Building an Enterprise Grade PostgreSQL Using Open Source Tools and Extensions

Avinash Vallarapu
Percona
Enterprise-Grade Support For Any Database

- Percona Server for MySQL
- Percona XtraDB Cluster
- Percona Server for MongoDB
- Percona XtraBackup
- Percona Toolkit
- Percona Monitoring and Management
- Percona Monitoring Plugins
- PostgreSQL
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 …
Some Blog Posts For Your Reference

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

- **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

- **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`)
Connection Pooling and Load Balancing

- **PostgreSQL Connections**
  - Process-based (each connection is a process)
  - Native application connection pooler (preferred)
  - External Connection Poolers

- **Open Source tools for Scaling PostgreSQL**
  - External Connection Poolers
  - pgBouncer
  - pgPool-II

- **Load Balancer**
  - HAProxy
High Availability and 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
  - pg_auto_failover
  - PostgreSQL Automatic Failover (PAF)
  - pglookout
  - pgPool - II
Patroni
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 Analyser

- **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

- Open Source tools
  - PMM
  - Munin
  - Zabbix
  - Cacti
  - Nagios
  - Grafana
  - POWA
  - PGObserver
  - pgCluu
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