

Resource Usage

Database Administration Lab Guide 1

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Consider a simplified invoice processing system with the following database schema:

Client: Id, Name, Address, Data.

Product: Id, Description, Data.

Invoice: Id, ProductId, ClientId, Data.

The application provides the following operations:

Sell: Add invoice record.

Account: List names of products sold to some client.

Top10: List currently 10 most sold products

Using the provided benchmark, explore the relation between performance and configuration of memory management parameters:

- `shared_buffers`
- `work_mem`

Steps

1. Adjust concurrency level (number of clients) and database size for the default configuration
2. Adjust configuration parameters, down and up, and repeat the benchmark.

Questions

1. What is the impact of work memory and shared buffer allocation e maximum achievable throughput?
2. Can baseline performance be improved?

Learning Outcomes Relate resource usage with performance. Use memory configuration parameters to influence system performance.

PostgreSQL HowTo

With Docker

1. Start the server:

```
$ docker run --name postgres -e POSTGRES_PASSWORD=postgres \
  -p 5432:5432 -d postgres:15
```

2. Access the psql client:

```
$ docker exec -it postgres psql -U postgres
```

3. Create a new database testdb:

```
# in psql
psql> create database testdb;

# with createdb
docker exec -it postgres createdb -U postgres testdb
```

4. Connect the new database:

```
psql> \c testdb
```

5. Get the list of relations:

```
psql> \d
```

6. Restart the server:

```
$ docker restart postgres
```

Update system parameters

```
-- check the parameter's current value (psql)
SHOW <param>;

-- change the value for the current session
-- (reverts back to the previous value when we
-- open a new session; not valid for shared_buffers)
SET <param> = <x>;

-- change the value permanently
-- (for shared_buffers, we need to restart the server;
-- for most other parameters the pg_reload_conf() is enough)
ALTER SYSTEM SET <param> = <x>;
SELECT pg_reload_conf();

-- change the value permanently, by editing the config file
SHOW config_file;
-> /path/to/postgresql.conf
-- edit the file, e.g., with vim
vim ...
-- restart the server
```