2/5)

Each extension has a unique name, so it is just a matter of issuing the following command:

```
CREATE EXTENSION myextname;
```

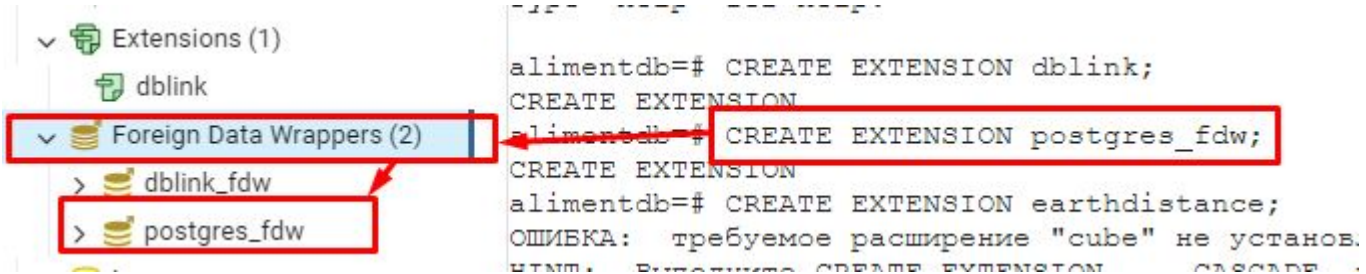
```
CREATE EXTENSION dblink;
```



Installing modules from PGXN (3/5)

The **postgres_fdw** module provides the foreign-data wrapper **postgres_fdw**, which can be used to access data stored in external PostgreSQL servers.The functionality provided by this module overlaps substantially with the functionality of the older **dblink** module. But **postgres_fdw** provides more transparent and standards-compliant syntax for accessing remote tables, and can give better performance in many cases.

```
CREATE EXTENSION postgres_fdw;
```

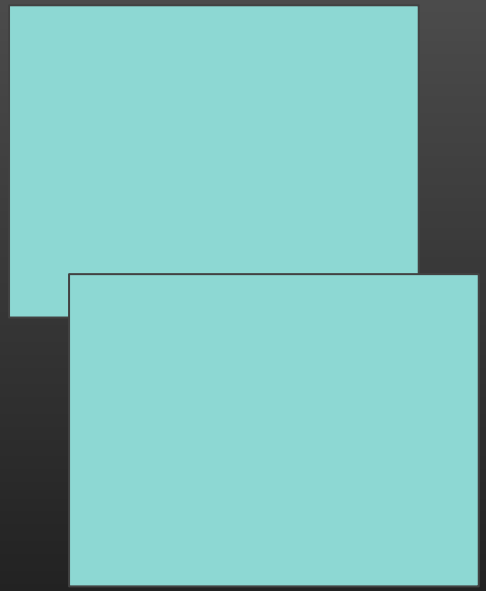


MVCC (1/2)

```
begin transaction;

set transaction isolation level repeatable read;

select a.pin

from aliment a

where id = 1;

update aliment

set pin = '23'

where id =1;

commit;
```

MVCC (2/2)

```
BEGIN TRANSACTION;

SET TRANSACTION ISOLATION LEVEL REPEATABLE READ;

SELECT pin

FROM aliment

WHERE id = 1;

UPDATE

  aliment

SET pin = '12'

WHERE id = 1;

COMMIT;
```



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CONCLUSION(1/7)

Try to match the Postgresql config files as much as possible.
Postgres gives us a lot and we need to be able to use it properly. During this presentation, I gave brief information.

REFERENCE

- https://www.percona.com/blog/how-can-i-take-a-backup-of-configuration-files-in-postgresql/
- https://www.postgresql.org/docs/
- https://t.me/postgresqluz_community
- https://pgxn.github.io/pgxnclient/

Thank you!

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