Write your own K8s operator

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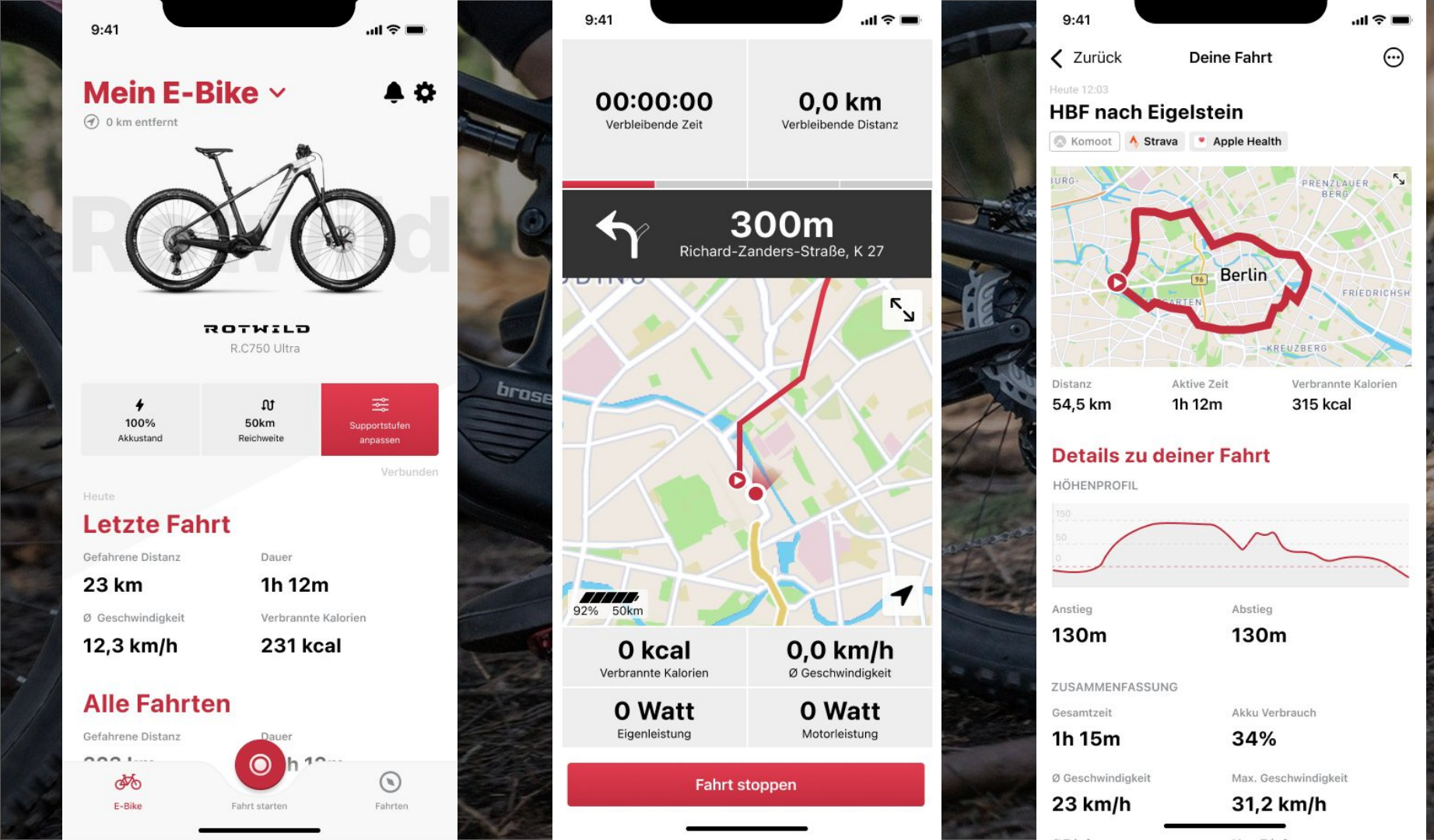
Simon Schneider

brose

Simon Schneider

Software Engineer


9:41
Mein E-Bike
0 km entfernt
ROTWILD
R.C750 Ultra
100%
Akkustand
50km
Reichweite
Supportstufen anpassen
Verbunden
Heute
Letzte Fahrt
Gefahrene Distanz
23 km
Dauer
1h 12m
Ø Geschwindigkeit
12,3 km/h
Verbrannte Kalorien
231 kcal
Alle Fahrten
Gefahrene Distanz
Dauer
E-Bike
Fahrt starten
Fahrten
9:41
00:00:00
Verbleibende Zeit
0,0 km
Verbleibende Distanz
300m
Richard-Zanders-Straße, K 27
92%
50km
0 kcal
Verbrannte Kalorien
0,0 km/h
Ø Geschwindigkeit
0 Watt
Eigenleistung
0 Watt
Motorleistung
Fahrt stoppen
9:41
Zurück
Deine Fahrt
Heute 12:03
HBF nach Eigelstein
Komoot
Strava
Apple Health
Berlin
PRENZLAUER BERG
FRIEDRICHSH
KREUZBERG
Distanz
54,5 km
Aktive Zeit
1h 12m
Verbrannte Kalorien
315 kcal
Details zu deiner Fahrt
HÖHENPROFIL
150
50
0
Anstieg
130m
Abstieg
130m
ZUSAMMENFASSUNG
Gesamtzeit
1h 15m
Akku Verbrauch
34%
Ø Geschwindigkeit
23 km/h
Max. Geschwindigkeit
31,2 km/h

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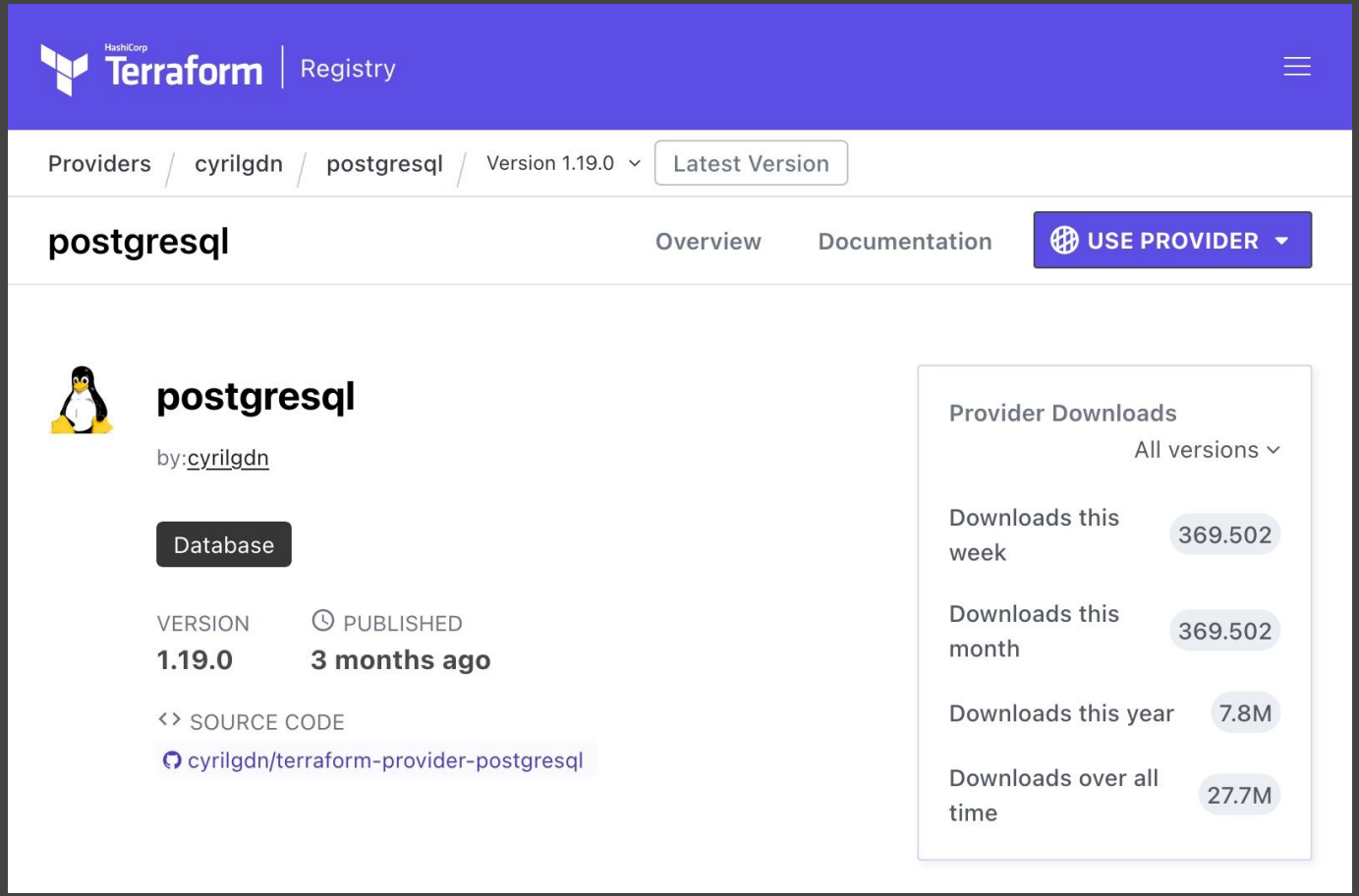
- Development around the globe
- Kubernetes for service orchestration
- We ❤️ Infrastructure as Code

Database management with(out) terraform!?


HashiCorp Terraform | Registry
Providers / cyrilgdn / postgresql / Version 1.19.0 Latest Version
postgresql
Overview
Documentation
USE PROVIDER
postgresql
by:cyrilgdn
Database
VERSION
1.19.0
PUBLISHED
3 months ago
SOURCE CODE
cyrilgdn/terraform-provider-postgresql
Provider Downloads
All versions
Downloads this week
369.502
Downloads this month
369.502
Downloads this year
7.8M
Downloads over all time
27.7M

- Everything in one place
- Database configuration is stored in GIT
- Database configuration can be tested

- Terraform needs direct network access to db server
- Terraform plan takes much time
- Developers need to learn HCL

DAMN YOU TERRAFORM
imgflip.com

Write custom K8s operator

WRITE MORE CODE
imgflip.com

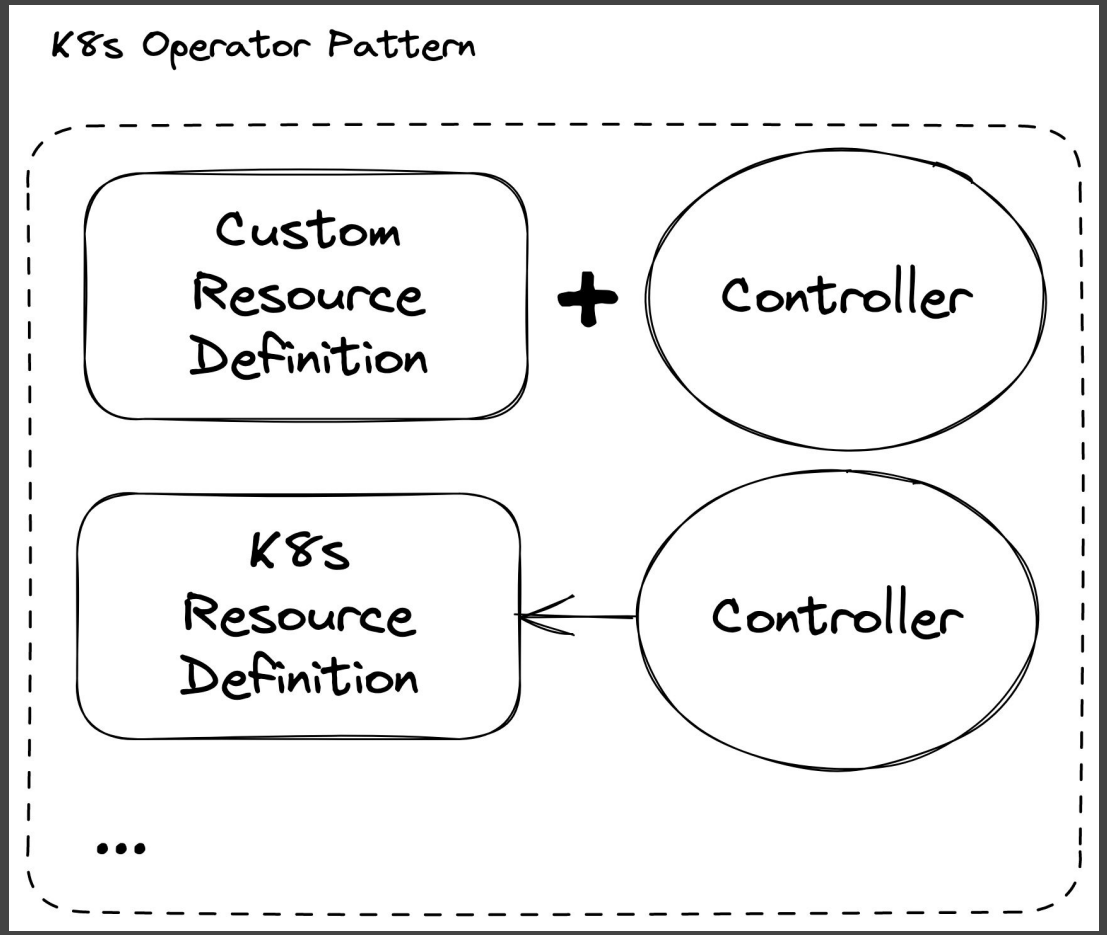
https://github.com/brose-ebike/postgres-operator/

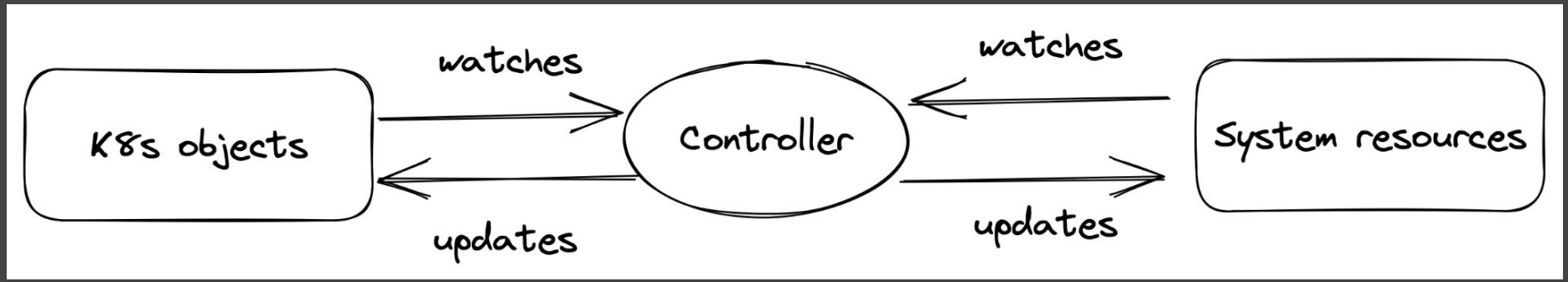
- Database config with application config
- Network access already available
- Known interface for developers

- Terraform needs to inject admin credentials
- Developer user handling
- Operator needs to be maintained

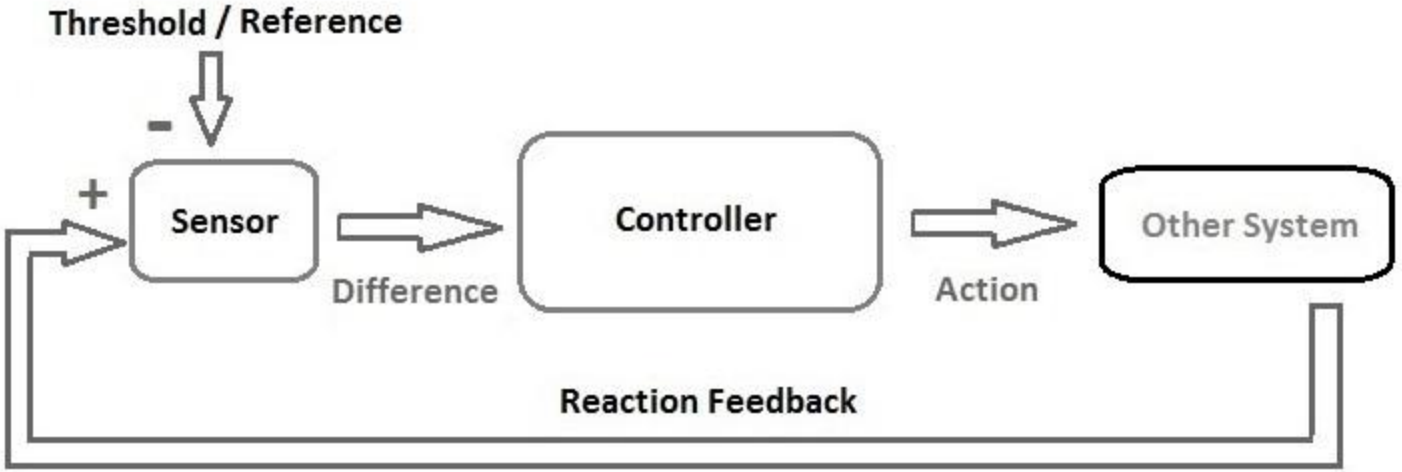
K8s basics

Operator, Controller, etc.


K8s Operator Pattern
Custom Resource Definition
Controller
K8s Resource Definition
Controller
...

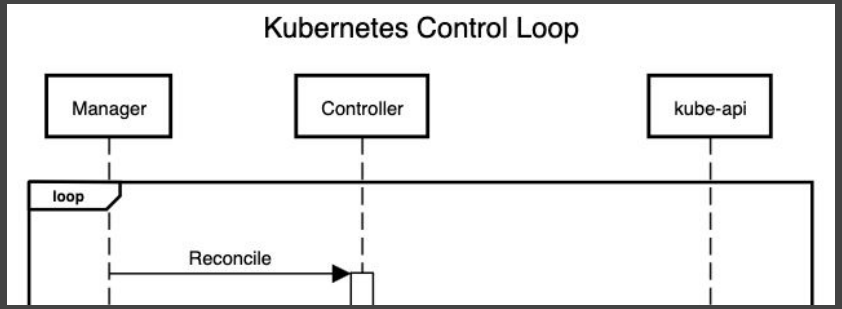

watches
watches
K8s objects
Controller
System resources
updates
updates

The cybernetics in kubernetes



A Cybernetic Loop

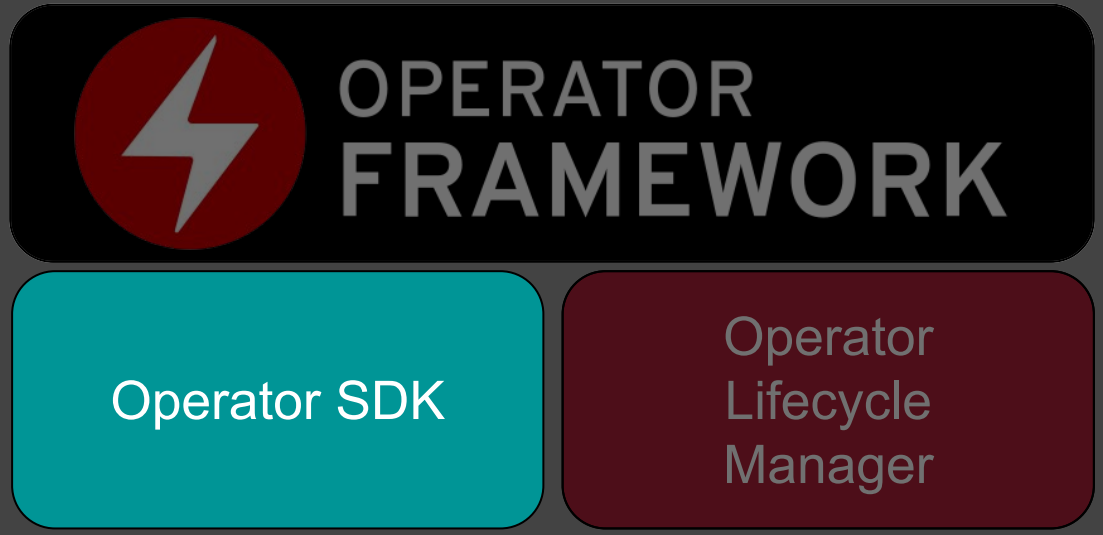
FRITZ!
0 6 12 18 24
Soll-Temperatur
12,0 °C
Menu
OK


Kubernetes Control Loop
Manager
Controller
kube-api
loop
Reconcile

OPERATOR
FRAMEWORK

OPERATOR
FRAMEWORK

The Operator Framework is an open source toolkit to manage Kubernetes native applications, called Operators, in an effective, automated, and scalable way.

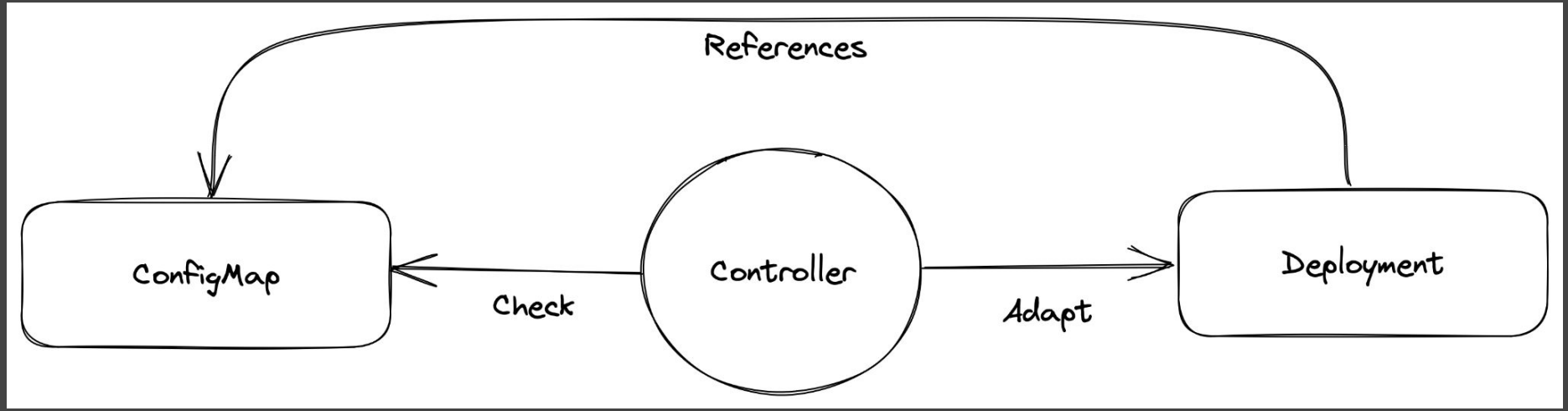

OPERATOR
FRAMEWORK
Operator SDK
Operator
Lifecycle
Manager

Coding Session

Let us write our own k8s operator,

which restarts pods of a deployment

when a config map gets changed


References
ConfigMap
Check
Controller
Adapt
Deployment

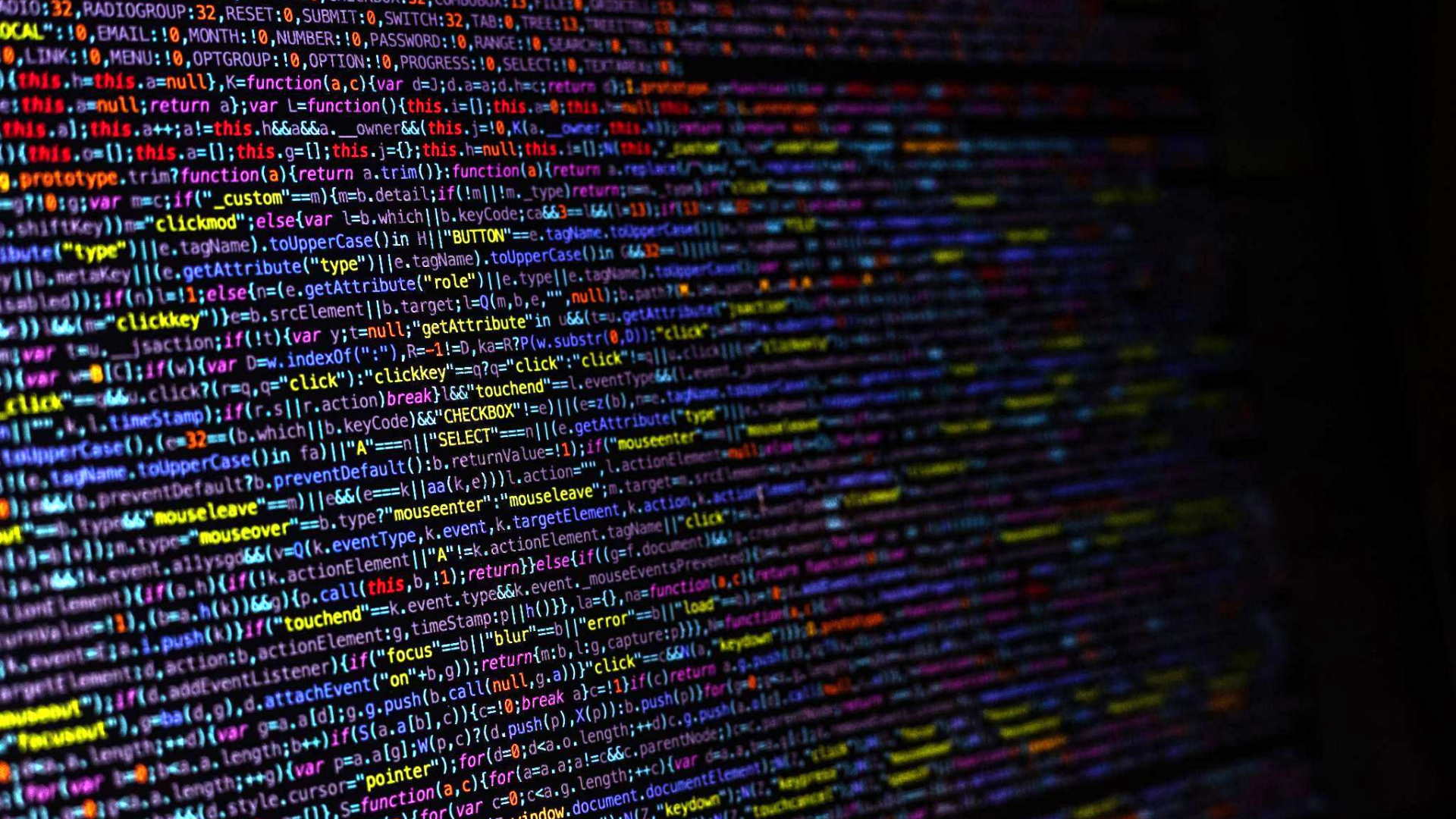
```
mkdir auto-reload-operator

cd auto-reload-operator

operator-sdk init --domain raynigon.com
--repo github.com/raynigon/auto-reload-...
```

```
operator-sdk create api --group=apps
--version=v1 --kind=Deployment
--controller=true --resource=false
```

```
operator-sdk create api --group=core
--version=v1 --kind=ConfigMap
--controller=true --resource=false
```



https://github.com/raynigon/auto-reload-operator

Summary

1. Cybernetic control loop as architecture of k8s controllers
2. What is the operator sdk and how to use it
3. Start writing your own k8s operator today

Questions

Thank you

We are hiring!

simon-schneider-nbg

raynigon

simon.schneider@brose.com

Image References

- Brose Logo: https://static.brose.bike/images/generic/brose-logo.png
- Screenshot Brose Apps: https://apps.apple.com/de/app/brose-e-bike-app/id1571894256
- Memes from imgflip.com
- Diagramm Cybernetic Loop: https://en.wikipedia.org/wiki/Cybernetics#/media/File:Cybernetics.jpg
- Thermostat: https://de.wikipedia.org/wiki/Thermostatventil#/media/Datei:AVM_FRITZ!DECT_301-8942.jpg
- Logo Operatorframework: https://operatorframework.io/
- Code Wallpaper: Mitchell Luo https://unsplash.com/de/fotos/FWoq_IdWINQ
- Diagrams were drawn with:
  - https://excalidraw.com/
  - https://sequencediagram.org/