How can I **backup** my **PostgreSQL** databases?

custom scripts, pg_backrest, WAL-G, pg_probackup, Barman, ..?

As technical people we have a tendency to focus on the **means** (tools)

Means without **goals**
are useless

With **clear goals**
any tool is fine

Barman in action

PGConf.eu 2019 - October 16

Gabriele Bartolini

About myself

- Open Source passionate and programmer since 1995
- First time with Postgres in 1997, regular from ~2000
- Co-Founder of ITPUG and PostgreSQL Europe
- With 2ndQuadrant since 2008
  - Head of Global Support
- Co-Founder and developer of Barman
- Lean and DevOps practitioner

Goals

Recovery Point Objective (RPO)
"How much data the business can afford to lose"

Recovery Time Objective (RTO)
"How long it takes to restore the business service"

"From 0 to 100: Business continuity with PostgreSQL":
https://www.youtube.com/watch?v=-EuVjj3zqE8

Incremental approach

- Keep our **goals** in mind (RPO and RTO)
- Focus on **Disaster Recovery** (DR)
- Incrementally build a solid DR solution for PostgreSQL based on Barman
- *What better approach than a practical one?*

Barman and PostgreSQL 12

- Native
- Transparent
  - *postgresql.auto.conf* for PostgreSQL 12
    - With *recovery.signal* and *standby.signal*
  - *recovery.conf* for PostgreSQL 8.3 -> 11
- Available from 1 Aug 2019
  - When PostgreSQL 12 was still in beta
  - Request originated from a support case

Playground used in this talk

https://github.com/2ndquadrant-it/ansible-postgresql-barman-playground

4 machine Vagrant playground environment with Ansible Playbooks for provisioning of PostgreSQL and Barman

Available under GNU GPL 3

After the talk explore the playbook and "play" with it

JOHN

PAUL

GEORGE

RINGO

The "Beatles" cluster

- 4 CentOS pre-configured virtual machines:
  - **Paul**: PostgreSQL 12 + barman-cli on 192.168.33.10
  - **John**: PostgreSQL 12 + barman-cli on 192.168.33.11
  - **George**: Barman 2.10dev on 192.168.33.12
  - **Ringo**: Barman 2.10dev on 192.168.33.13

What Ansible did for us

- Basic PostgreSQL configuration
  - PGDATA initialised with data checksums
  - Archive mode enabled
    - archive_command = /bin/true
  - Syslog destination for logs
  - Enable md5 access from 192.168.33.x in pg_hba
  - Empty database for pgbench
- Paul and John have a running PostgreSQL instance
- SSH key exchange between *postgres* and *barman* users

Asciinema

- I have recorded casts using Asciinema
  - https://asciinema.org
- I will now be playing some casts, not all of them
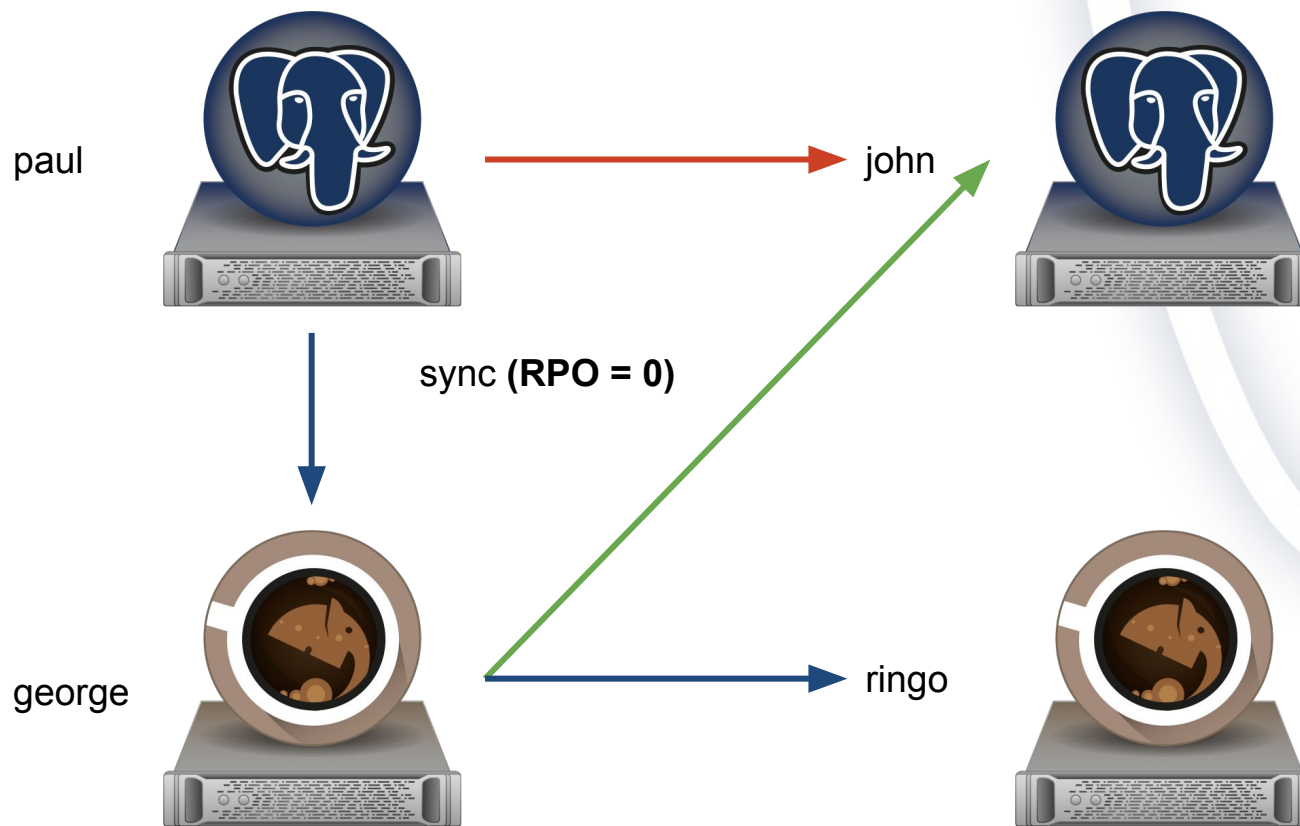 - *See link at the end of the presentation*

Pgbench

All commands have been executed with **pgbench** simulating workload in background.
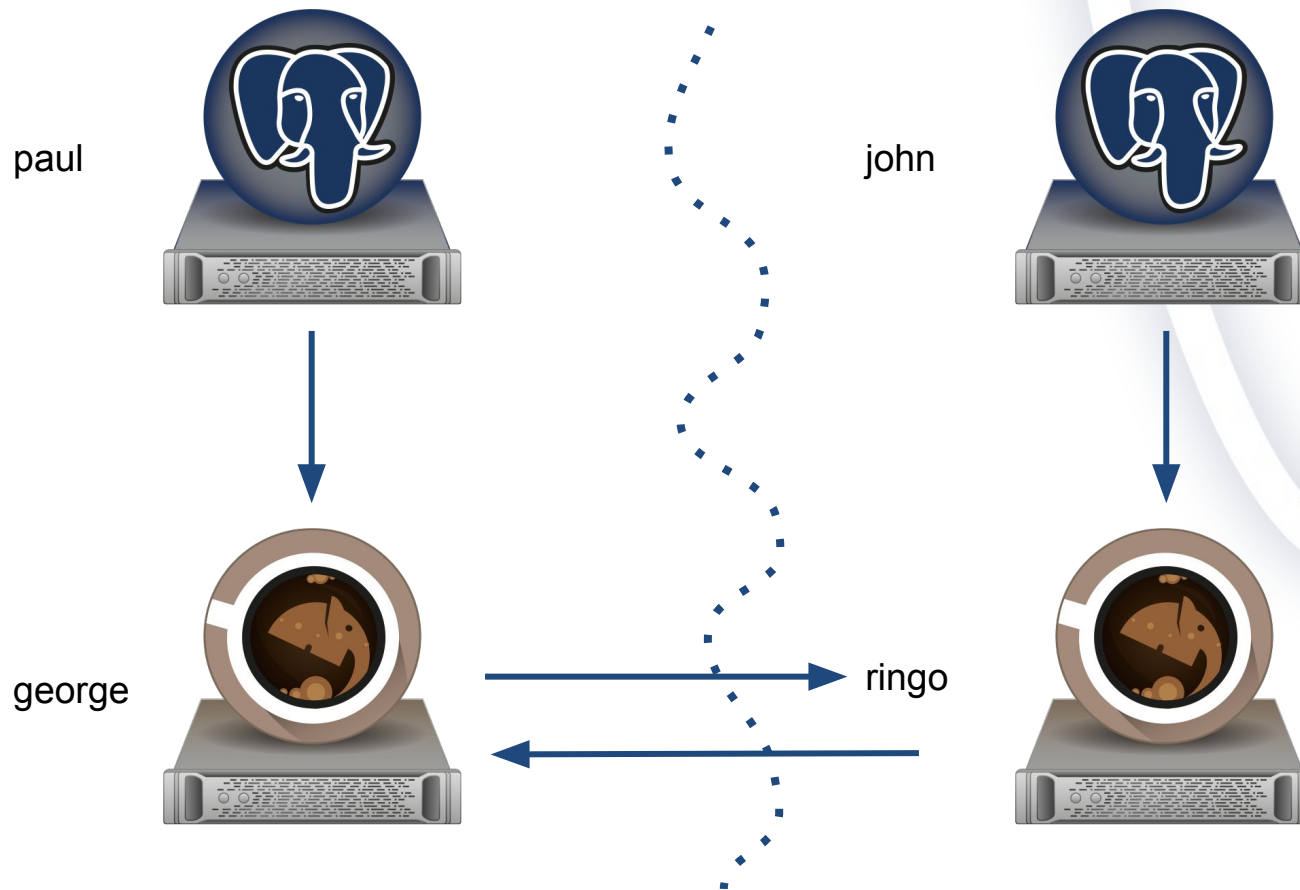
What we will be doing today

paul

sync **(RPO = 0)**

george

john

ringo

Hands-on now

There's more …

paul

john

george

ringo

There's more

- Backup frequency (cron for "barman backup")
- Retention policies
  - Redundancy (number of backups)
  - Point of Recoverability (based on time)
- Archive command (barman-wal-archive)
- Streaming backup
- Point In Time Recovery (define a target)
- Monitoring, monitoring, monitoring
- Backup from standby

Future

- Direct cloud storage (starting with AWS S3) - 2.10
  - barman-cloud-wal-archive
  - barman-cloud-wal-restore
  - barman-cloud-backup
  - barman-cloud-recover
- Integration of the above with Barman - 2.11/3.0?
- Multi-tier setups, based on retention policies:
  - Tier 2: Local compressed backups
  - Tier 3: Cloud storage

DR Through the Beatles

I'm down. Yesterday my PostgreSQL cluster had a storage problem. I can't bring it up. **Don't let me down! You can't do that! I should have known better**, I have no backups! It's been a **hard day's night** …

Help! Please **get back** my Postgres database! **I've got a feeling**: I've lost all my data. **I'll cry instead**.

Recovery is now a **long and winding road**. **Do you want to know a secret**? I have learnt my lesson now. **We can work it out**, it is going to be a **revolution**. I will now take backups **eight days a week**.

Oh, **Here comes the sun**! And with geo-redundancy and cloud storage it is going to be **here, there and everywhere**. **From me to you**: now **I feel fine**.

Sincerely yours,
The fool on the hill   (You: "**All you need is ~~love~~ Barman**")

Feedback

Please leave your feedback about my presentation, thanks!

https://2019.pgconf.eu/f

Asciinema recordings

- https://asciinema.org/a/udbWdTB4MqAthUhHIL5FP5IJw
- https://asciinema.org/a/UGX6VPOm6BBeYvb7M6wYH03on
- https://asciinema.org/a/hPiH7ZEaJux83aS6STaF56qX5
- https://asciinema.org/a/wK8MMh1zvjbyIQKvAbQEkvIQZ
- https://asciinema.org/a/Mes4u4FktkVtjFbeln7NybIzY
- https://asciinema.org/a/g9VZvMg5gqZUt9I8cn1ziJJX2
- https://asciinema.org/a/XK0kRXmE9I4oFULXQtdmoOlD4
- https://asciinema.org/a/YPGrH0GGZg7fNxmbtMo6W1IZk
- https://asciinema.org/a/WUiCvtnDH8PFEcR5fSsrBtBHi

Thanks to

- Barman development team
  - **They are all here today**
- For Ansible automation:
  - Rubens Souza
  - Anna Bellandi
- Benjamin Zander for Rule #6
  - https://www.youtube.com/watch?v=M-HG6X6fpBM

Thank you!
Questions?

pgbarman.org - docs.pgbarman.org

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