ScaleGrid

PostgreSQL HIGH AVAILABILITY

FRAMEWORK TEST SCENARIOS

Which PostgreSQL high availability management tool is best for your deployments? Compare PostgreSQL Automatic Failover (PAF), Replication Manager (repmgr), and Patroni high availability tests to discover the framework that offers the best performance.

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Standby Server Tests	PAF (PostgreSQL Automatic Failover)	repmgr (Replication Manager)	Patroni
Kill the PostgreSQL Process	✓ No downtime	MANUAL INTERVENTION No downtime	✓ No downtime
Stop the PostgreSQL Process	✓ No downtime	MANUAL INTERVENTION No downtime	✓ No downtime
Reboot the Server	✓ No downtime	MANUAL INTERVENTION No downtime	✓ No downtime
Stop the Framework Agent Process	✓ No downtime	UNMANAGED STATE No downtime	UNMANAGED STATE No downtime
Primary Server Tests	**PAF (PostgreSQL Automatic Failover)**	**repmgr (Replication Manager)**	**Patroni**
Kill the PostgreSQL Process	✓ Downtime	MANUAL INTERVENTION No downtime	✓ No downtime
Stop the PostgreSQL Process and bring it back immediately after health check expiry	✓ No downtime	MANUAL INTERVENTION No downtime	✓ No downtime
Reboot the Server	Downtime	Downtime	✓ Downtime
Stop the framework agent process	Agent: pacemaker Downtime	Agent: repmgrd No downtime	Agent: patroni Multi-master
Network Isolation Tests	**PAF (PostgreSQL Automatic Failover)**	**repmgr (Replication Manager)**	**Patroni**
Split Brain Scenario Network isolate the master server from other servers	Downtime	MANUAL INTERVENTION	Downtime
Network isolate the standby server from other servers	✓ No downtime	MANUAL INTERVENTION	✓ No downtime

What's the best high availability framework for PostgreSQL?

#1 PATRONI

Patroni is a valuable tool for PostgreSQL database administrators (DBAs), as it performs end-to-end setup and monitoring of a PostgreSQL cluster. The flexibility of choosing DCS and standby creation is an advantage to the end user, as they can choose the method they are comfortable with.

REST APIs, HAProxy integration, Watchdog support, callbacks and its feature-rich management ***makes Patroni the best solution for PostgreSQL HA management.***

#2 PAF

PostgreSQL Automatic Failover provides several advantages in handling PostgreSQL high availability. PAF uses IP address failover instead of rebooting the standby to connect to the new master during a failover event, proving advantageous in scenarios where a user does not want to restart the standby nodes. PAF also needs very little manual intervention and manages the overall health of all the resources. The only case where manual intervention is a requirement is in the event of a timeline divergence where the user can elect to use pg_rewind.

#3 REPMGR

repmgr provides several commands to setup and monitor PostgreSQL replication. It is feature-rich and also eases the job of the database administrator (DBA). However, it's not a full fledged high availability management tool since it will not manage the resources. Manual intervention is required to ensure the resource is in proper state.

Pros & Cons	PAF	repmgr	Patroni
Framework automates the initialization and configuration of PostgreSQL.	✗	✓	✓
Handles node failures and trigger elections when the master goes down.	✓	✓	✓
Quorum behavior can be enforced.	✓	✗	✓
Complete high availability management solution for the resource, including start, stop, and monitor, and handle network isolation scenarios.	✓	✗	✓
Distributed solution which enables the management of any node from another node in the cluster.	✓	✗	✓
Detects if a standby is misconfigured with an unknown or non-existent node in recovery configuration.	✗	✗	✗
Requires an extra port to be opened.	Pacemaker & Corosync UDP communication	✗	REST API for Patroni. 2 (mins) ports for DCS.
Supports NAT-based configuration.	✗	✓	✓
Automatic pg_rewind (dangerous to enable).	✗	✓	✓
Provides notification by invoking the user scripts for the registered events.	✓	✓	✓
Handles recovering the health of individual nodes.	✓	✗	✓
Supports REST APIs and HAproxy integration.	✗	✗	✓

Read the analysis of each PostgreSQL high availability framework test scenario

READ THE FULL REPORT

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Automate your PostgreSQL high availability at ScaleGrid

PostgreSQL Solutions

ScaleGrid's fully managed PostgreSQL cloud solution and database management software for private on-premise deployments allows you to automate high availability at cluster creation. Easily deploy, monitor, provision, and scale PostgreSQL while keeping full superuser and SSH access with no vendor lock-in, and install unlimited PostgreSQL extensions with no restrictions.

About ScaleGrid

ScaleGrid is a fully managed Database-as-a-Service (DBaaS) solution used by thousands of developers, startups, and enterprise customers including Polaris, UPS, and Adobe. ScaleGrid supports MongoDB, Redis, MySQL, and PostgreSQL on public and private clouds, including AWS, Azure, DigitalOcean, and VMware, and automates your time-consuming tasks at any scale so you can focus on product.

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Tests were performed while the app was running and inserting data to the PostgreSQL database. The app was written using PostgreSQL Java JDBC Driver leveraging the connection failover capability.