

Building an Enterprise-grade PostgreSQL Server using Open Source tools

Webinar

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10th October, 2018



Usual Myths

- Security is not free
- Cannot take a full backup that is good for PITR (Point-in-time-recovery)
- High Availability is a concern
- Not scalable
- Less options for Database maintenance

Enterprise-grade PostgreSQL using Open Source Solutions

- Satisfy enterprise features such as -
 - Encryption
 - User Management
 - Ability to tune
 - Connection pooling/load balancing
 - Logging and auditing
 - Monitoring
 - Durable Replication methods
 - High Availability and automatic failover
 - Reliable Backups
 - Tools for routine database maintenance tasks
 - Partitioning
 - Continuous bug fixes
 - Fixing security vulnerabilities and many more ...

Topics we cover in this Webinar and Demo

- [Securing your PostgreSQL database cluster](#)
- [High Availability](#)
- [Preparing a Backup strategy and the tools available to achieve it](#)
- [Scaling PostgreSQL using connection poolers and load balancers](#)
- [Tools/extensions available for DBAs/Developers/Business requirements](#)
- [Detailed logging in PostgreSQL](#) and
- [Monitoring your PostgreSQL and real-time analysis.](#)

Security in PostgreSQL

Security in PostgreSQL

- **Authentication**

- Host based authentication
- SCRAM-SHA-256, PAM/LDAP, Kerberos, SSL

- **Authorization**

- User Management
- Row level security
- Data security using Encryption

- **Accounting and Auditing**

- Logging
- Auditing

- **Security Bug Fixes**

- Please subscribe to our blog posts

Backup Strategy

Backup Strategy

- **PostgreSQL**

- pg_basebackup - Consistent Online backup - helps achieve PITR
- pg_dump/pg_restore - Logical Backups
- Archiving on WAL's in Archive Mode.

- **PostgreSQL Umbrella projects**

- pgBackRest
- BARMAN
- WAL-g (previously WAL-e)
- More on each of these solutions in our future blog posts ...

Connection Pooling and Load Balancer

Connection Pooling & Load Balancing

- **PostgreSQL Connections**

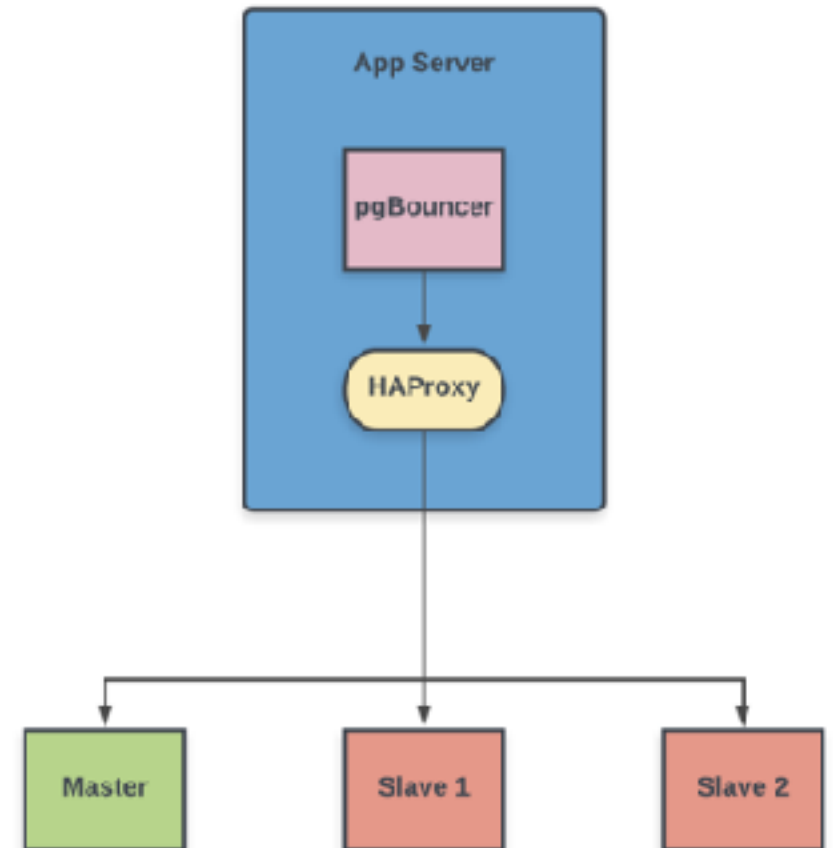
- Process-based (each connection is a process)
- Native application connection pooler (preferred)
- External Connection Pools

- **Open Source tools for Scaling PostgreSQL**

- External Connection Pools
- pgBouncer
- pgPool-II

- **Load Balancer**

- HAProxy



High Availability and Automatic Failover

High Availability & Automatic Failover

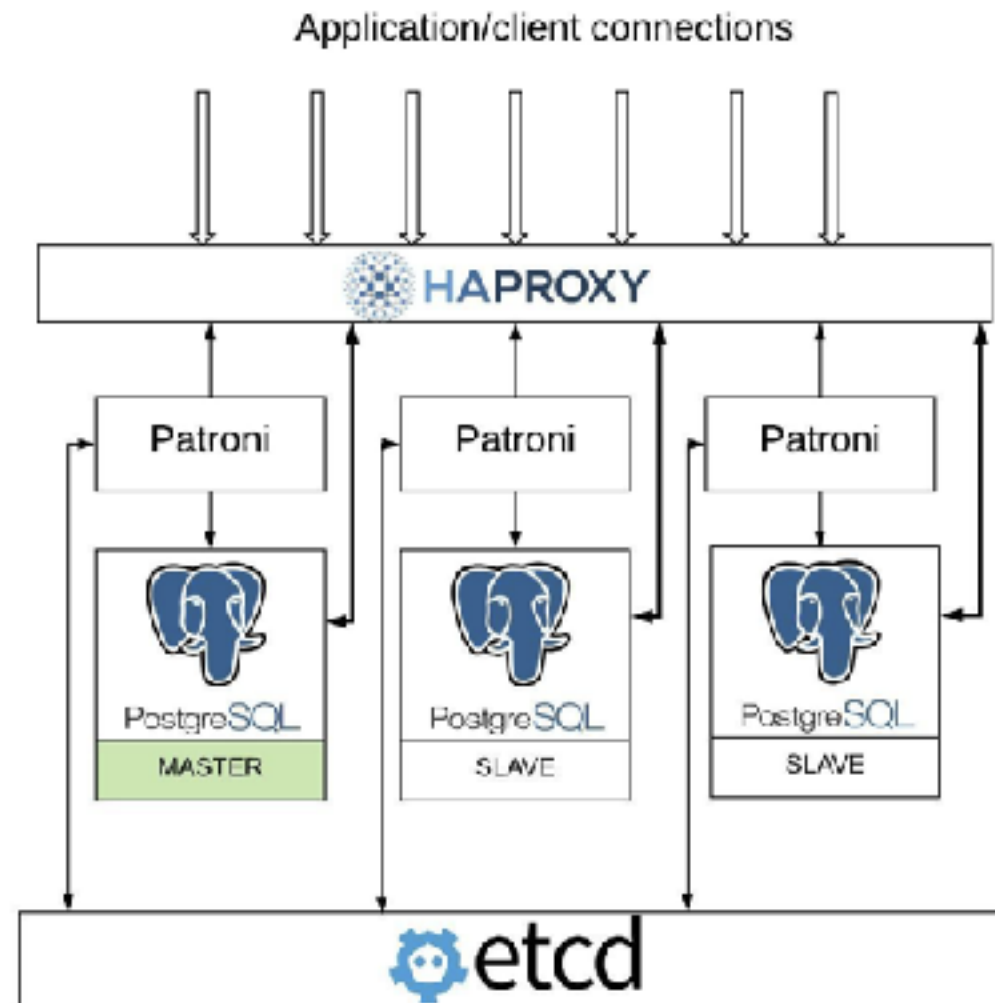
- **PostgreSQL - Replication methods**

- Streaming Replication (preferred for HA)
 - Cascaded Replication
 - Synchronous and Asynchronous Replication
 - Warm Standby and Hot Standby
- Logical Replication
 - Cascaded Replication

- **Open Source Contributions for Automatic Failover**

- Patroni
- REPMGR
- Stolon
- PostgreSQL Automatic Failover (PAF)
- pglookout
- pgPool - II

Patroni



PostgreSQL Extensions

PostgreSQL Extensions

- **PostgreSQL**

- Feature-rich and Community driven
- Capability of adding Extensions

- **A few extensions among hundreds of extensions**

- pg_stat_statements - Query stats
- pg_repack - Online table reorg
- pl/profiler - Profiling of Stored procedures
- Orafce - Oracle functions to port applications on Oracle to PostgreSQL easily
- Language extensions like - PL/PGSQL, PL/Python, PL/Perl, PL/Java, PL/R, etc ..
- Foreign Data Wrappers like - mysql_fdw, mongo_fdw, postgres_fdw, etc ...

PostgreSQL Detailed Logging and Analyzer

PostgreSQL Detailed Logging and Analyzer

- **PostgreSQL**

- Enable detailed logging of activity.
- Customizable logging
- Log DDLs
- Log statements running for more than `log_min_duration_statement` time.

- **Open Source Log Analyzer**

- pgBadger
- PMM QAN (Query Analytics) - Under development

Monitoring

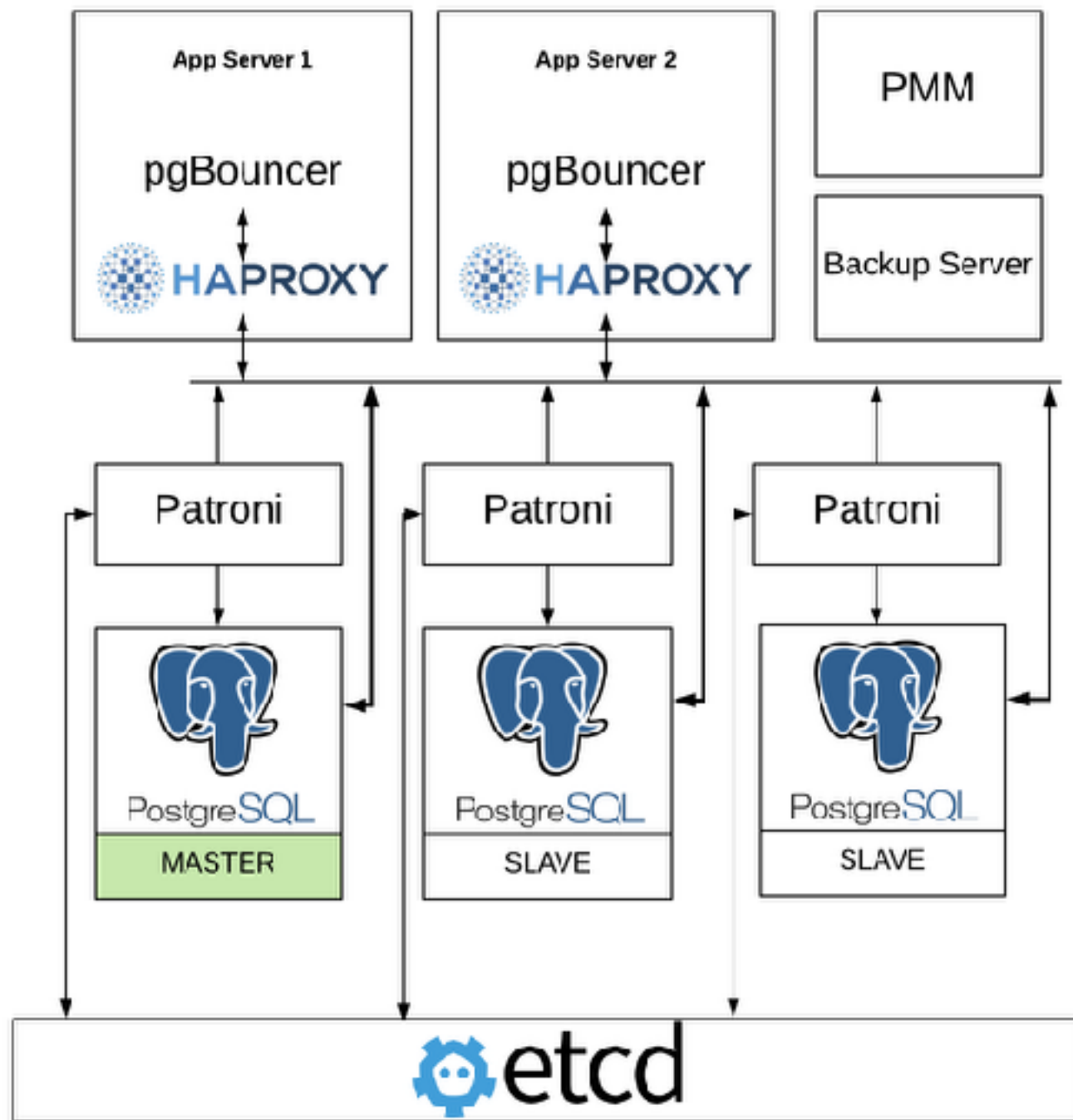
Monitoring

- **Monitoring methods**

- **Open Source tools**

- Munin
 - Zabbix
 - Cacti
 - Nagios
 - Grafana
 - PMM
 - PGObserver
 - pgCluu

Final Architecture of our Webinar Demo



Percona Live - PostgreSQL track

<https://www.percona.com/live/e18/>

Questions ???