



Higher-Order Deployments

Reducing Boilerplate With Kubernetes
Custom Resource Definitions

@jrbowes
May 3, 2018

<https://www.manifold.co>

SIGN UP
TODAY



YES, WE
ARE HIRING



Photo by [Caleb Jones](#) on [Unsplash](#)





HashiCorp

Packer



HashiCorp

Terraform



BASH

THE BOURNE-AGAIN SHELL

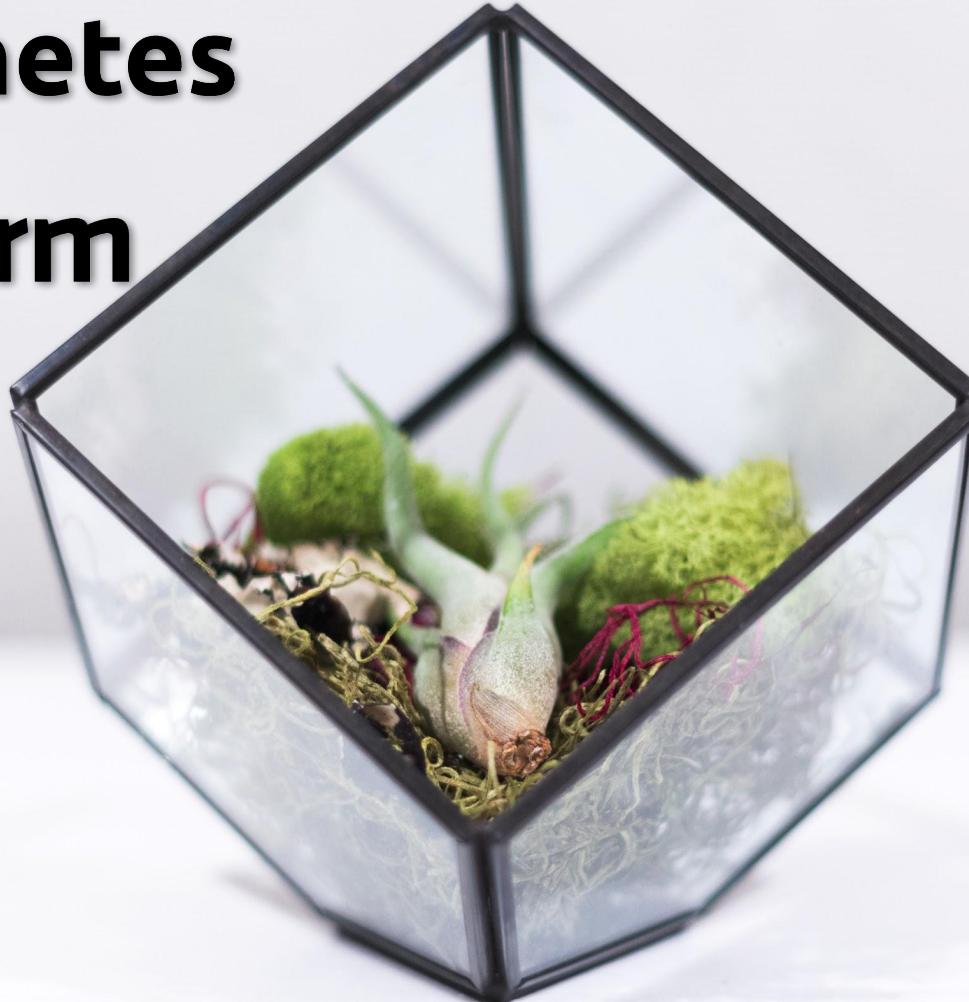


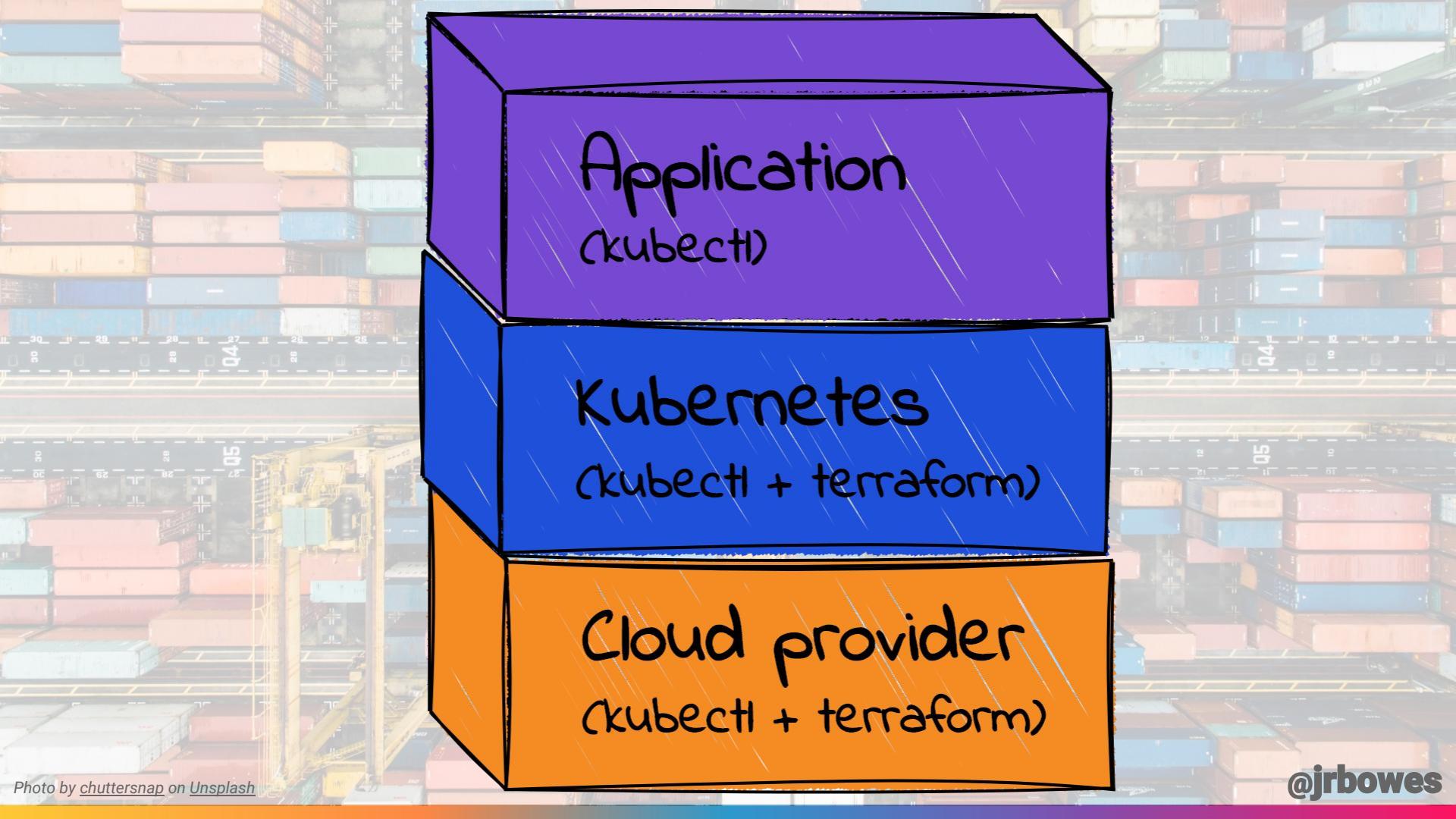


kubernetes

HashiCorp

Terraform





Application
(kubectl)

Kubernetes
(kubectl + terraform)

Cloud provider
(kubectl + terraform)



Photo by [Etienne Pauthenet](#) on [Unsplash](#)



DRIVE IN



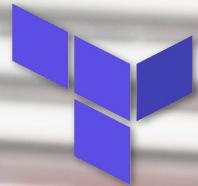
McDonald's

McDrive

McCafe

```
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  name: worker
spec:
  replicas: 2
  strategy:
```





HashiCorp

Terraform

ANSIBLE



puppet



CHEF™

Photo by Alexandru Tugui on [Unsplash](#)

@jrbowes



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Deployment

ReplicaSet

ReplicaSet

Pod

Pod

Pod

Pod

Pod

docker
kubectl

Compose
Controller

Compose
API Server

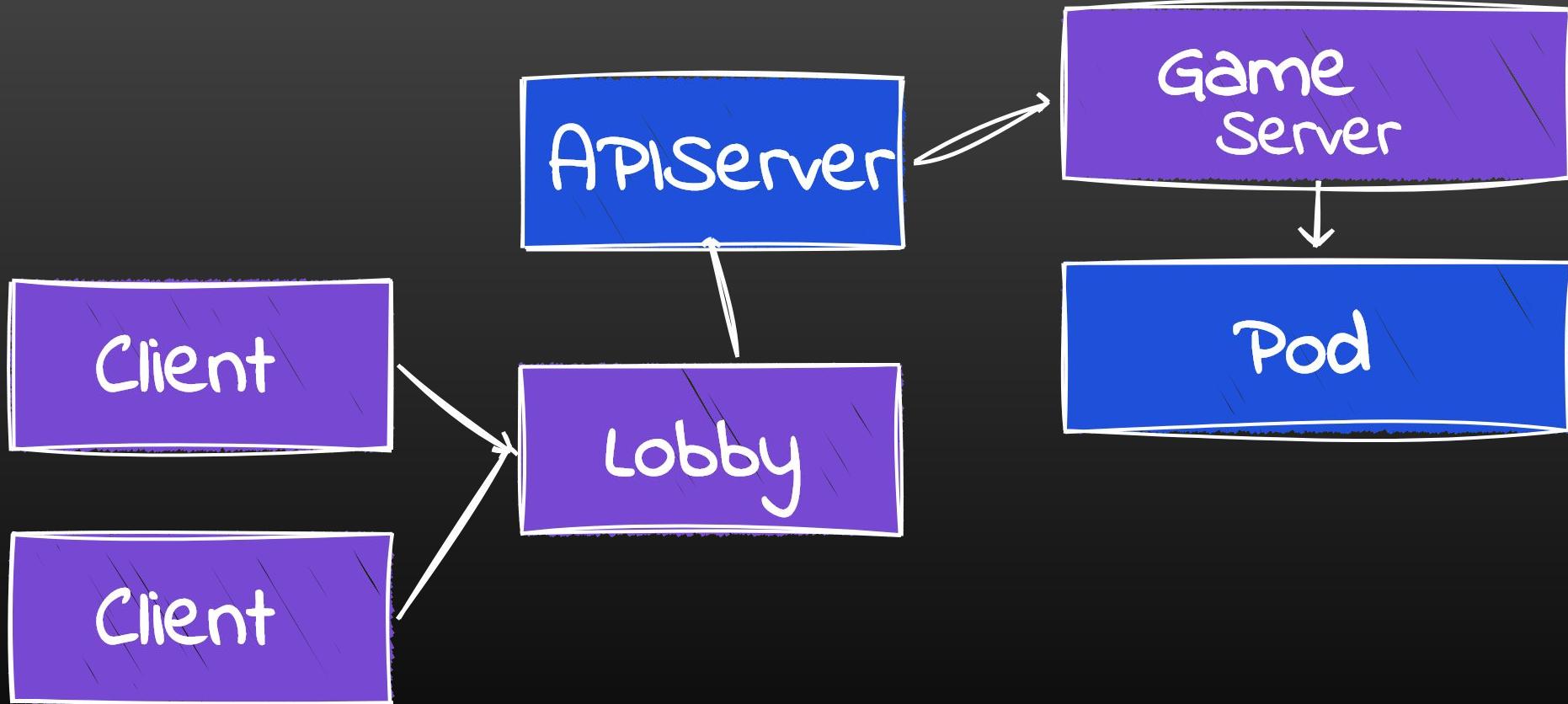
k8s
API Server

Compose

Deployment

ClusterIP
Service

LoadBalancer
Service



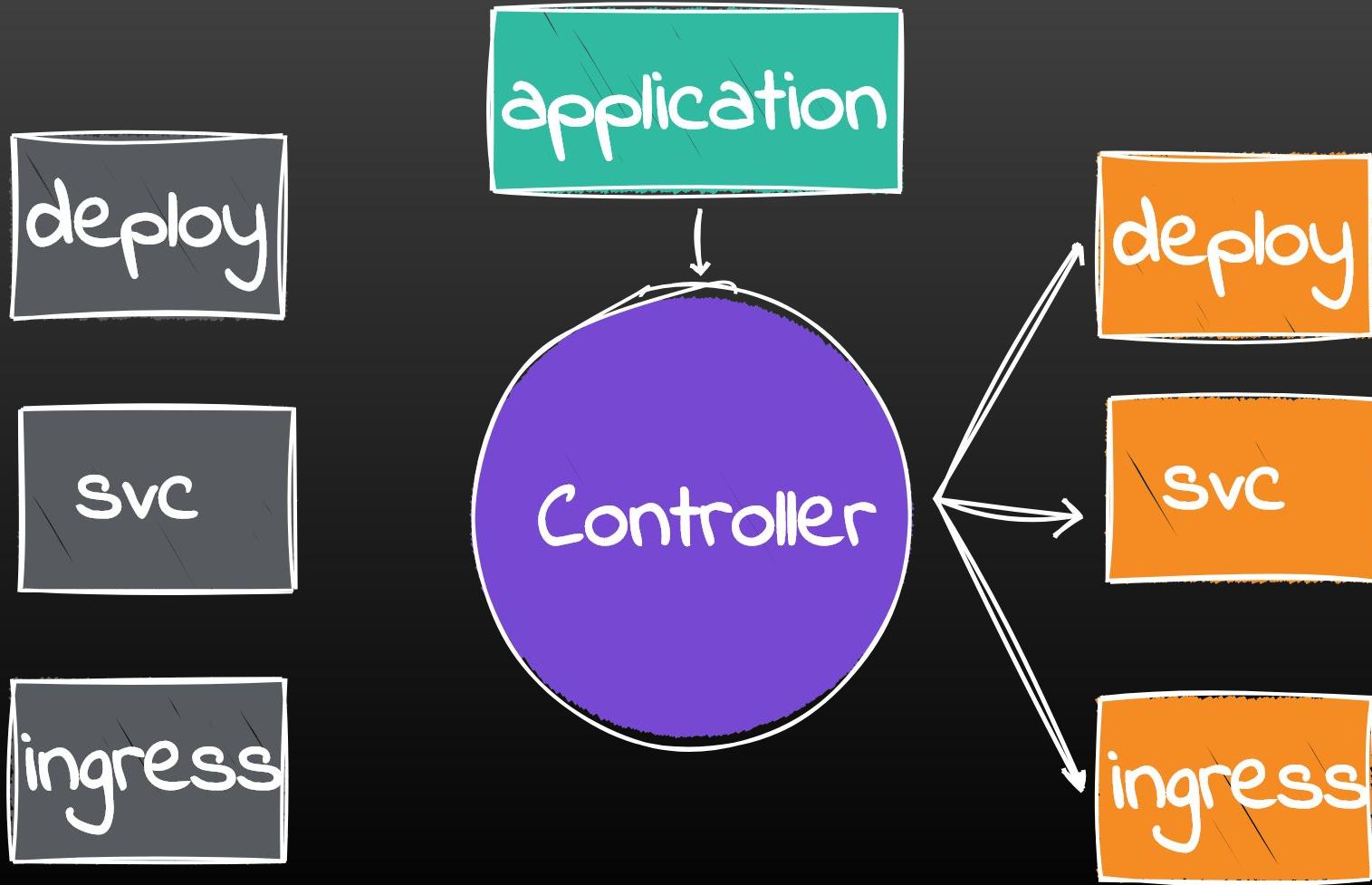
Kubernetes is Composition

Kubernetes is a Database

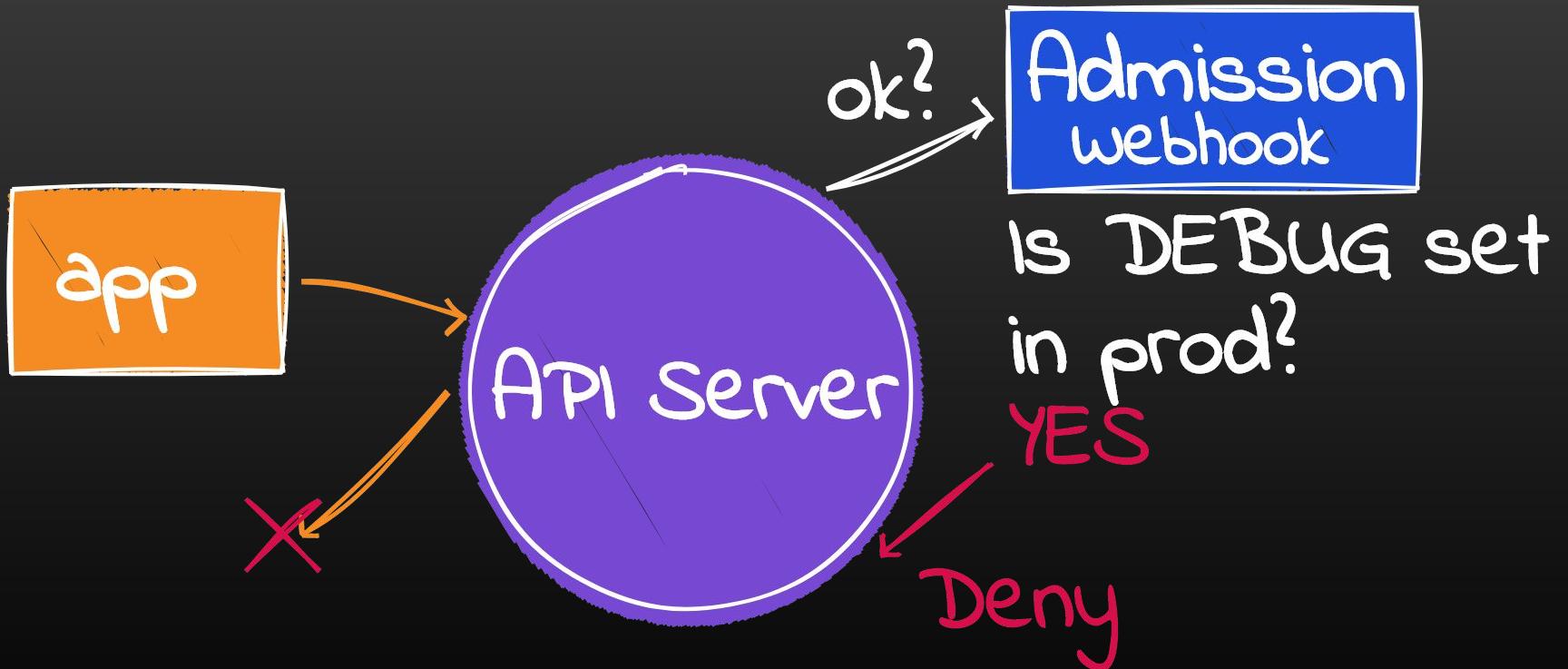
- **1 Custom Resource Definition**
- **1 Controller**
- **Admission Controllers to taste**

```
apiVersion: apiextensions.k8s.io/v1beta1
kind: CustomResourceDefinition
metadata:
  name: applications.manifold.co
spec:
  group: stable.manifold.co
  version: v1
  scope: Namespaced
  names:
    plural: applications
    singular: application
    kind: Application
```

```
validation:  
  openAPIV3Schema:  
    properties:  
      spec:  
        properties:  
          replicas:  
            type: integer  
            minimum: 2  
          image:  
            type: string
```

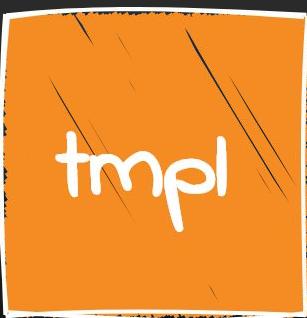


**Start with
Metacontroller**

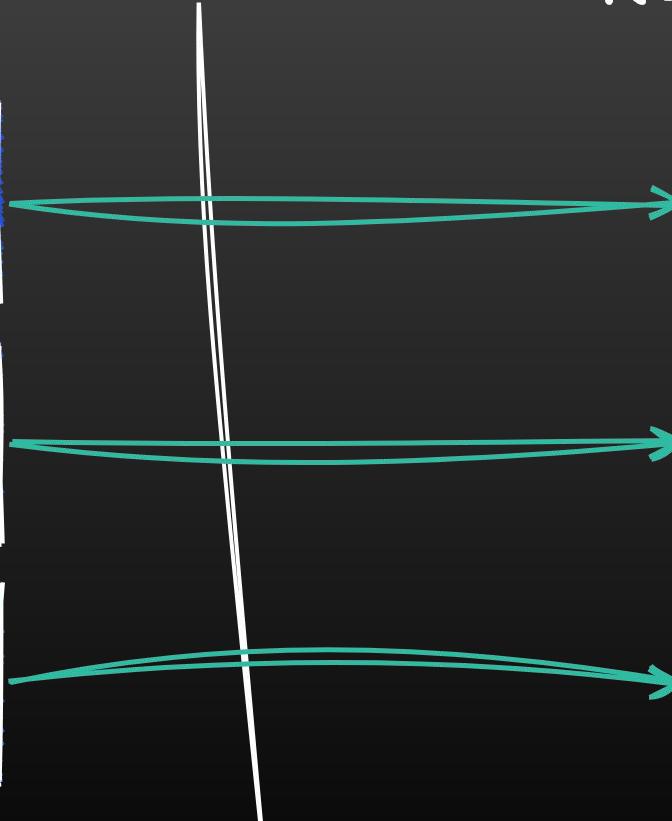


Why?

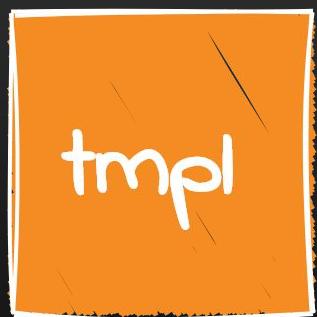
Your laptop



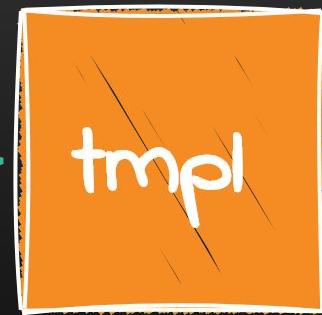
Kubernetes

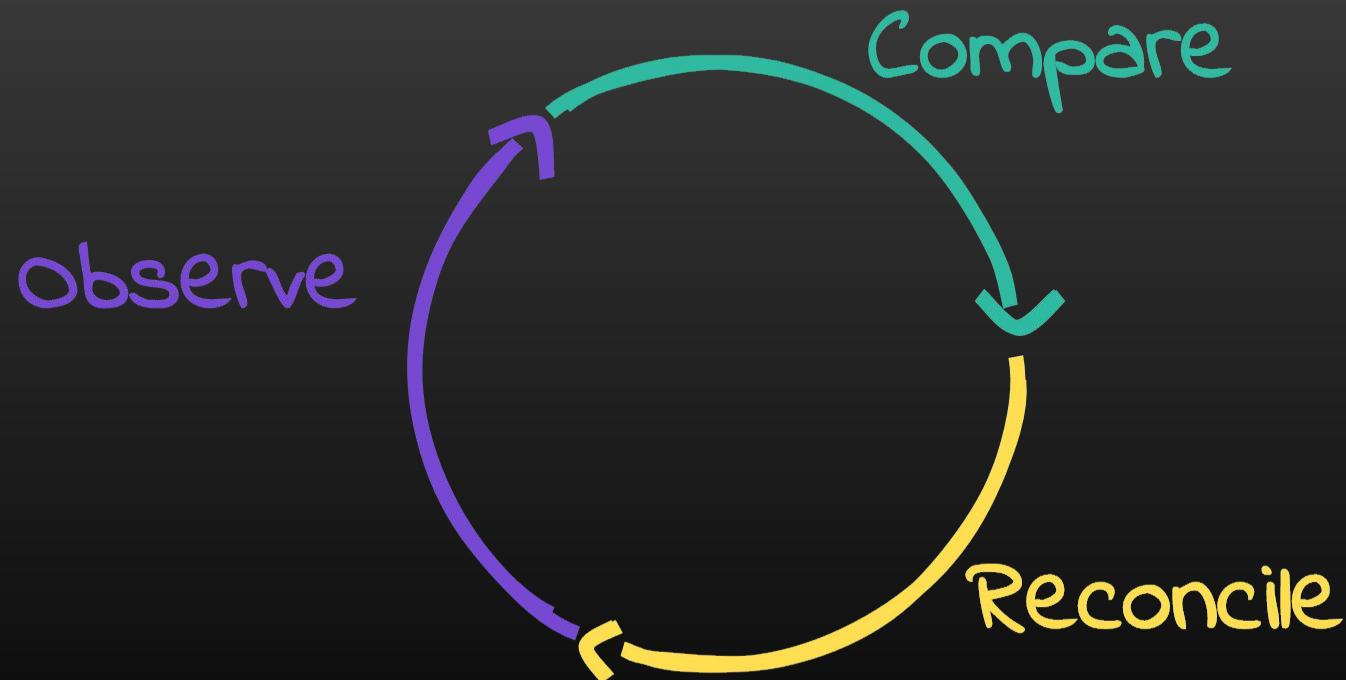


Your laptop



Kubernetes





```
- name: Create my app's deployment  
  k8s_raw:  
    state: present  
    definition:  
      apiVersion: extensions/v1beta1  
      kind: Deployment  
      metadata:  
        name: my-app  
      spec:  
        replicas: 2
```

```
- name: Create all of my app

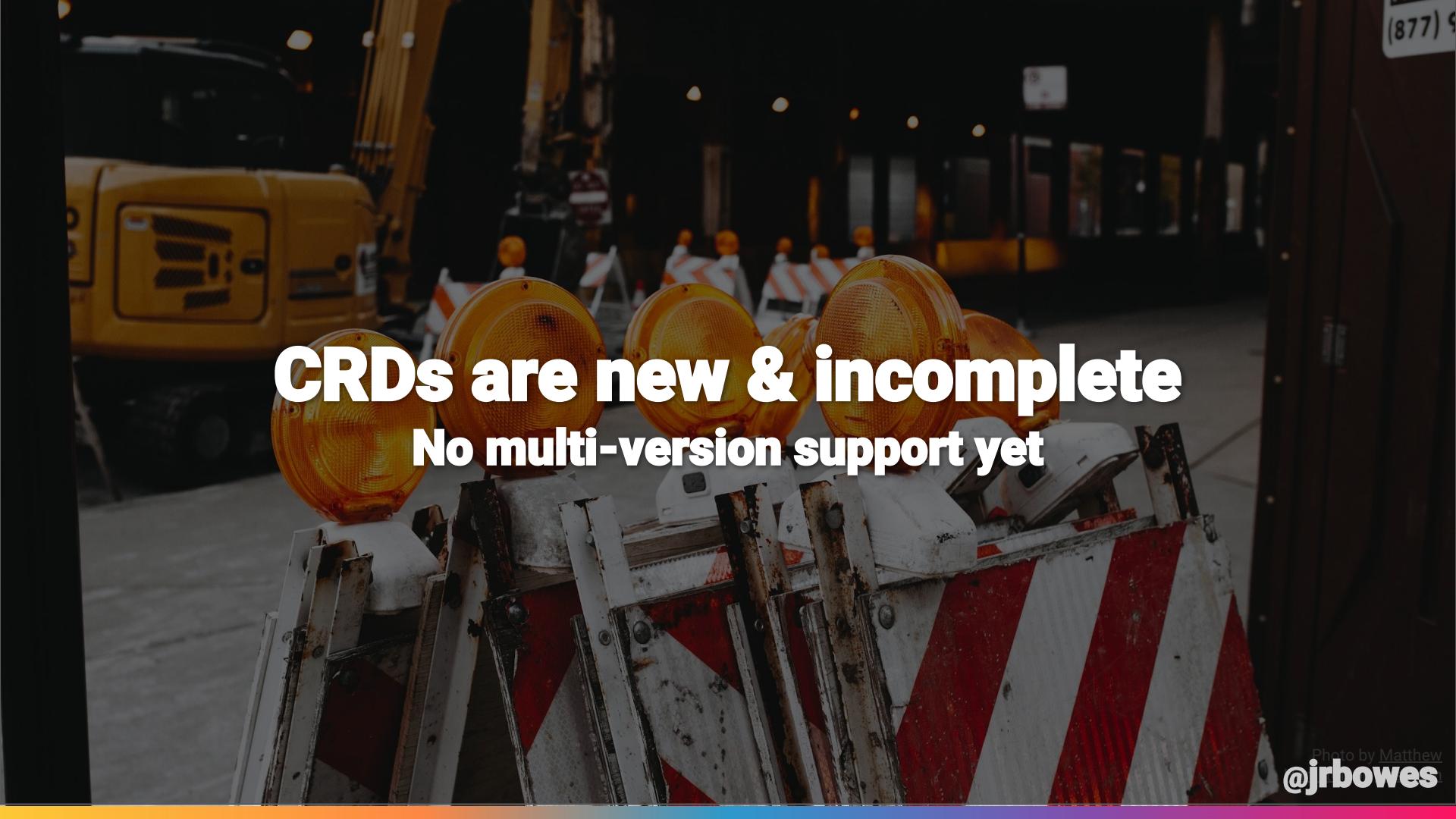
k8s_raw:

  state: present

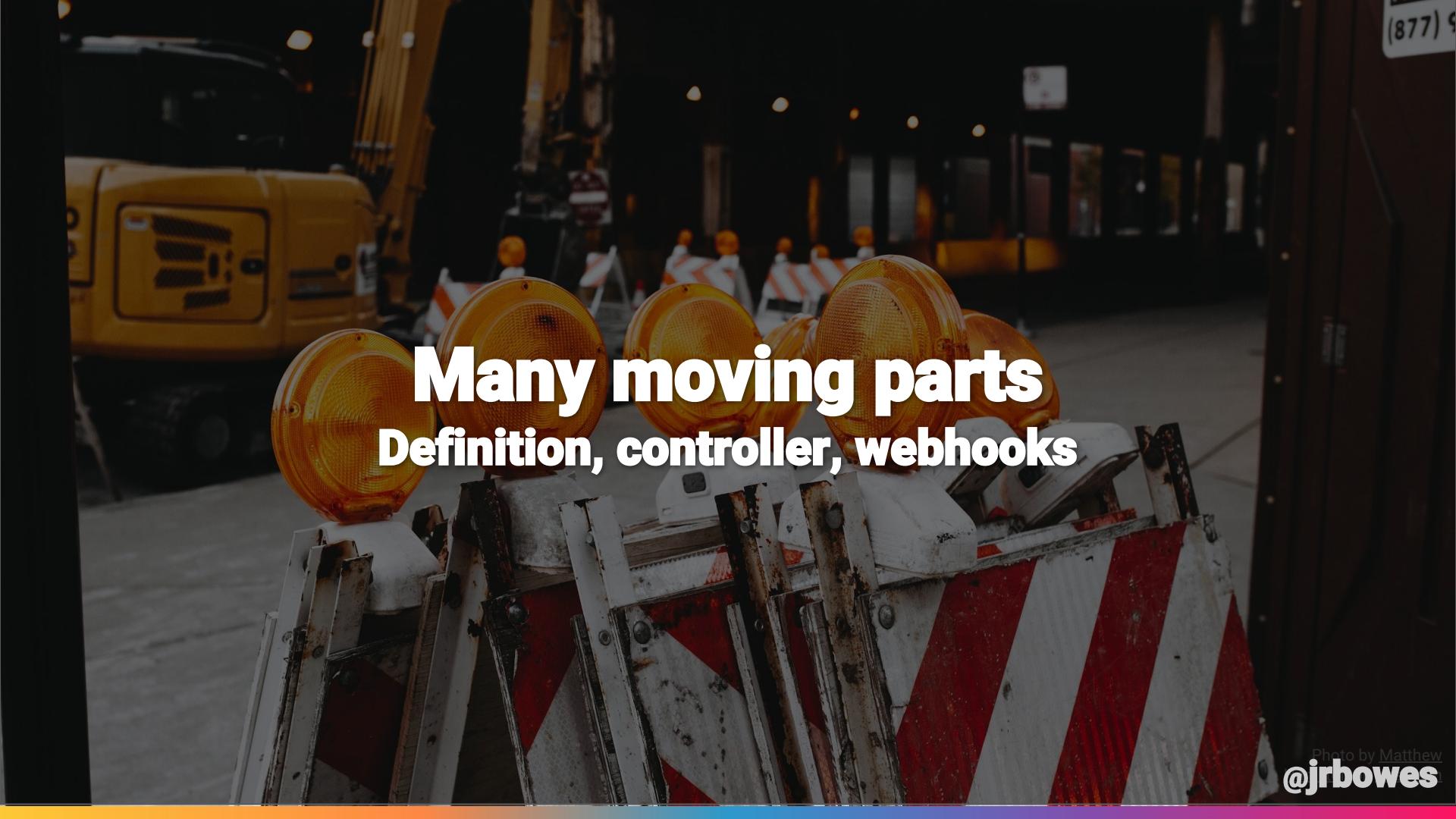
  definition:

    apiVersion: manifold.co/v1
    kind: Application
    metadata:
      name: my-app
    spec:
      external: true
```

Build your own Operators

A night photograph of a construction site. In the foreground, several yellow traffic cones are lined up. Behind them, a yellow truck is parked. The background is dark, with some blurred lights from other vehicles or streetlights.

**CRDs are new & incomplete
No multi-version support yet**



A night photograph of a construction site. In the foreground, several yellow traffic cones are stacked. Behind them, a yellow truck with a large black rectangular logo on its side is parked. The background is dark, showing more traffic cones and some blurred lights from other vehicles or equipment.

Many moving parts
Definition, controller, webhooks



Attempts to simplify are still early

- Metacontroller
- Kubekit
- operator-sdk NEW!
- Your cool project?



Thank you!

@jrbowes
April 18, 2018