



Crunchy Data and Red Hat OpenShift: Automating Postgres Deployment & Administration at Enterprise Scale

Karen Jex | Senior Solutions Architect @ Crunchy Data
Red Hat Summit Connect | Darmstadt | November 2024

Karen Jex

Senior Solutions Architect

25 Years in Database
Administration

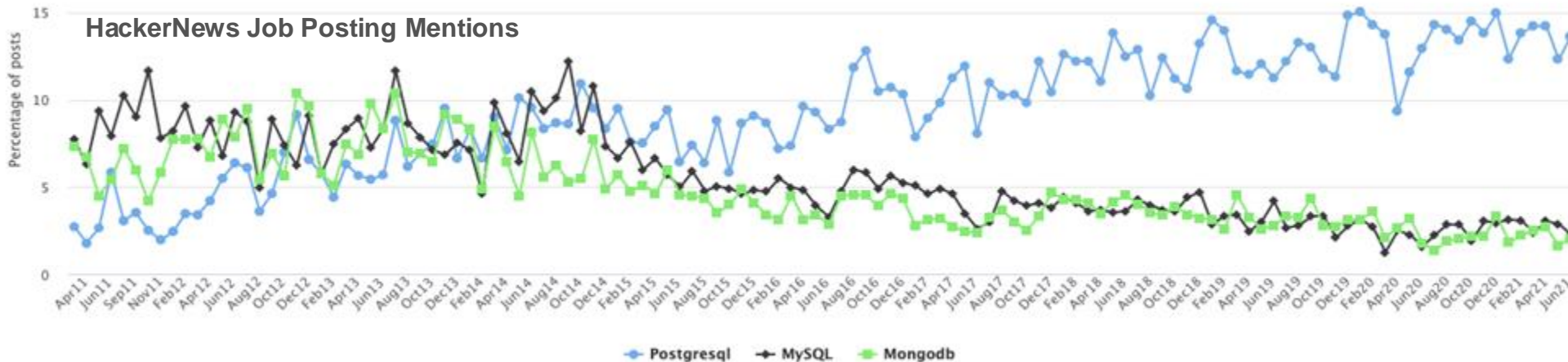
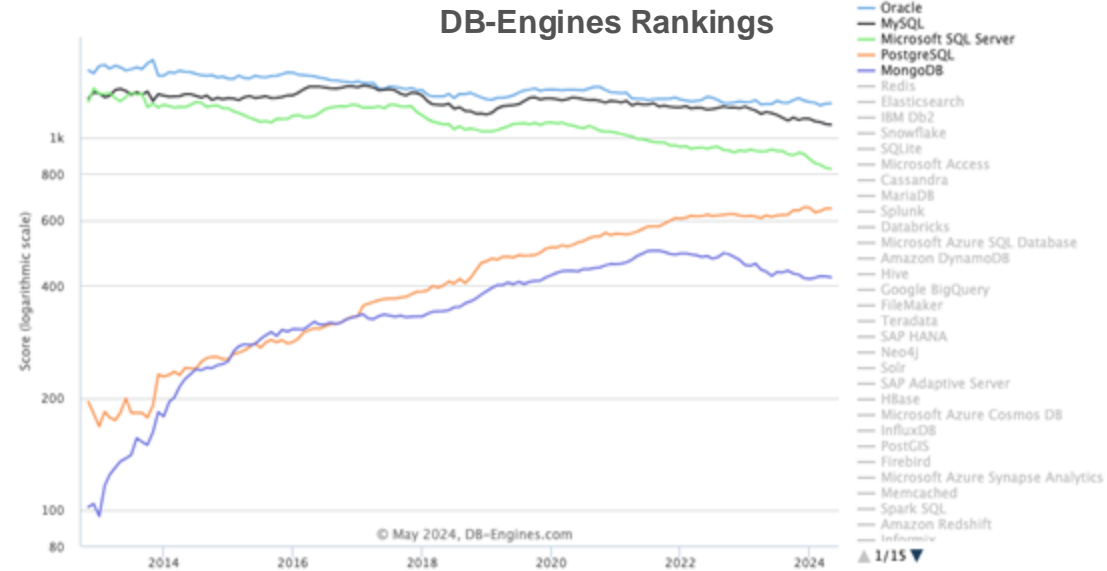




Agenda

- 1 Postgres
- 2 Crunchy Data & Red Hat
- 3 Enterprise Scale Postgres
- 4 Crunchy Postgres for Kubernetes on OpenShift

PostgreSQL is a Growing Part of the Database Landscape



Why Postgres

- ✓ Established, Reliable & Secure
- ✓ Feature Rich
- ✓ Extensibility
- ✓ No Central Owner
- ✓ Hiring
- ✓ 35+ year evolution

The Technical Details

- Datatypes
- Transactional DDL
- Foreign Data Wrappers
- Concurrent Index Creation
- Conditional indexes
- JSON
- Common Table Expressions
- Fast column addition
- Listen/Notify
- Upsert
- Partitioning
- Per transaction sync replication
- Window function
- JSON/JSONB
- Continued innovation



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Your Partner for Postgres

AI



Stored RAG Embeddings to
integrate with you favorite LLM

Analytics



Query your data lake directly
from Postgres

Kubernetes



Production Grade Postgres in
Kubernetes

Come visit us at our booth to learn more...

Postgres Anywhere

BARE METAL, VMS, CLOUD

Crunchy Postgres

Crunchy Certified PostgreSQL is production ready Postgres.

INCLUDES:

- Backups
- Disaster recovery
- High availability
- Monitoring
- Automation
- Self managed

KUBERNETES

Crunchy Postgres for Kubernetes

Cloud Native Postgres on Kubernetes powered by Crunchy Postgres Operator.

INCLUDES:

- Simple provisioning
- Backups and DR included
- High availability
- Seamless upgrades
- Scale from 1 to thousands of databases
- Self managed

FULLY MANAGED CLOUD

Crunchy Bridge

The fully managed Postgres option on your choice of Cloud provider.

INCLUDES:

- AWS, Azure or GCP
- Continuous protection
- Backups
- Point in Time Recovery
- Pay for what you use
- The developer experience you want

Crunchy Data + Red Hat

Advanced PostgreSQL Solutions for Leading Red Hat Technology including:



Crunchy Data & OpenShift



Level 5 Certified PostgreSQL Operator



Crunchy Data & Ansible Automation Platform



Crunchy Data with Quay & Clair





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Enterprise Scale Postgres



Backups

Ensure your critical enterprise data isn't at risk



Disaster recovery

The ability to quickly and reliably recover from data corruption or loss.



High availability

With high availability you can trust your database is online.



Connection scaling

With built in connection scaling you can easily scale to tens of thousands of connections for your database.



Monitoring

Ensure your database is properly resourced so your application performs well



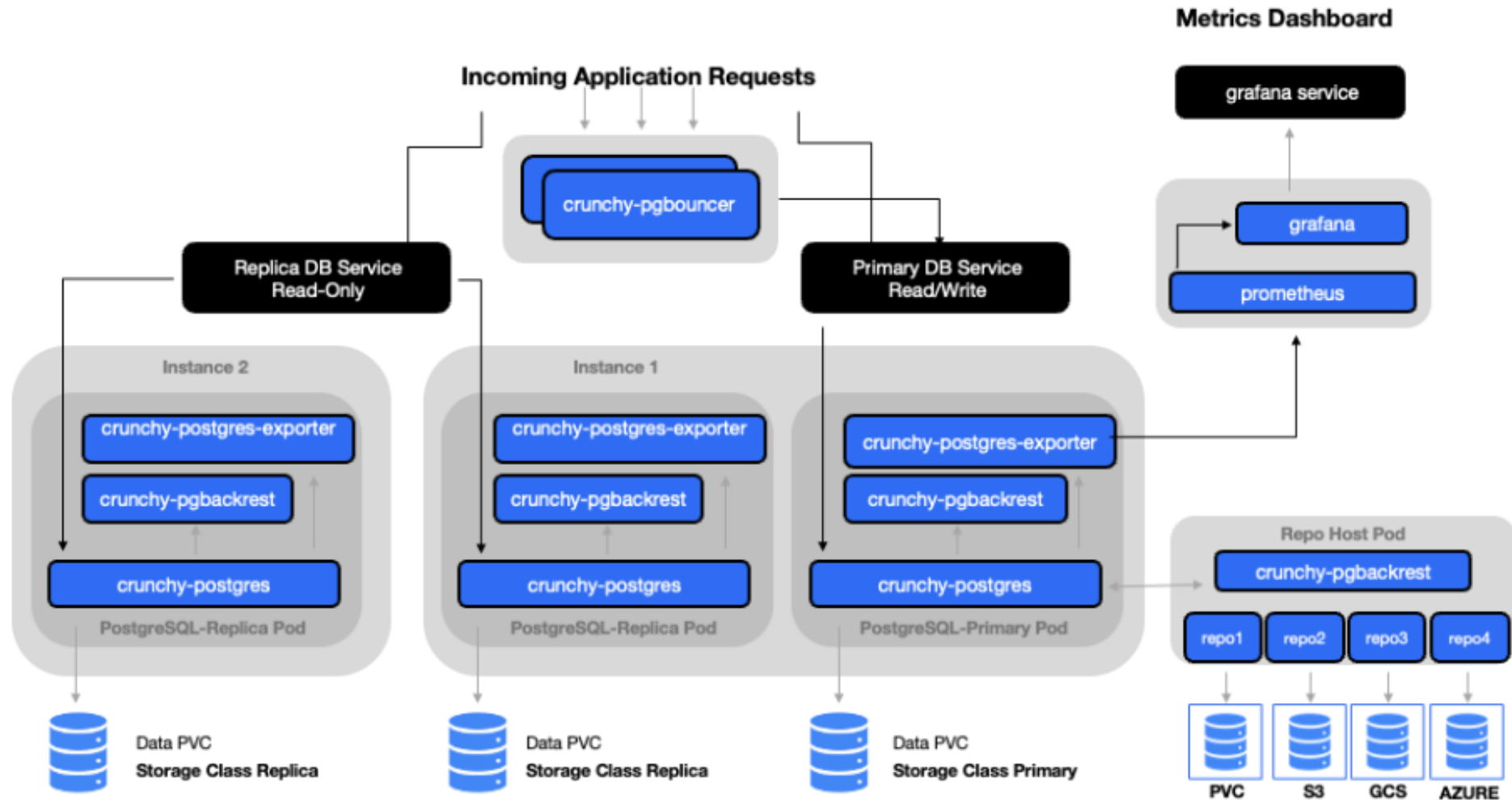
Easy Upgrades

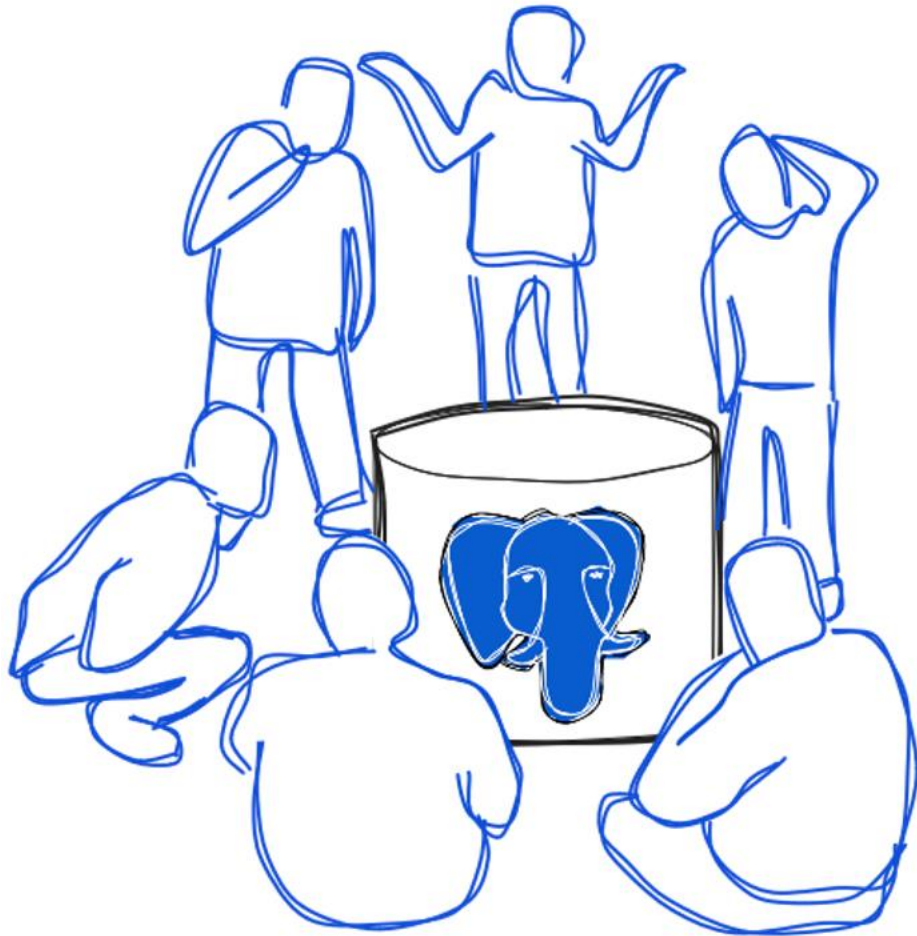
Keeping pace with security fixes and version updates is critical.

Why Postgres on OpenShift?

- Automation
- Deploying at scale
- Multi-tenancy
- Microservices
- OpenShift already in use
- Database as a Service (DBaaS)

Enterprise Scale Postgres





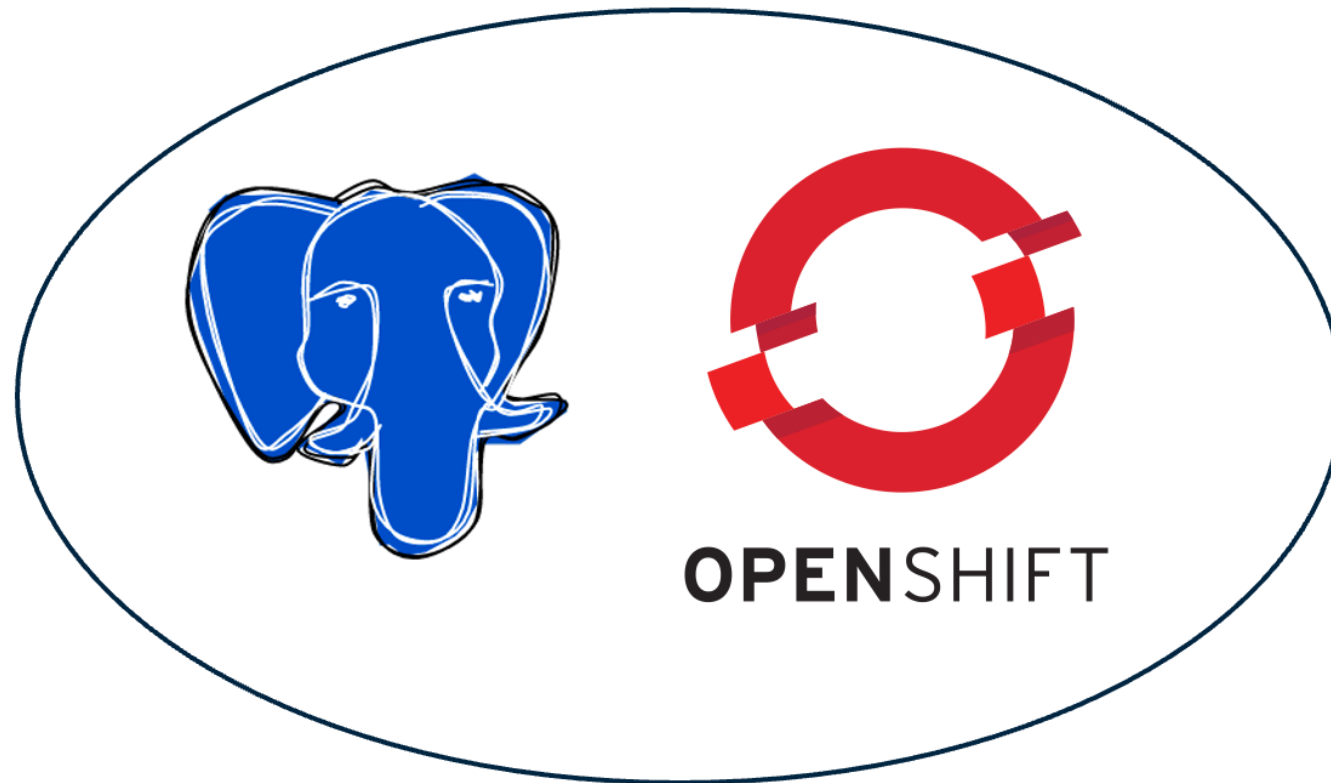
Enterprise PostgreSQL on OpenShift



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Crunchy Postgres for Kubernetes



Crunchy Postgres for Kubernetes

- Enterprise scale PostgreSQL on OpenShift
- Combined strength of OpenShift and Postgres
- Robust, secure, scalable architecture
- Virtual database administrator

```
apiVersion: postgres-operator.crunchydata.com/v1beta1
kind: PostgresCluster
metadata:
  name: darmstadt
spec:
  postgresVersion: 16
  instances:
    - name: instance1
      replicas: 3
      dataVolumeClaimSpec:
        accessModes:
          - "ReadWriteOnce"
      resources:
        requests:
          storage: 1Gi
```

High Availability

Backup & Recovery

Security

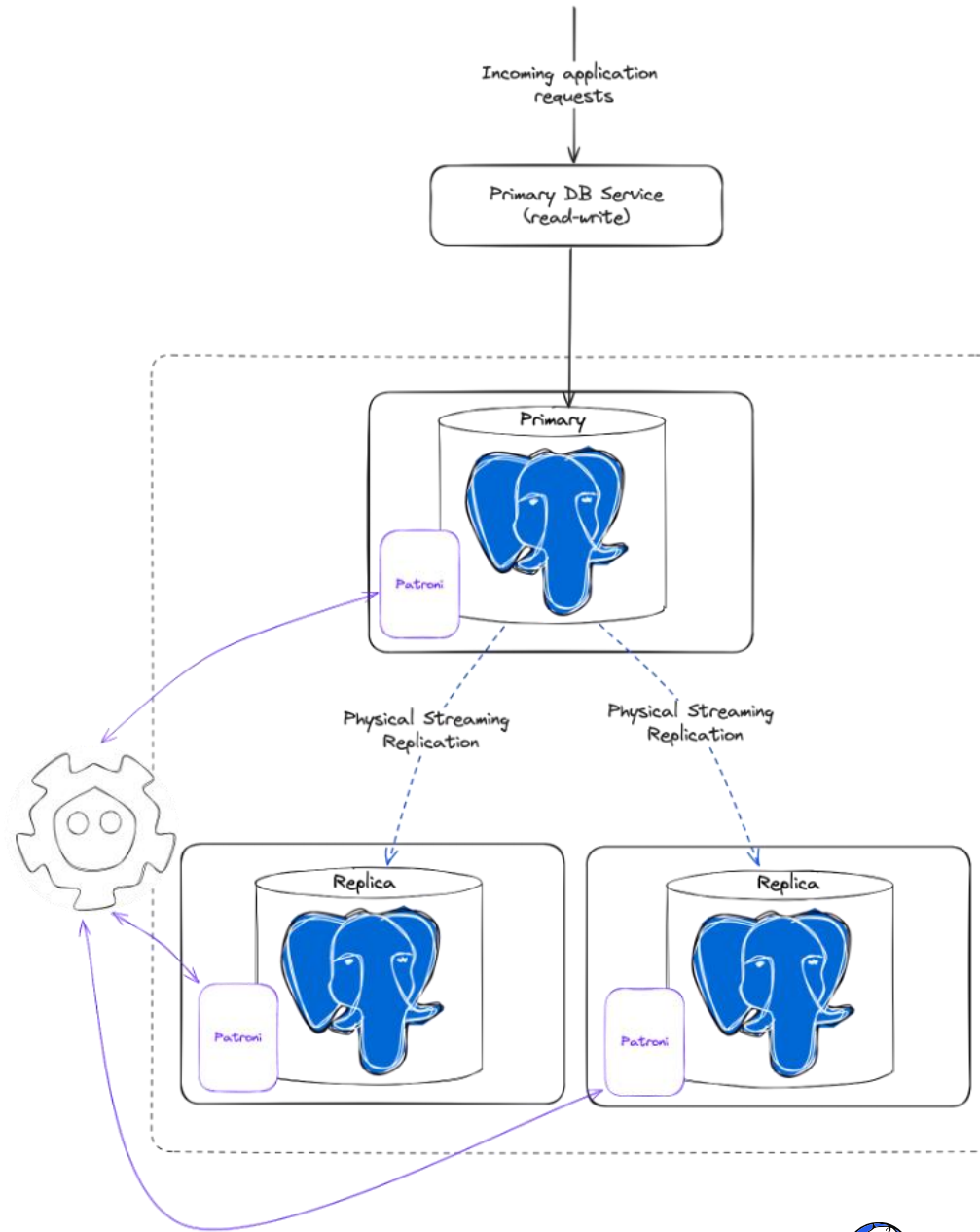
Monitoring

Install & Upgrade

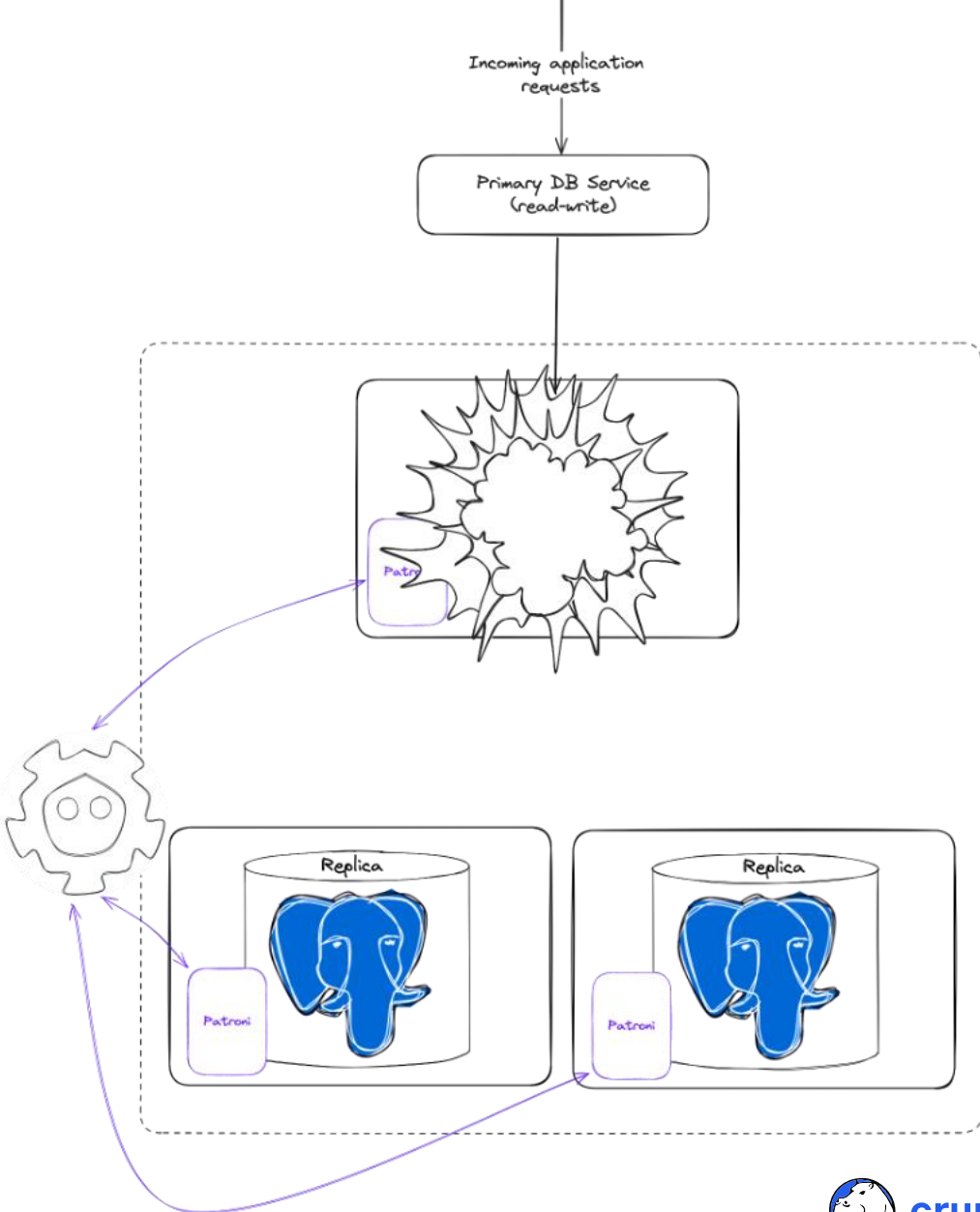
Provisioning & Scaling

Your Virtual DBA

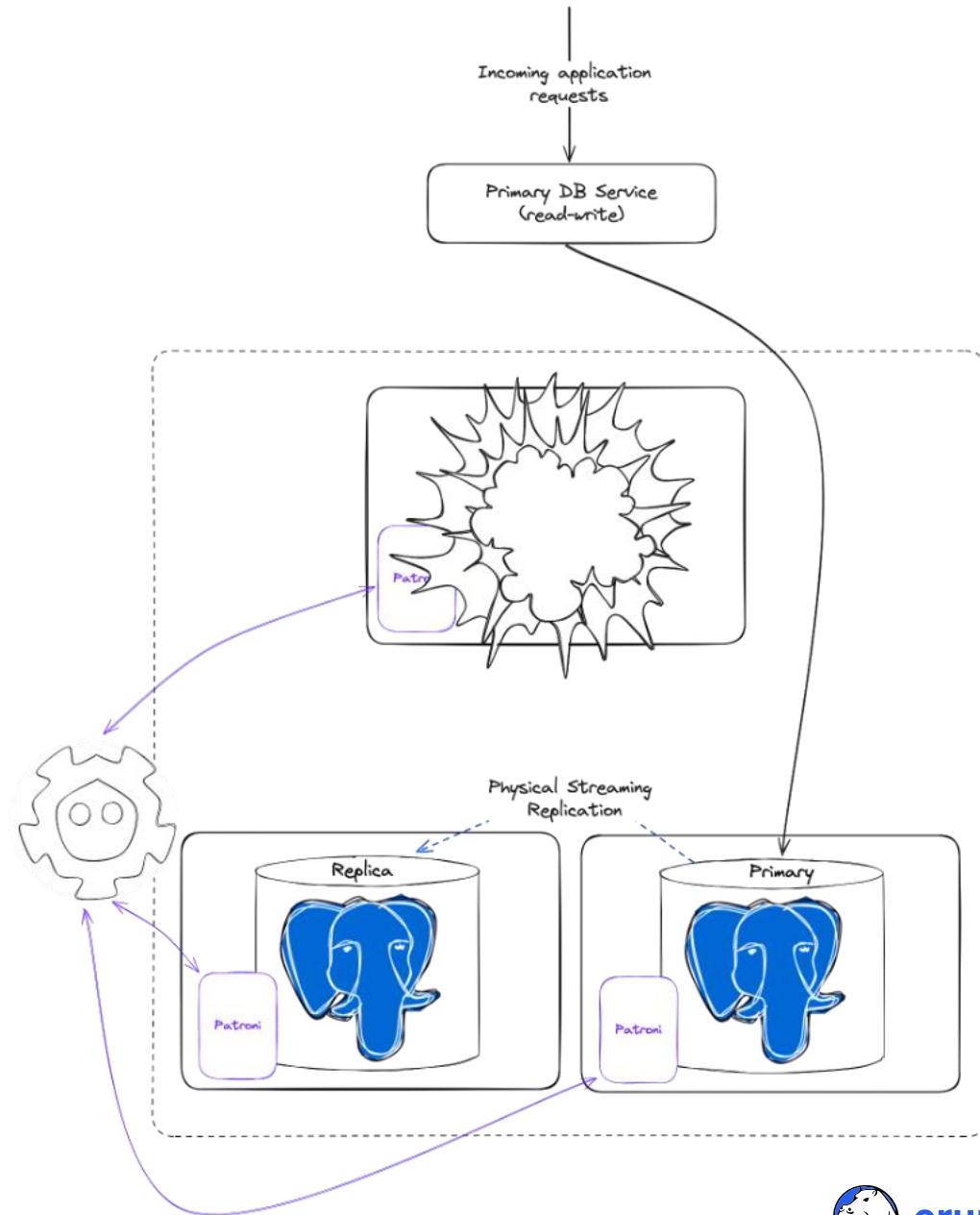
CPK: High Availability



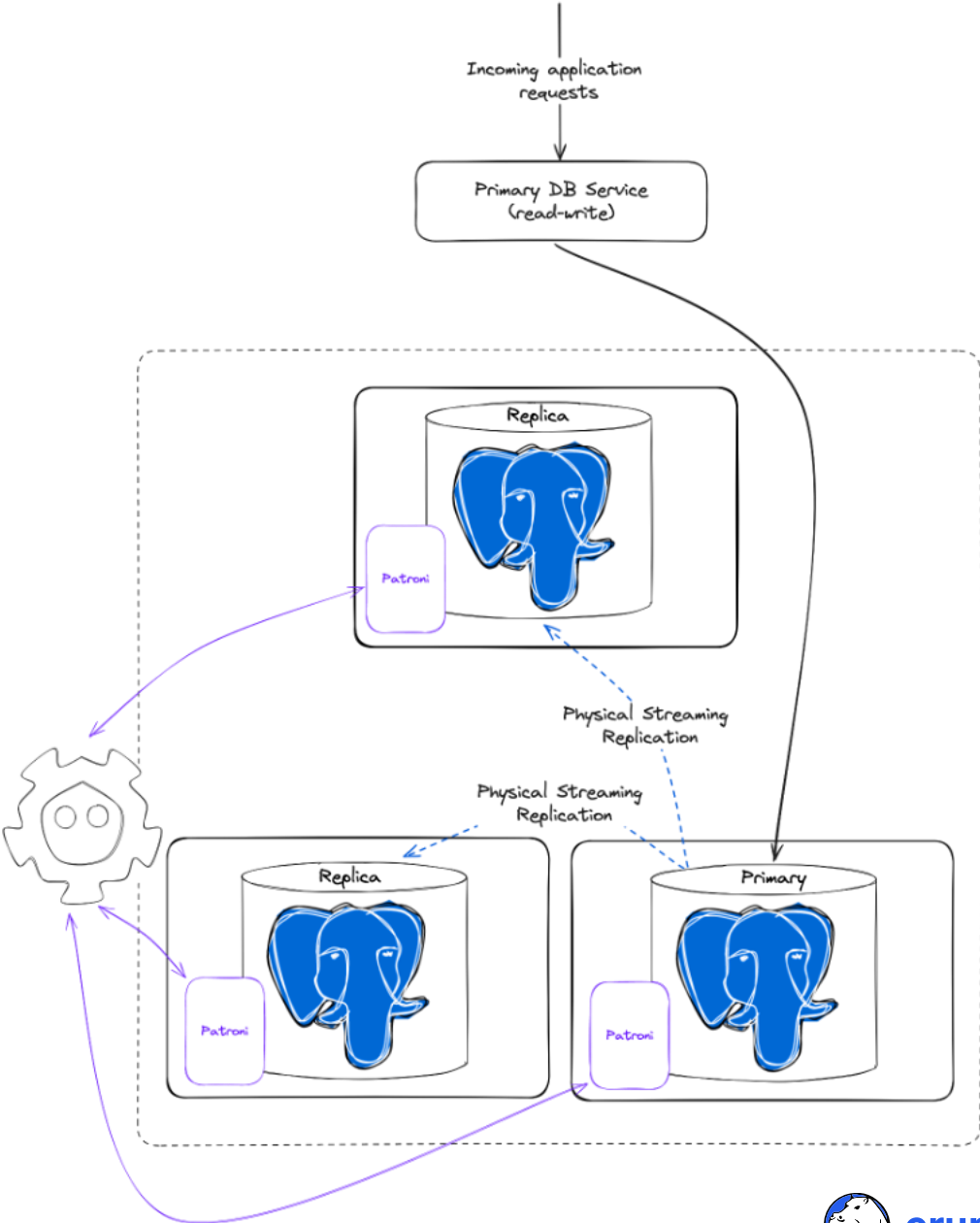
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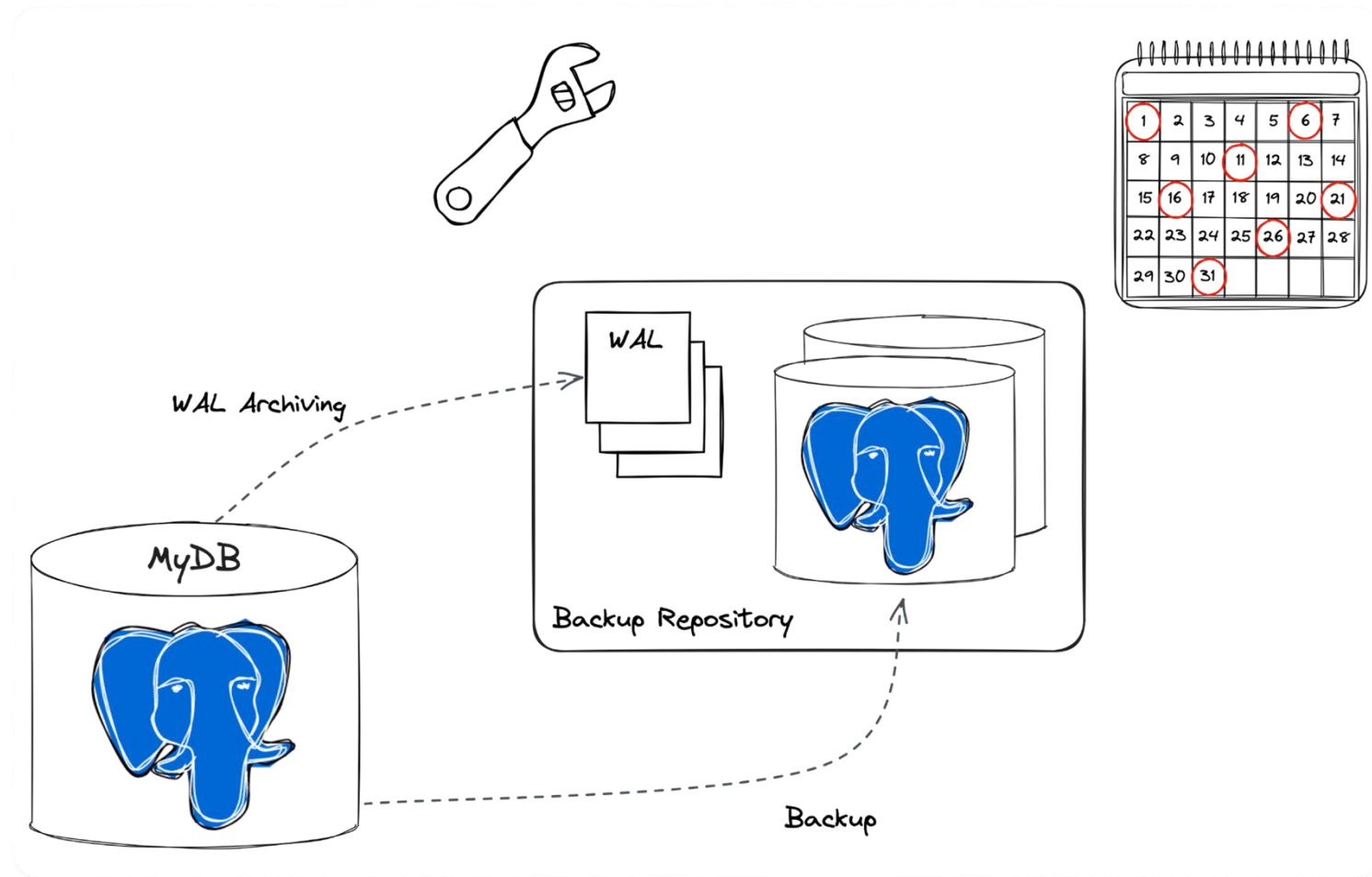
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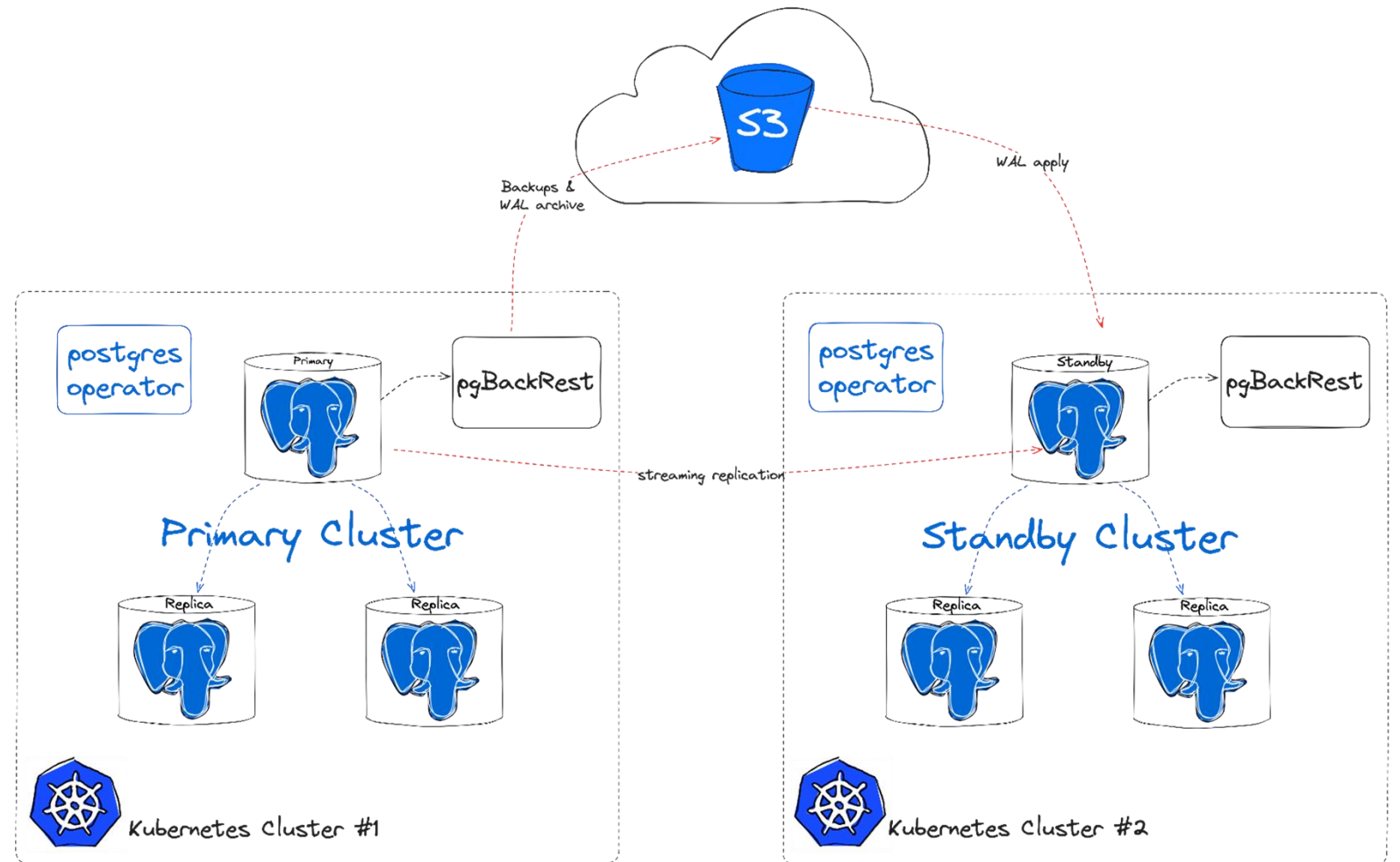
CPK:
High
Availability

- OpenShift
- Operator (PostgresCluster)
- Patroni

CPK: Backup & Recovery



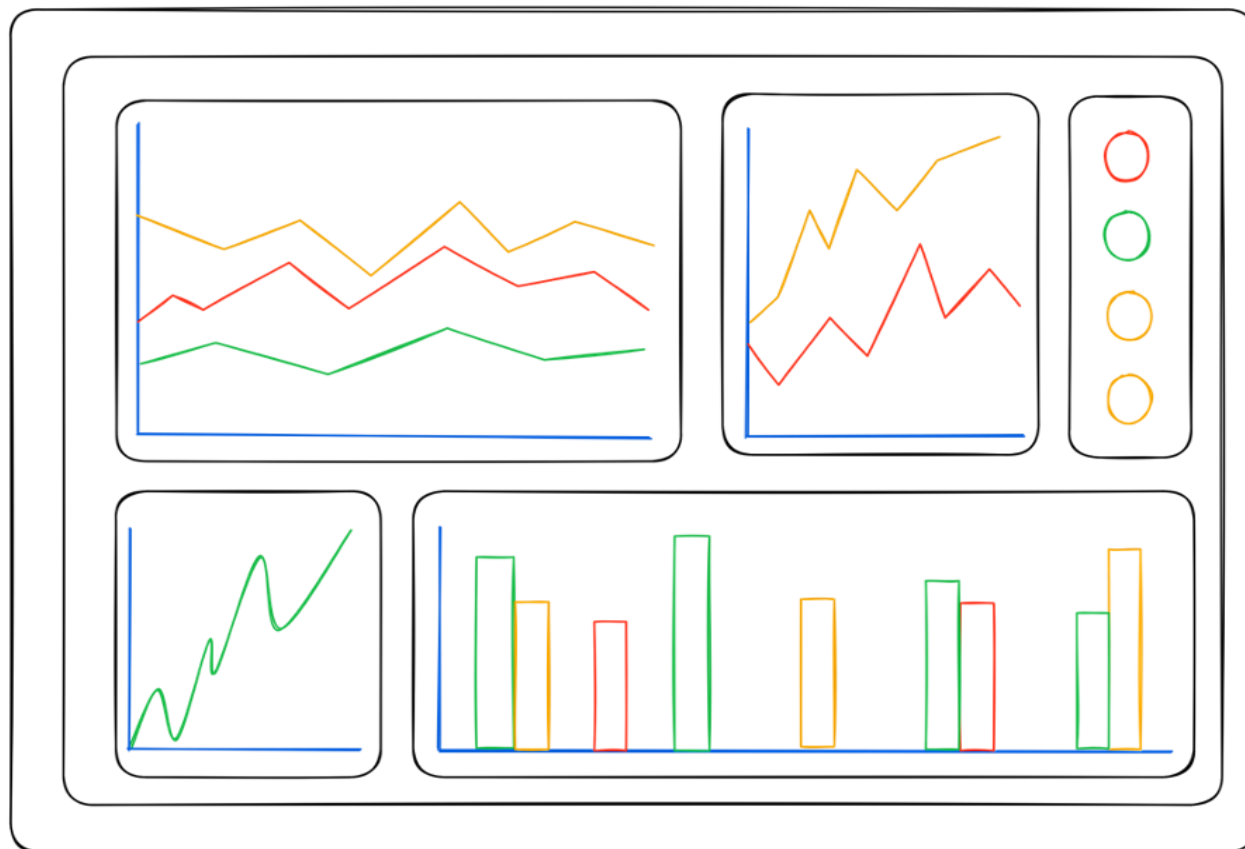
CPK: Backup & Recovery



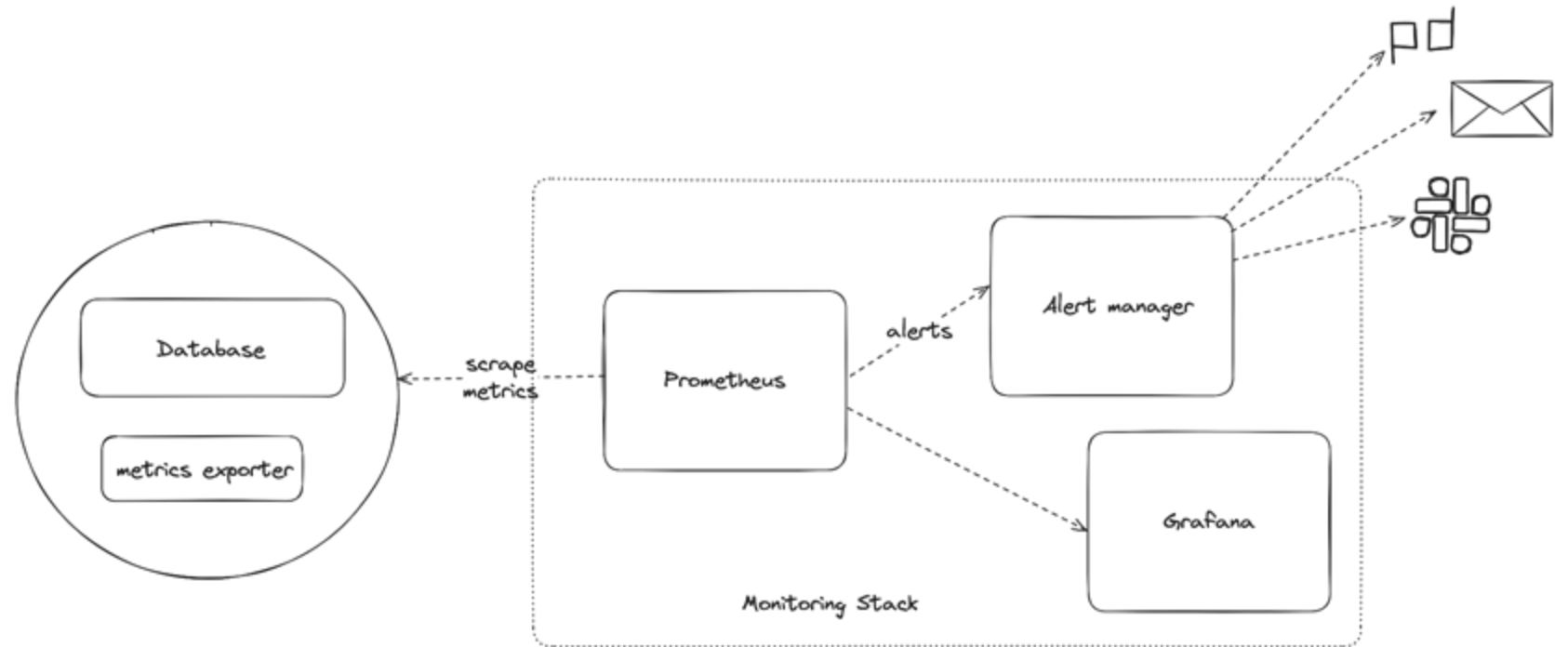
CPK: Security

- Database Access
- Password Encryption
- Secrets
- SSL/TLS
- Certificates

CPK: Monitoring

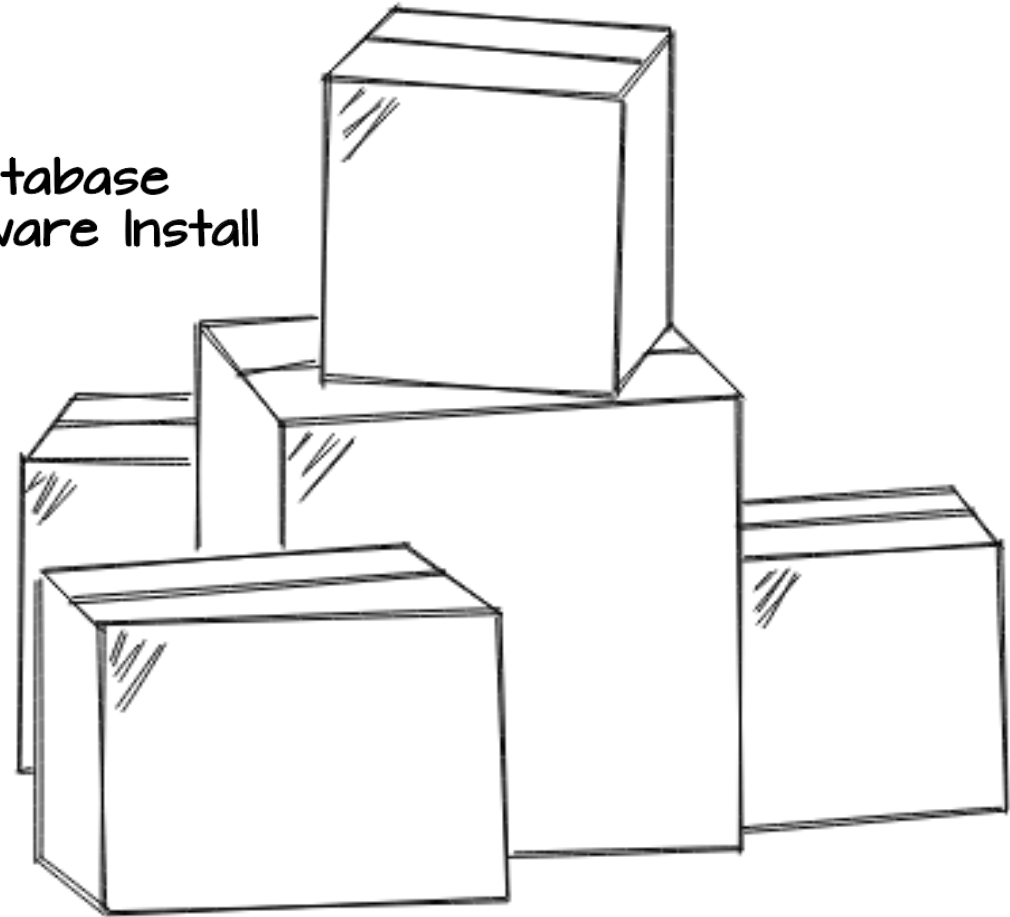


CPK: Monitoring



CPK: Database Software Install & Upgrade

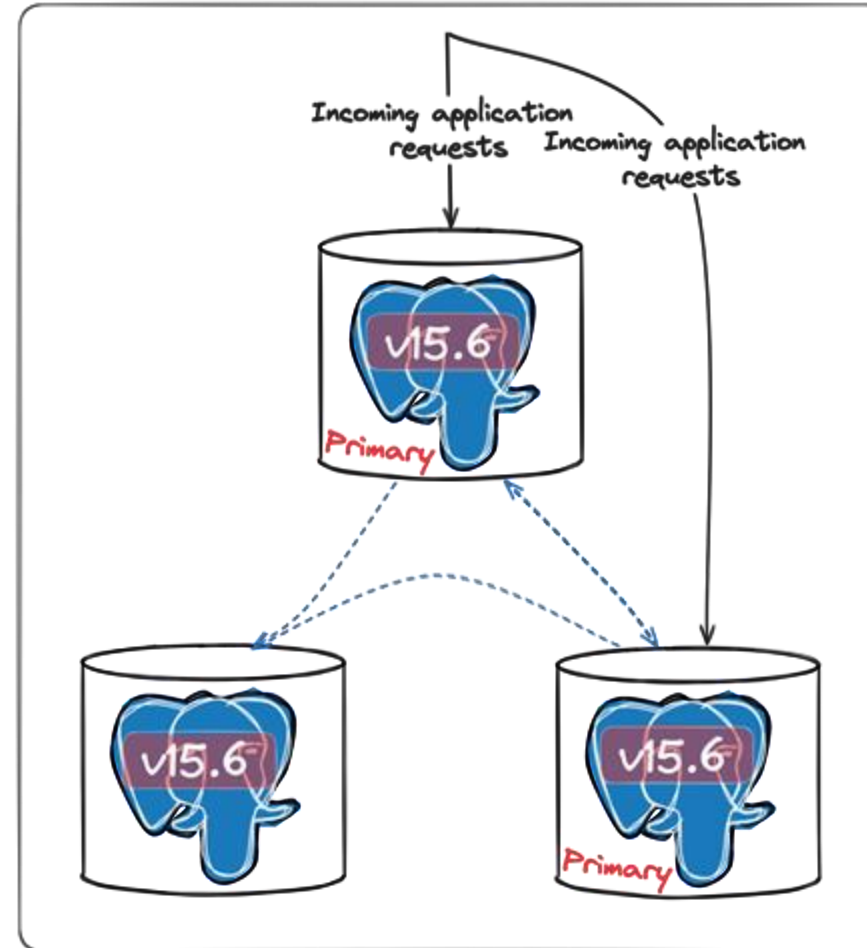
Database
Software Install



CPK: Database Software Install & Upgrade

Postgres Minor Upgrade

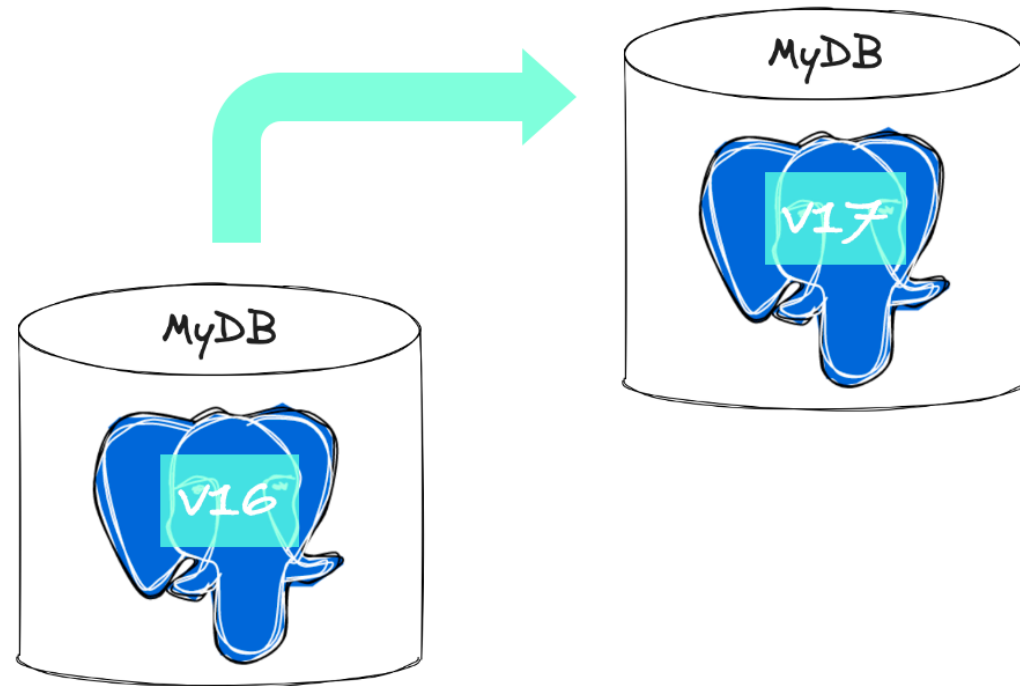
Ordered, automated rolling updates



CPK: Database Software Install & Upgrade

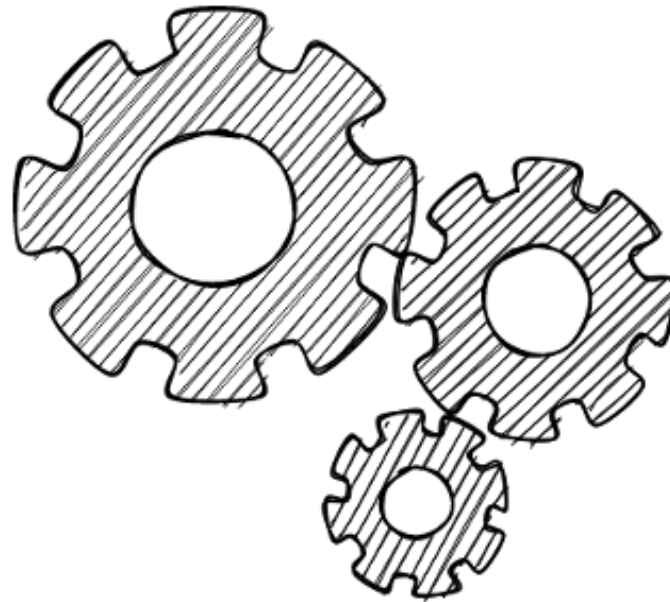
Postgres Major Upgrade

Automated by Operator



CPK: Scaling

- Configuration Parameters
- Connection pooling



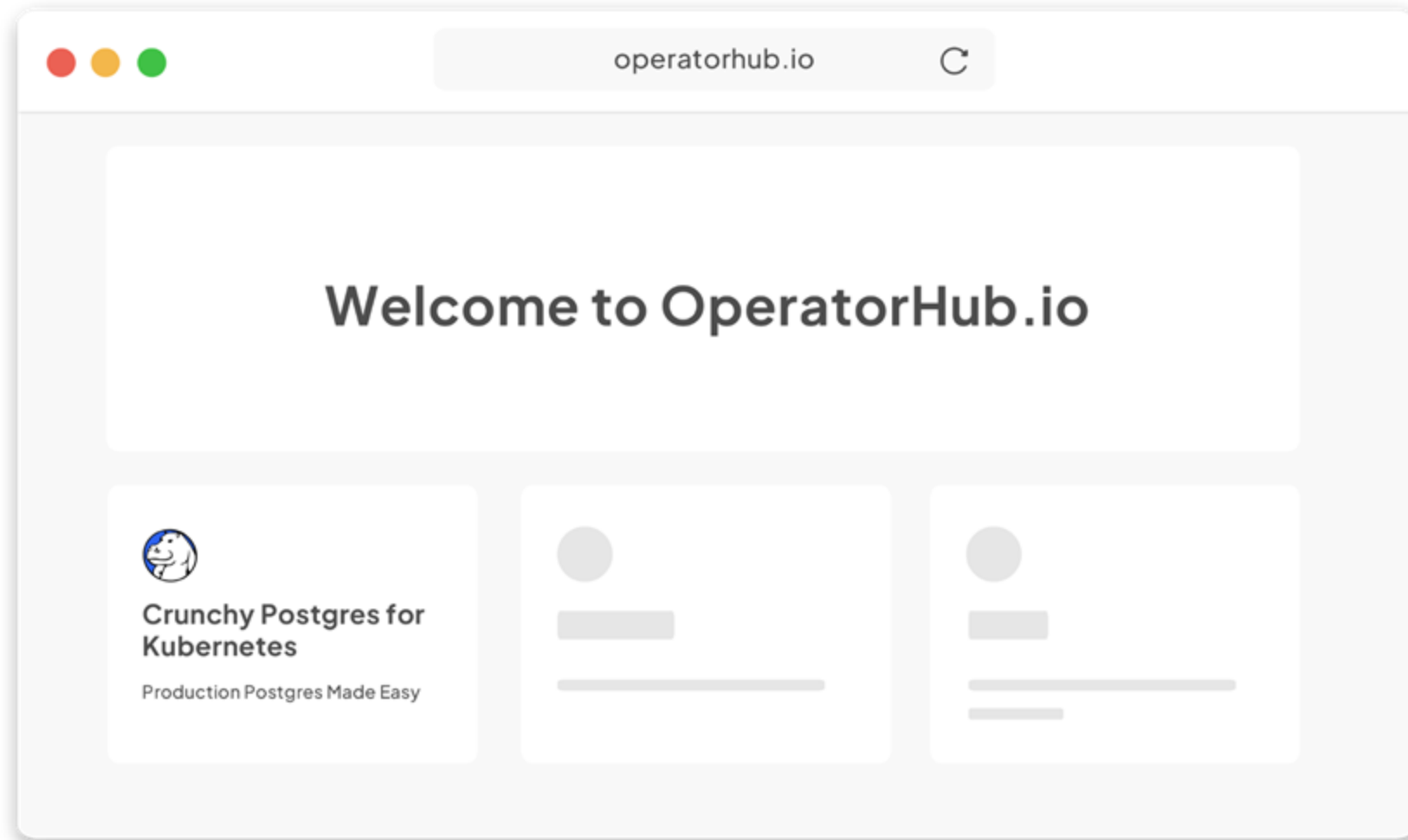
CPK: Capacity Planning

```
dataVolumeClaimSpec:  
  accessModes:  
  - "ReadWriteOnce"  
  resources:  
    requests:  
      storage: 1Gi  
      storage: 10Gi
```

CPK: Database Creation

```
users:  
- name: connect  
  databases:  
    - darmstadt
```

Easy Button



A wireframe elephant, composed of a network of white lines forming a mesh, is positioned on the left side of the image against a solid blue background. The elephant is facing right, with its trunk extending towards the center of the frame.

Demo

<https://github.com/CrunchyData/postgres-operator-examples>

Crunchy Postgres for Kubernetes

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Thank You!

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