

# PostgreSQL High Availability using Anycast and ExaBGP

## Initial Situation

Our previous PostgreSQL setup relied on HAProxy to manage client connections and failovers for Patroni. However, we encountered increasing performance bottlenecks — specifically, high load on the HAProxy nodes. In response, our network team proposed a new approach leveraging Anycast IP routing in combination with ExaBGP to provide a more robust, decentralized solution.

## What is Anycast?

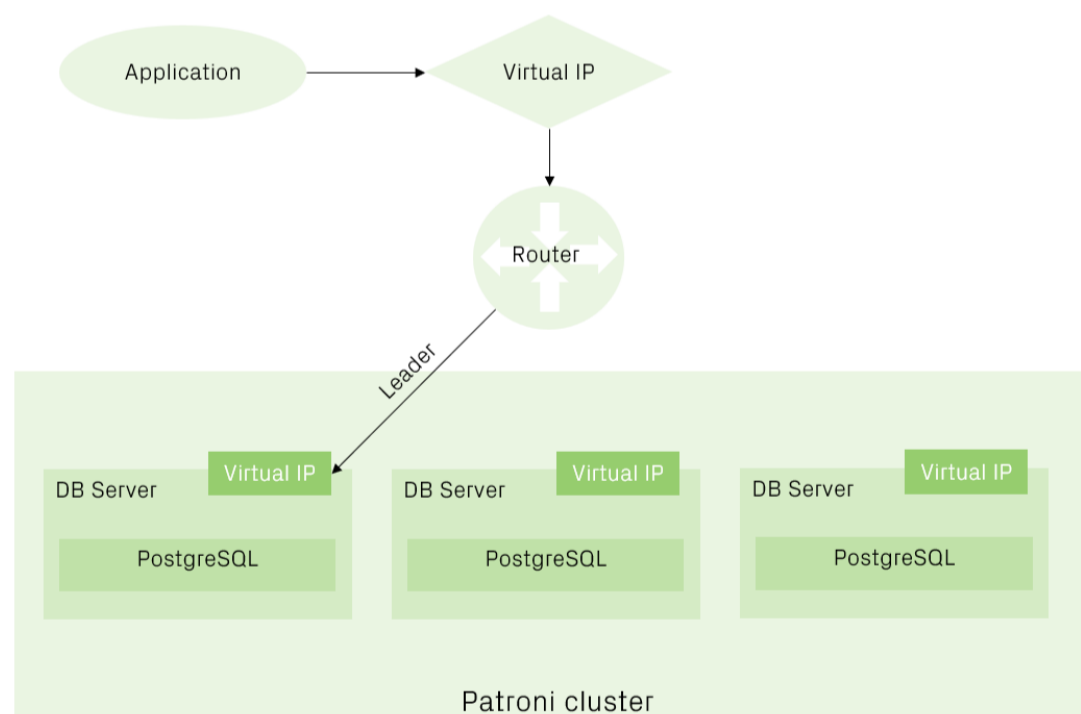
Anycast is a network addressing and routing method in which a single IP address is advertised from multiple locations. Routers direct clients to the most optimal node based on BGP routing metrics. This allows traffic to be directed dynamically to the current leader.

## What is ExaBGP?

ExaBGP is a flexible BGP speaker implemented in Python. It allows user-defined logic to control when IP addresses are advertised or withdrawn. We integrated ExaBGP with the Patroni API to announce the IP only from the current leader node.

## How does it work?

Each router is configured for every PostgreSQL service with a virtual IP address and a list of all potential PostgreSQL nodes. Every database server has this virtual IP assigned to its network interface. The ExaBGP service on each server runs a script that checks the status of the Patroni API via an HTTP `GET /` request every few seconds — only the current leader responds with a status code 200. If the response is 200, ExaBGP announces the IP address; otherwise, the routers consider the node unavailable.



In the event of a failover, the new leader will return a 200 status, while the former leader will respond with a 503. The routing is then adjusted automatically to reflect the new leader.

## Results and Operational Benefits

We are now building our high-availability setup using Anycast and ExaBGP — initial testing shows the new solution is approximately 25-30% faster compared to the previous HAProxy-based setup. Beyond improved performance, the operational workflow has also been streamlined: after the initial provisioning of the Anycast configuration by the network team, ExaBGP can be automatically installed and configured as part of our Ansible deployment playbook. This simplifies the overall deployment process.