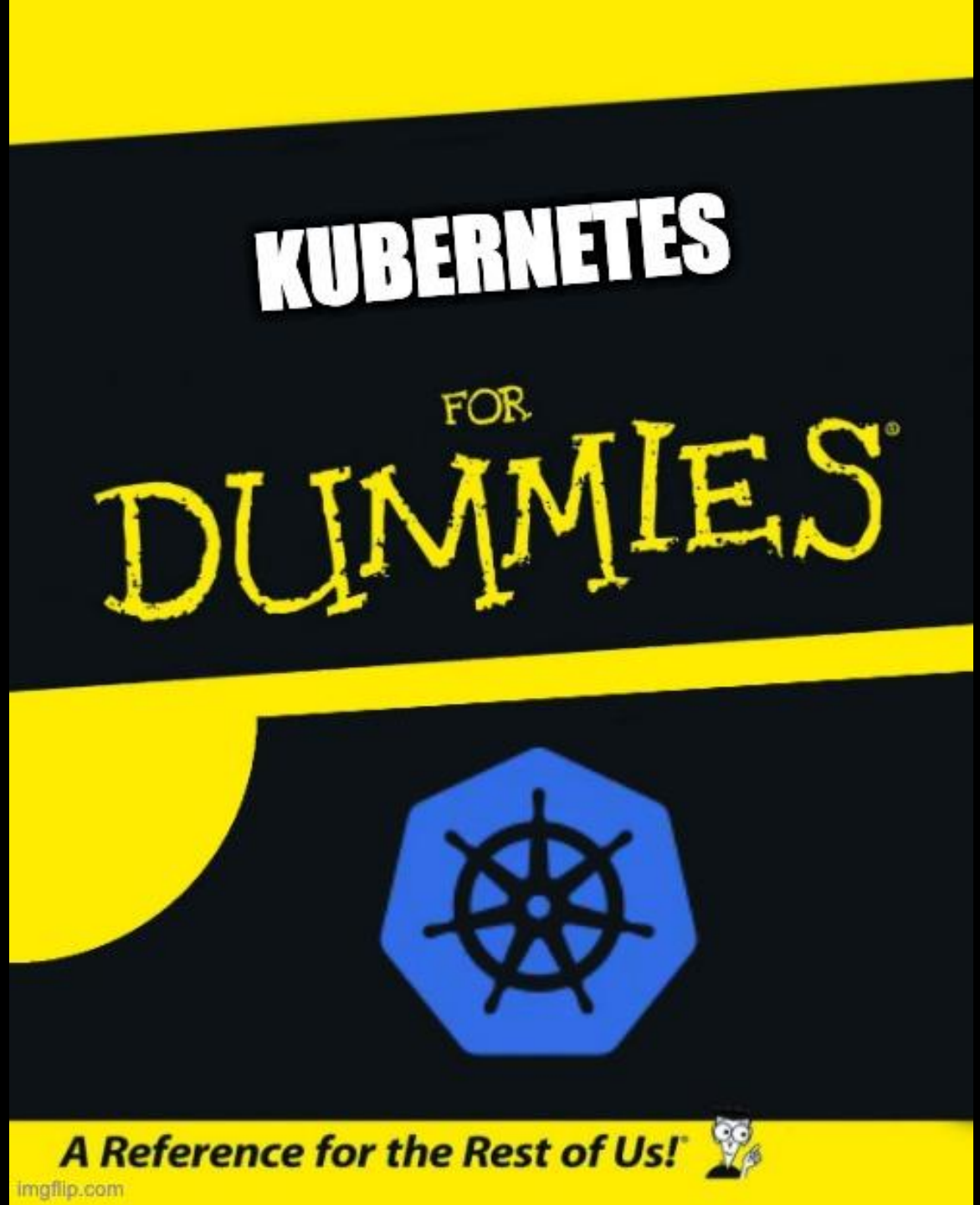


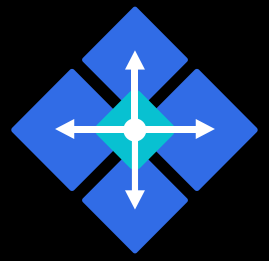
Sec 0, Public

Kai Mayer

Heilbronn, 19.02.2026

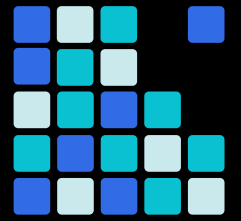
© 2025 XL2. All rights reserved.

What Problems does Kubernetes solve?



Scaling Application and Resources in a declarative manner

Self-Healing Deployments and Rollbacks

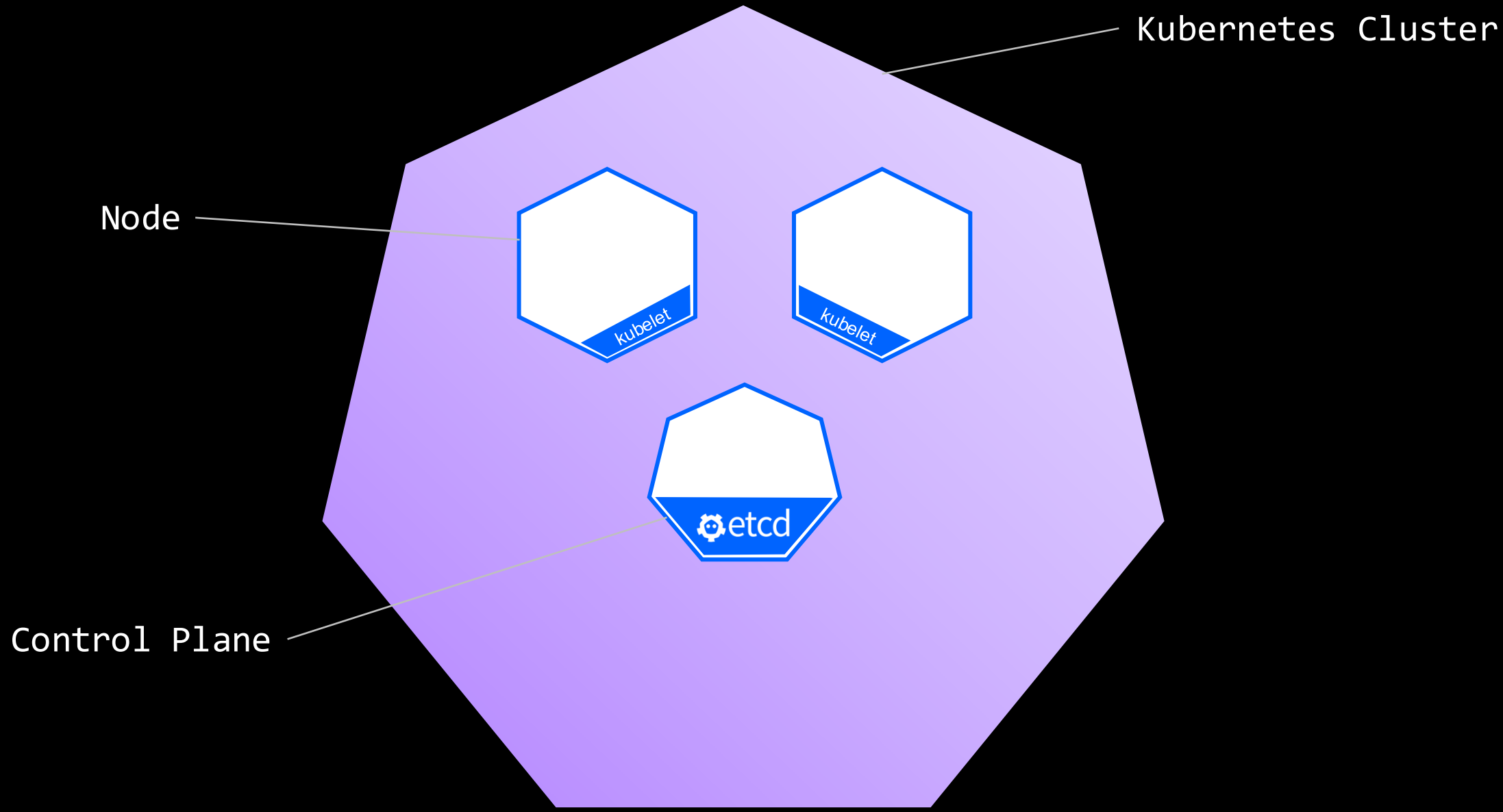


Extensible to solve your needs
(and sometimes a little bit more)

https://kubernetes.io/

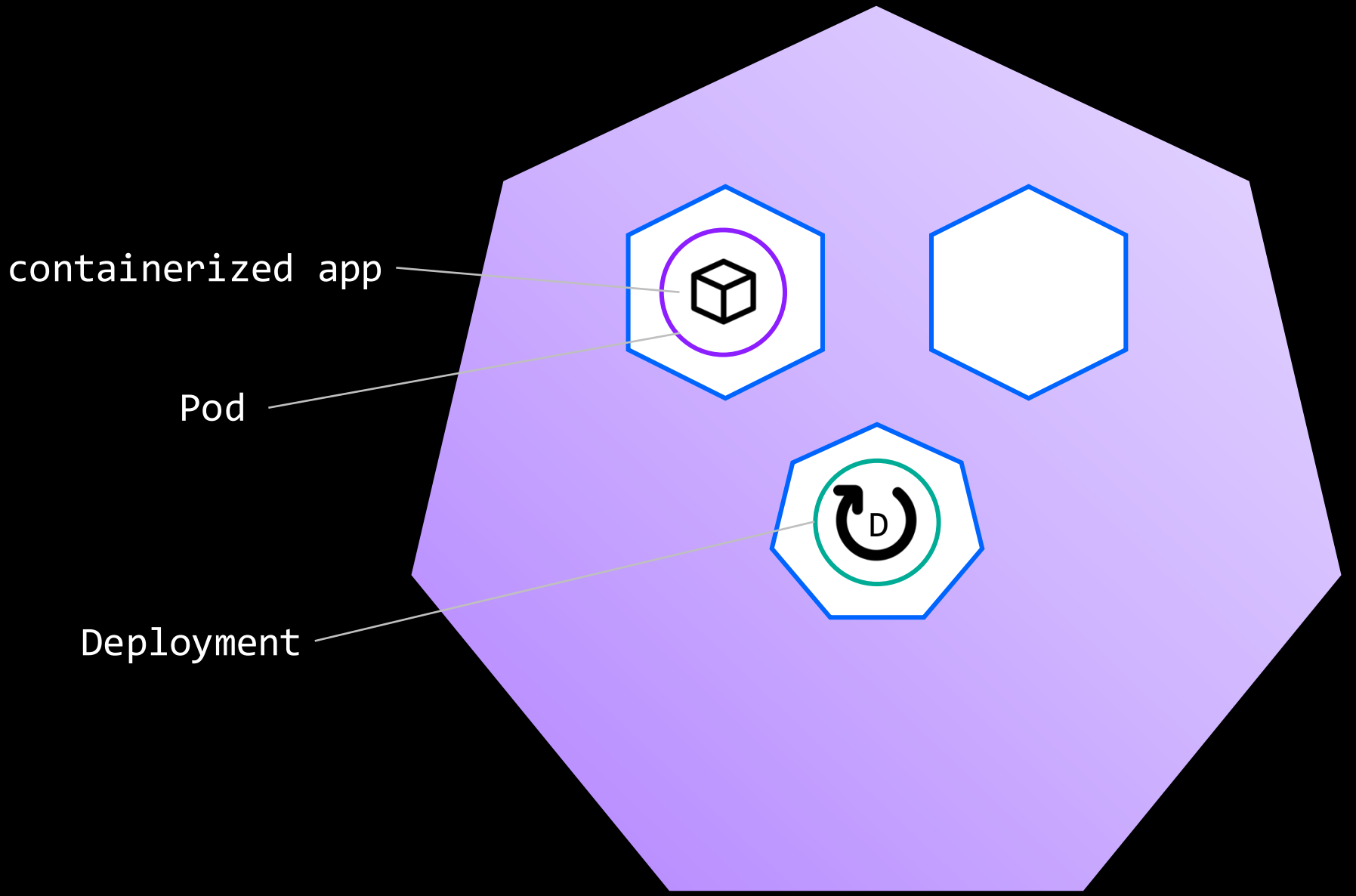
© 2025 XL2. All rights reserved.

© 2025 XL2. All rights reserved.



https://kubernetes.io/docs/tutorials/kubernetes-basics/deploy-app/deploy-intro/

© 2025 XL2. All rights reserved.



https://kubernetes.io/docs/tutorials/kubernetes-basics/deploy-app/deploy-intro/

© 2025 XL2. All rights reserved.

What‘s a pod?

and what‘s a deployment?

Resources!

© 2025 XL2. All rights reserved.

What's a Resource?

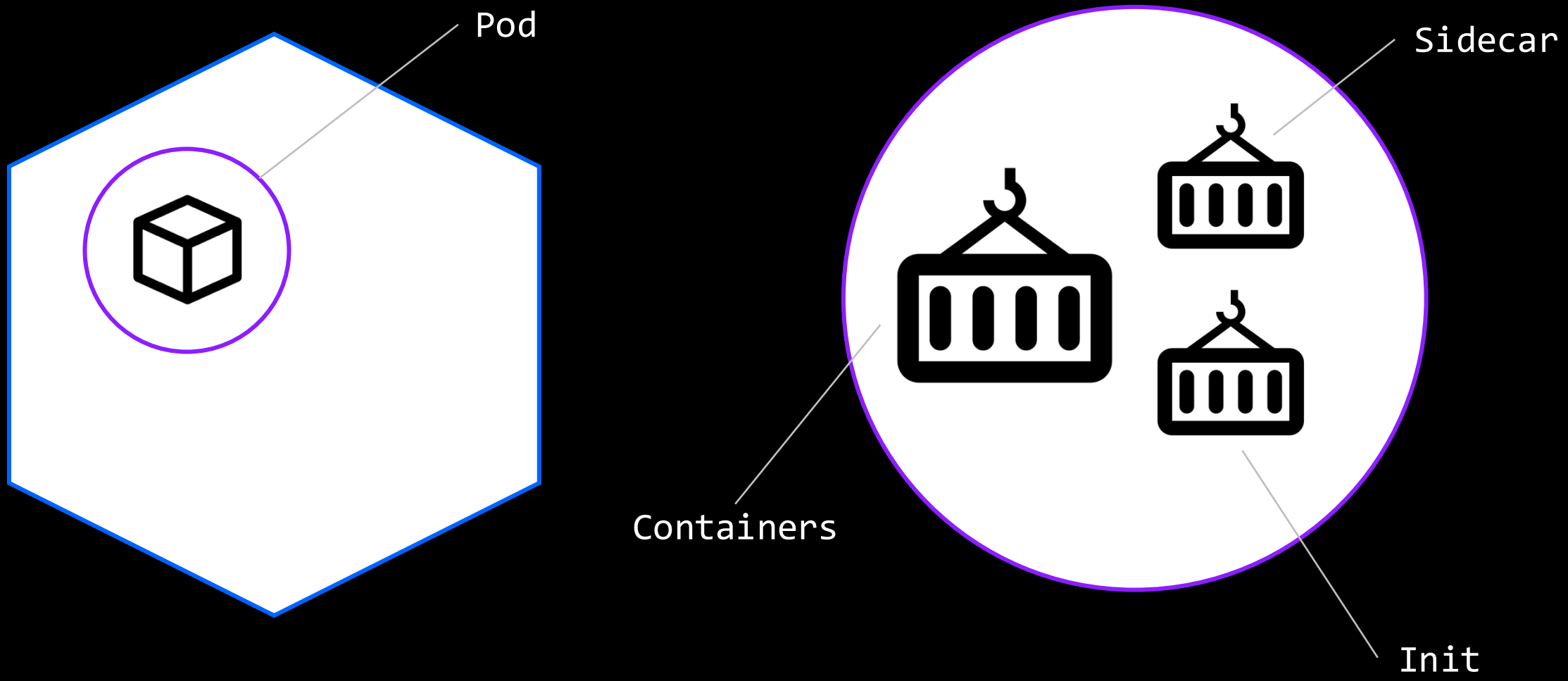
```yaml
apiVersion: v1
kind: Pod
metadata:
  namespace: my-namespace
  name: my-name
spec:
  ...
```

https://kubernetes.io/docs/reference/kubernetes-api/

© 2025 XL2. All rights reserved.

What's a Pod?

Pod



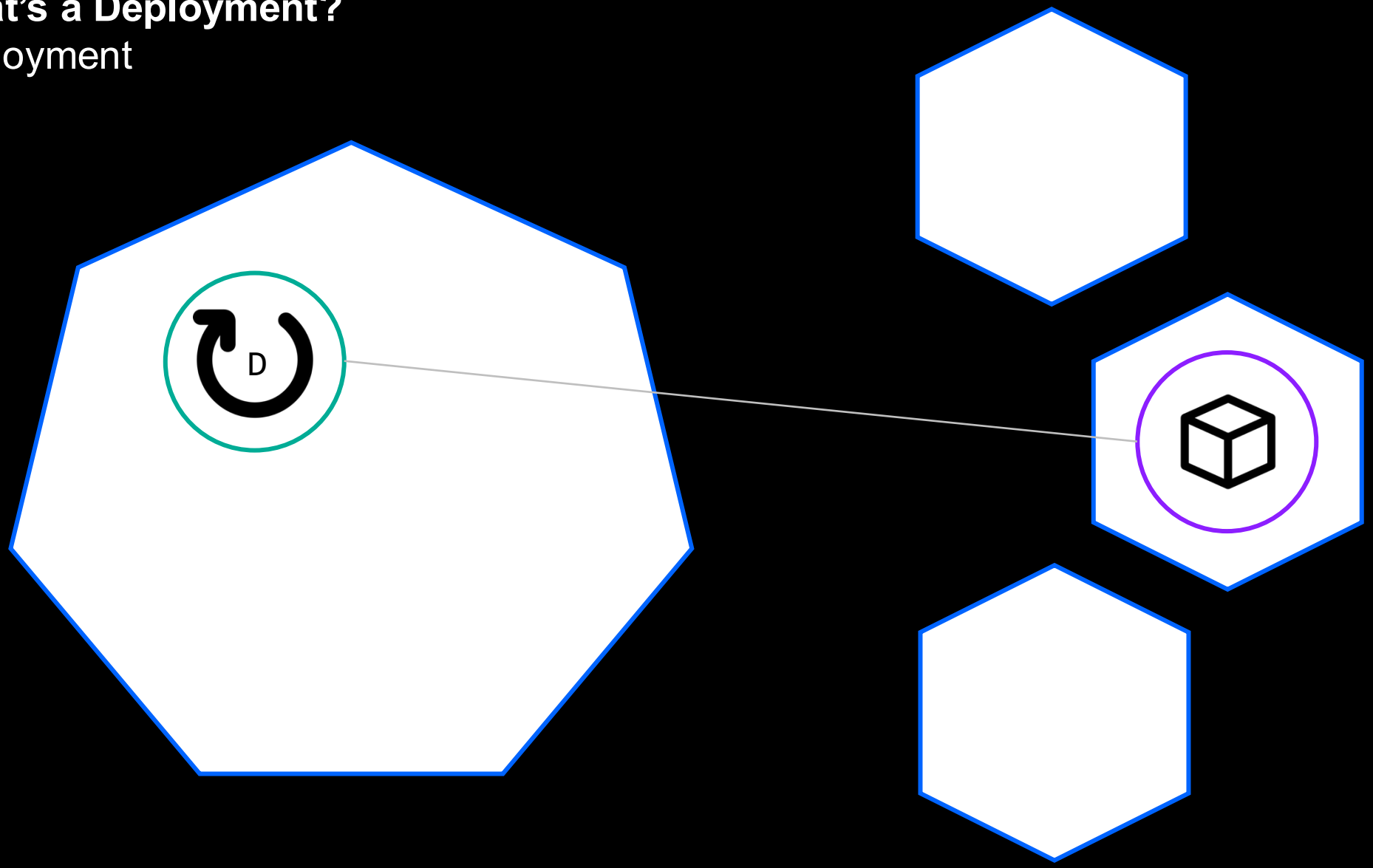
https://kubernetes.io/docs/concepts/workloads/pods/

https://github.com/kai-mayer-xl2/k8s-core-concepts

© 2025 XL2. All rights reserved.

What's a Deployment?

Deployment

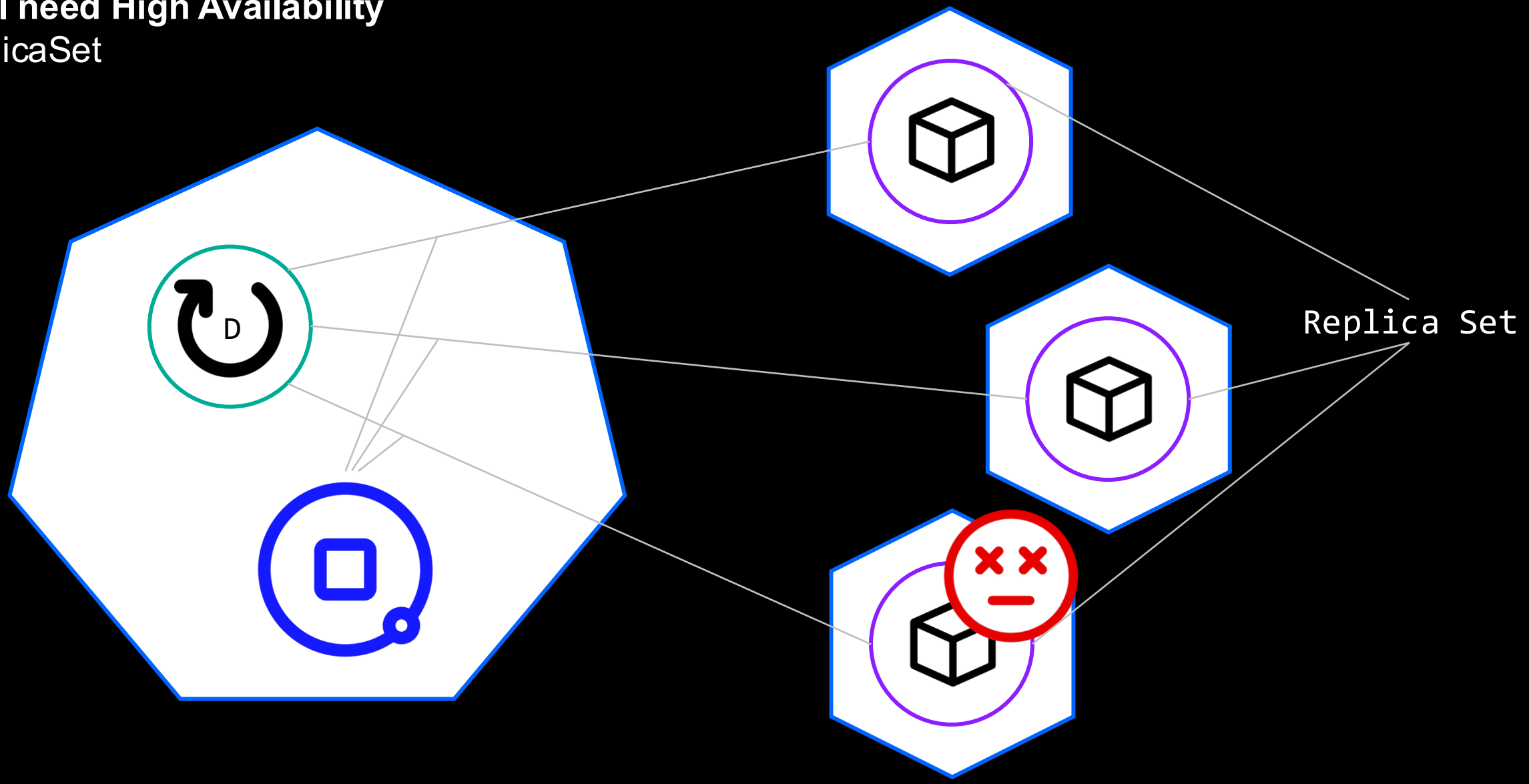


https://kubernetes.io/docs/concepts/workloads/controllers/deployment/

© 2025 XL2. All rights reserved.

But I need High Availability

ReplicaSet



https://kubernetes.io/docs/concepts/workloads/controllers/deployment/

© 2025 XL2. All rights reserved.

How to configure the containers?

ConfigMap

ConfigMap

Secret

```yaml
apiVersion: v1
kind: ConfigMap
metadata:
  name: my-app-config
data:
  MAX_WORKERS: "3"
  CONFIG_DIR: "/var/www"
```

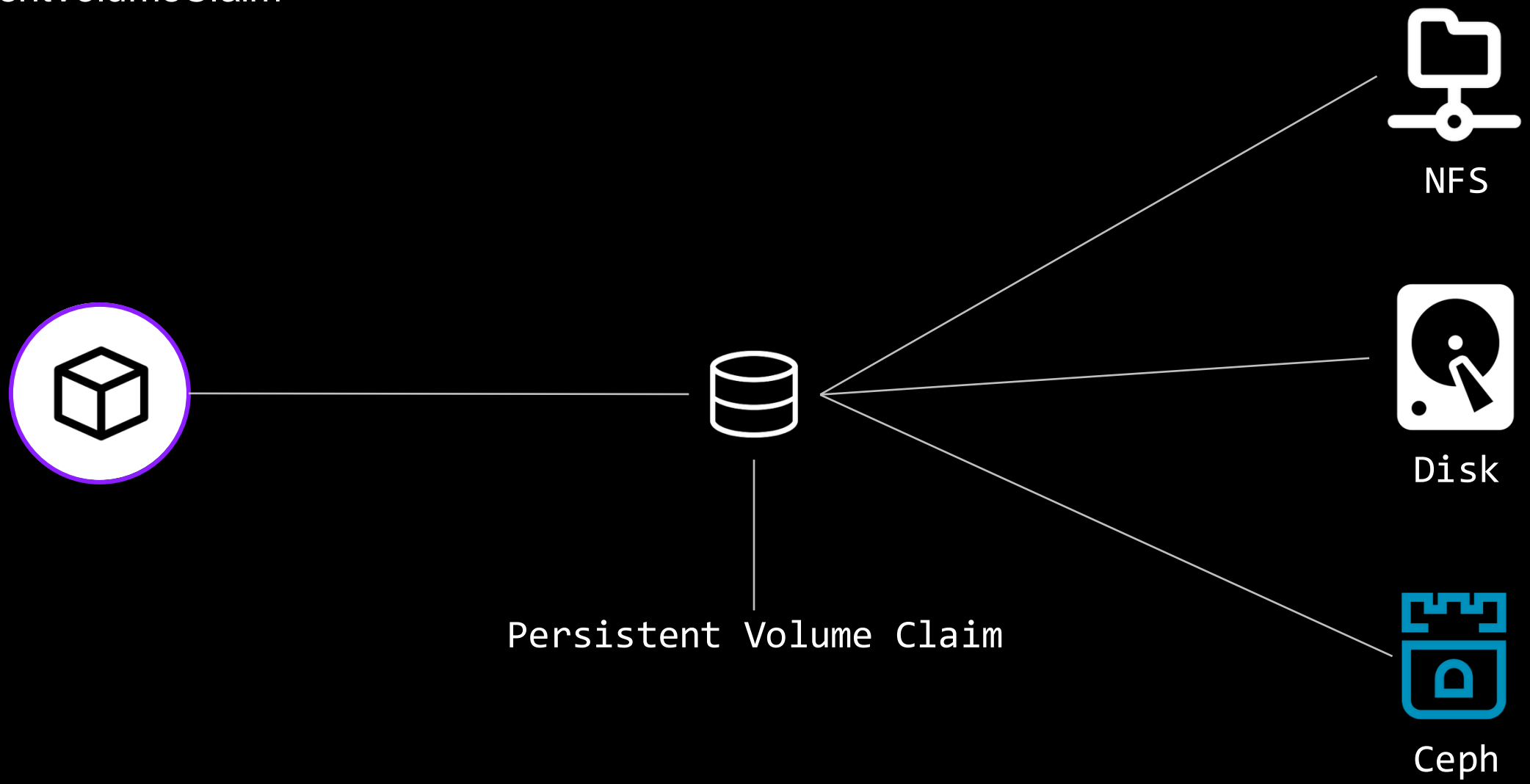
```yaml
apiVersion: v1
kind: ConfigMap
metadata:
  name: my-app-config
data:
  application.properties: |
    max.workers=3
    config.dir=/var/www
```

https://kubernetes.io/docs/concepts/configuration/configmap/

© 2025 XL2. All rights reserved.

Stateless is cool, but I like building complex things

PersistentVolumeClaim

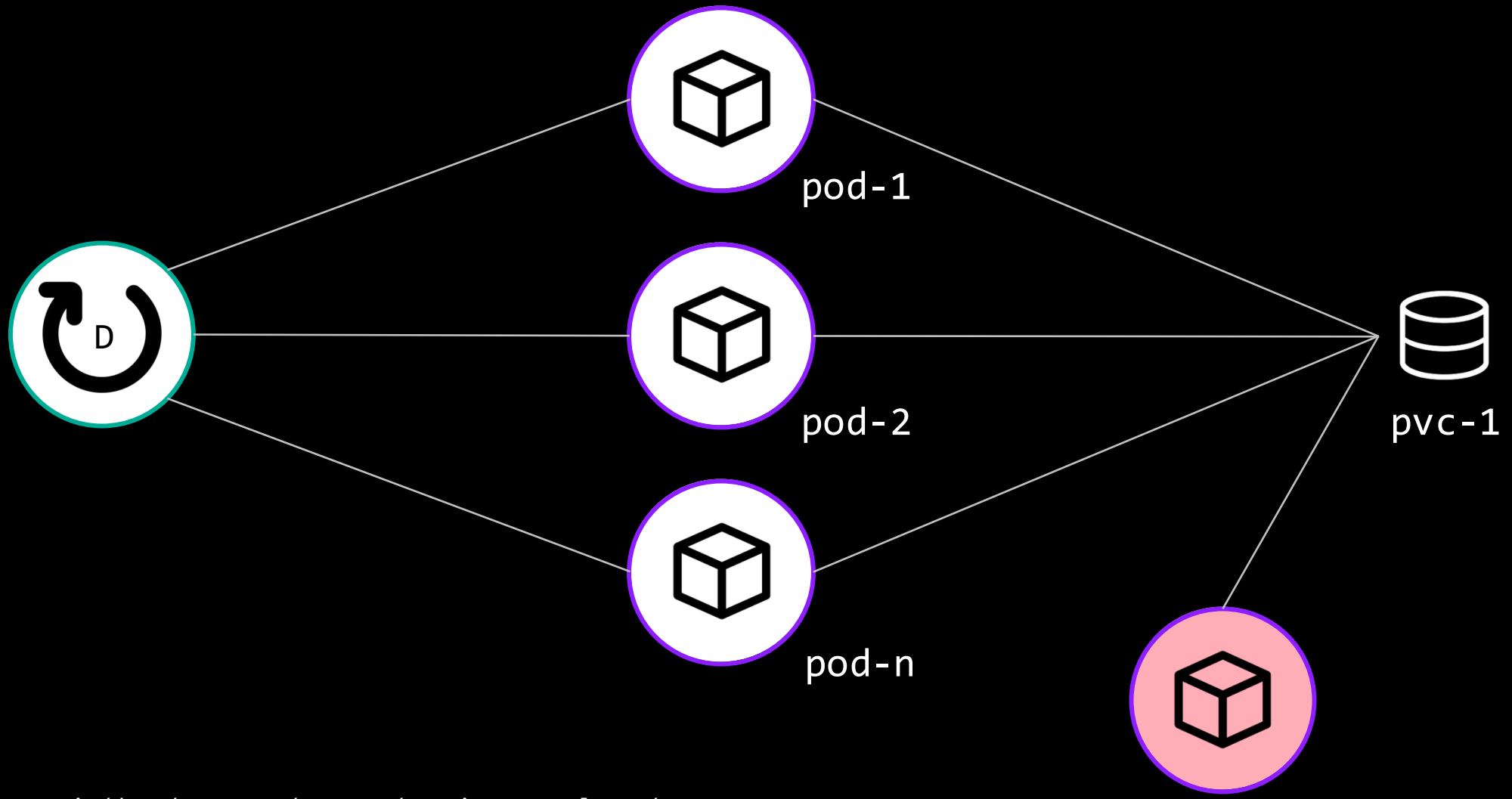


https://kubernetes.io/docs/concepts/storage/persistent-volumes/

© 2025 XL2. All rights reserved.

Stateless is cool, but I like building complex things

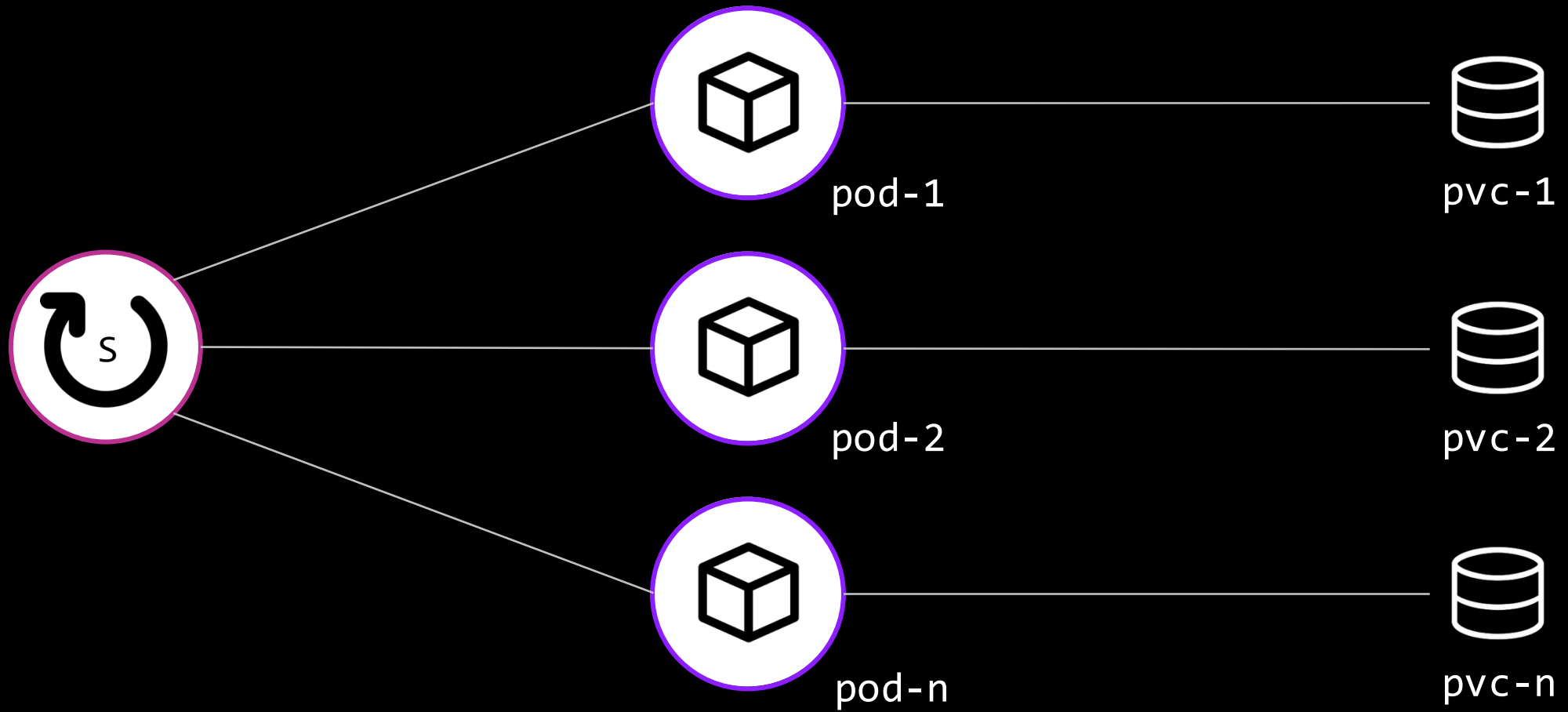
PersistentVolumeClaim



https://kubernetes.io/docs/concepts/storage/persistent-volumes/

© 2025 XL2. All rights reserved.

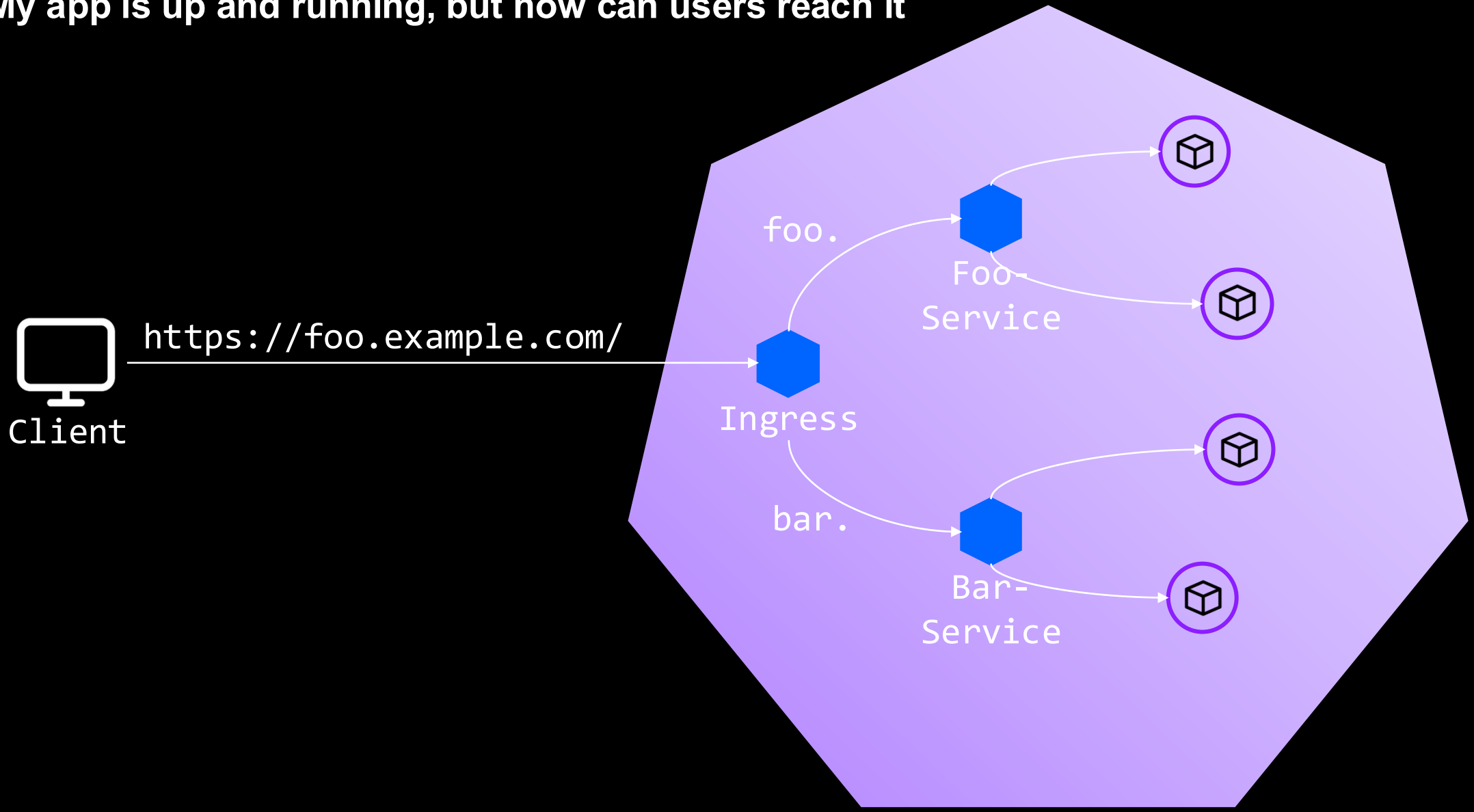
Even more complex
StatefulSet



https://kubernetes.io/docs/concepts/storage/persistent-volumes/

© 2025 XL2. All rights reserved.

My app is up and running, but how can users reach it

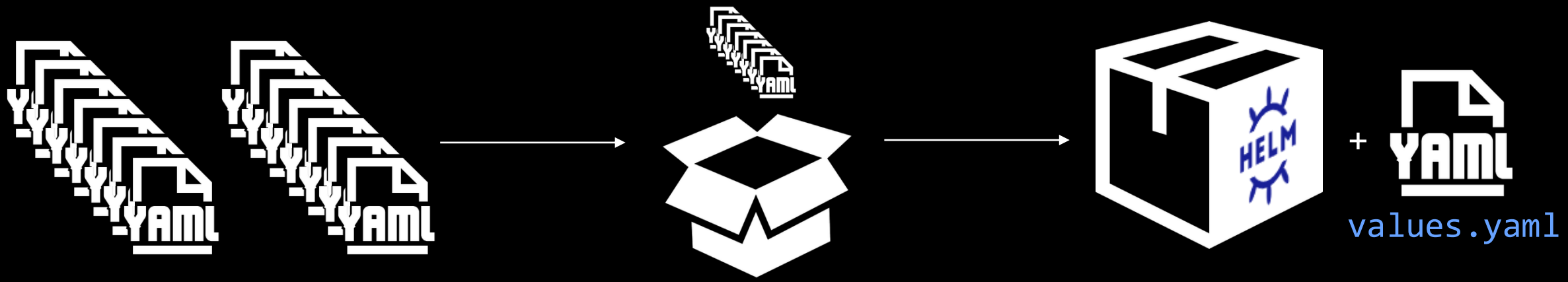


https://kubernetes.io/de/docs/tutorials/kubernetes-basics/explore/explore-intro/

© 2025 XL2. All rights reserved.

Helm

Package Manager for Kubernetes




```
helm install -f my-happy-panda-values.yaml happy-panda bitnami/wordpress
             values                         name        package
```

https://helm.sh/

https://www.redhat.com/en/topics/devops/what-is-helm

© 2025 XL2. All rights reserved.

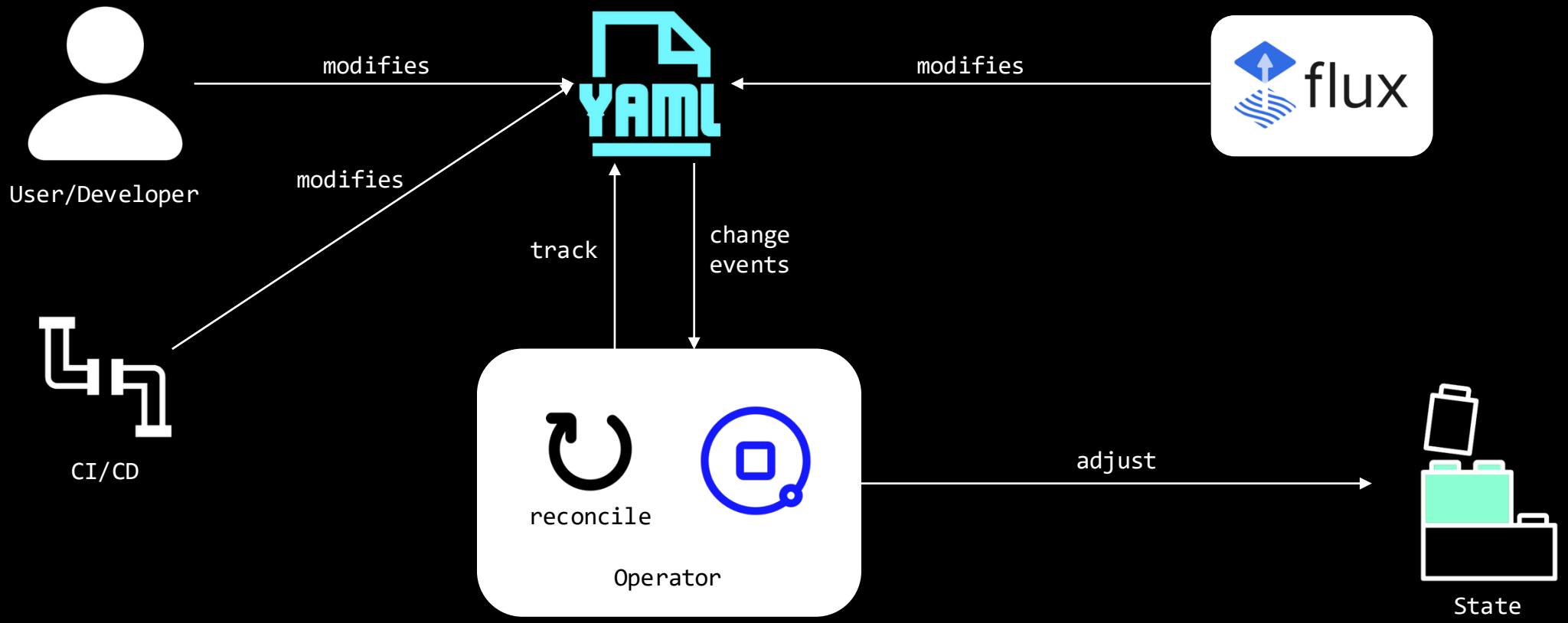
Can I build my own Resources?

*like Json Schema, describing Json with Json

https://kubernetes.io/docs/concepts/extend-kubernetes/api-extension/custom-resources/

© 2025 XL2. All rights reserved.

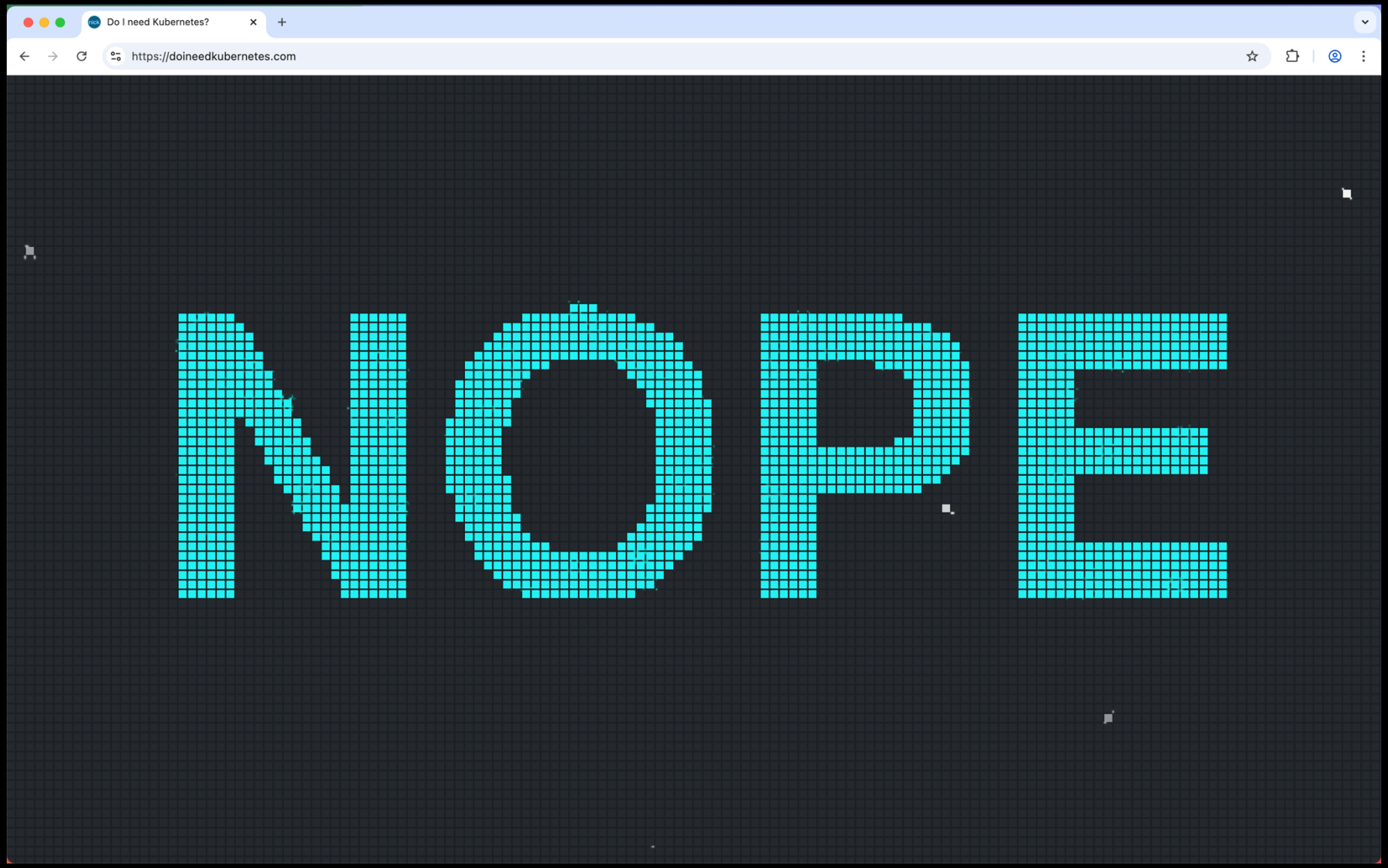
Operating your own Resources



https://kubernetes.io/docs/concepts/extend-kubernetes/operator/

© 2025 XL2. All rights reserved.

https://doineedkubernetes.com/



https://kubernetes.io/de/docs/tutorials/kubernetes-basics/explore/explore-intro/

© 2025 XL2. All rights reserved.

https://doineedkubernetes.com/

Microservices

Multiple Machines

High Availability

Multi-Cloud or Cross-Cloud

GitOps Tools like FluxCD or ArgoCD

Declarative, exensible and reproducible Environment

© 2025 XL2. All rights reserved.

Sound like lots of fun

Chessernetes : The game of Kings.

https://youtu.be/Cb2lFFbm294

Custom Operator and Custom Resource Definition to manage a Chess-Game as Kubernetes Resources

Manage physical mail with kubernetes

https://github.com/circa10a/postk8s

Custom Operator and Custom Resource Definition to manage an api for sending postcards managed as Kubernetes Resources

© 2025 XL2. All rights reserved.

© 2025 XL2. All rights reserved.