



PostgreSQL Backup and Recovery Best Practices and Tools

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About me

- Who is this guy?
 - Using PostgreSQL since 1999.
 - Responsible for PostgreSQL YUM repository.
 - Used to break website, but recently gave up.
 - Working at EnterpriseDB.
 - Istanbul, Turkiye.

Social media

- Please tweet!
 - #pgdayuk
 - #PostgreSQL

Backups are... not something like this!



What is a “backup”?

- A (full?) copy of your database
 - Schema
 - Data
 - Both!
- Restore
 - Same or different database
- SQL backup
- Filesystem backup
 - (a.k.a. base backup)
- ...

Strategy?

- A major issue that we need to talk...
- Location
- Testing
 - Do you really do it?
- Retention
 - Business needs...
- Cleanup
- Replication(!)
- Don't forget

SQL Backup

- Logical dump
- A (full) copy of your database
 - Schema
 - Data
 - Both!
 - Snapshot
 - MVCC
 - Consistent backup

The old, the good, the one that always works

pg_dump IYF : SQL Dump

- **pg_dump**
 - **Plain or custom (compressed)**
 - **Per database (even table, schema (namespace))**
 - **Option to dump only schema or only data.**
 - **Parallel dump (9.3+)**
 - **No global objects (roles and tablespaces)**
 - **-Fc is also your friend.**

Dump everything!

pg_dumpall

pg_dumpall

- **Only text**
- **One single file**
- **All db's in cluster**
- **Global objects**
- **Option to dump only schemas or roles or tablespaces (or both)**

pg_dump: Pros and cons

- **Pros:**
 - Always works (TM)
 - May be used even between different major versions
 - Parallel backup
 - Ability to dump (and restore) specific table(s), schema(s)
- **Cons:**
 - Snapshot
 - No incremental option

Filesystem backup

- “Filesystem level backup of a running PostgreSQL cluster”
- Binary copy
- “Backup mode”
- Entire cluster
- Streaming replication protocol (9.1+)
 - (Also) allows taking backups from standby

Filesystem backup

- Stick to a specific major version
- Stick to same architecture during restore
- Three steps:
 - `pg_start_backup()`, FS backup, `pg_stop_backup()`
- Must include WAL files
 - Archiver
 - Continuous archiving

Storage snapshot

- Take snapshot of **all** data files, including xlogs
- Atomicity
- Not reasonable for large databases.

pg_basebackup: The tool

- Oscar goes to Magnus Hagander
- Prior to pg_basebackup:
 - Three steps:
 - pg_start_backup()
 - FS backup
 - pg_stop_backup()
 - Fast checkpoint
 - No tablespace mapping
 - ...

pg_basebackup: The tool

- With pg_basebackup:
 - Backup using replication protocol (with replication privilege)
 - Plain or tar backup
 - Option to specify transfer rate
 - Tablespace mapping (9.4+)
 - Select between fast or spreaded checkpoints
 - Enter and exit backup mode automatically.

Barman

- Backup And Recovery MANager for PostgreSQL
- Developed by 2ndQuadrant
- Open Source, Python (#win)
- Great features
- Easy configuration

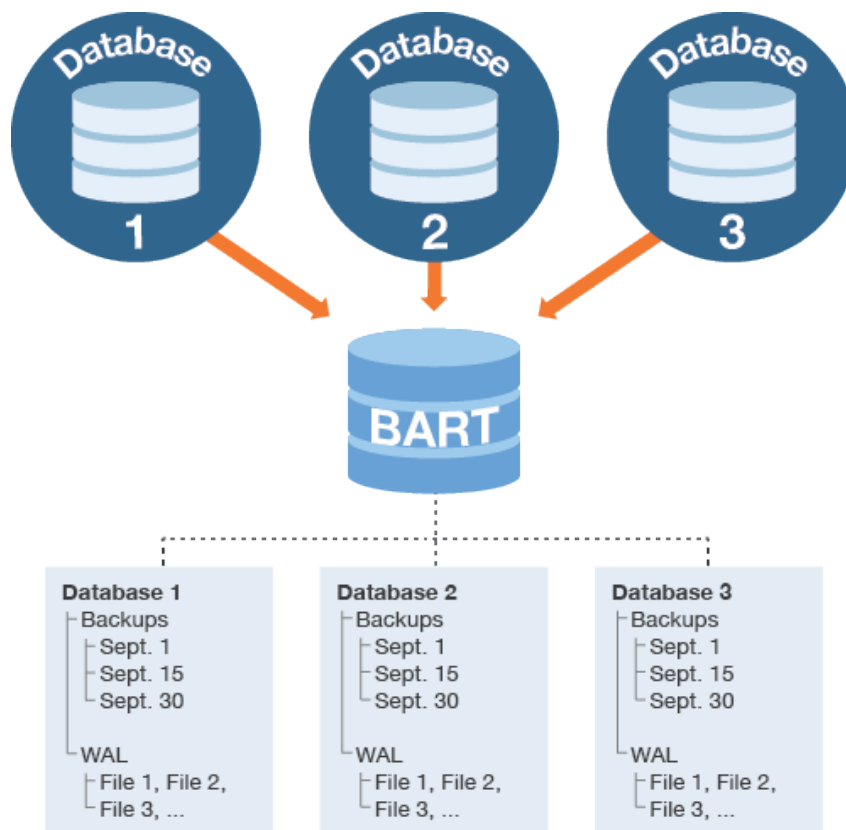
Barman: Filesystem level backup

- Take backup of entire cluster
- List backups
- Check status of backups
- Define retention period!
- Ability to restore (recover)
- Single config file for multiple servers
- Add pre/post hook scripts
- Automated cleanup jobs via cron

BART: Filesystem level backup

- BART: Backup And Recovery Tool
- Developed and supported by EnterpriseDB
- pg_basebackup
- Easy configuration
- Similar features with Barman

BART: Filesystem level backup



PgBackRest

- Highly scalable backup solution
- Multi-threaded backup/restore for performance
- Checksums
- Full, differential, and incremental backups

NetBackup: Zmanda

- PostgreSQL Agent for Symantec NetBackup
- Uses XBSA API of NetBackup
- Supports PITR
- Full and incremental backups

Lessons learned:

- Always take backups!
- `pg_dump` is not good for large databases
- Remote location
- Well tested backups!

Questions, comments?



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