KUBERNETES: A QUICK WALKTHROUGH

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Introduction

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What is Kubernetes?

Kubernetes is a portable, extensible, open-source platform for managing **containerized workloads and services**, that facilitates both *declarative configuration* and *automation*.

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Kubernetes provides you with a framework to run **distributed systems** resiliently. It takes care of *scaling* and *failover* for your application, provides automated *rollouts* and *rollbacks*, *storage orchestration*, and more.[2]

Architecture

Architecture
Schema[1]

API server

Cloud controller manager *(optional)*

Controller manager

etcd (persistence store)

kubelet

kube-proxy

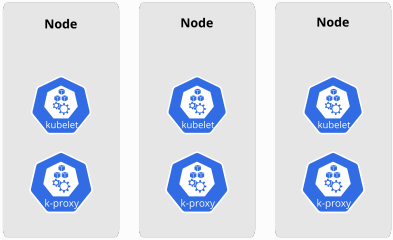
Scheduler

Control plane

Node

Architecture

Schema[1]



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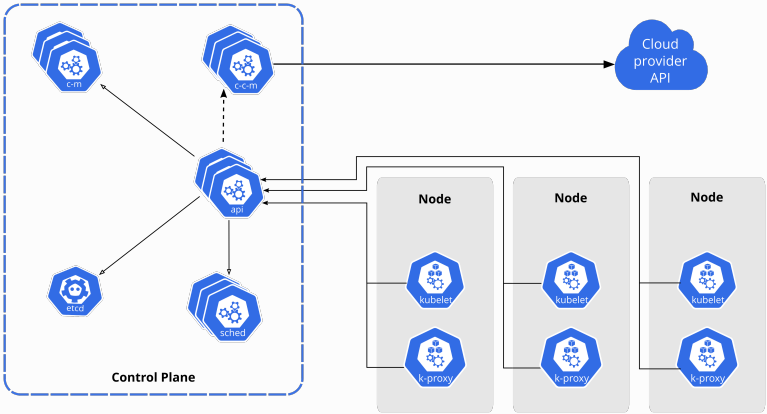

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YAML Blueprint[3]

deployment.yaml

```
apiVersion: v1
kind: <object>
metadata:
  name: <identifier>
  labels:
    app: <application name>
spec:
  <object-specific settings>
```

Configuration
Object Kinds - Stateless Application[4]

- Pod

Configuration

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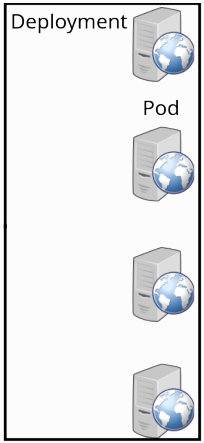
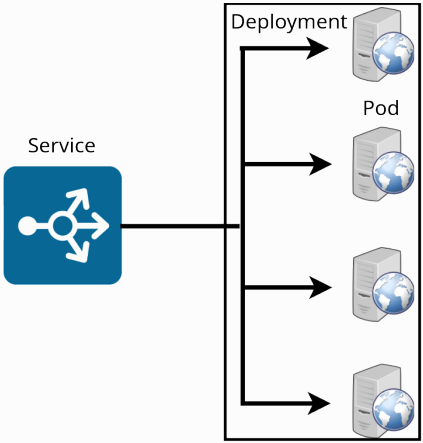
- Deployment



Configuration

Object Kinds - Stateless Application[4]

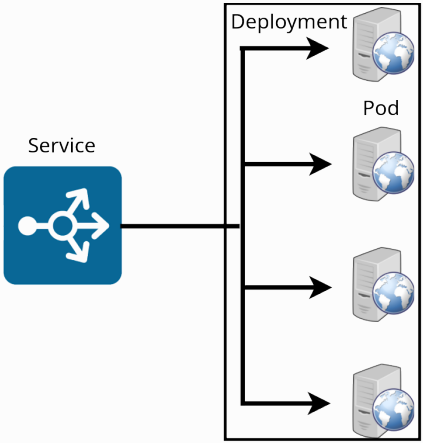
- Pod
- Deployment
- Service

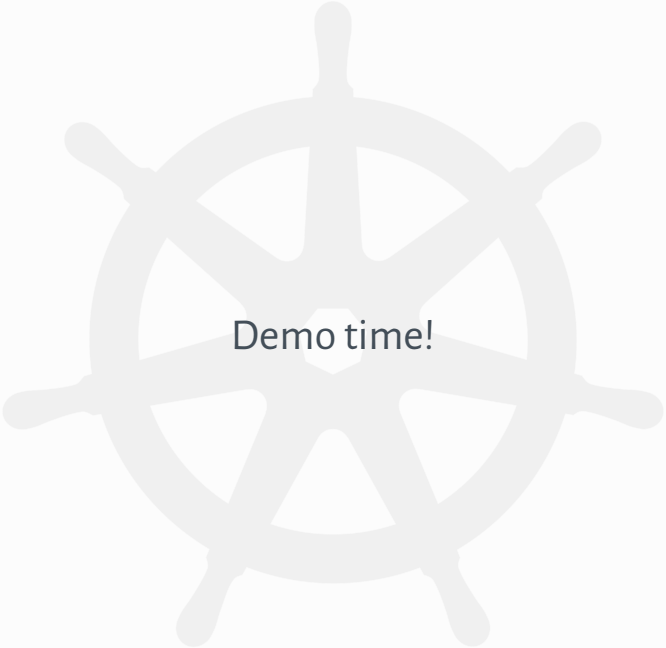


Configuration

Object Kinds - Stateless Application[4]

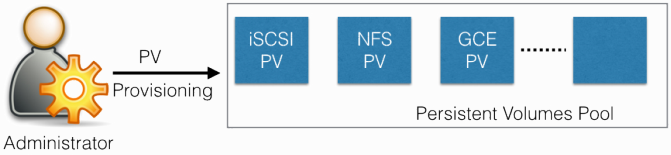
- Pod
- Deployment
- Service
- HorizontalPodAutoscaler




Demo time!

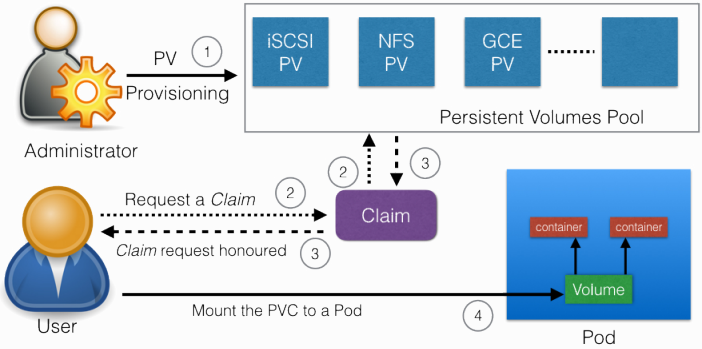
Configuration
Object Kinds - Stateful Application

Persistent Volumes (PV)



Configuration
Object Kinds - Stateful Application

Persistent Volumes Claim (PVC)



Conclusions

Conclusions
Pros

Pros

- Platform independent
- Highly customizable
- Quite popular

Conclusions
Usage

Conclusions
Usage

Conclusions
Cons

Cons

- Overkill for small projects
- Requires much knowledge and expertise *(helm package manager)*
- Documentation lacks complete examples

Thanks for your attention!

References
and credits

Presentation theme adapted from UniNa-Beamer
Kubernetes icons and diagrams from the official documentation website

Sources

[1] *Kubernetes Components*.

[2] *What is Kubernetes?*

[3] *Understanding Kubernetes Objects*.

[4] *Run a Stateless Application Using a Deployment*.