PostgreSQL
Backup & Restore

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Model Backup

- Logical backups
  - pg_dump
  - pg_dumpall
- Physical backups (Hot Backup)
  - pg_basebackup
  - FS-Level
- Replication

Logical Backup - performance

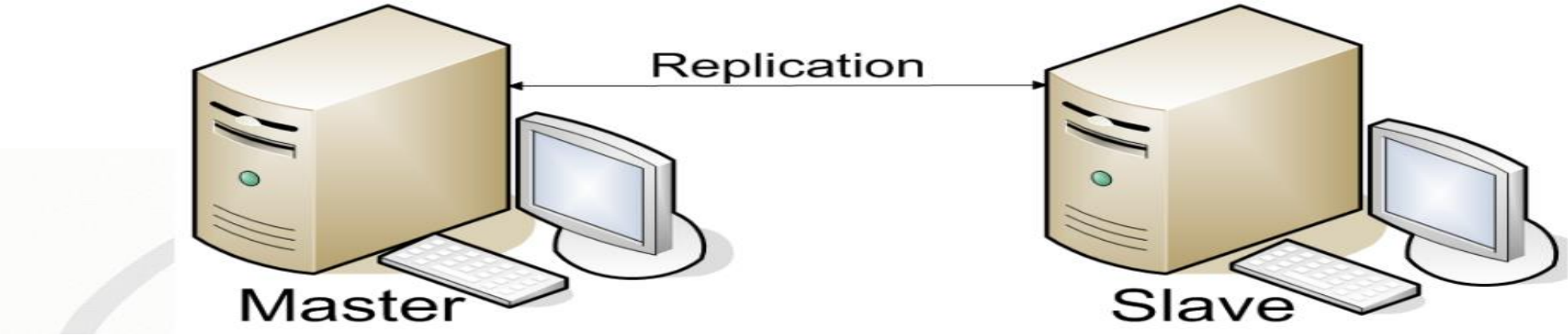
- Single Transaction
- Single Backend – per 1 CPU
- Fine for up to 100GB (masih besar)
- Postgres cache : berjalan baik
- Disk
  - Bergantung pada I/O dari disk (throttled by disk IO)
  - Lebih baik memisahkan disk dibanding PGDATA

Physical backup - performance

- Dump data berupa file-file database (Hot Backup)
- Lebih cepat dari logical backup
- Ketergantungan pada Architecture, Version dan Opsi compile
- Backup hanya pada level cluster

Replikasi - performance

- Backup secara live (realtime)
- Proses Lebih cepat dan otomatis
- Waktu proses restore lebih cepat



Logical Backup Backup

- pg_dump
- pg_dumpall

pg_dump

- Utilitas backup/dump database PostgreSQL
- Data hasil backup bersifat konsisten (walau database sedang digunakan)
- Non-Blocking
- Multiple Output File Format
- Memiliki opsi pilihan backup yang fleksibel

Sintaks pg_dump

- Syntax:

  pg_dump [options] dbname

- Connection Options:

  pg_dump -h <host> -p <port> -U <user> -W

  pg_dump --host=<host> --port=<port> --username=<user> --password

- Environment Variables:

  PGDATABASE PGHOST PGPORT PGUSER

Opsi pg_dump

- Common Options:
  - -a (--data-only)
  - -c (--clean)
  - -C (--create)
  - -d (--inserts)
  - -N (--exclude-schema=<schema>)
  - -n (--schema=<schema>)
  - -s (--schema-only)
  - -t (--table=<tablename>)
  - -T (--exclude-table=<tablename>)
  - -v (--verbose)
  - -F <format> (--format=<format>)

pg_dump : format option

- File Format Options:
  - Plain
  - Creates a plain text SQL file (default)

    -F p (--format=plain)
  - Custom
  - Create a custom compressed format (compatible with pg_restore)

    -F c (--format=custom)
  - Tar
  - Creates a tar format file (also compatible with pg_restore)

    -F t (--format=tar)

pg_dump : format option

- File Format Options:
  - Plain
  - Creates a plain text SQL file (default)

    -F p (--format=plain)
  - Custom
  - Create a custom compressed format (compatible with pg_restore)

    -F c (--format=custom)
  - Tar
  - Creates a tar format file (also compatible with pg_restore)

    -F t (--format=tar)

pg_dump : examples

- $ pg_dump -C --inserts prod1_db > prod1_db.sql

  Creates a dump of insert statements including a create database statement

- $ pg_dump --data-only --table=customer -F c prod1_db > prod1_db.fc.dmp

  Dump the customer table in a custom format from the prod1_db database

- $ pg_dump -S prod1_db > prod1_db.ddl_only.sql

  Creates a DDL only dump of the prod1_db database

- $ pg_dump --schema=gold -F t prod1_db > prod1_db.gold_schema.dmp

  Creates a dump of the gold schema in the prod1_db database in a tar format

pg_dumpall

- Utilitas backup/dump instan database PostgreSQL Cluster
- Data hasil backup bersifat konsisten (walau database sedang digunakan)
- Non-Blocking
- Multiple Output File Format
- Memiliki opsi pilihan backup yang fleksibel

Sintaks pg_dumpall

- Syntax:

  pg_dumpall [options]

- Connection Options:

  pg_dump -h <host> -p <port> -U <user> -W

  pg_dump --host=<host> --port=<port> --username=<user> --password

- Environment Variables:

  PGDATABASE PGHOST PGPORT PGUSER

pg_dumpall -- options

- Common Options:
  - -a (--data-only)
  - -c (--clean)
  - -D (--column-inserts) (--attribute-inserts)
  - -d (--inserts)
  - -g (--globals-only)
  - -o (--oids)
  - -r (--roles-only)
  - -s (--schema-only)
  - -S (--superuser=<username>)
  - -v (--verbose)
  - -t (--tablespaces-only)
  - --disable-triggers

pg_dumpall -- options

- $ pg_dumpall -g > prod1_db.global_structures.sql

  Creates a cluster dump containing only the cluster global structures

- $ pg_dumpall --tablespaces-only > prod1_db.tablespaces.sql

  Dump the cluster tablespaces

- $ pg_dumpall -r > prod1_db.roles_only.sql

  Creates a dump of only the cluster roles

- $ pg_dumpall -o -S gold_user > prod1_db.oids.dmp

  Creates a dump of the cluster including oid's as the superuser 'gold_user'

Restore

- psql
- pg_restore

Restore : psql

- $ pg_dump prod1_db > prod1_db.sql
- $ psql -ef prod1_db.sql > load_db.log 2>&1
- $ pg_dump prod1_db | psql -h qa_server
- $ pg_dumpall -g | psql -h dev_server -p 5433 > load_dev.log 2>&1
- $ pg_dump prod1_db | psql -e test_db > load_test_db.log 2>&1

pg_restore options

- Common Options:
  - -d <dbname> (--dbname=<dbname>)
  - -a (--data-only)
  - -c (--clean)
  - -C (--create)
  - -i (--ignore-version)
  - -I (--index=<index>)
  - -l (--list)
  - -L <filename> (--use-list=<list-file>)
  - -n (--schema=<schema-name>)
  - --disable-triggers
  - -P function-name (args)
    --function=function-name(args)
  - -s (--schema-only)
  - -S (--superuser=<username>)
  - -v (--verbose)
  - -t <table> (--table=<table>)
  - -T <trigger> (--trigger=<trigger>)
  - -F <format> (--format=<format>)
    (c or t only)

pg_restore example

- $ pg_restore -a -F c -d prod2_db prod1_db.fc.dmp

  Restores data only from a custom formatted file into database prod2_db

- $ pg_restore -c --schema=gold_partners -v -F t -d prod2_db prod_dump.tar.dmp

  Cleans (removes data & structures first) then restores the gold_partners schema
  From a tar formatted file into the prod2_db database

- $ pg_restore --schema-only -d qa1_db -F c prod1_db.fc.dmp

  Restores the schema only (DDL) from a custom formatted file
  into the qa1_db database

Contoh: pg_dump – pg_restrore

- Backup

  $pg_dump –Fc dblama –U namauser > dblama.dump

- Restrore
  - Buat database baru

    $created dbbaru –U namauser
  - Lakukan restore

    $pg_restore –d dbbaru dblama.dump –U namauser

Q ?

- Kapan sebaiknya melakukan proses backup & restore ?
- Apa perbedaan backup : pg_dump dan pg_dumpall ?
- Apa perbedaan restore dengan psql dan pg_restore ?