

# Pimp my k8s

Kubernetes erweitern mit Java

1



Matthias Seifert

🐦 @0x378

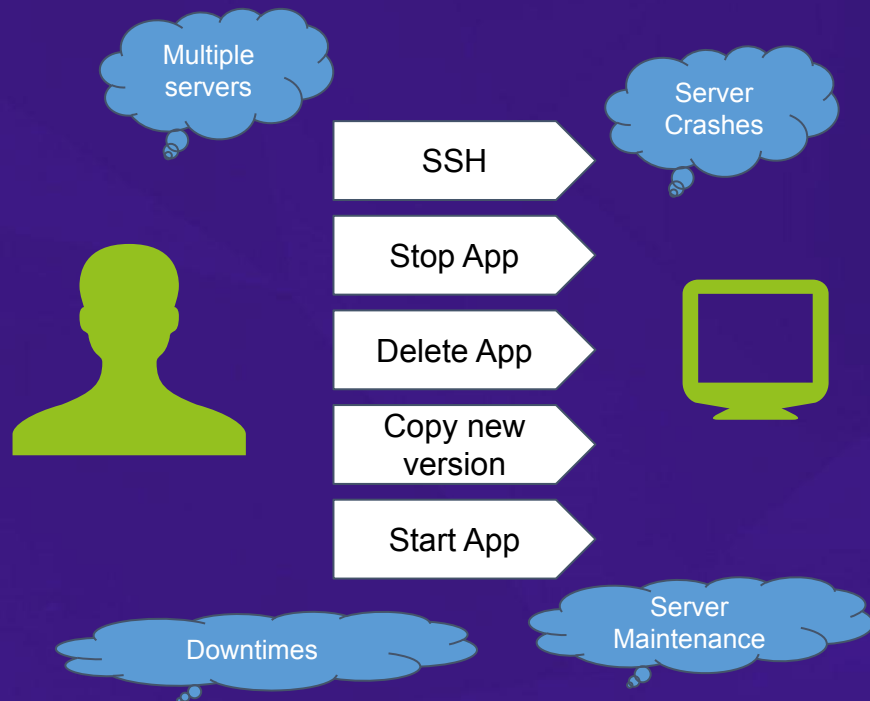


Nikolai Neugebauer

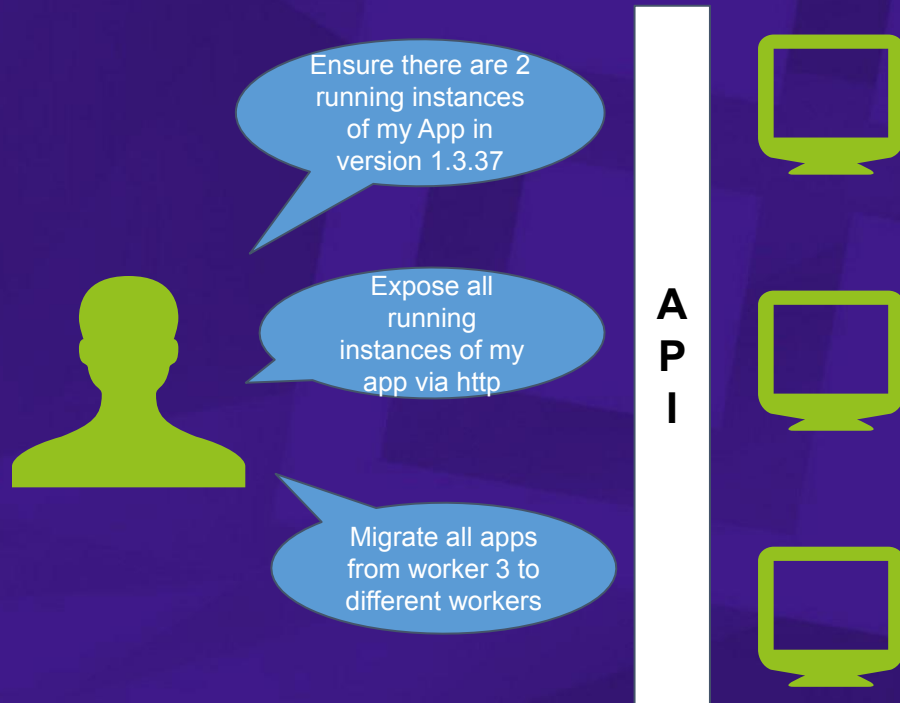
🐦 @nik101010

# Kubernetes: A Declarative Operation API

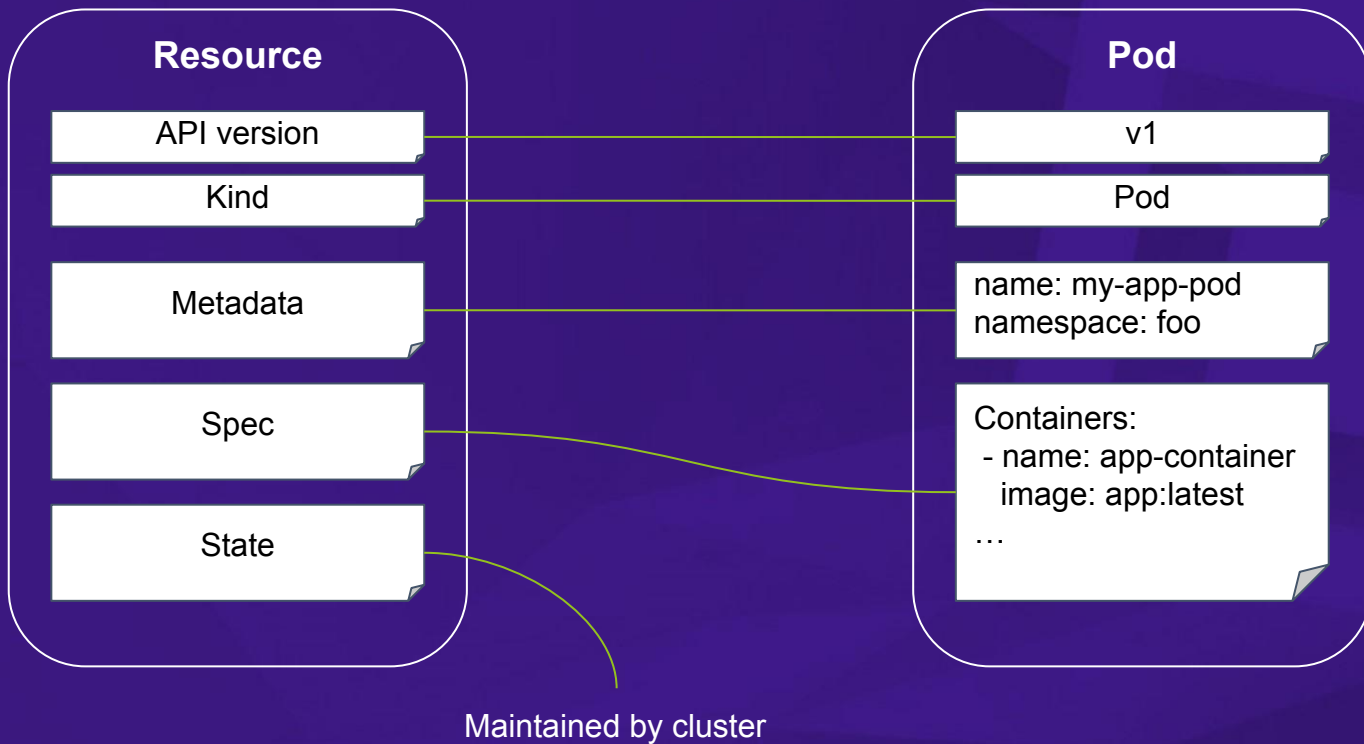
## Back then



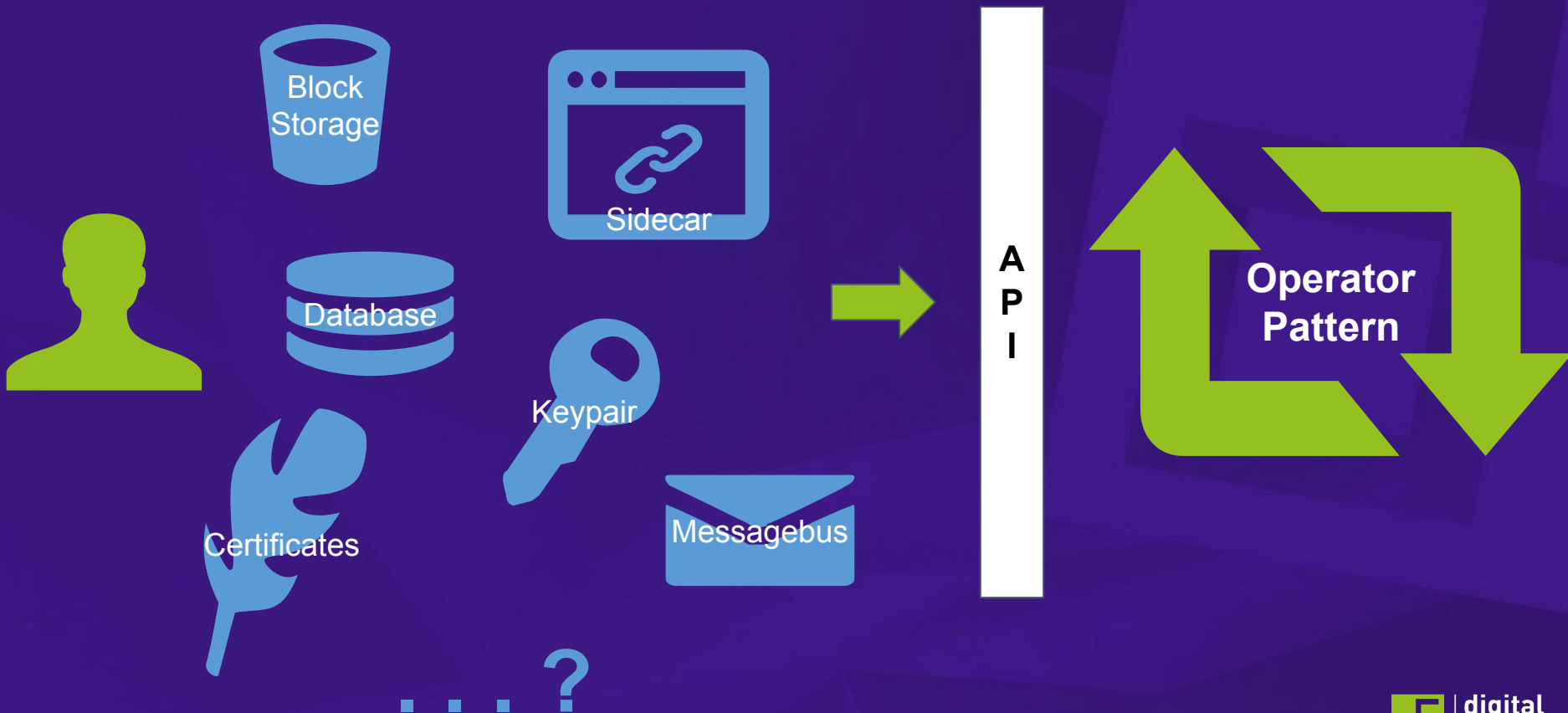
## The Declarative Kubernetes Way



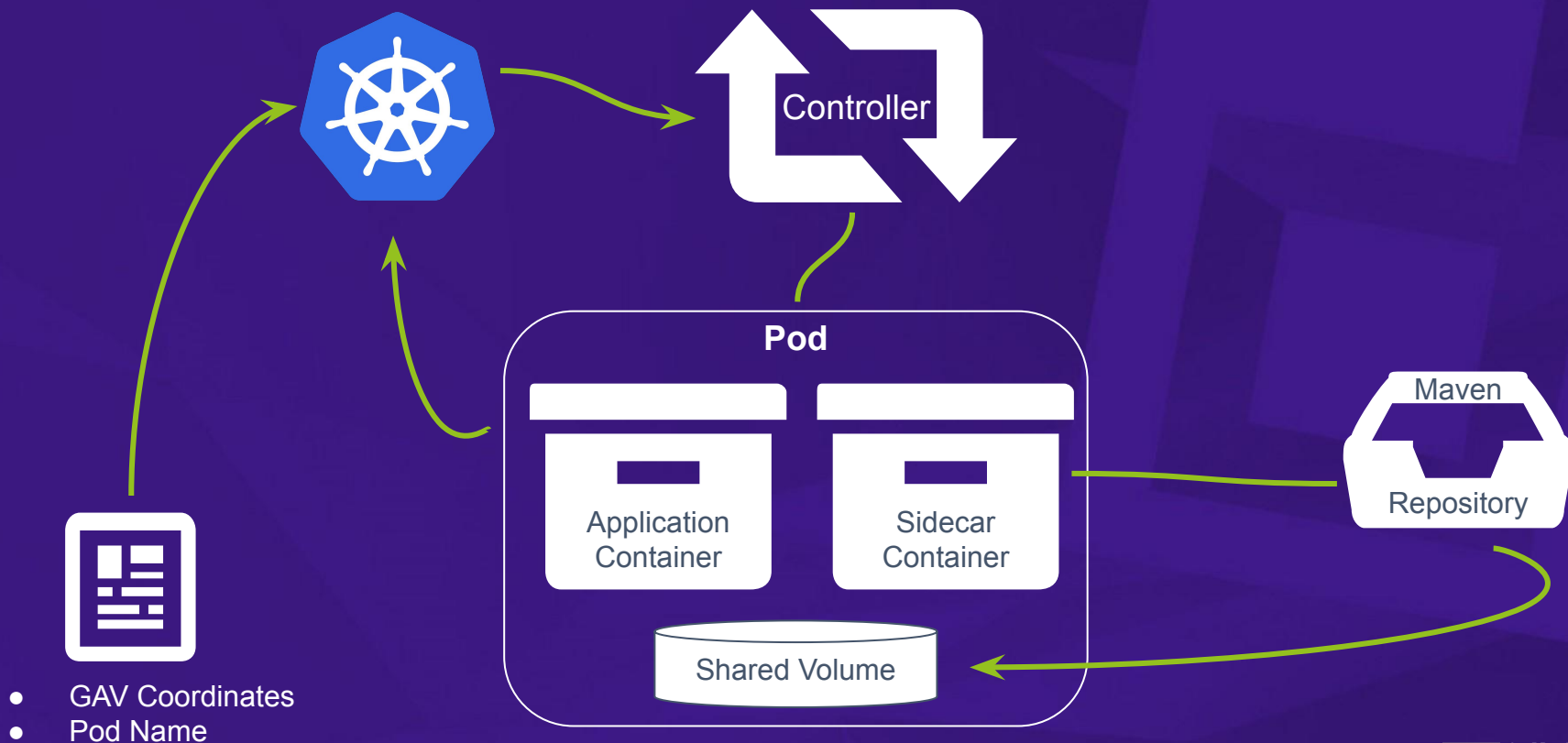
# Kubernetes API: Applying Resources



## Platform as a Service: Extending the Kubernetes API



## Demo: Maven Deployment Operator



## Custom Resource: MavenDeployment

### Maven Deployment Resource

**apiVersion:** k8s-demo.dxfrontiers.de/v1

**kind:** MavenDeployment

**metadata:**

**name:** some-resource-name

**namespace:** some-namespace

**spec:**

**gav:** de.dxfrontiers.demos.operator-demo:foo:0.0.1

**podName:** sample-pod

APPLY?

Custom  
Resource  
Definition

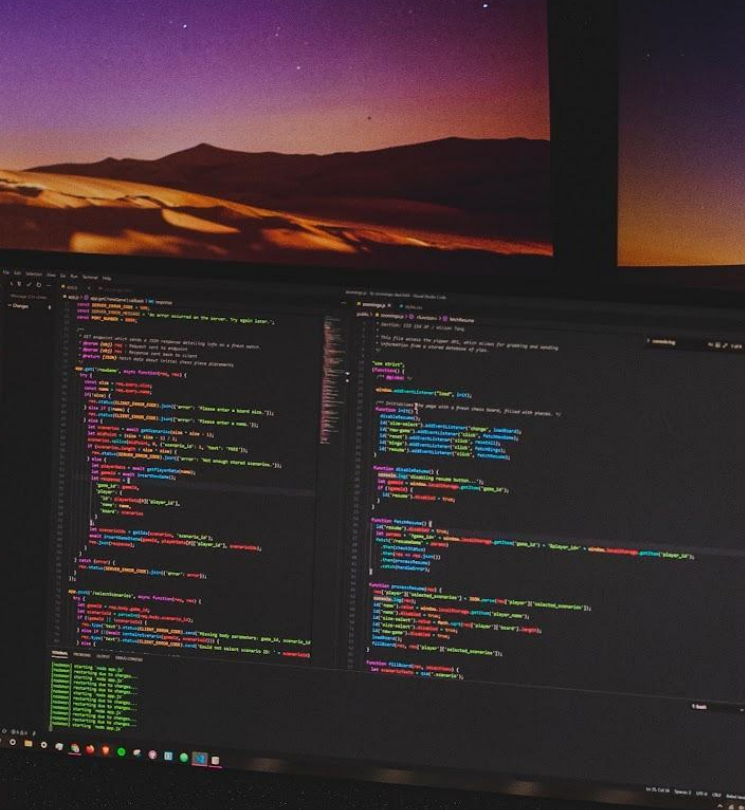




# Live Coding

## Custom Resource Definition (CRD)

Defining a custom Kubernetes Resource Type



## Operator



Perform operations  
towards described  
state

Get collection of custom resource type

Start watch

Compare state described in resource with  
actual state

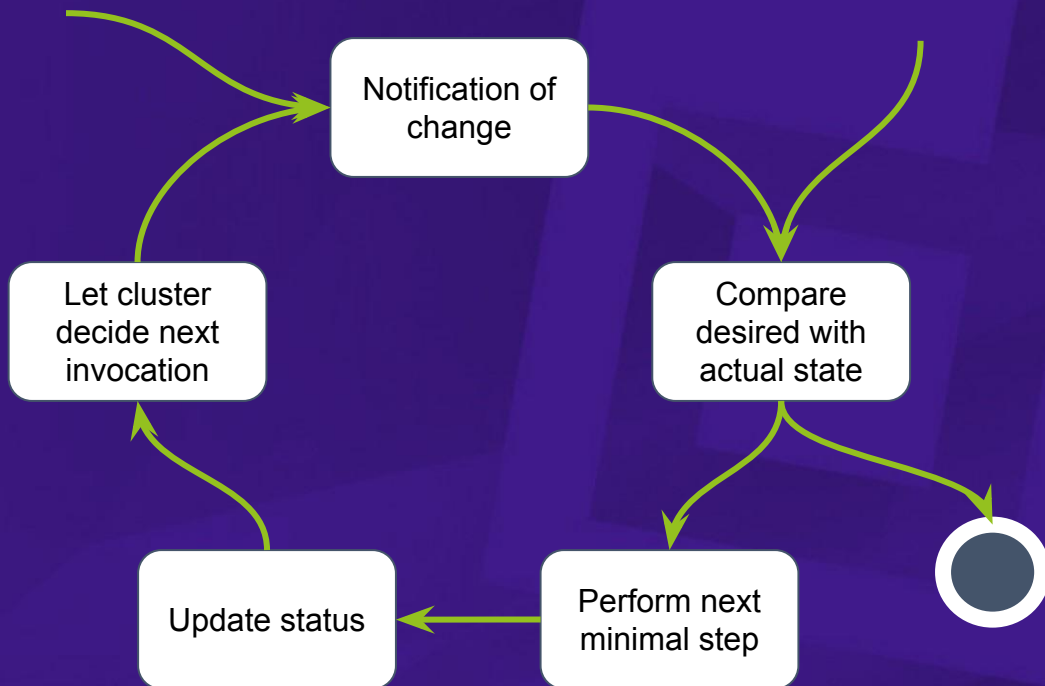
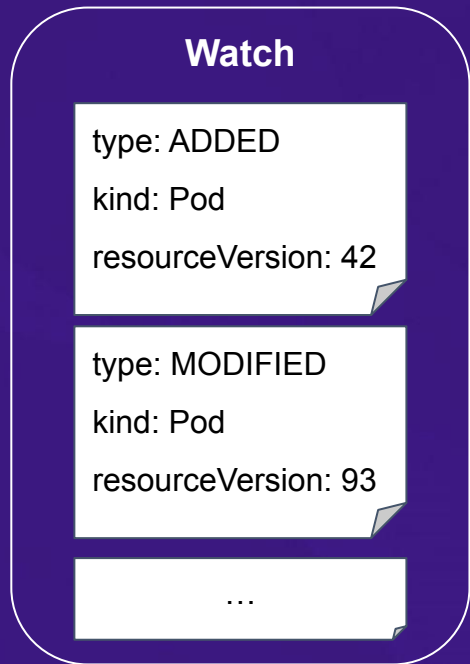
Perform operations towards described  
state

Write current state





## Control / Reconcile Loop



# Live Coding

## Operator's Control Loop

Watching and updating the state of the cluster

- fabric8 Kubernetes Client
- Java Operator SDK

## Kubernetes: Deleting Resources

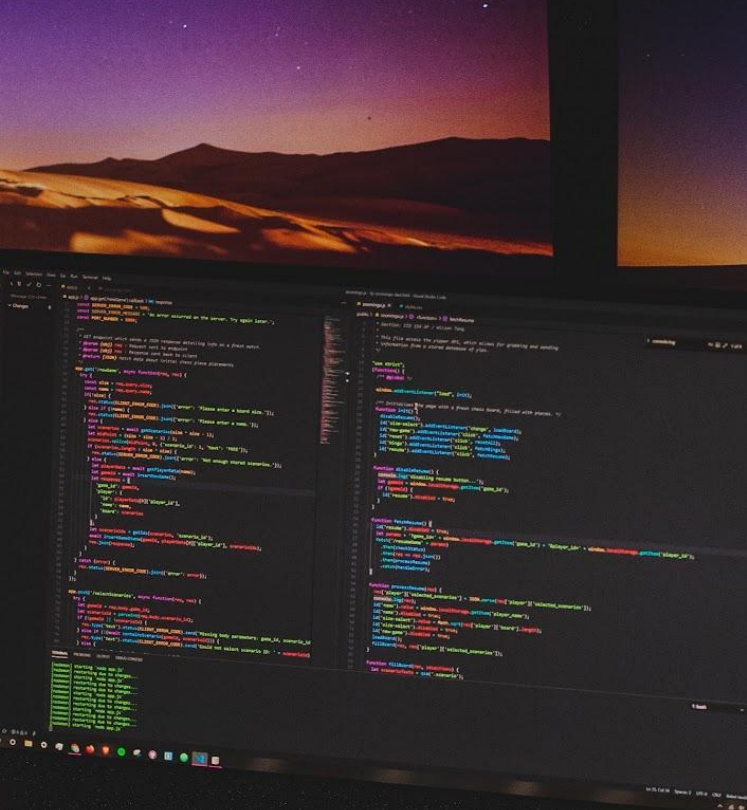


# Live Coding

## Finalizers

### Cleaning up the Cluster

- fabric8 Kubernetes Client
- Java Operator SDK



## Operator Pattern: Extend the Kubernetes API

- Introduce new API Elements (Resource Types)
- Consists of
  - Custom Resource Definition
  - Controller
- Where the magic lives: Control / Reconcile Loop
- Idempotency as central pattern
- Can influence Kubernetes Resources, Kubernetes itself or 3rd party systems
- Clean up using finalizers

## Even more is waiting out there ...

- Healing Controllers
- Deployment in the Cluster
- Leader Election
- Automated testing
- Permission management (RBAC)
- ...



## Pimp my k8s

Are you already customizing your Cloud Platform?



 @0x378



 @nik101010



<https://gitlab.com/dxfrontiers/kubernetes-operator-demo/>

 @dxfrontiers

<https://blog.digitalfrontiers.de>

**#JetztBewerben**



**digital  
frontiers**