

Connection pooling lab

Setup

Standardzik:

```
./initdb -D ~/test_db
```

Zmiana portu na 8091

```
/pg_ctl -D /home/przemek/test_db -l /home/przemek/test_db/logfile start
```

Edytujemy `/etc/pgbouncer/pgbouncer.ini`:

```
[databases]
postgres_template = host=localhost port=8091 dbname=postgres auth_user =
testuser

port = 6455
```

Łączymy się i tworzymy testuser:

```
psql -p 8091 -U przemek -d postgres

postgres=# create user testuser superuser;
CREATE ROLE
```

Włączamy pgbouncer:

```
pgbouncer -d pgbouncer.ini
```

Łączymy się przez niego do bazy:

```
psql -p 6455 -U testuser -d postgres_template
```

Benchmarki

Tworzę plik `/home/przemek/studia/sem8/databases/lab09/test_query.sql` o treści:

```
select 1;
```

Przygotowanie do benchmarku:

```
pgbench -i postgres -U przemek -p 8091
```

Lecimy z benchmarkiem bez bouncera:

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S postgres -C
-f /home/przemek/studia/sem8/databases/lab09/test_query.sql -p 8091 -U
przemek
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 47.106 ms
tps = 424.570891 (including connections establishing)
tps = 446.603964 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 9969 transactions (49.8% of total, tps = 211.627361)
- latency average = 21.061 ms
- latency stddev = 12.779 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 10031 transactions (50.2% of total, tps = 212.943530)
- latency average = 21.331 ms
- latency stddev = 12.773 ms
pgbench -c 20 -t 1000 -S postgres -C -f
/home/przemek/studia/sem8/databases/lab09/test_query.sql -p 8091 -U przemek
```

A teraz z pgbouncer:

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S
postgres_template -C -f
/home/przemek/studia/sem8/databases/lab09/test_query.sql -p 6455 -U
testuser
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
```

```
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 3.295 ms
tps = 6069.891271 (including connections establishing)
tps = 6356.626329 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 9966 transactions (49.8% of total, tps = 3024.626820)
- latency average = 1.480 ms
- latency stddev = 0.894 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 10034 transactions (50.2% of total, tps = 3045.264451)
- latency average = 1.389 ms
- latency stddev = 0.869 ms
```

TPS urósł z 400 na 6000, co jest znaczną poprawą!

Zmieniamy w `pgbouncer.ini`:

```
pool_mode = transaction
```

I odpalamy znowu to samo:

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S
postgres_template -C -f
/home/przemek/studia/sem8/databases/lab09/test_query.sql -p 6455 -U
testuser
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 3.467 ms
tps = 5768.826137 (including connections establishing)
tps = 6041.189938 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 10043 transactions (50.2% of total, tps = 2896.816044)
- latency average = 1.534 ms
- latency stddev = 0.903 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 9957 transactions (49.8% of total, tps = 2872.010092)
- latency average = 1.461 ms
- latency stddev = 0.893 ms
```

W moim przypadku bez żadnej poprawy w stosunku do poprzedniego.

Tworzymy tabele:

```
postgres_template=# create table test_tbl (id int, name varchar);
CREATE TABLE
```

Zmieniamy plik `test_query.sql` na:

```
insert into test_tbl (id, name) values(1, 'some random name');
```

Powtarzamy benchmarki.

1. Bez pgbouncer:

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S postgres -C
-f /home/przemek/studia/sem8/databases/lab09/test_query.sql -p 8091 -U
przemek
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 48.266 ms
tps = 414.367832 (including connections establishing)
tps = 435.879977 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 10047 transactions (50.2% of total, tps = 208.157680)
- latency average = 21.436 ms
- latency stddev = 13.067 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 9953 transactions (49.8% of total, tps = 206.210151)
- latency average = 21.485 ms
- latency stddev = 13.211 m
```

2. pgbouncer z `pool_mode = session`:

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S
postgres_template -C -f
/home/przemek/studia/sem8/databases/lab09/test_query.sql -p 6455 -U
```

```
testuser
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 3.521 ms
tps = 5680.090221 (including connections establishing)
tps = 5944.795371 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 9914 transactions (49.6% of total, tps = 2815.620723)
- latency average = 1.343 ms
- latency stddev = 0.817 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 10086 transactions (50.4% of total, tps = 2864.469498)
- latency average = 2.067 ms
- latency stddev = 0.941 ms
```

3. pgbouncer z `pool_mode = transaction`

```
przemek@przemek-laptop:/etc/pgbouncer$ pgbench -c 20 -t 1000 -S
postgres_template -C -f
/home/przemek/studia/sem8/databases/lab09/test_query.sql -p 6455 -U
testuser
starting vacuum...end.
transaction type: multiple scripts
scaling factor: 1
query mode: simple
number of clients: 20
number of threads: 1
number of transactions per client: 1000
number of transactions actually processed: 20000/20000
latency average = 3.653 ms
tps = 5475.022772 (including connections establishing)
tps = 5729.718010 (excluding connections establishing)
SQL script 1: <builtin: select only>
- weight: 1 (targets 50.0% of total)
- 10060 transactions (50.3% of total, tps = 2753.936454)
- latency average = 1.391 ms
- latency stddev = 0.838 ms
SQL script 2: /home/przemek/studia/sem8/databases/lab09/test_query.sql
- weight: 1 (targets 50.0% of total)
- 9940 transactions (49.7% of total, tps = 2721.086318)
- latency average = 2.117 ms
- latency stddev = 0.963 ms
```

Ostatecznie mamy: 1 - 414 TPS 2 - 5680 TPS 3 - 5475 TPS