// KUBERNETES EINSTIEG:

MIT DER TÜR INS HAUS

JOHANNES SCHNATTERER

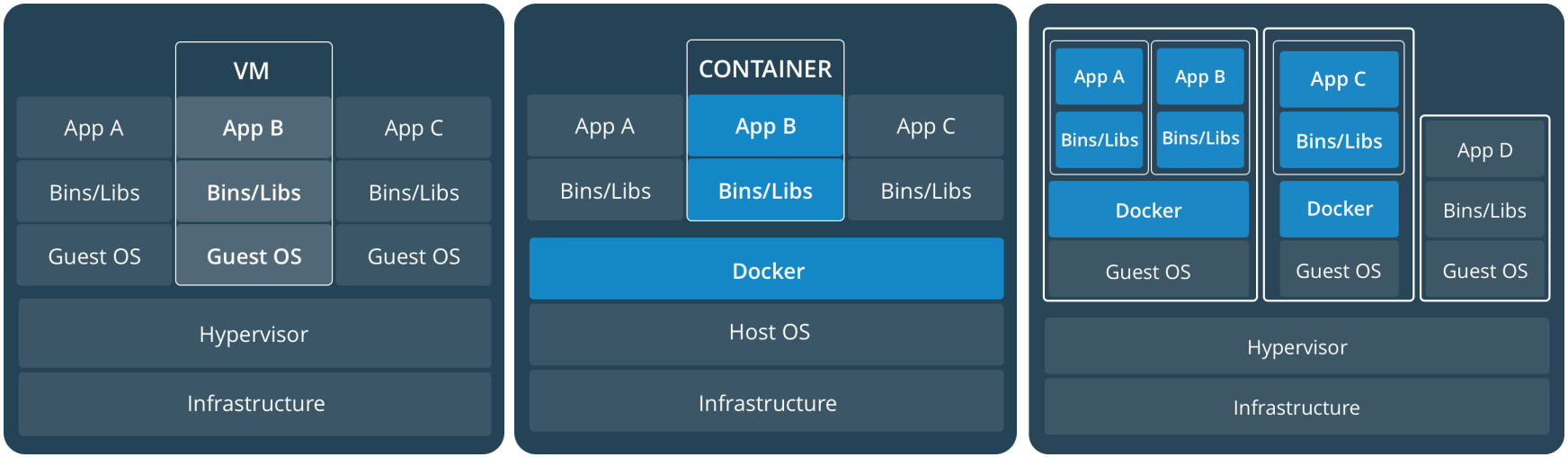
CLOUDOGU GMBH

VERSION: 202007081420-E3D57D2

Pull image for workshop

```
# Start container with all tools necessary for workshop
$ docker run -it cloudogu/k8s-training
```

Container Recap



https://web.archive.org/web/20180701005535/https://www.docker.com/what-container

Operations on "plain" Docker host in production — what is missing?

- 🗜 For some use cases: Nothing!
- For others:
  - High availability
  - Load Balancing
  - Solutions for challenges of distributed systems, e.g networking, storage
  - Scaling out containers
  - Rolling updates

Solution:

Container orchestrator

Kubernetes (k8s)

You will see the following features hands-on:

- Scheduling containers on multiple nodes
- Scaling out (scaling horizontally)
- Load balancing
- Self healing
- Rolling updates

Cluster access

```
# In cloudogu/k8s-training container - Create cluster config
$ k8s-training-auth fdt 2020

# Test connection: no error means success
$ kubectl version
```

First deployment

```
$ NAME=think-of-something-unique

$ kubectl create deployment $NAME --image=cloudogu/hello-k8s

# Success?
$ k get deployment $NAME
```

Access via the internet

```
k expose deployment $NAME --port=80 --target-port 8080 --type=LoadBalancer

# Query EXTERNAL-IP, then open in browser
k get service $NAME
```

https://media.giphy.com/media/z9sFrQMfEME5a/giphy.gif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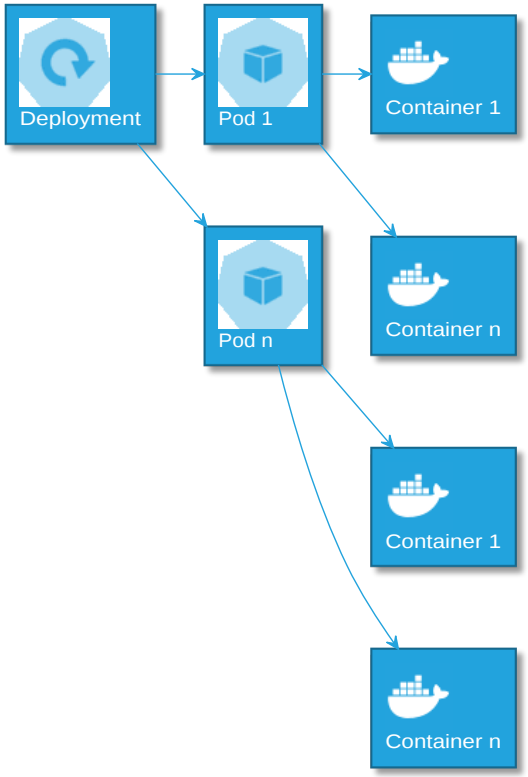
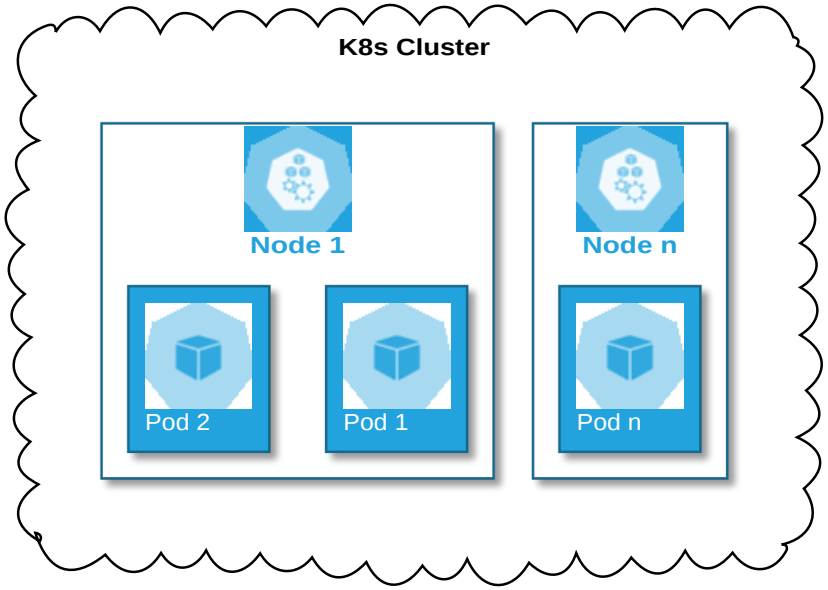
Deployment Pod Container




```
$ k get pod | grep $NAME
```

Pod Node




```
$ k get pod -owide
$ k get node
```


High availability?

Scaling out

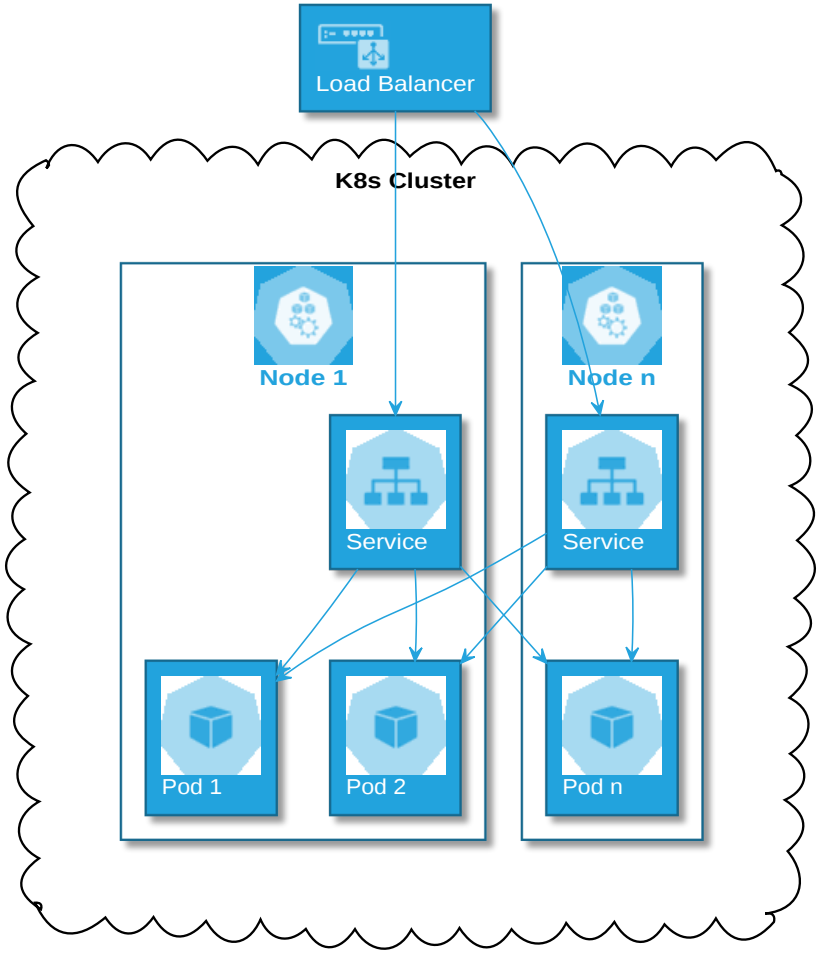
```
$ k scale deployment $NAME --replicas=2
$ k get deployment $NAME
$ k get pod | grep $NAME
```

Load Balancing

- Reload app in browser multiple times (look at "`pod:`")
- or run script:

```
# k get service $NAME
$ EXTERNAL_IP=w.x.y.z
$ while [ 1 ]; do echo $(curl -s http://$EXTERNAL_IP/api/hostName); done
```

Services

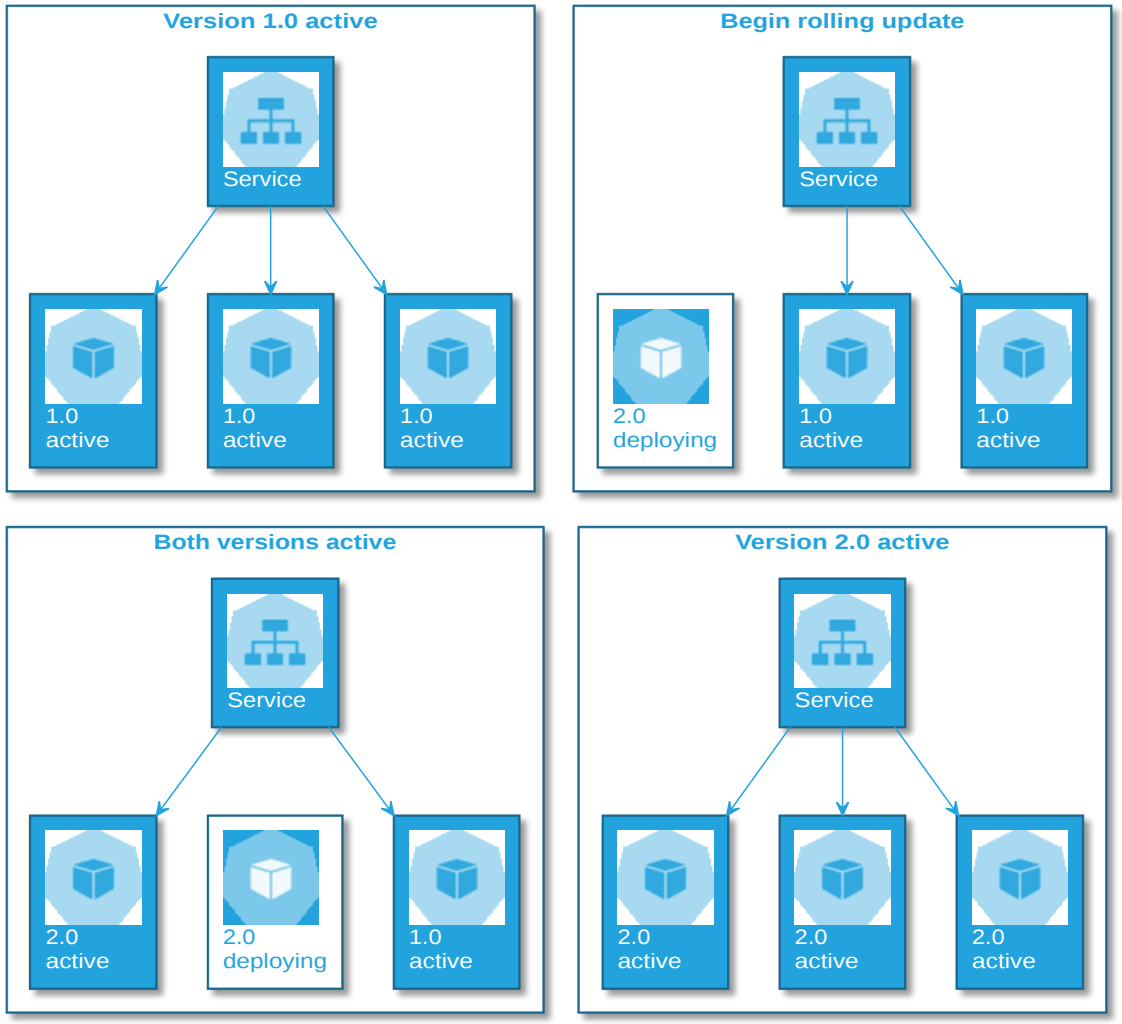

Load Balancer
K8s Cluster
Node 1
Node n
Service
Service
Pod 1
Pod 2
Pod n

Self healing

```
# New terminal (or use tmux)
$ docker run -it cloudogu/k8s-training
$ k8s-training-auth fdt 2020

# k get service $NAME
$ EXTERNAL_IP=w.x.y.z
$ while [ 1 ]; do echo $(curl -s http://$EXTERNAL_IP/api/hostName); done
```

```
$ k get pod | grep $NAME

$ PODNAME=one-of-your-pods
$ k delete pod $PODNAME

$ k get pod | grep $NAME
```

Rolling update



```
$ EXTERNAL_IP=w.x.y.z
$ while [ 1 ]; do
    echo $(curl -s --connect-timeout 1 -m 1 http://$EXTERNAL_IP/api/appVersion);
  done
# -m  max-time
```

```
# Other terminal
$ k get pod | grep $NAME

$ k set image deploy $NAME hello-k8s=cloudogu/hello-k8s:1.9.1

# Multiple times
$ k get pod | grep $NAME
```


END

Key takeaways

- **k8s** - run containers in a cluster (on multiple nodes)
- **pod** - smallest resource in k8s (comprising containers)
- **deployment**
  - scaling out containers
  - self-healing
  - rolling updates
- **service**
  - cluster access
  - load balancing

Johannes Schnatterer

Cloudogu GmbH

my.cloudogu.com
cloudogu.com/schulungen

Questions or feedback?

https://forum.cloudogu.com/topic/65

@cloudogu
@jschnatterer