kubernetes

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Classic application deployment process

foreach environment:

1. Server staging
2. Web server installation
3. install all dependencies
4. Web Server configuration
5. install forgotten dependencies
6. copy binaries

The state of the server and application changes over time

What we need to deliver applications and changes fast

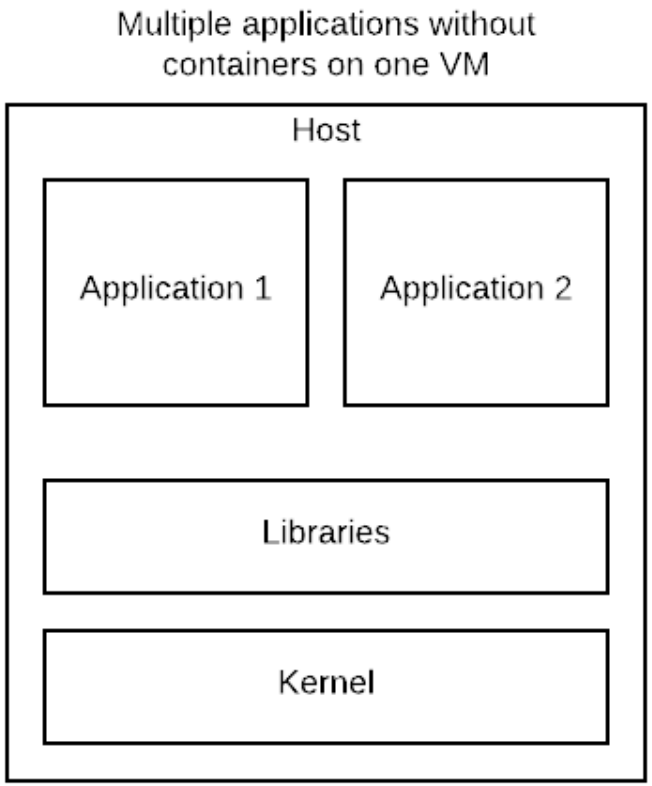
- Automated deployment
- Versioning
- Infrastructure as Code
- No dependency hell
- Consistent environment (from dev to production)
  itWorkedonMyMachine
- Immutable
- Automated testing

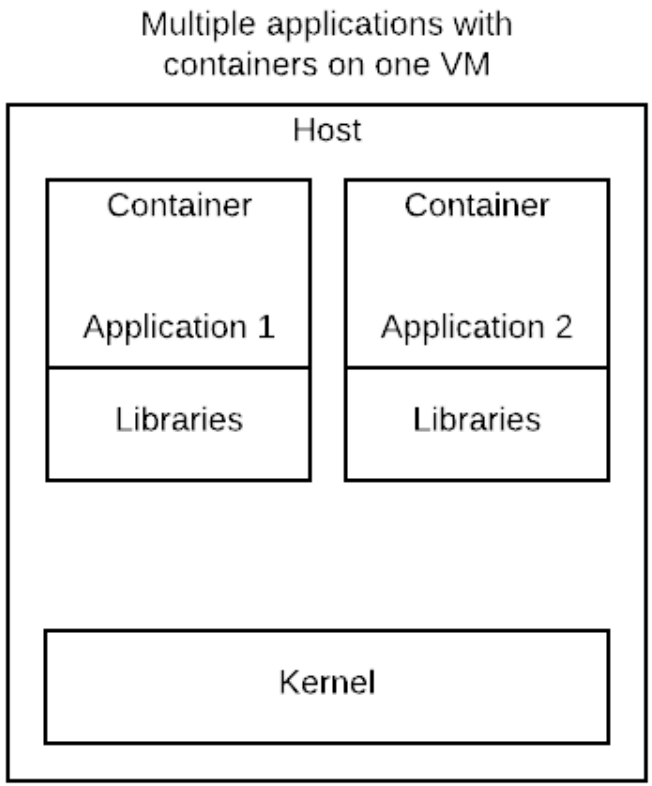
What containers can solve

- Isolate applications
- Abstraction of resources
- Consistent environment
- Minimalistic configuration on targed machine
- Configuration can be versioned

What is a container

Isolated Artifact which shares the kernel and if possible libraries





Example docker file

```
1  FROM nginx:1.13.3-alpine
2  ## Remove default nginx website
3  RUN rm -rf /usr/share/nginx/html/*
4  ## From 'builder' stage copy over the
       artifacts in dist folder to default
       nginx public folder
5  COPY / /usr/share/nginx/html
6  CMD ["nginx", "-g", "daemon off;"]
```

kubernetes, what is it and why we need it

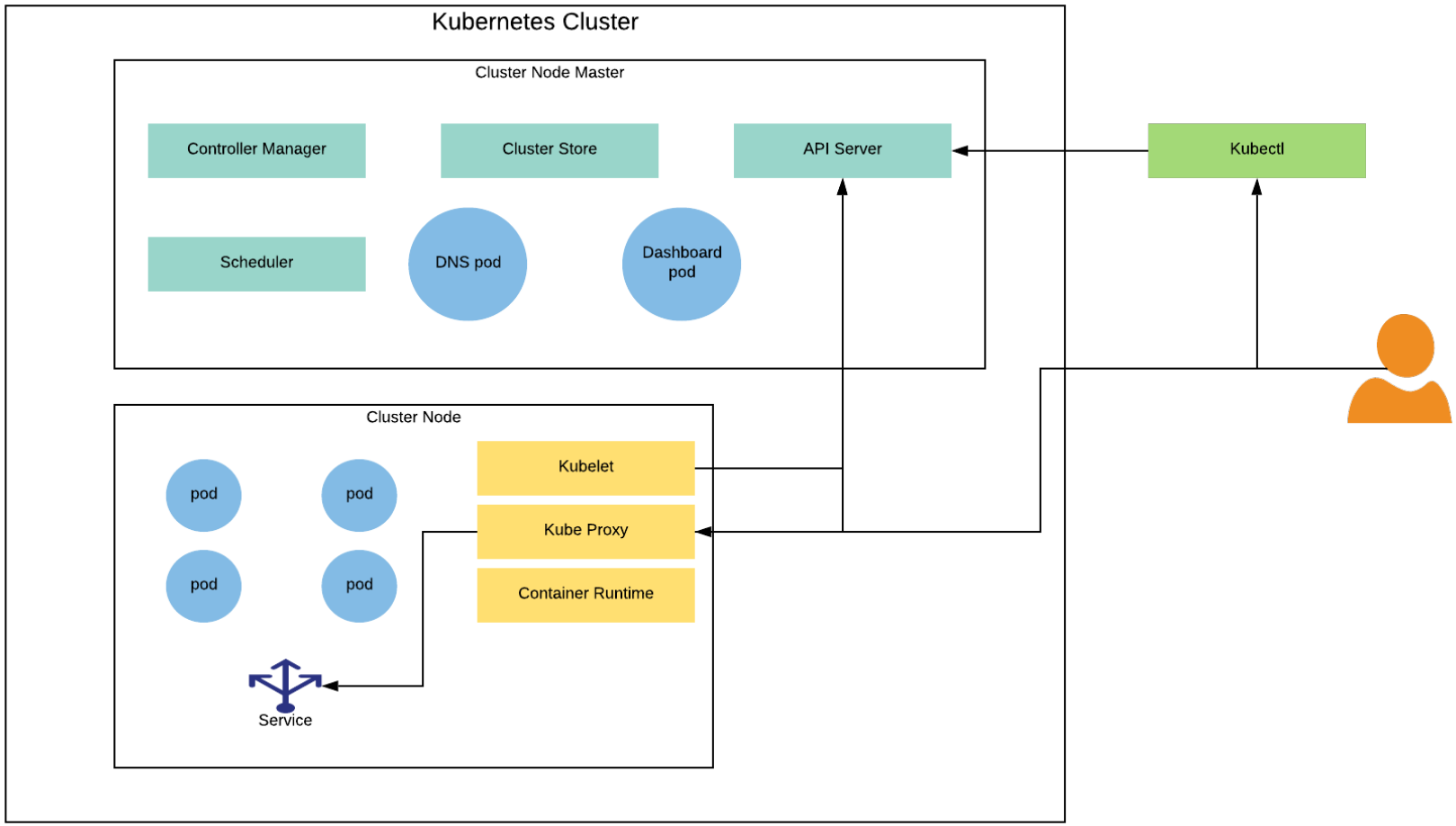
kubernetes is a container orchestration platform

- abstraction of infrastructure
- desired state
- automation
- scaling
- self healing

How to get kubernetes

- Minikube
- on premise installation
  - All pods can communicate with all other pods on all Nodes
  - All Nodes can communicate with all pods
  - There is no Network Translation happening (NAT)
- cloud platform (Azure, Google, AWS)

Overview of kubernetes



Components

Masters

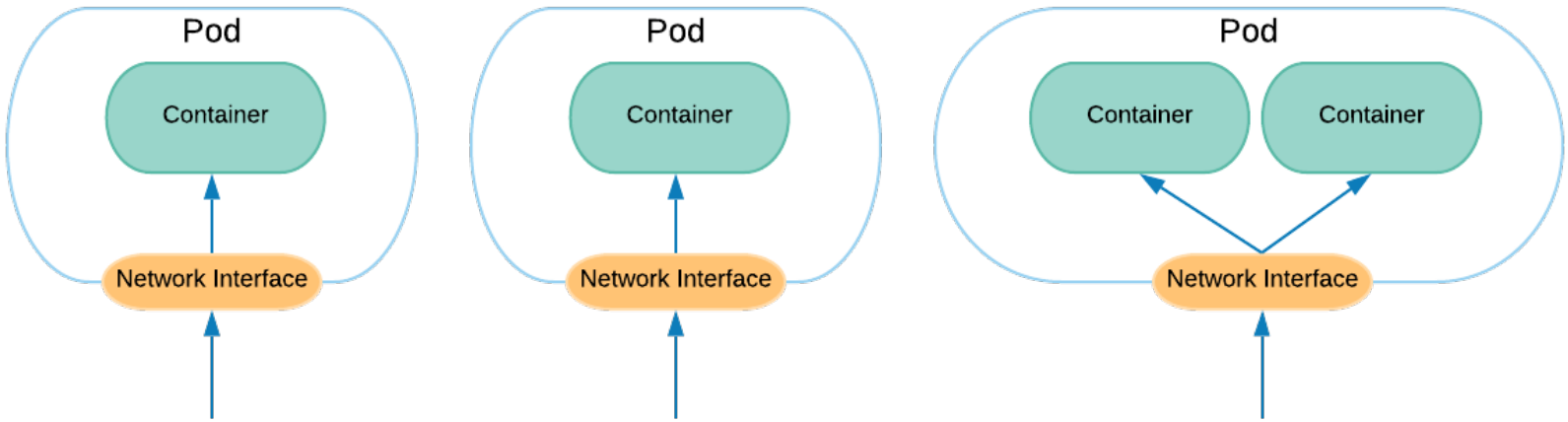
- API Server
- Cluster store
- Scheduler
- Controller manager
- Addon components

Nodes

- Kubelet (worker agent)
- Container runtime
- Kube proxy (ip tables)

Pod

- one network interface
- one or more pods
- one container is usually one pod



Deployment of pods

Pods are usually deployed through pod controllers

- Replica Set
- Deployment

lifecycle and probes

- ExecAction
- TCPSocketAction
- HTTPGetAction

```
livenessProbe:
      httpGet:
        path: /status/health
        port: 80
      initialDelaySeconds: 90
      timeoutSeconds: 10
```

Restart policies

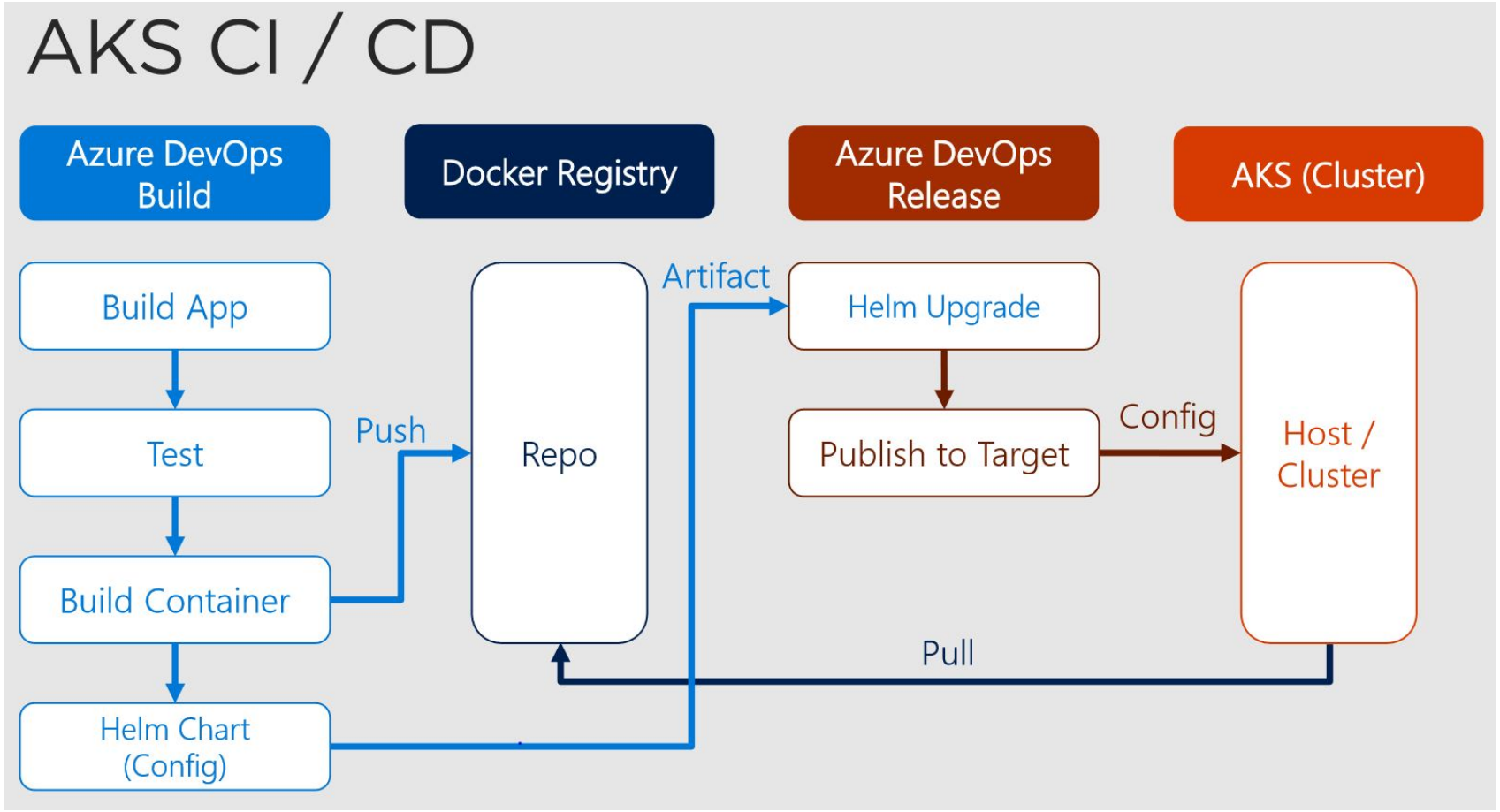
- Always
- OnFailure
- Never

Services

- Static endpoint
- Mapped to pods

Demo

Possible deployment process



Conclusion / Result

Questions?