Operadores de Kubernetes

Introducción

Lima, Peru 2023

PERCONA UNIVERSITY

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- Technology Evangelist at Percona
- Embajadora de Cloud Native Computing Foundation
- Capitan de Docker
- Colaborador de código abierto: Apache Airflow, Kubernetes Website

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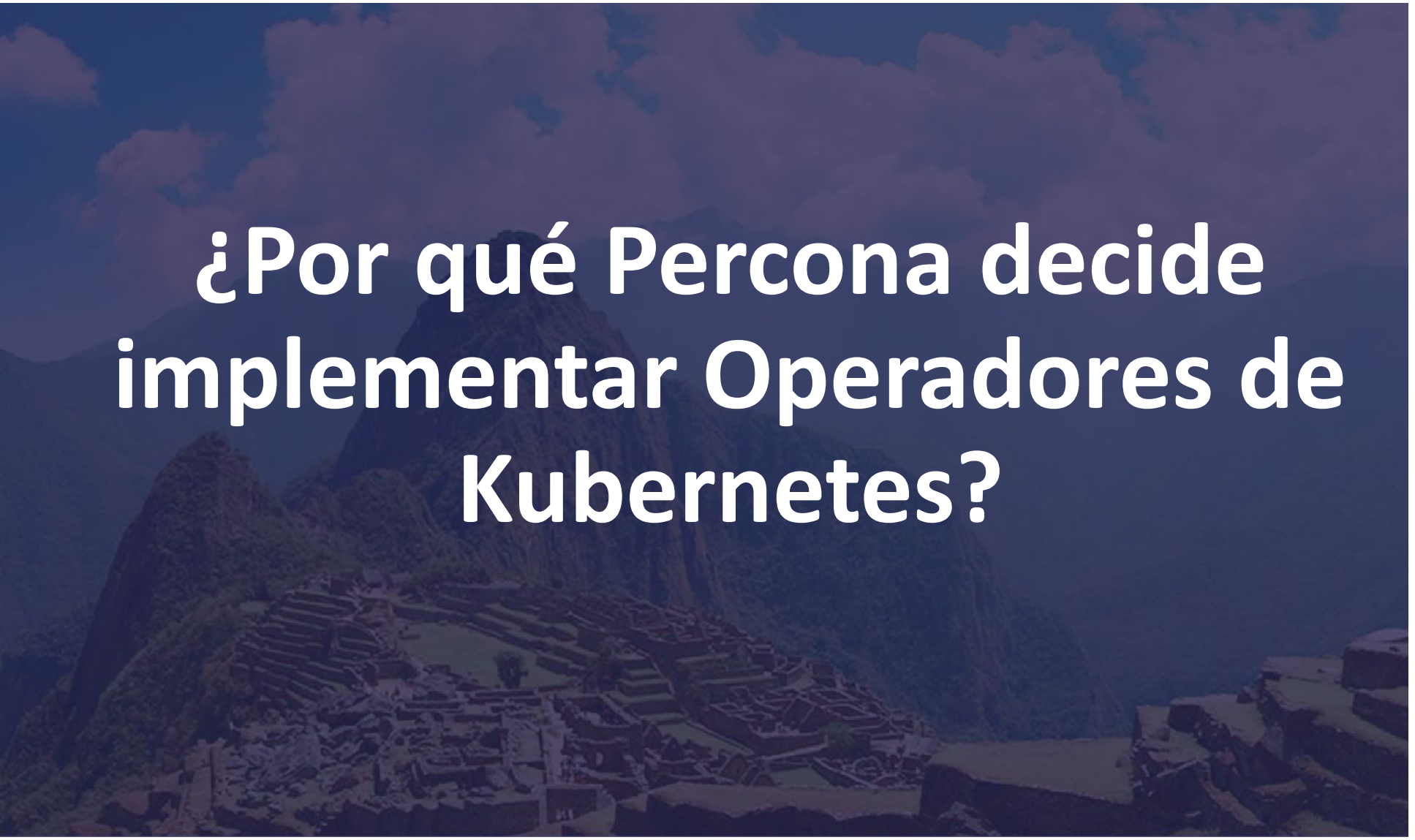
Agenda

- ¿Por qué Percona decide implementar Operadores de Kubernetes?
- Kubernetes
  - Terminología, ejemplo y arquitectura
- Operadores de Kubernetes
  - CRD, Controllers, Con y Sin Operadores, Capability Model
  - Operator Hub, Operator Pattern and SDKs


START

¿Por qué Percona decide implementar Operadores de Kubernetes?



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- Decisión impulsada por el cliente/comunidad
- Contenedores -> Kubernetes
- Operadores = Simplificación + Automatización
  - Despliegue
  - Administración
  - Configuracón
- Aplicaciones complejas -> base de datos

Kubernetes

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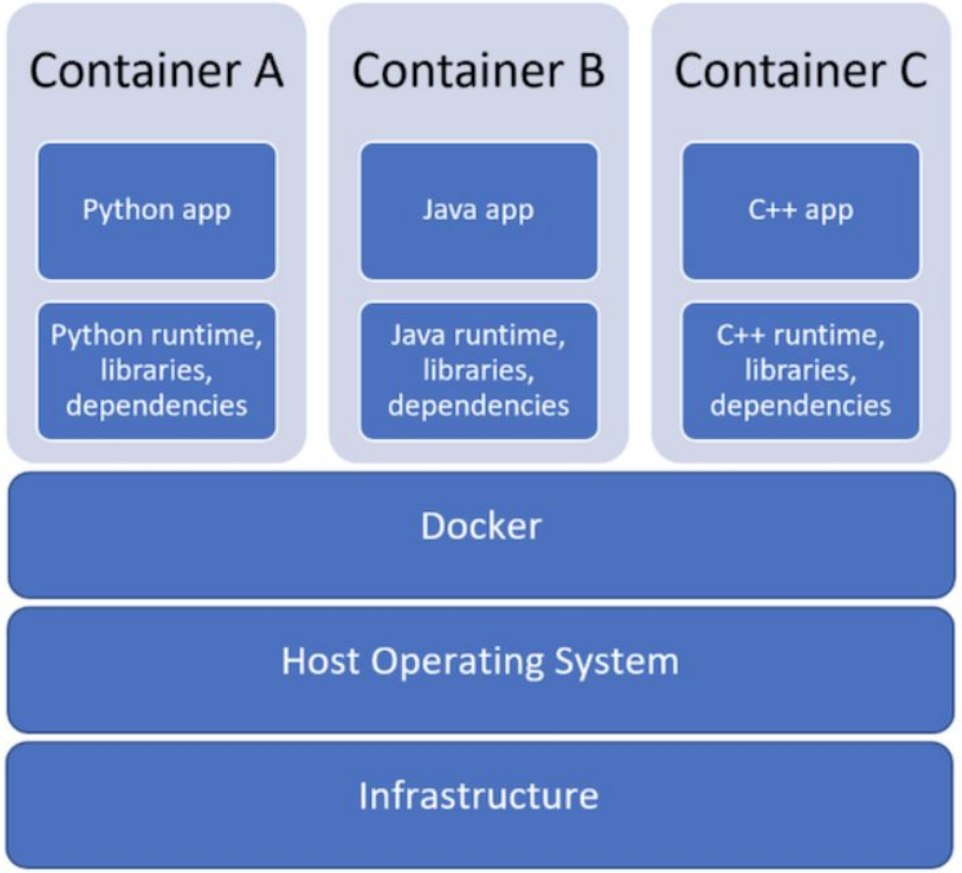
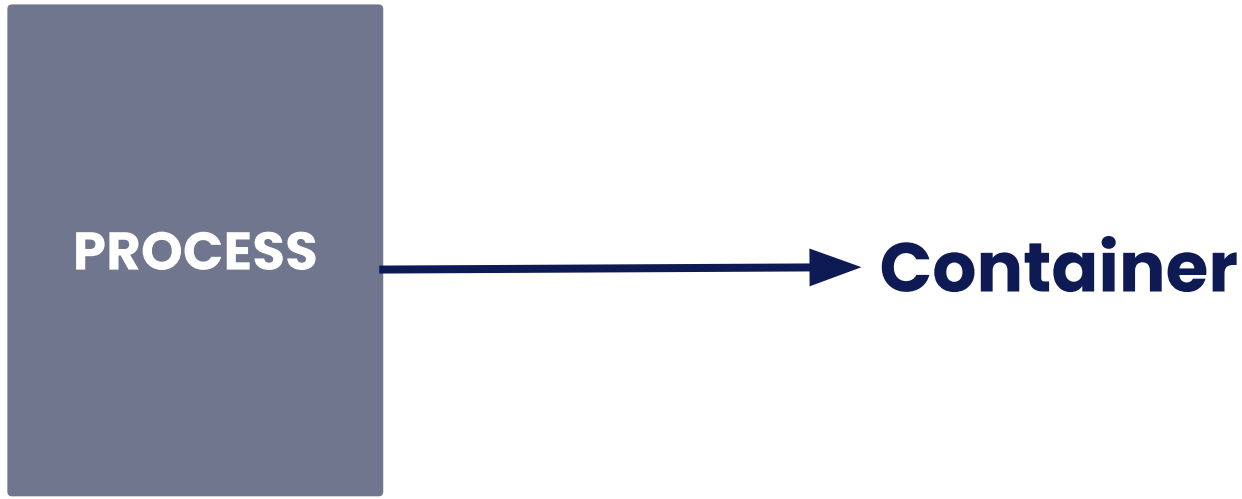
Contenedores

- Application
- Runtime
- Dependencies

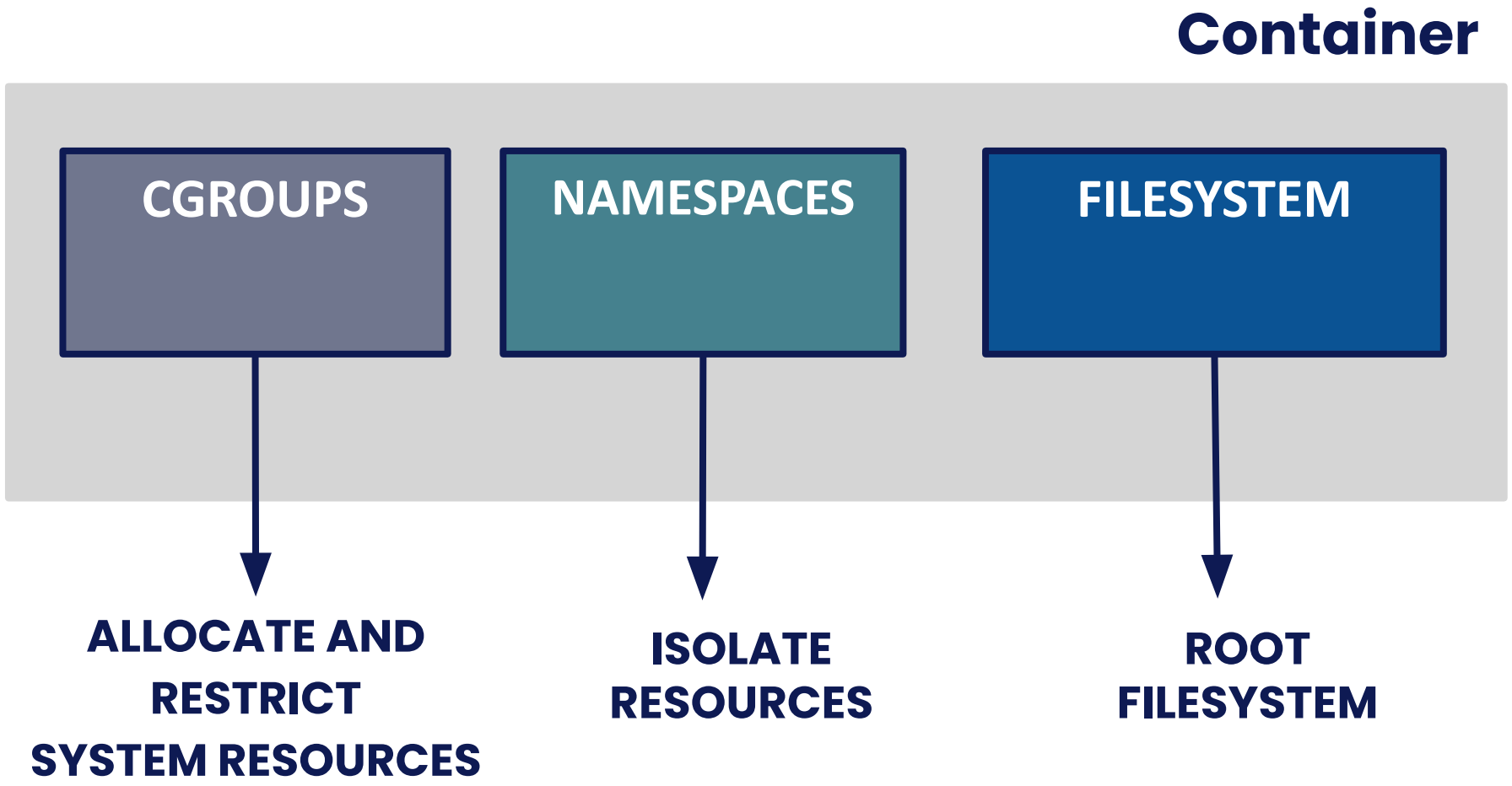


Simplificándolo



OPERATING SYSTEM

¿Qué hace un contenedor?



Desafíos con contenedores a escala

- Automatización
- Administrar servicios , Equilibrio de carga
- Gestión eficiente de los recursos
- Capacidades de autocuración (Self-healing capabilities)
- Provisión para actualización y reversión(update and rollback)

kubernetes

Advantages of Kubernetes

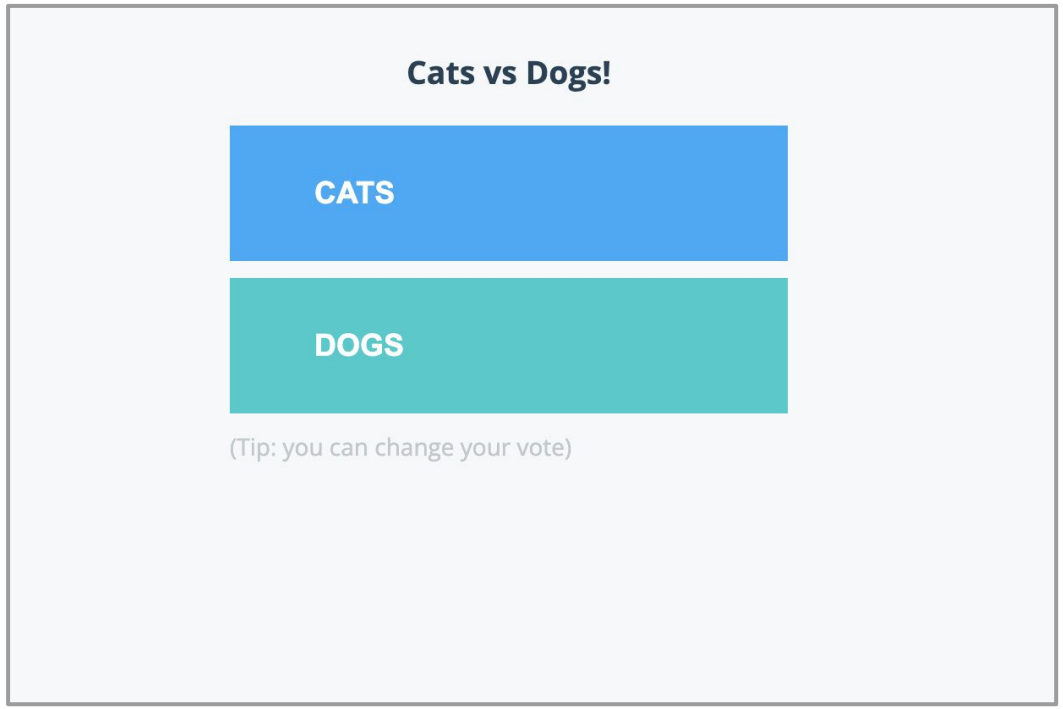
- Portabilidad de aplicaciones
- Sin bloqueo de proveedor (No Vendor lock-in)
- Buena opción para microservicios
- Comunidad activa (03 lanzamientos por año).
- Amplia adopción
- Community

Terminología Kubernetes

- Pods
- Deployments
- Services

Ejemplo: Application de Voto

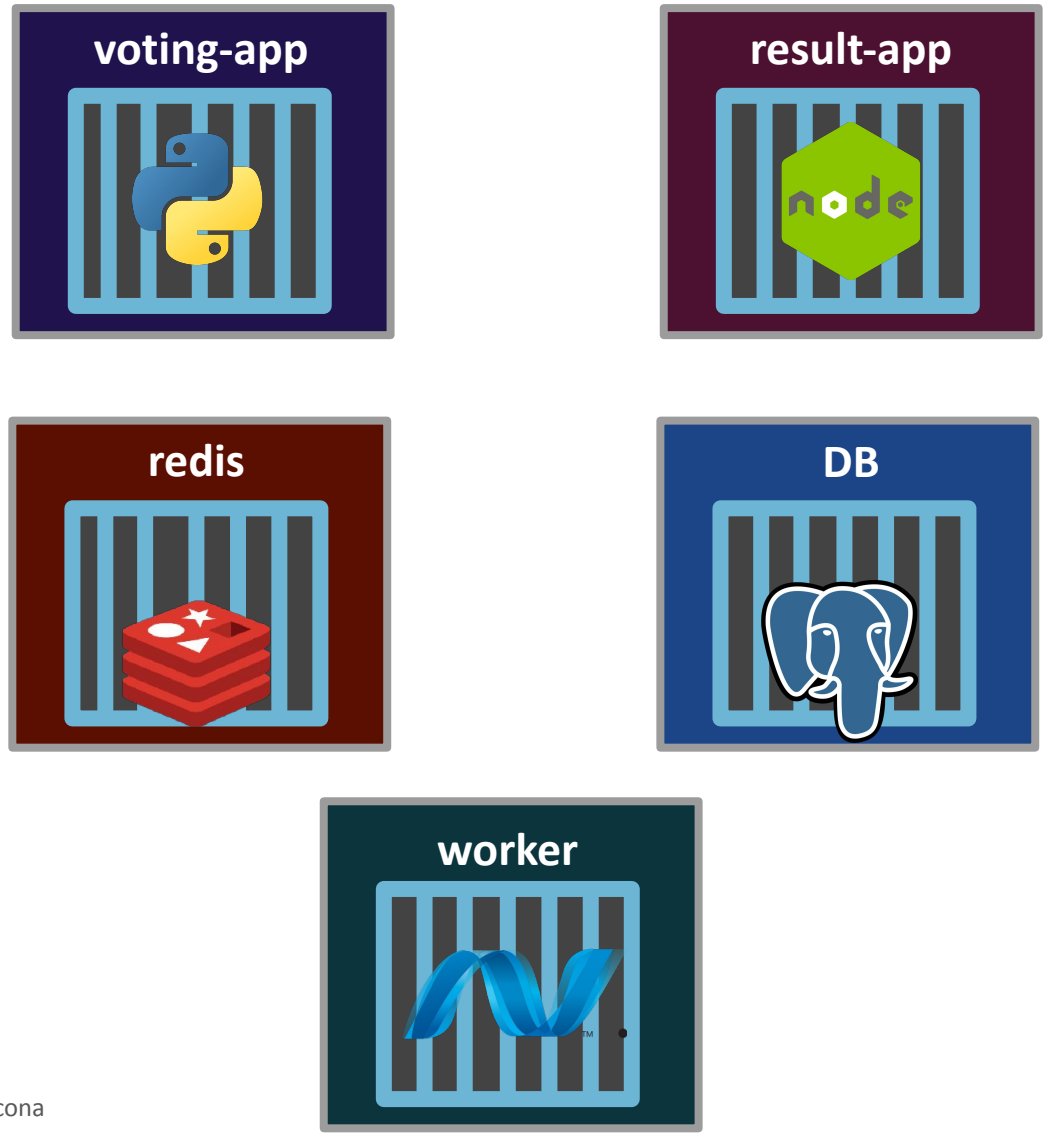
voting-app



result-app

KodeKloud: www.youtube.com/watch?v=XuSQU5Grv1g

Ejemplo: Application de Voto



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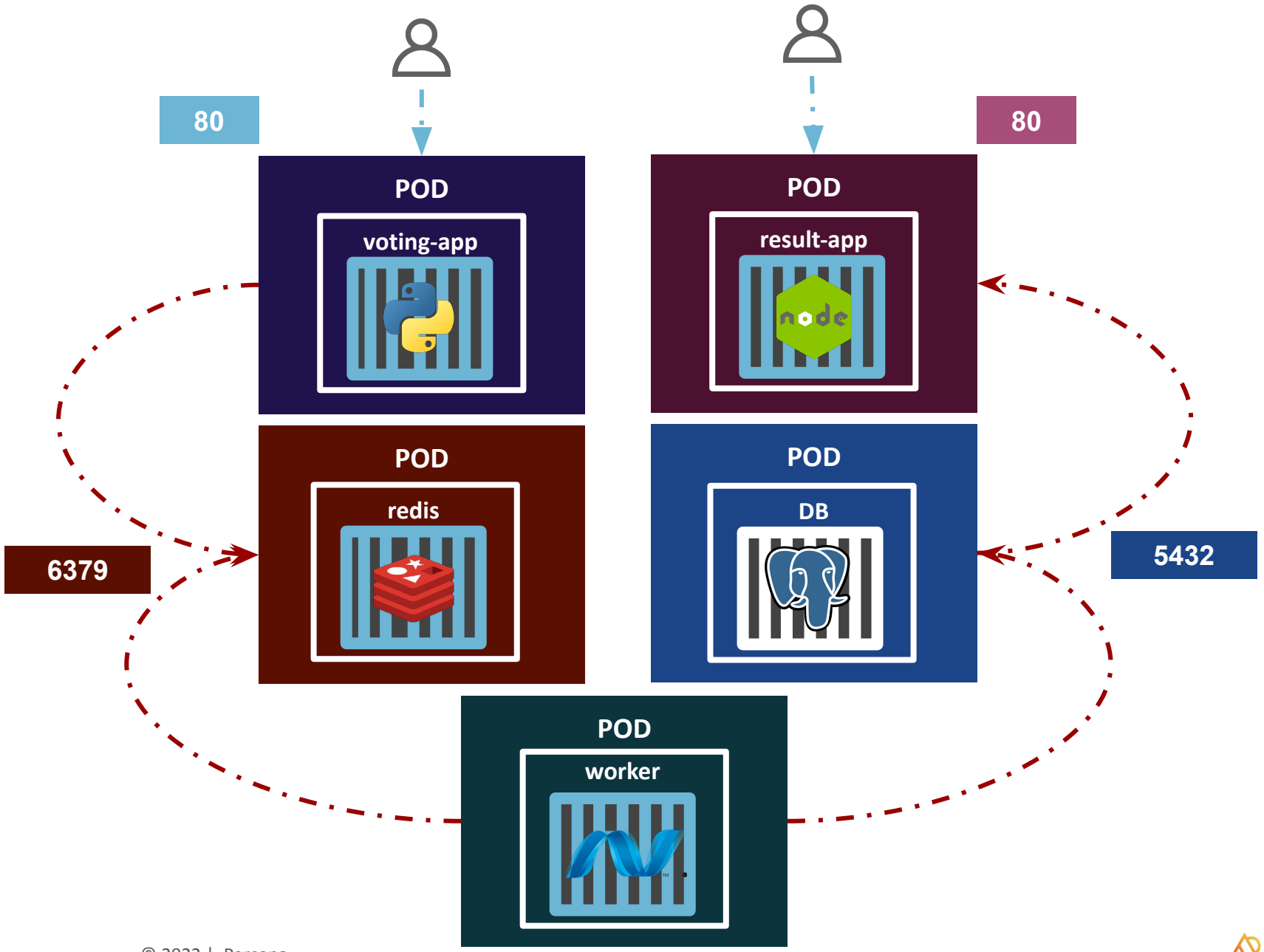
PODS



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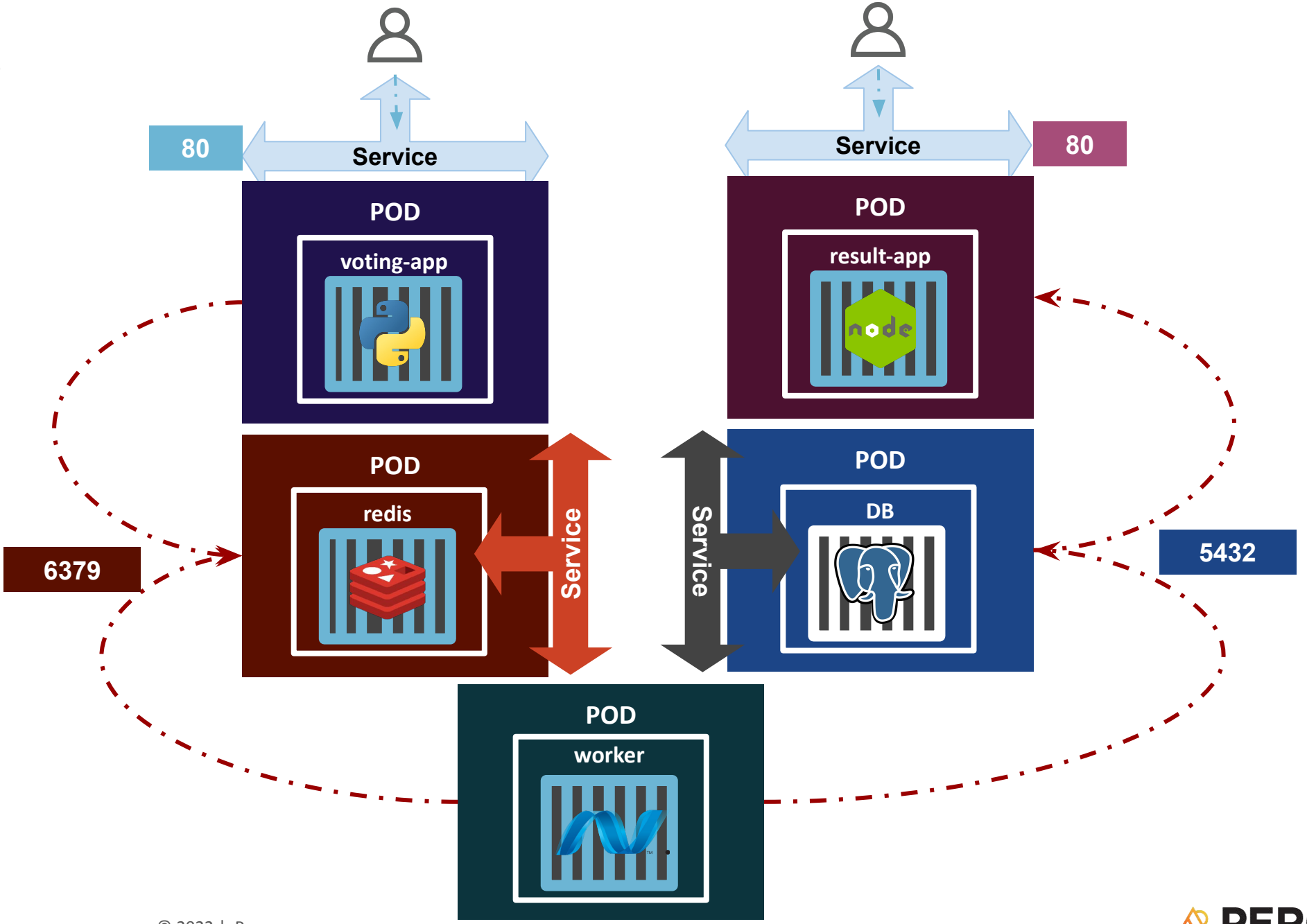
SERVICES



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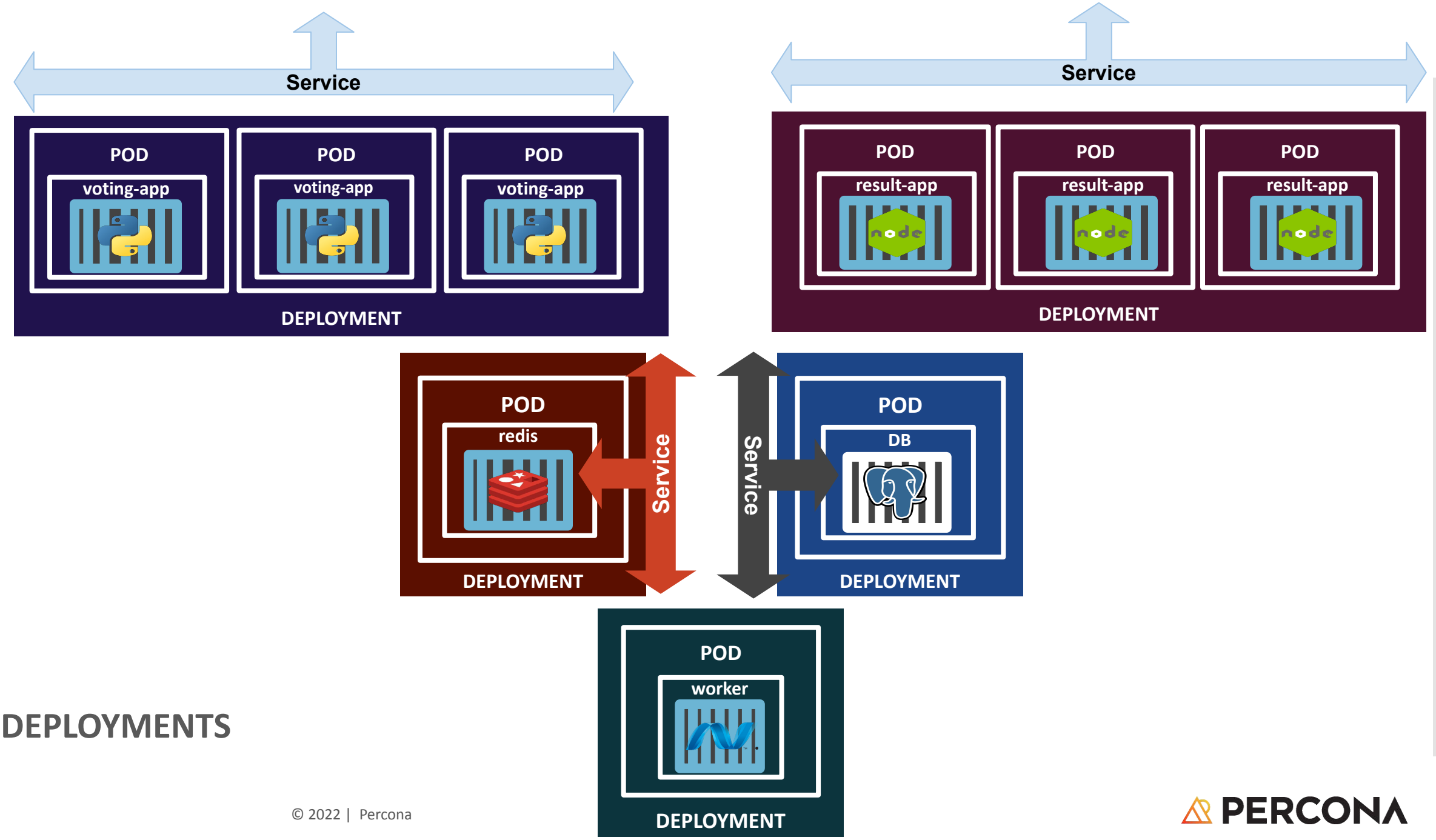

DEPLOYMENTS

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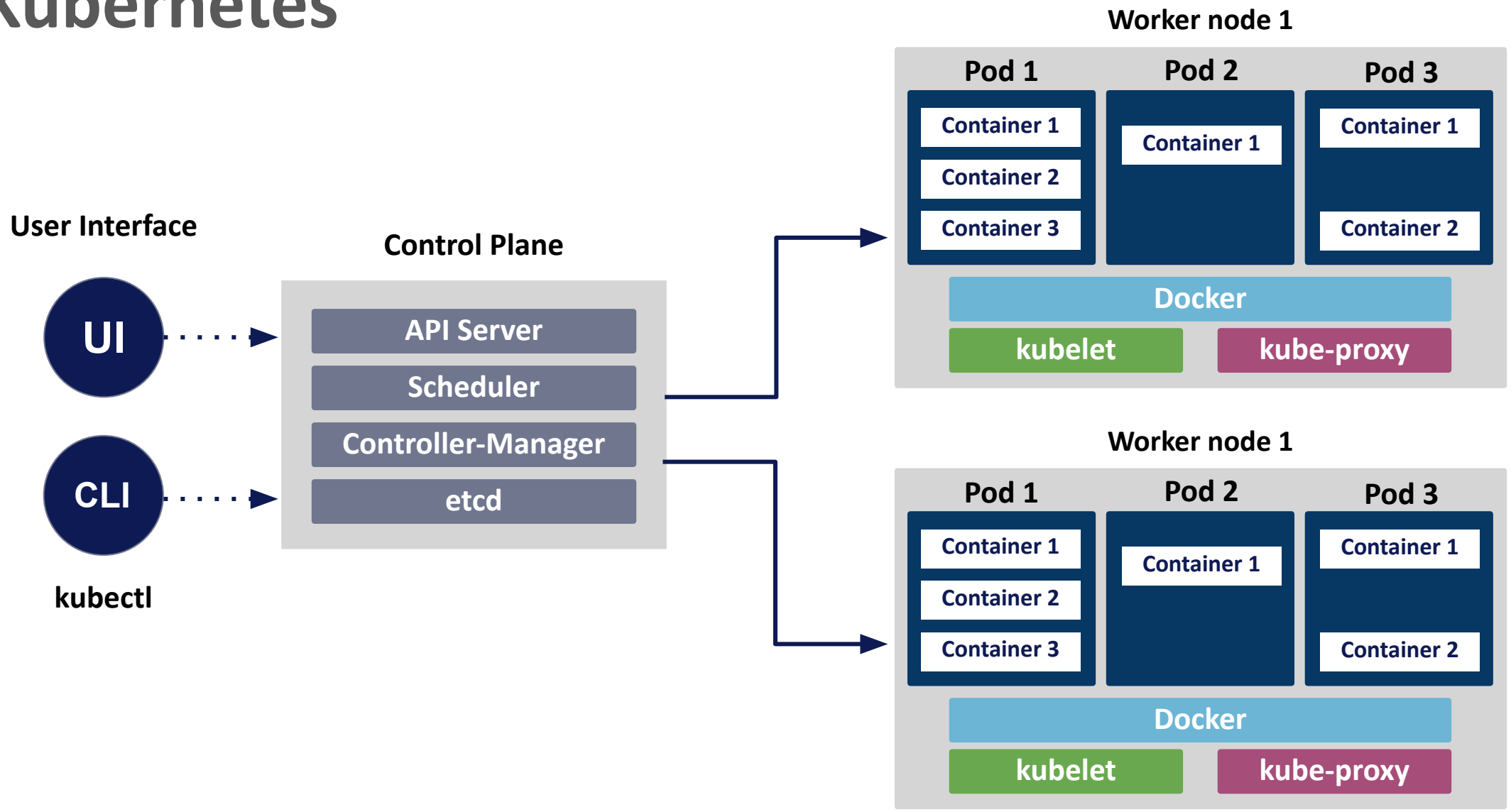
YAML

File: **voting-app-deploy.yaml**

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: voting-app-deploy
  labels:
    name: voting-app-deploy
    app: demo-voting-app
spec:
  replicas: 1
  selector:
    matchLabels:
      name: voting-app-pod
      app: demo-voting-app

  template:
    metadata:
      name: voting-app-pod
      labels:
        name: voting-app-pod
        app: demo-voting-app
    spec:
      containers:
        - name: voting-app
          image: kodekloud/examplevotingapp_vote:v1
          ports:
            - containerPort: 80
```

Arquitectura de Kubernetes



Kubernetes Operators

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Escalado de aplicaciones sin estado: fácil

```
$ kubectl scale deploy/staticweb --replicas=4
```

¿Qué pasa con las aplicaciones que almacenan datos?

“Deployar” una base de datos: fácil

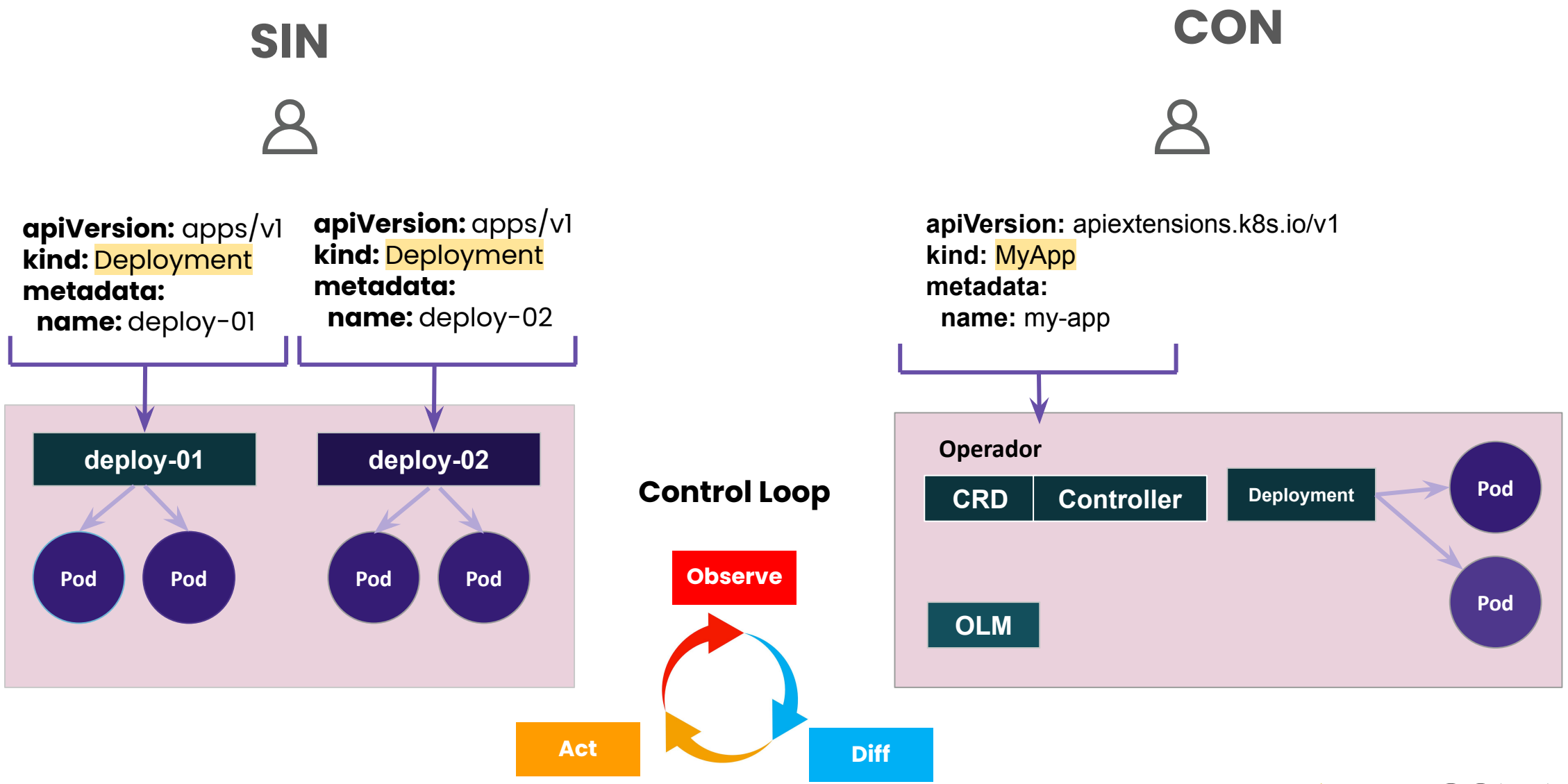
Ejecutar una base de datos a lo largo del tiempo es lo más difícil

Operators: Extienden la API de Kubernetes

1. Application-specific custom **controllers**
2. Custom Resource Definitions (**CRD**)

Los operadores siguen los principios de Kubernetes, en particular el **ciclo de control** (control loop).

Kubernetes Operators



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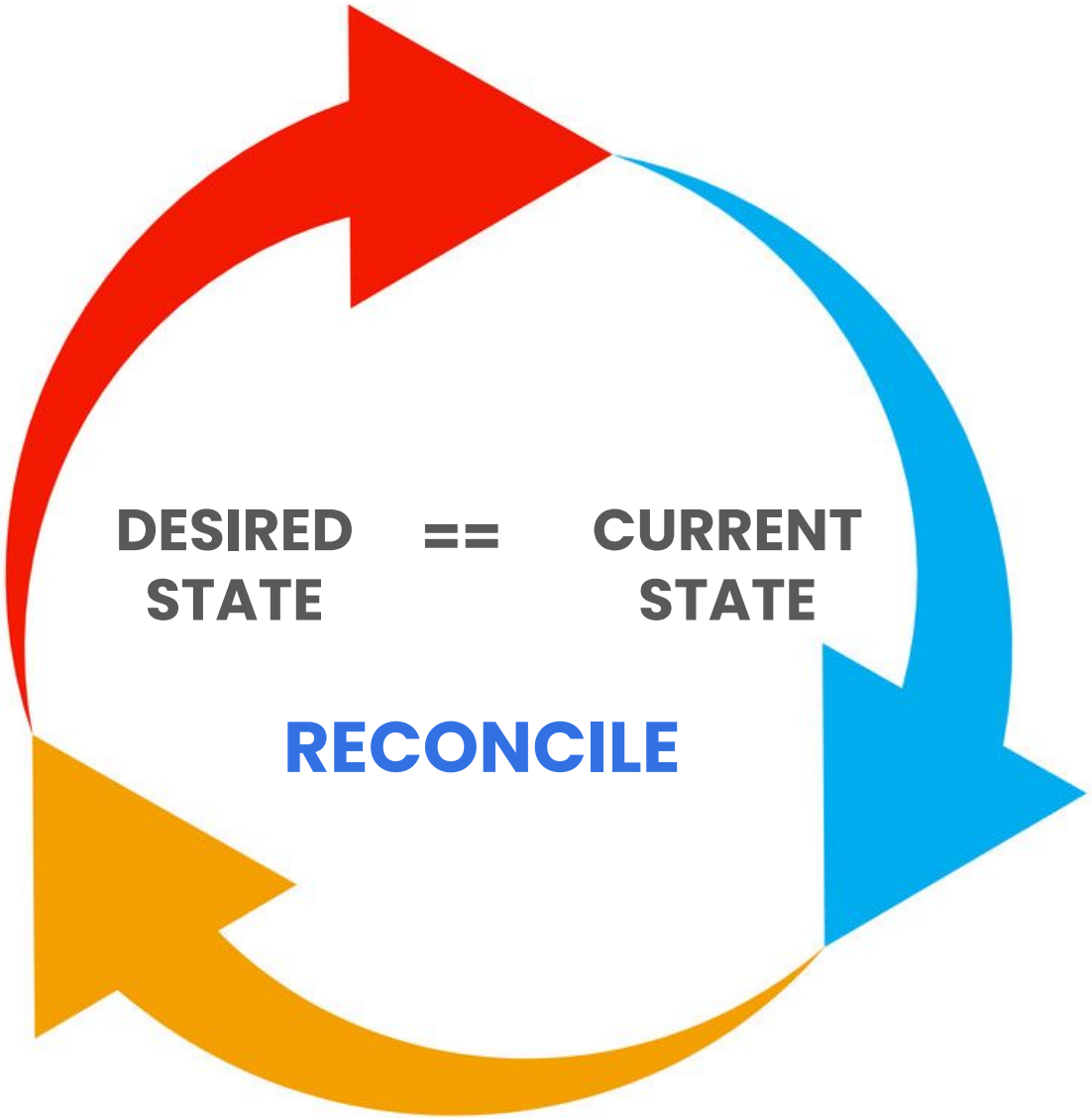
Custom Controller

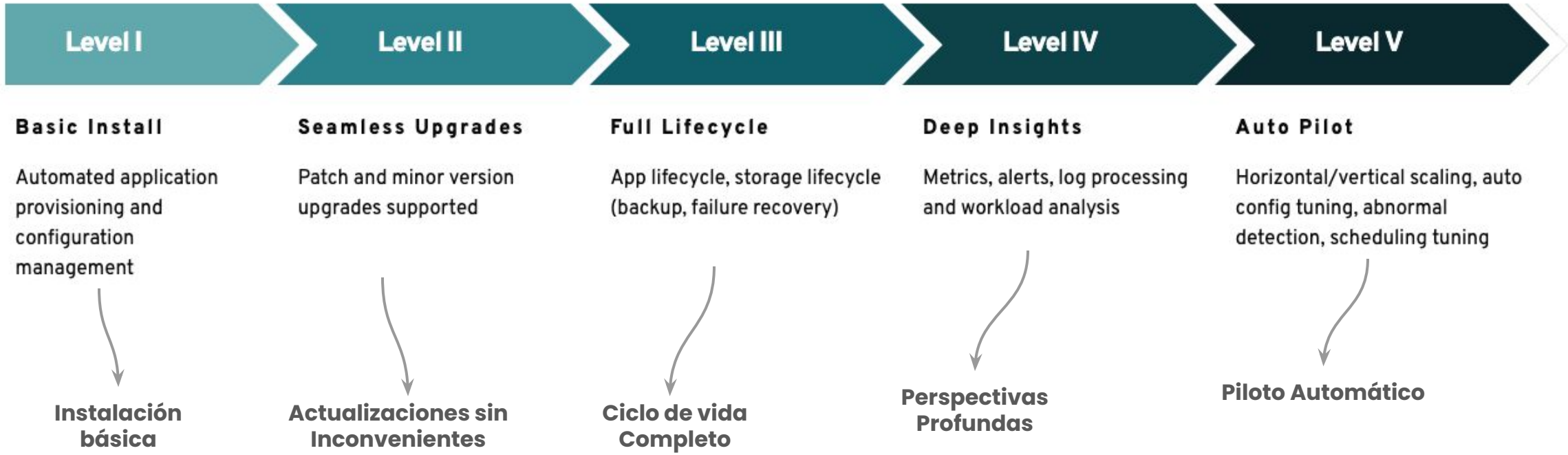


Custom Resource

Optionally Modify

Other K8s objects

Capability Model (Modelo de Capacidad)



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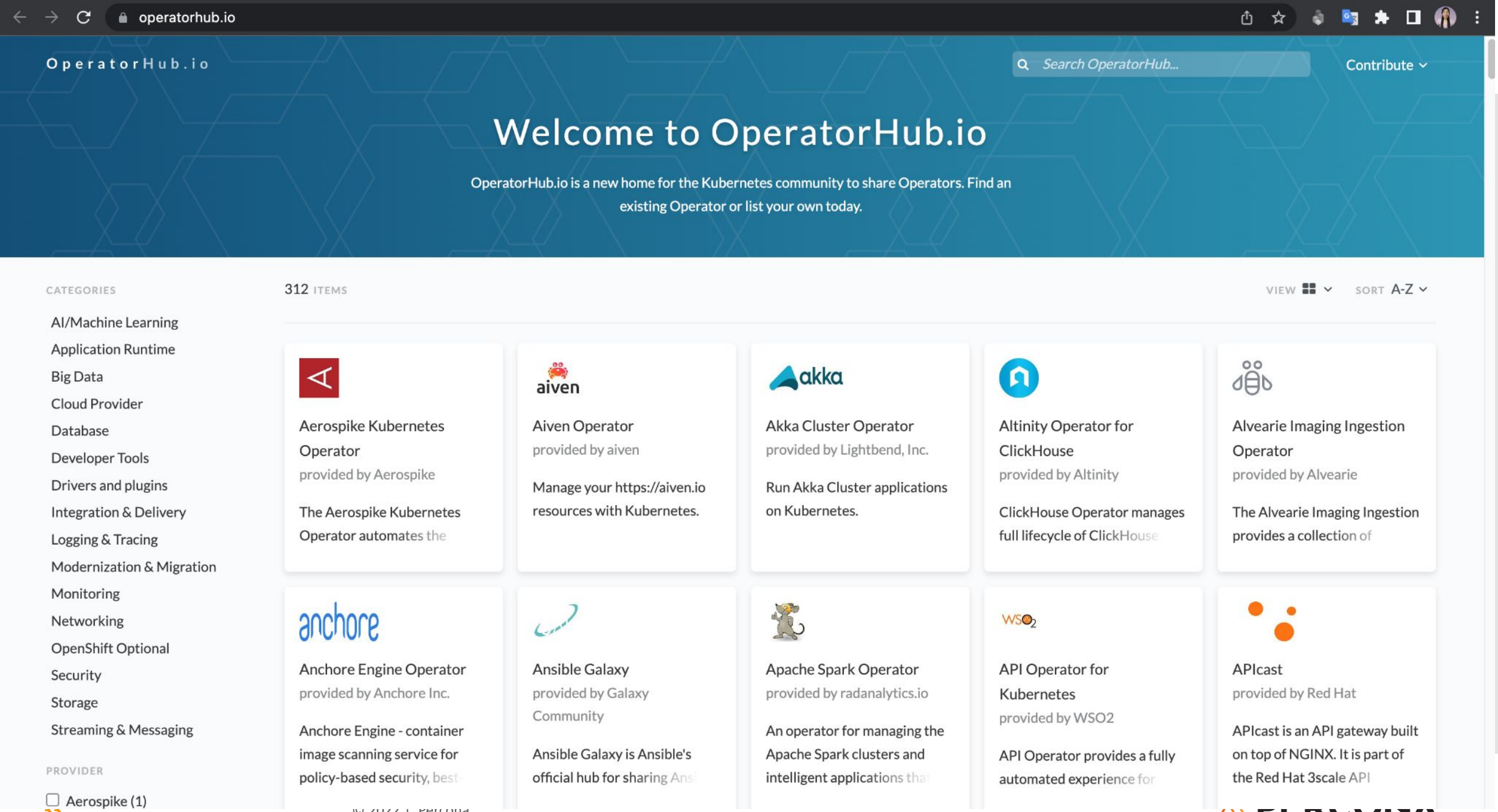

Percona Operator for MySQL based on Percona XtraDB Cluster

Percona Operator for MySQL based on Percona XtraDB Cluster manages the lifecycle of Percona XtraDB cluster instances.

Percona Operator for MySQL based on Percona XtraDB Cluster

Install

Percona is Cloud Native

Percona Operator for MySQL based on Percona XtraDB Cluster is an open-source drop in replacement for MySQL Enterprise with synchronous replication running on Kubernetes. It automates the deployment and management of the members in your Percona XtraDB Cluster environment. It can be used to instantiate a new Percona XtraDB Cluster, or to scale an existing environment.

Consult the documentation on the Percona Operator for MySQL based on Percona XtraDB Cluster for complete details on capabilities and options.

Supported Features

- **Scale Your Cluster** change the `size` parameter to add or remove members of the cluster. Three is the minimum recommended size for a functioning cluster.
- **Manage Your Users** add, remove, or change the privileges of database users
- **Automate Your Backups** configure cluster backups to run on a scheduled basis. Backups can be stored on a persistent volume or S3-compatible storage. Leverage Point-in-time recovery to reduce RPO/RTO.
- **Proxy integration** choose HAProxy or ProxySQL as a proxy in front of the Percona XtraDB Cluster. Proxies are deployed and configured automatically with the

CHANNEL
stable

VERSION
1.12.0 (Current)

CAPABILITY LEVEL
- Basic Install
- Seamless Upgrades
- Full Lifecycle
- Deep Insights
- Auto Pilot

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LINKS

¿Interesado en contribuir?

Join us on Slack at **DoK.community**, and then join the **#sig-operator** channel!

dok.community slack:

shorturl.at/rsyK0

https://www.percona.com/

Twitter: @Percona, @PerconaBytes

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Thank You :)
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