KUBERNETES

BJÖRN BESKOW

2016-01-27 | CALLISTAENTERPRISE.SE

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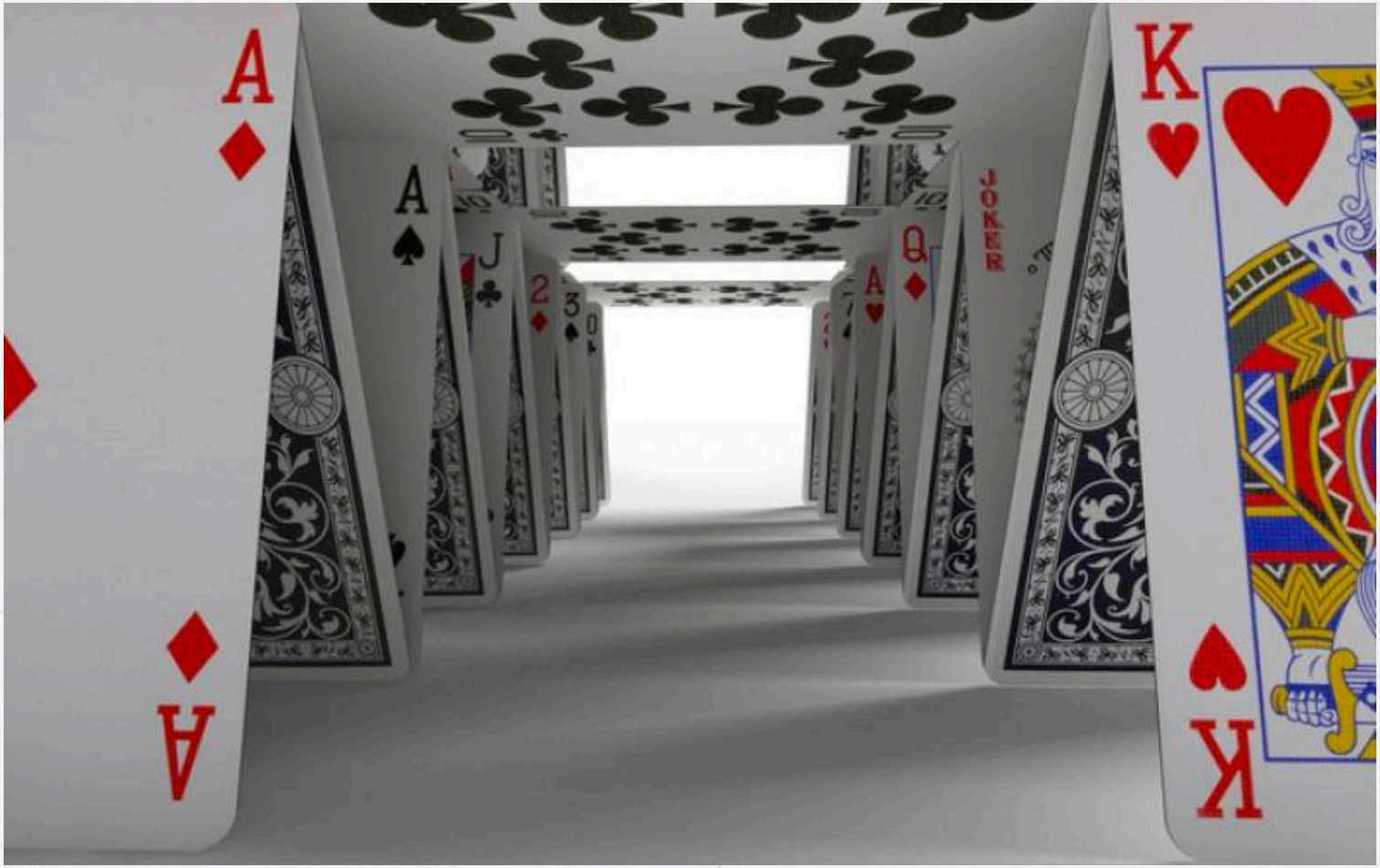
— ENTERPRISE —

Many small, moving parts



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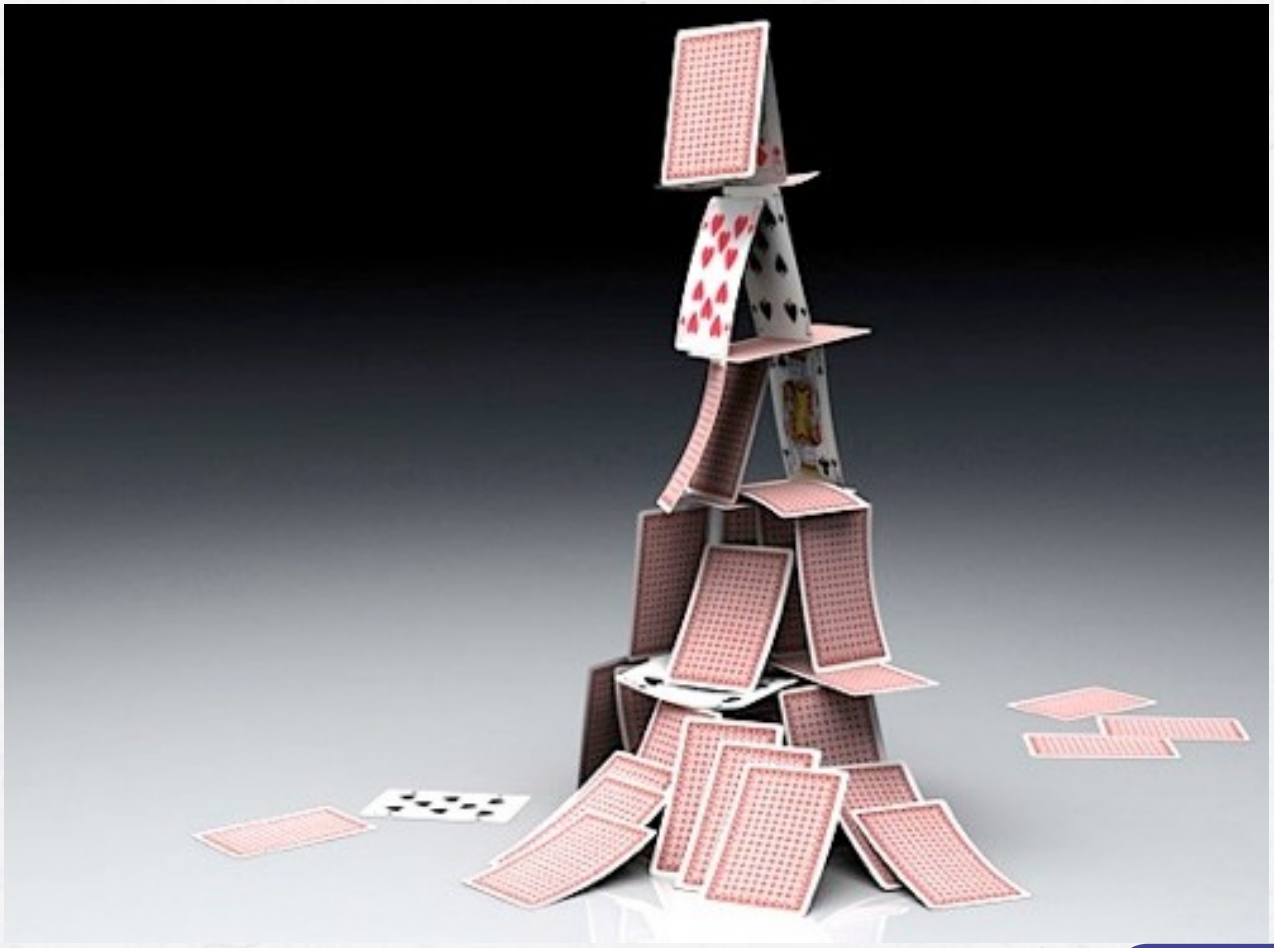
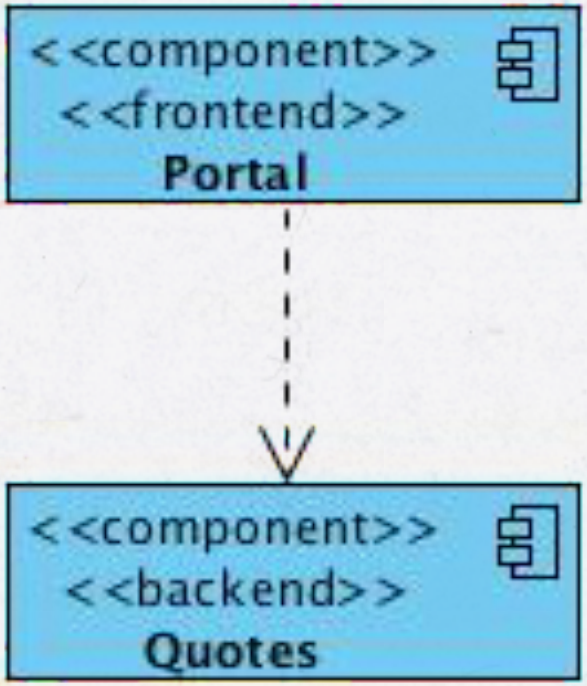
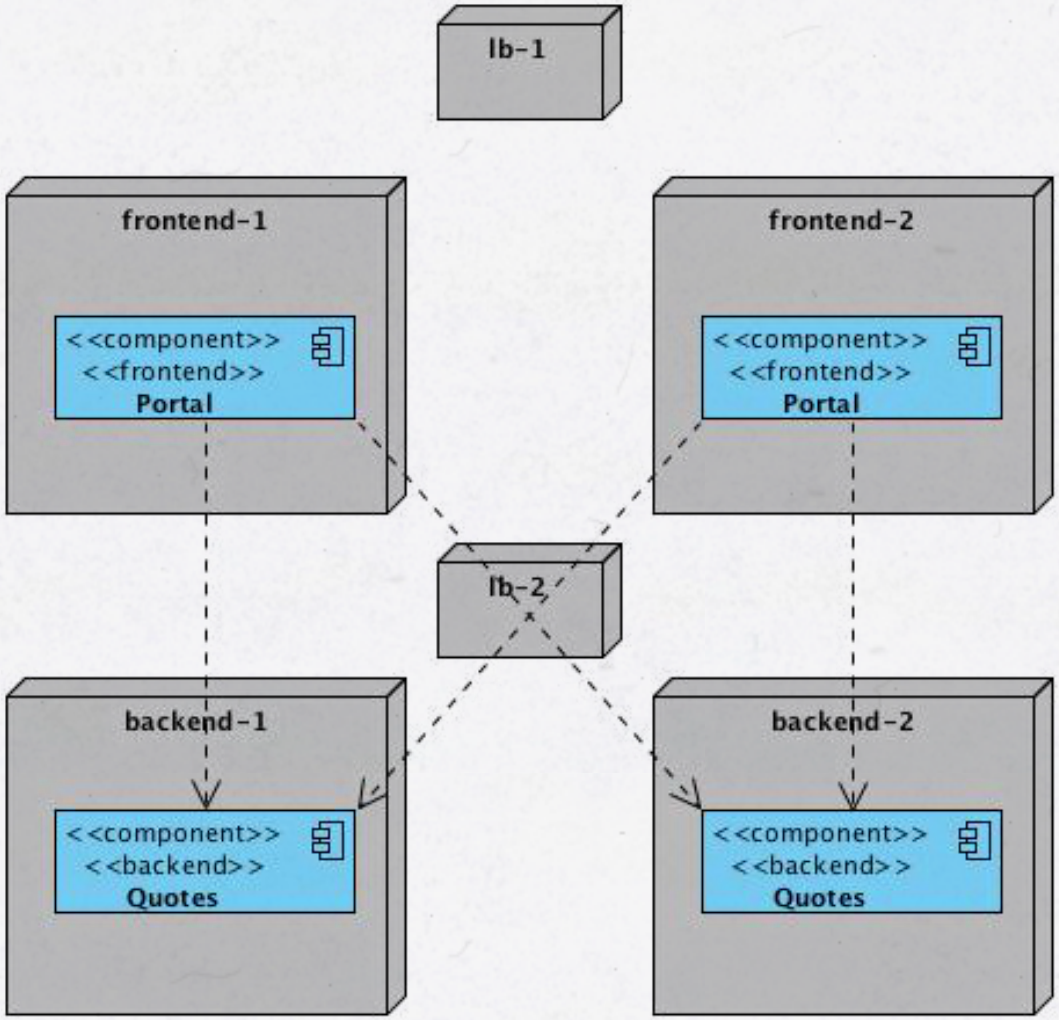
Software, Hardware & Networks

Failures are inevitable



Ephemeral





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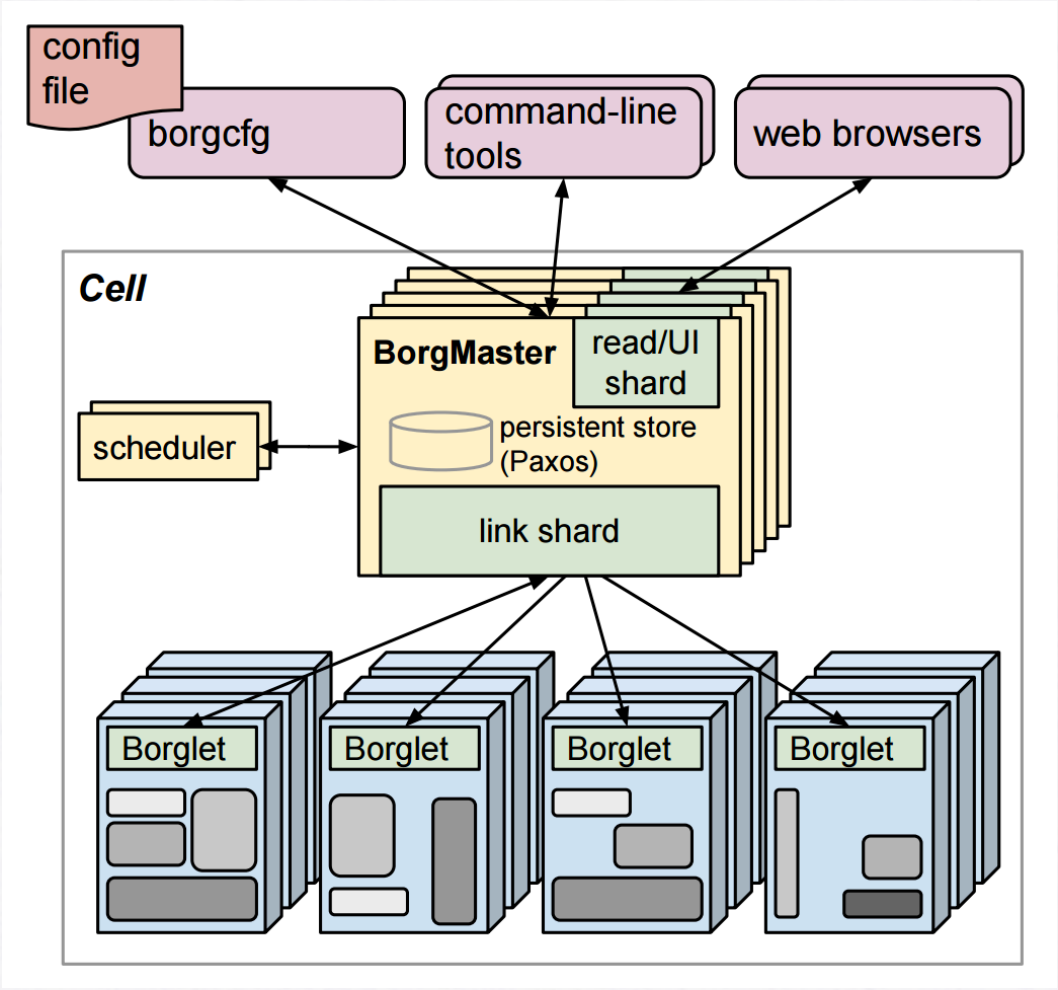
Google
Svenska



Source: https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/43438.pdf

GOALS

Treat all hardware nodes as one giant logical machine

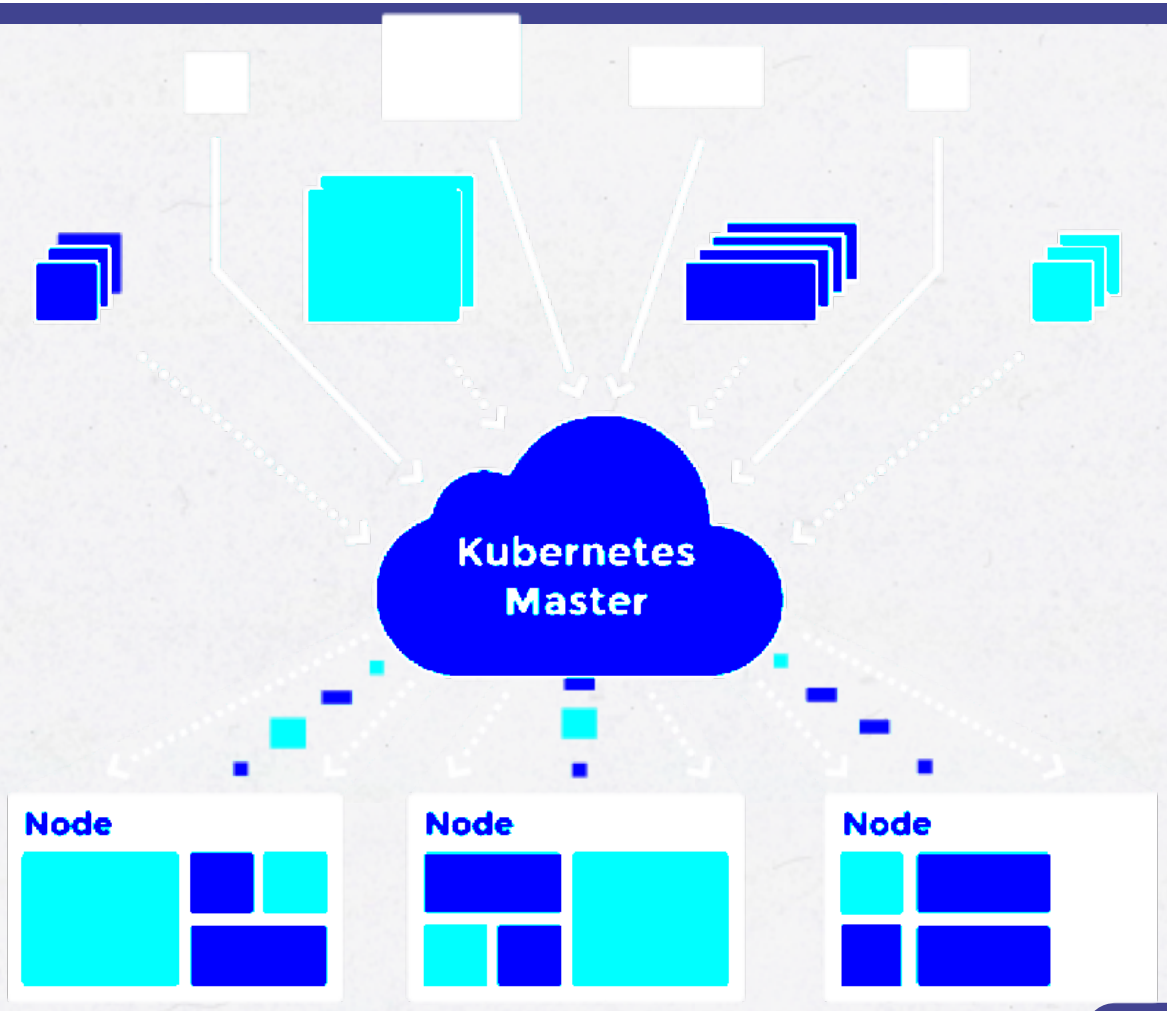
GOALS

Focus on your "applications"

GOALS

Manage your applications through "Wishful Thinking": Declare how it *ought to be*

kubernetes by Google



Source: http://kubernetes.io/

DEMO SETUP

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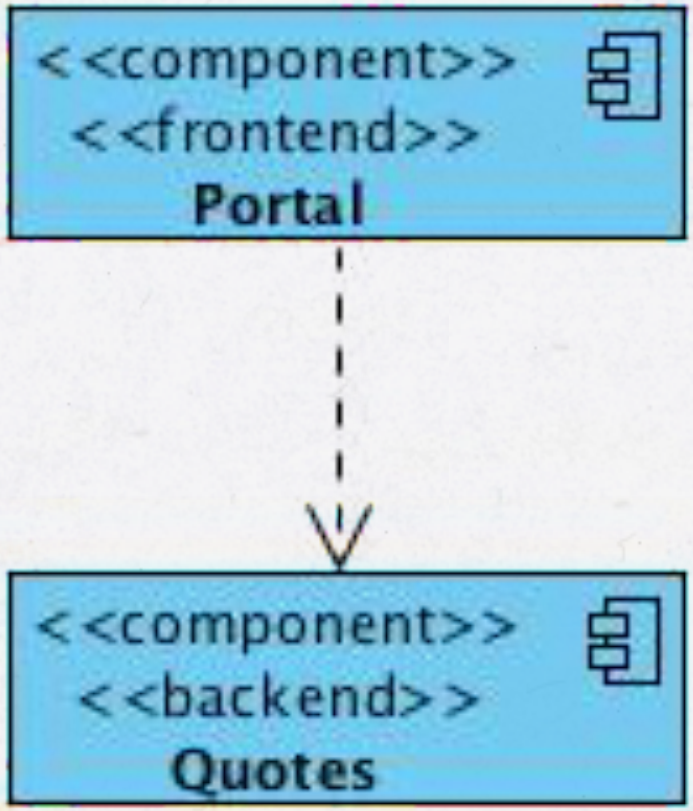
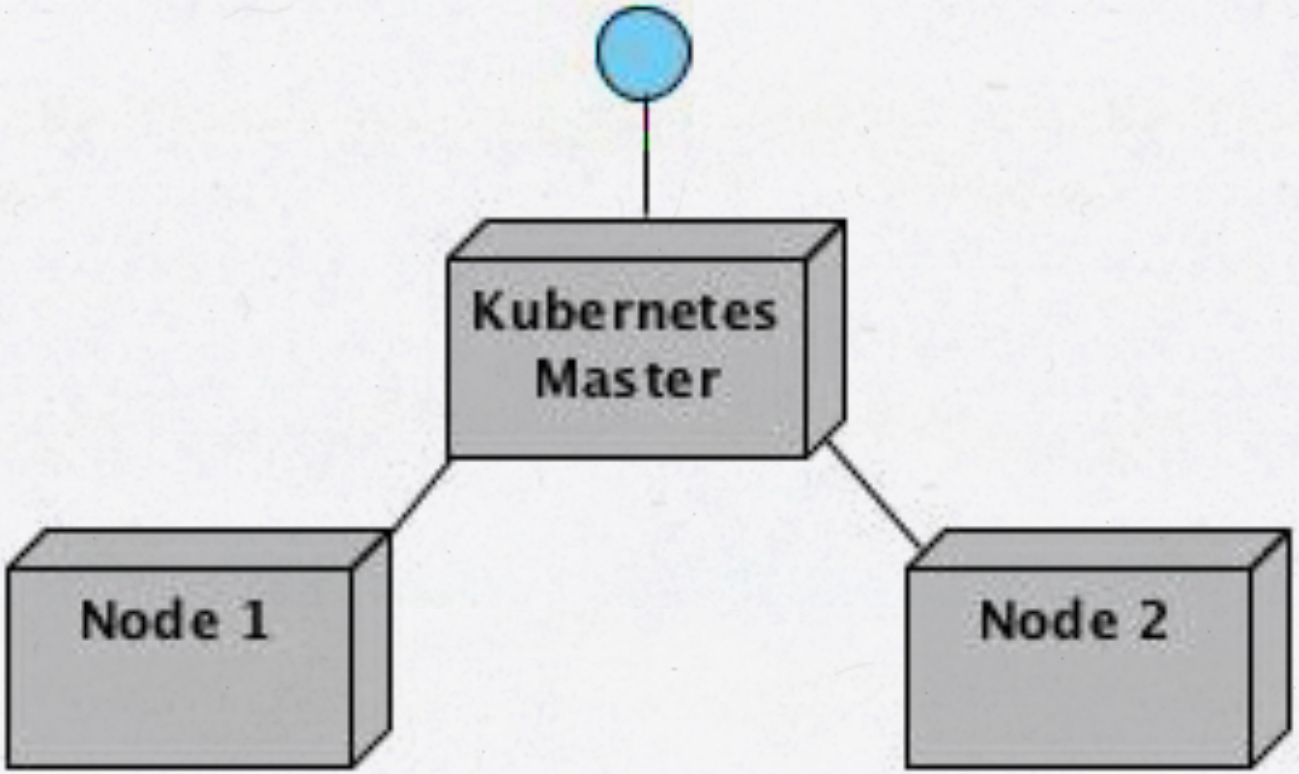
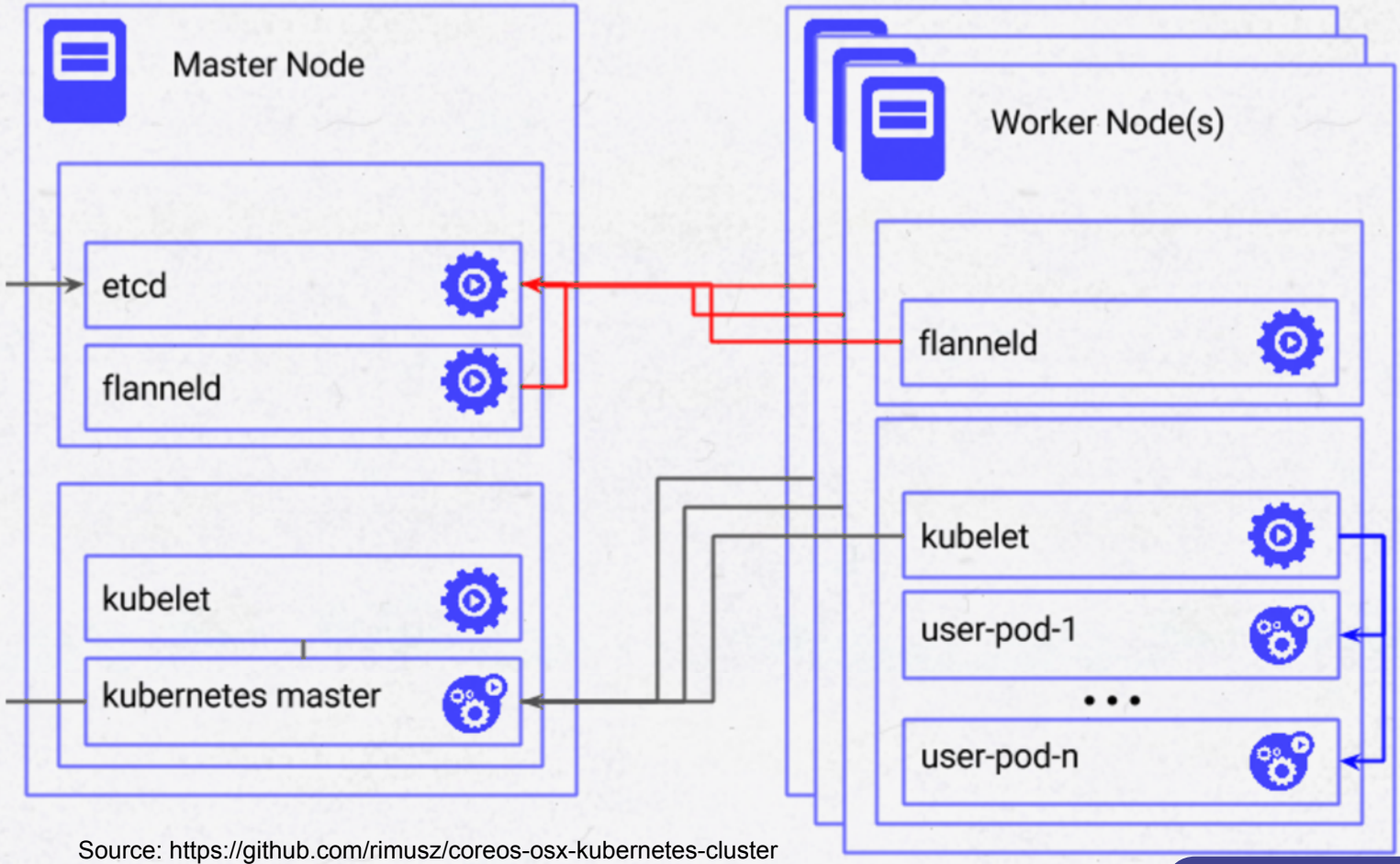
DEMO SETUP



DEMO SETUP





Source: https://github.com/rimusz/coreos-osx-kubernetes-cluster

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CORE CONCEPTS

Kubectl CLI

CORE CONCEPTS


Node

- Node

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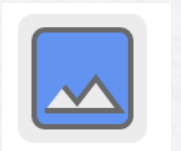
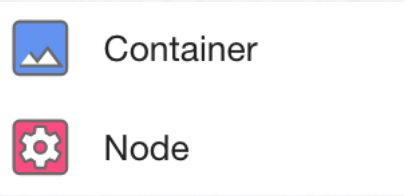
CORE CONCEPTS

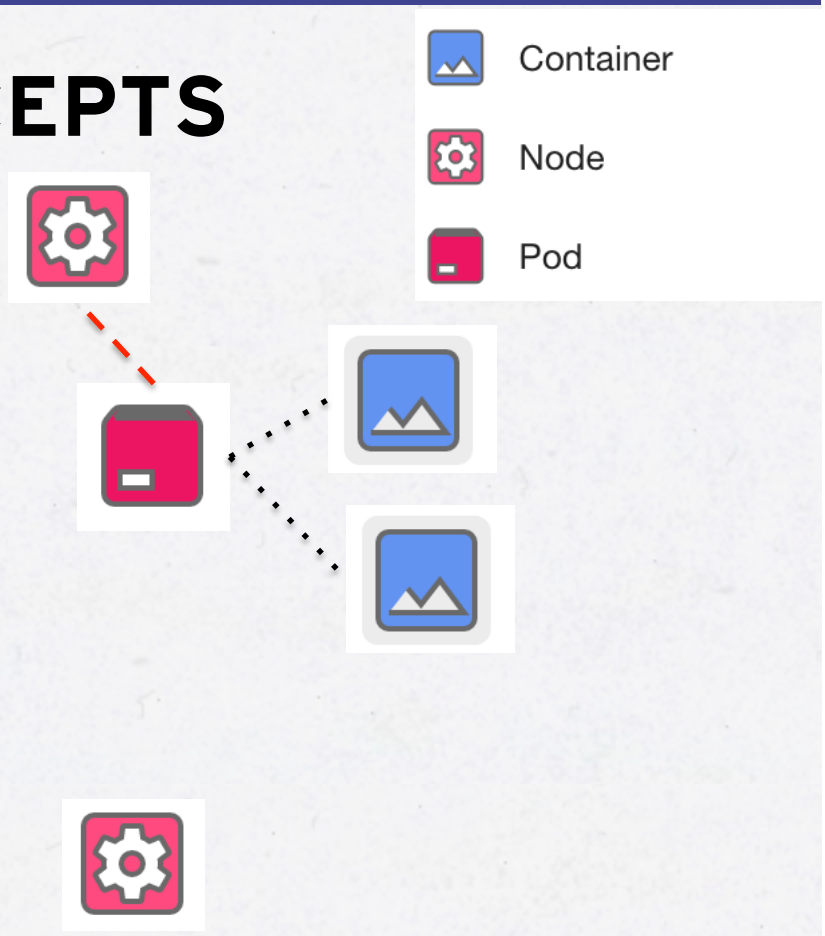
- Node
- Container





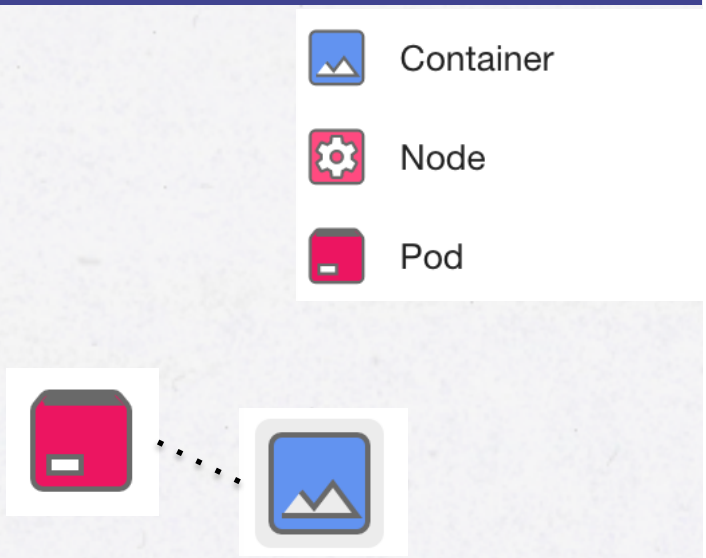
CORE CONCEPTS

- Node
- Container
- Pod



QUOTES-POD.YAML

```
apiVersion: v1
kind: Pod
metadata:
  name: quotes
spec:
  containers:
  - name: quotes
    image: docker:5000/quotes:1
    ports:
    - containerPort: 9090
      hostPort: 9090
```



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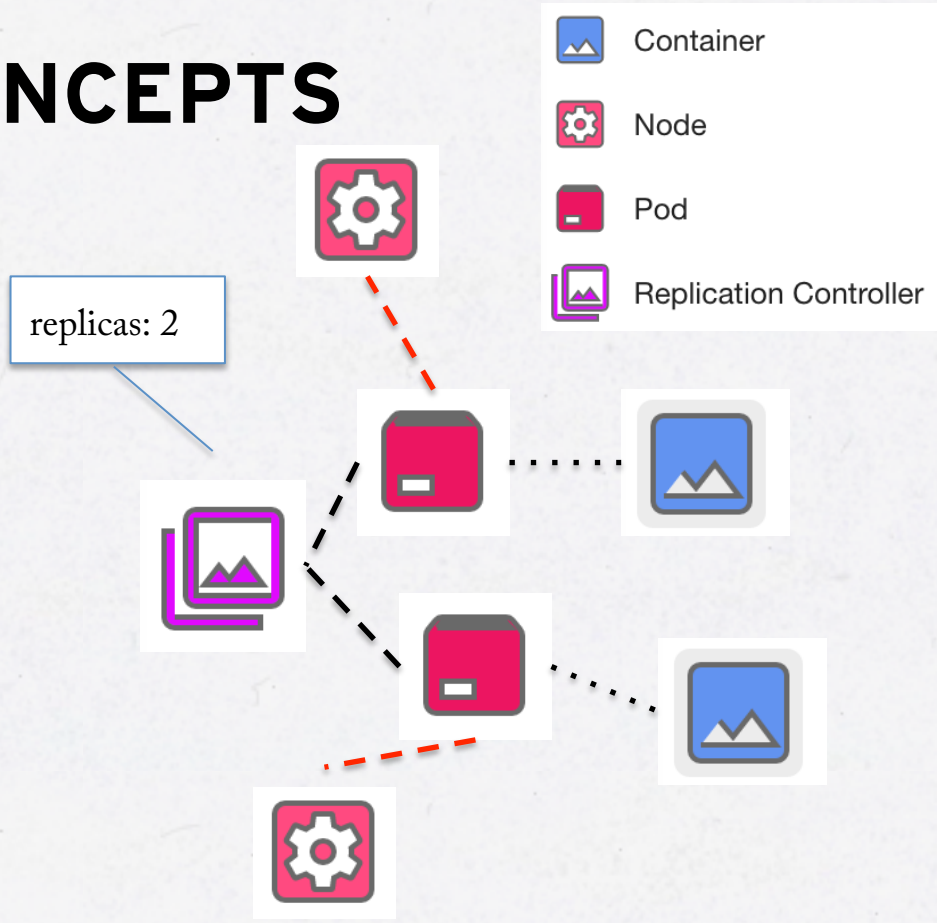
CORE CONCEPTS

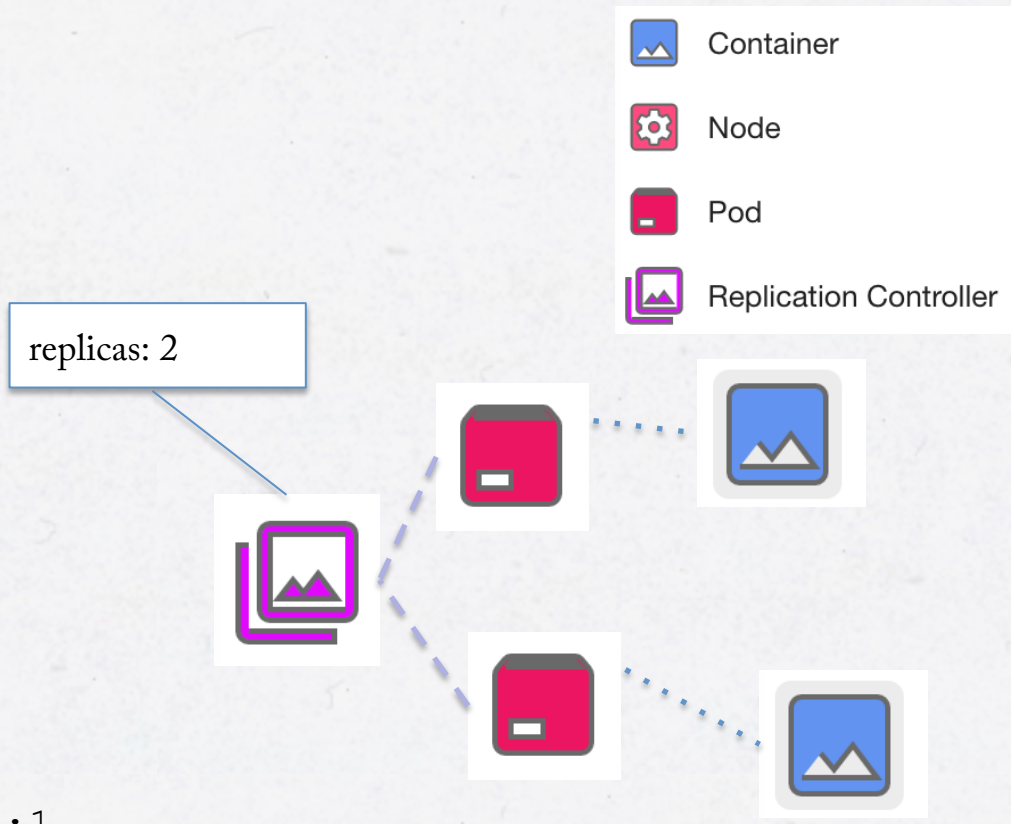
- Node
- Container
- Pod
- Replication Controller



Upcoming feature: auto-scaling based on load: see
https://github.com/kubernetes/kubernetes/blob/master/docs/design/horizontal-pod-autoscaler.md

QUOTES-CONTROLLER.YAML

```
apiVersion: v1
kind: ReplicationController
metadata:
  name: quotes
spec:
  replicas: 2
...
template:
  spec:
    containers:
    - name: quotes
      image: docker:5000/quotes:1
```



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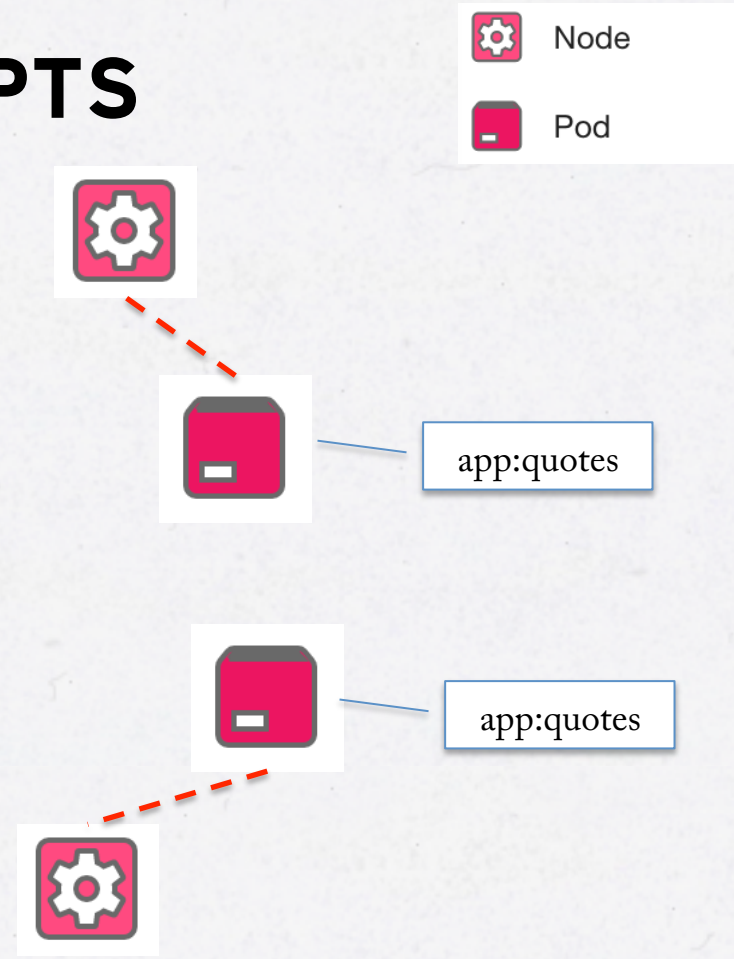
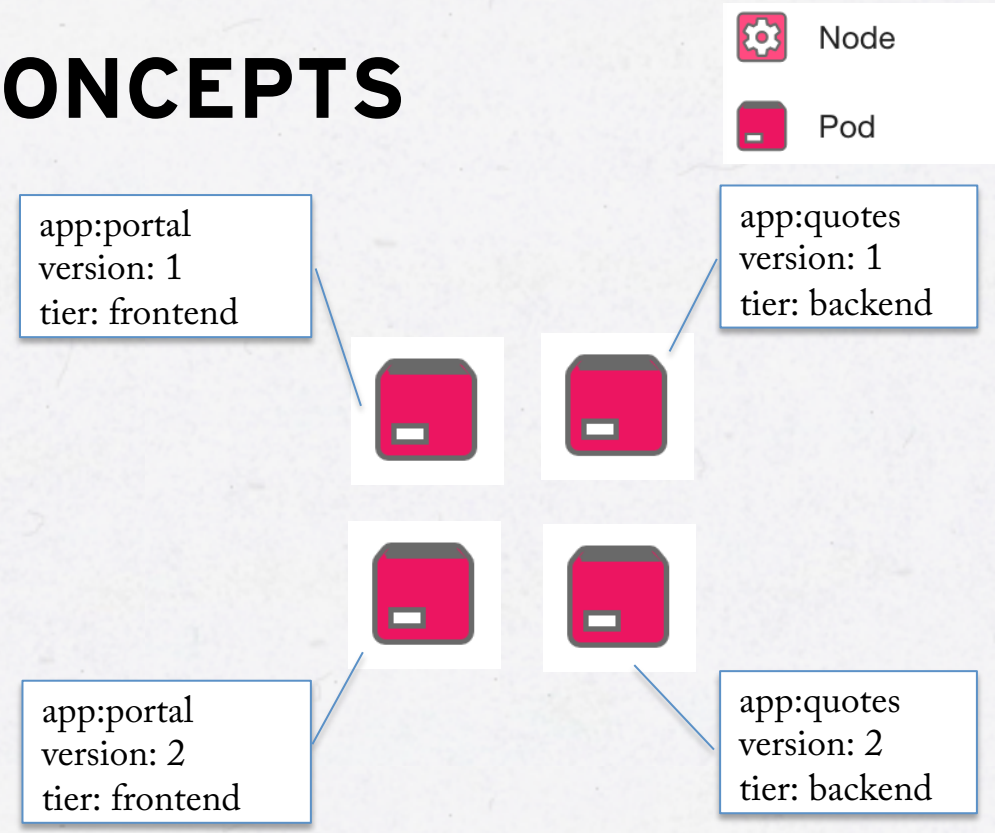
CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Labels



CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Labels



CORE CONCEPTS

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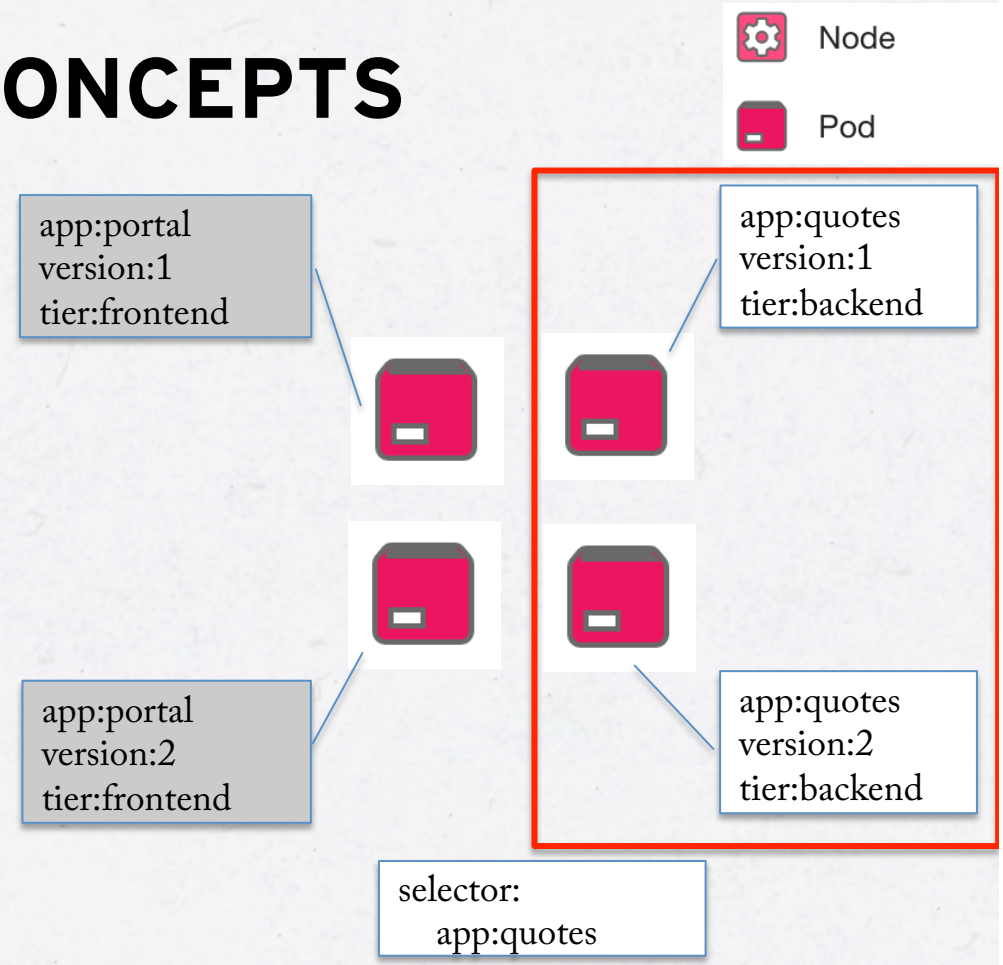
- Container
- Pod
- Replication Controller
- Labels



CORE CONCEPTS

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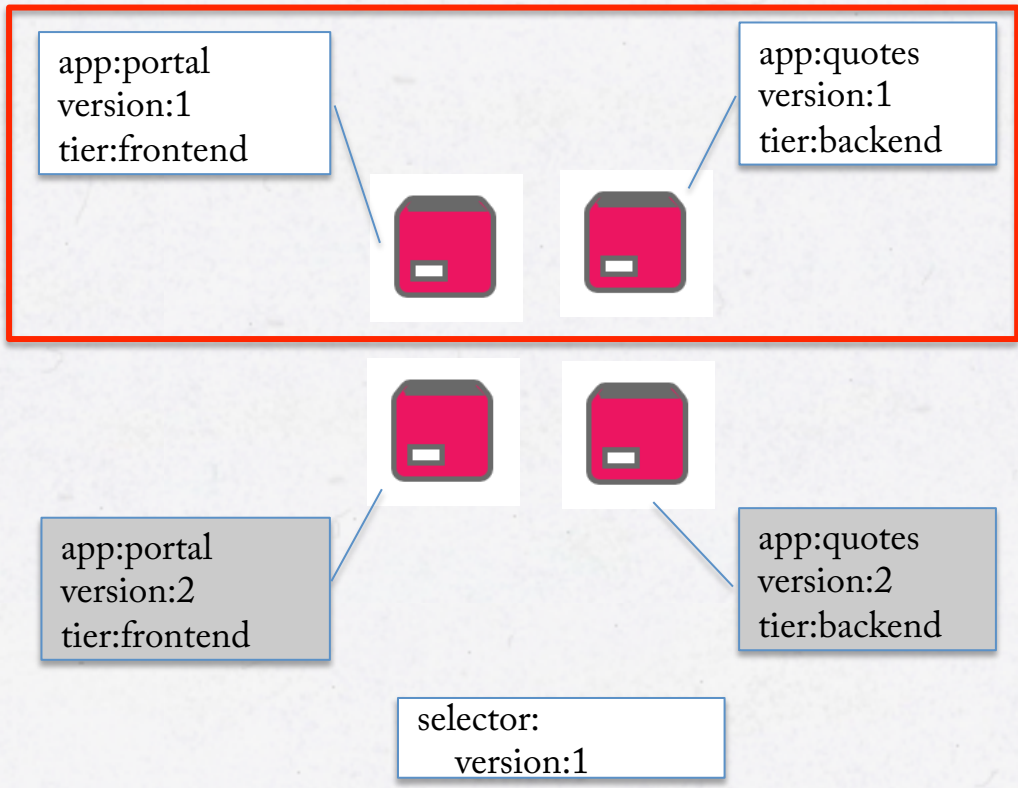
- Container
- Pod
- Replication Controller
- Labels



CORE CONCEPTS

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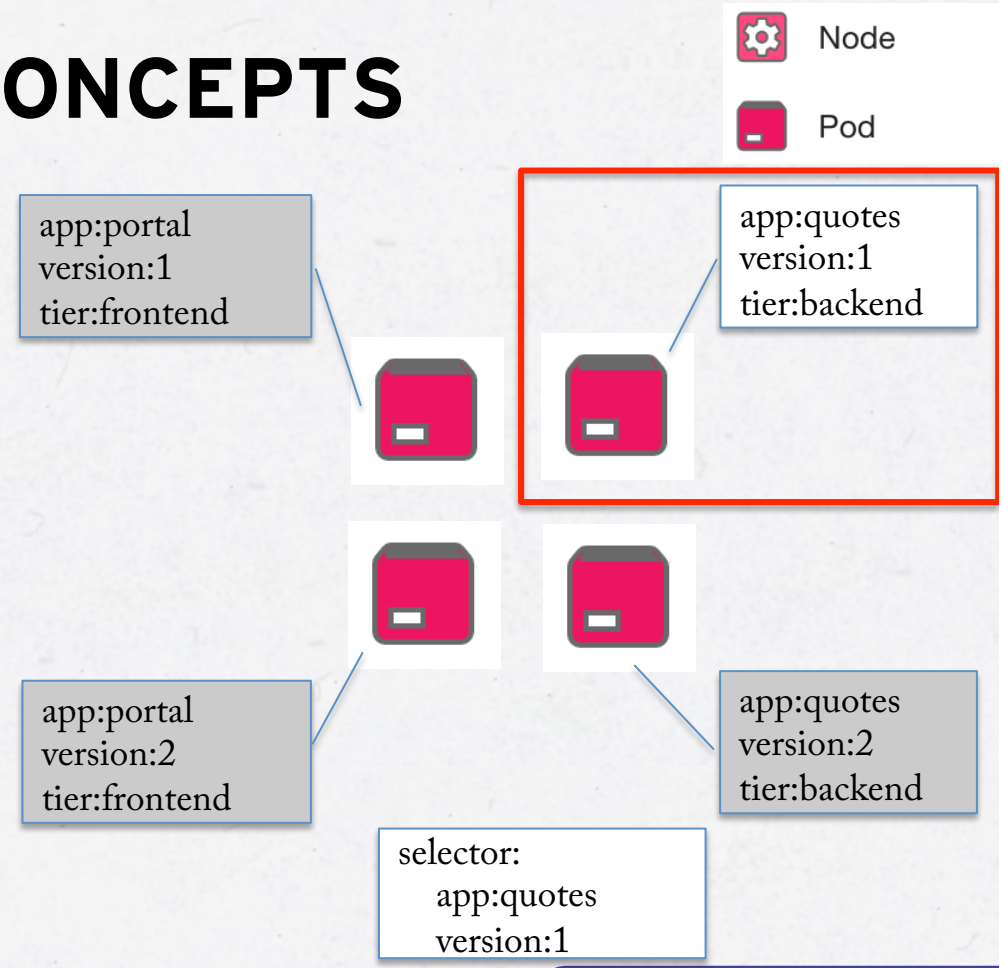
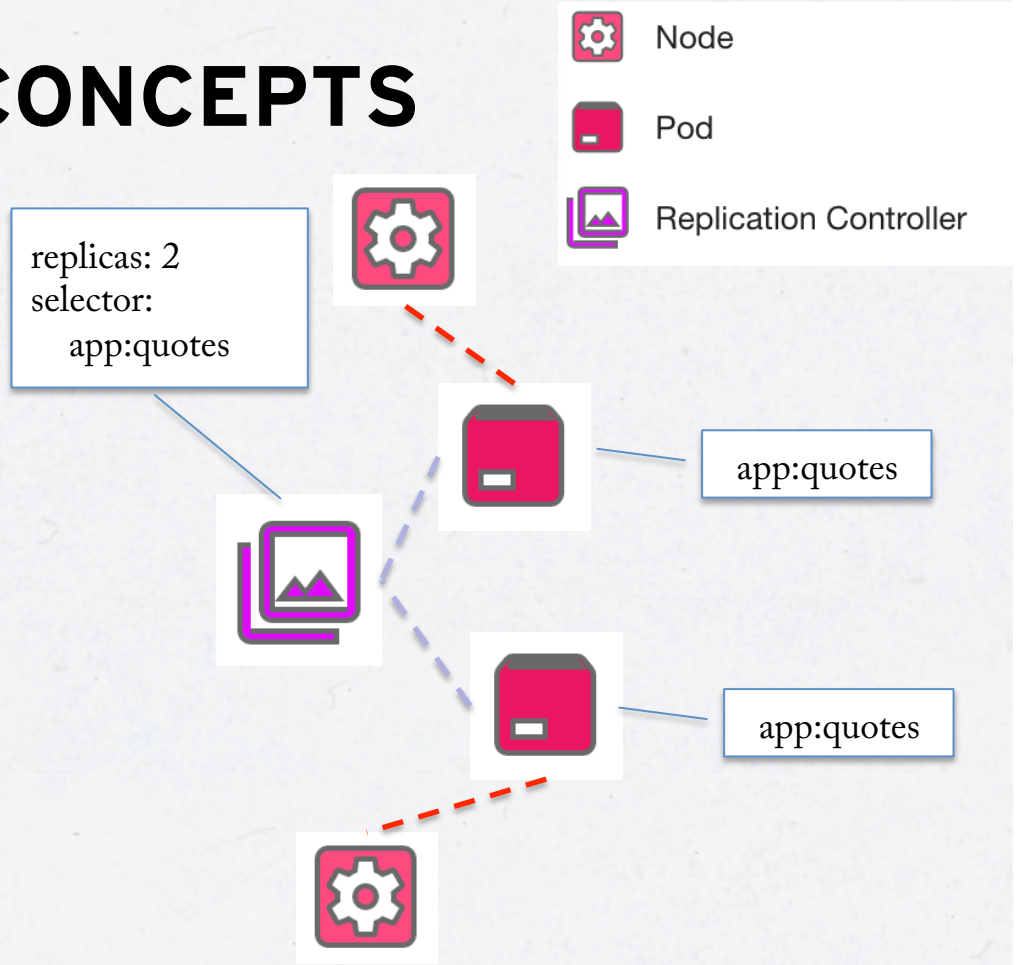


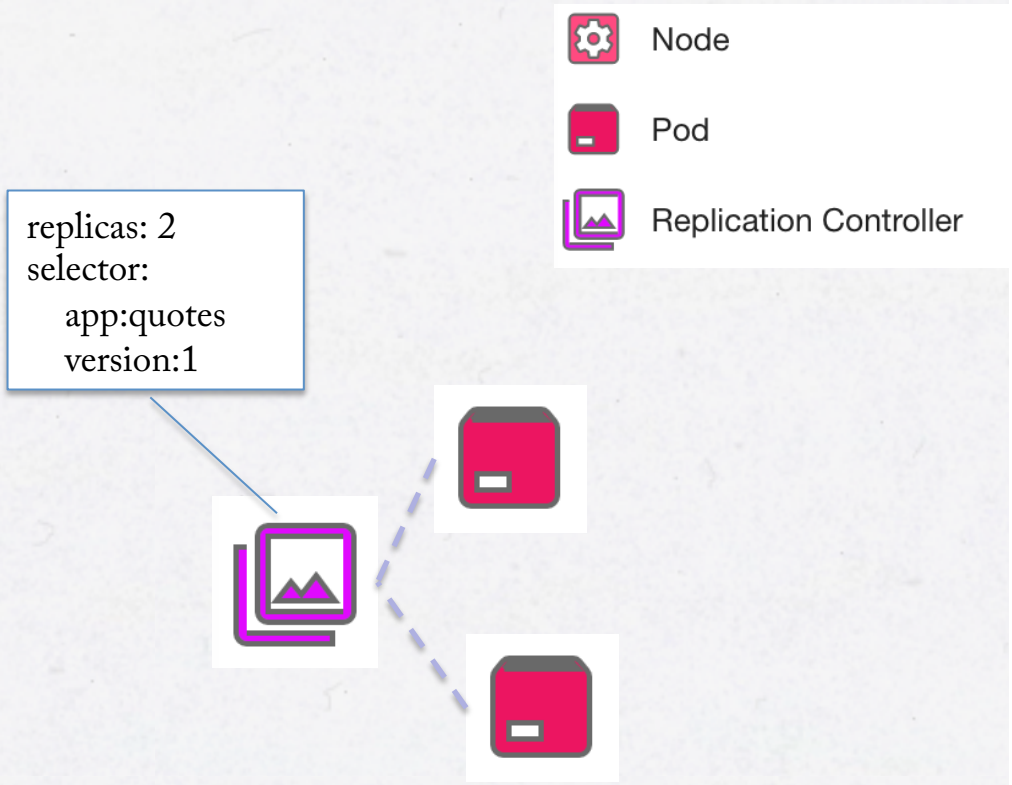
CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Labels



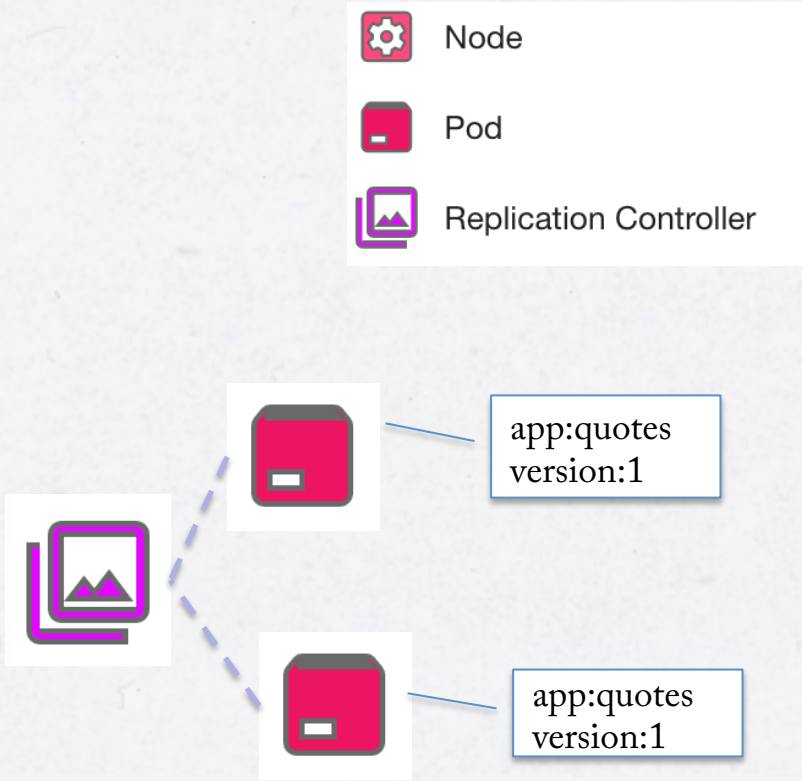
QUOTES-CONTROLLER.YAML

```
apiVersion: v1
kind: ReplicationController
metadata:
  name: quotes
  labels:
    app: quotes
spec:
  replicas: 2
  selector:
    app: quotes
    version: 1
  template:
...
```



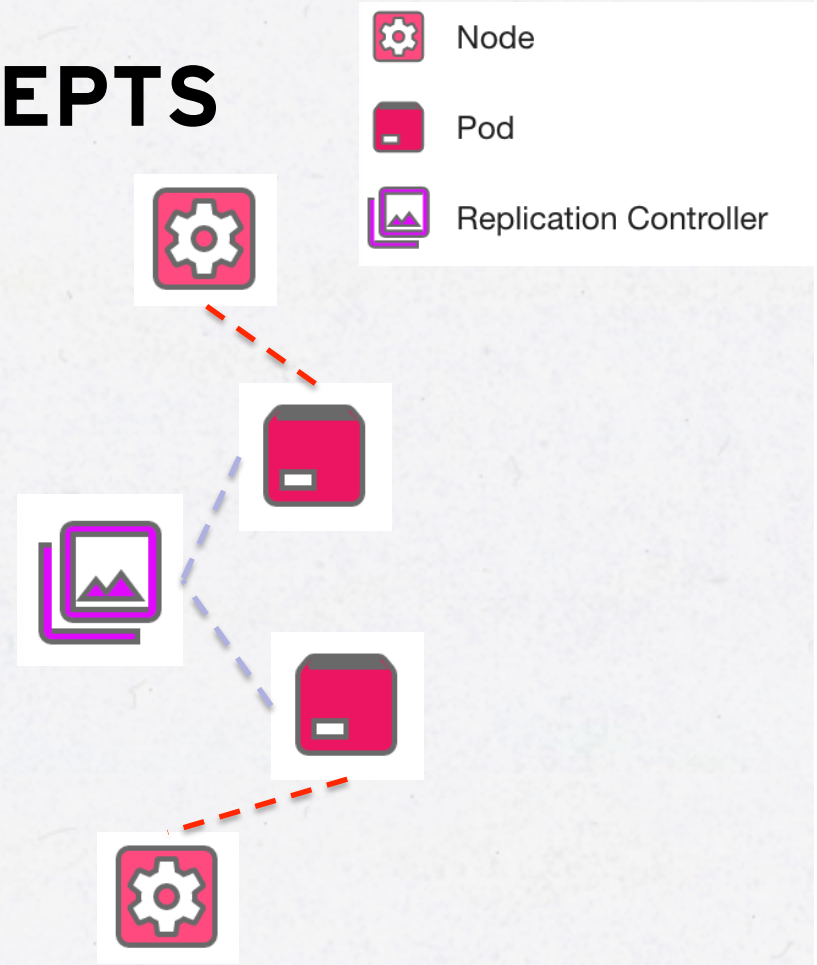
QUOTES-CONTROLLER.YAML

```
...
  template:
    metadata:
      labels:
        app: quotes
        version: 1
    spec:
      containers:
      - name: quotes
        image: docker:5000/quotes:1
        ports:
        - containerPort: 9090
```



CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Label
- Liveness



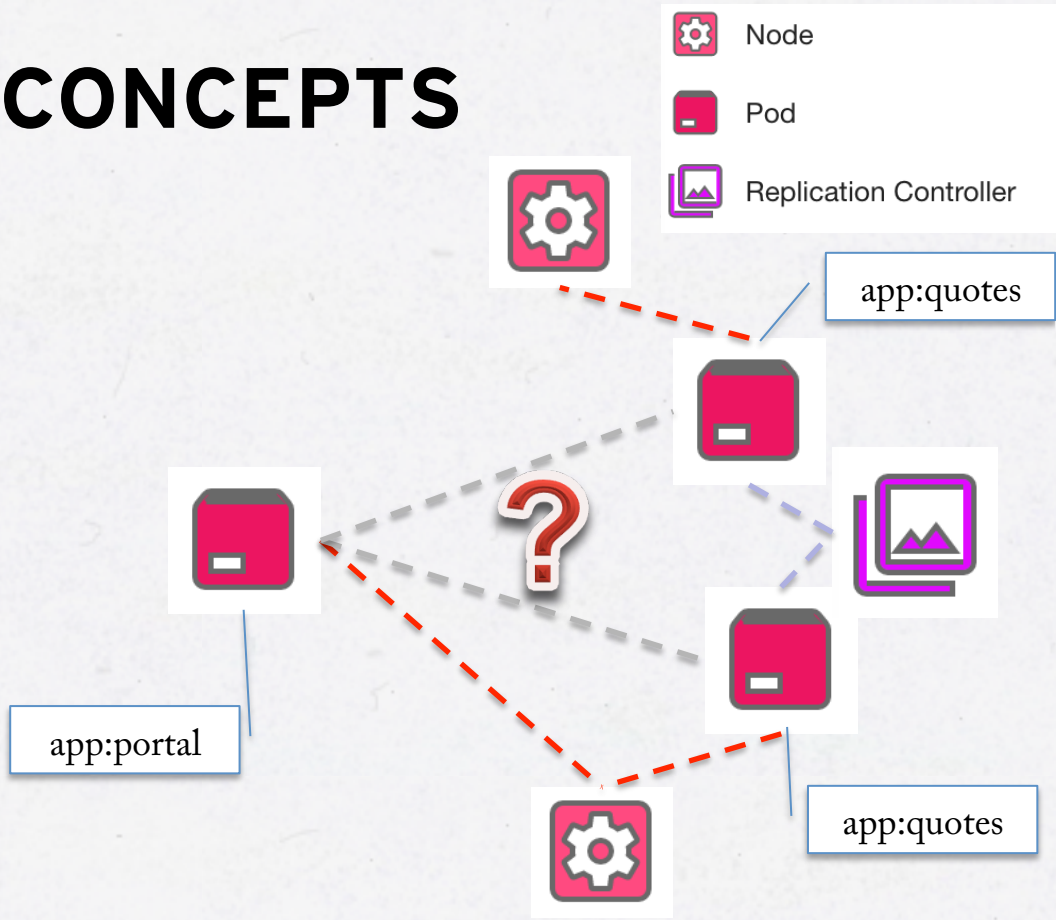
QUOTES-CONTROLLER.YAML

```
...
    livenessProbe:
     httpGet:
       path: /health
       port: 9090
     initialDelaySeconds: 10
     timeoutSeconds: 1
```


DEMO

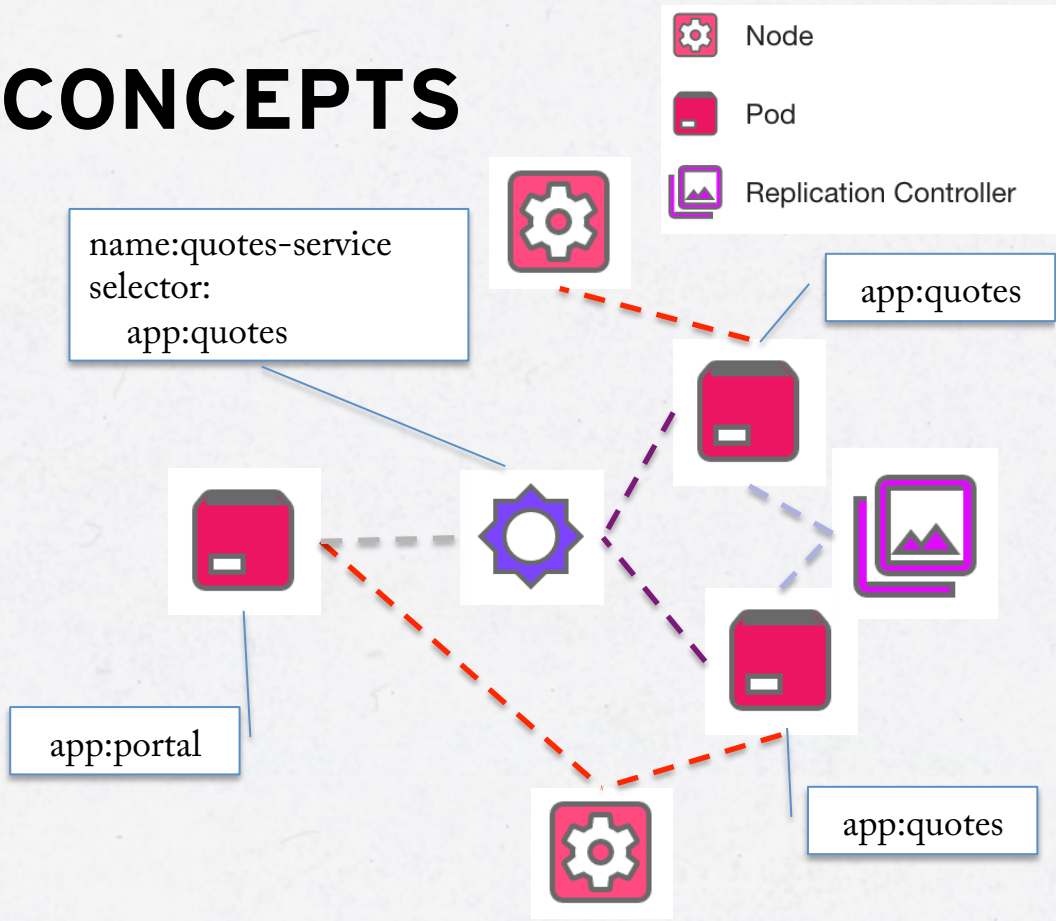
CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Label
- Liveness
- Service



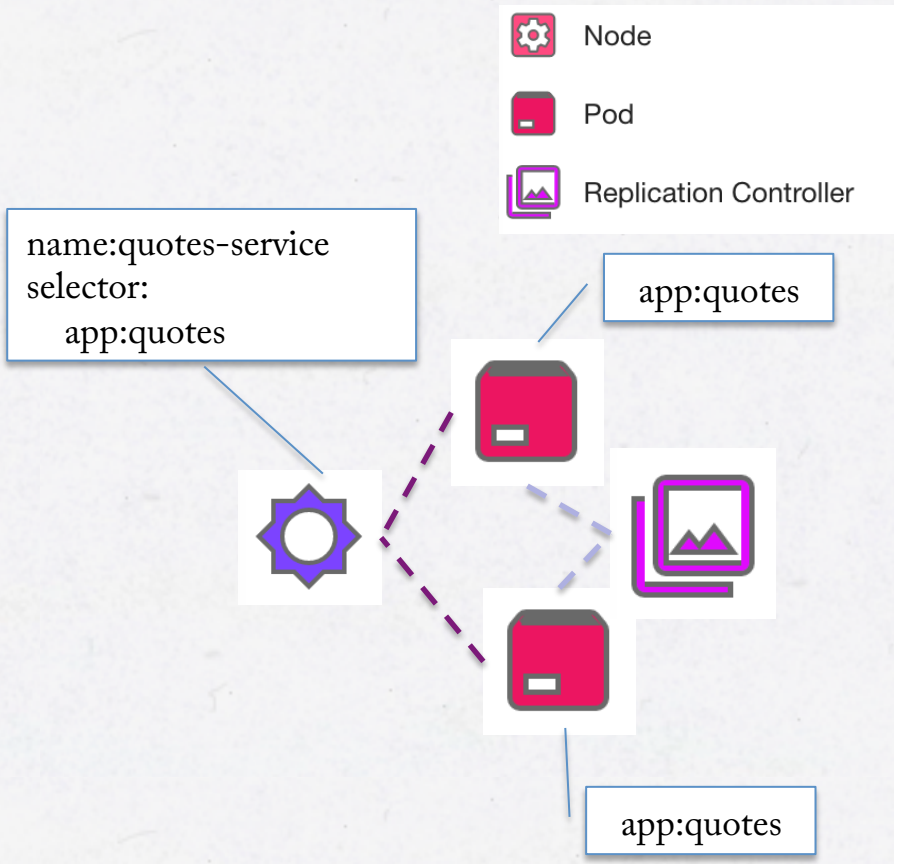
CORE CONCEPTS

- Node
- Container
- Pod
- Replication Controller
- Label
- Liveness
- Service



QUOTES-SERVICE.YAML

```
apiVersion: v1
kind: Service
metadata:
  name: quotes-service
  labels:
    app: quotes
    tier: frontend
spec:
  ports:
    - port: 8080
      targetPort: 8080
  selector:
    app: quotes
```



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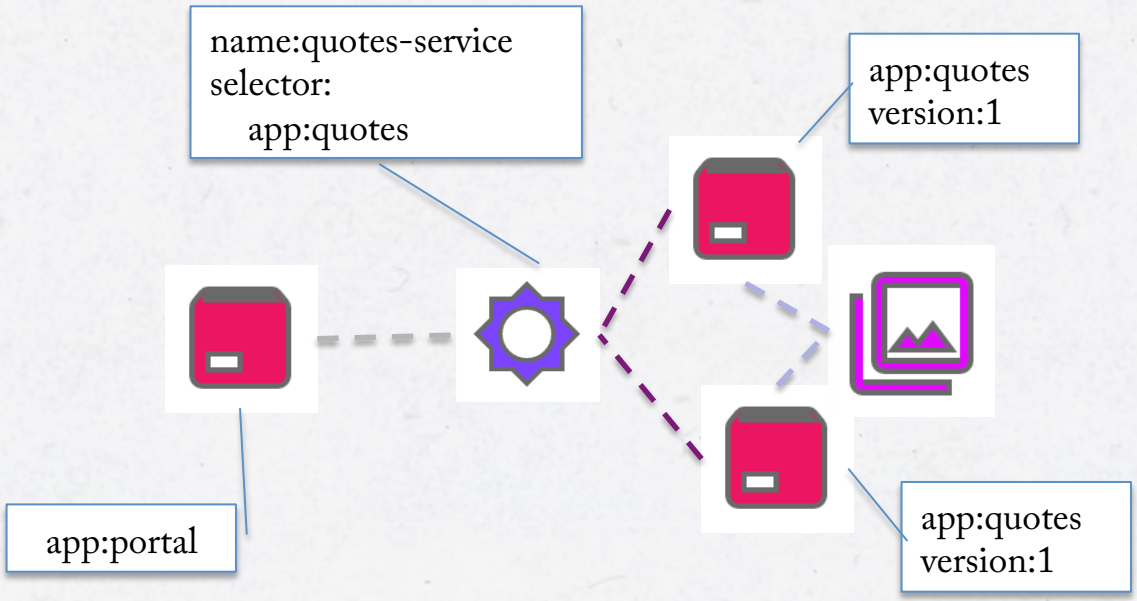
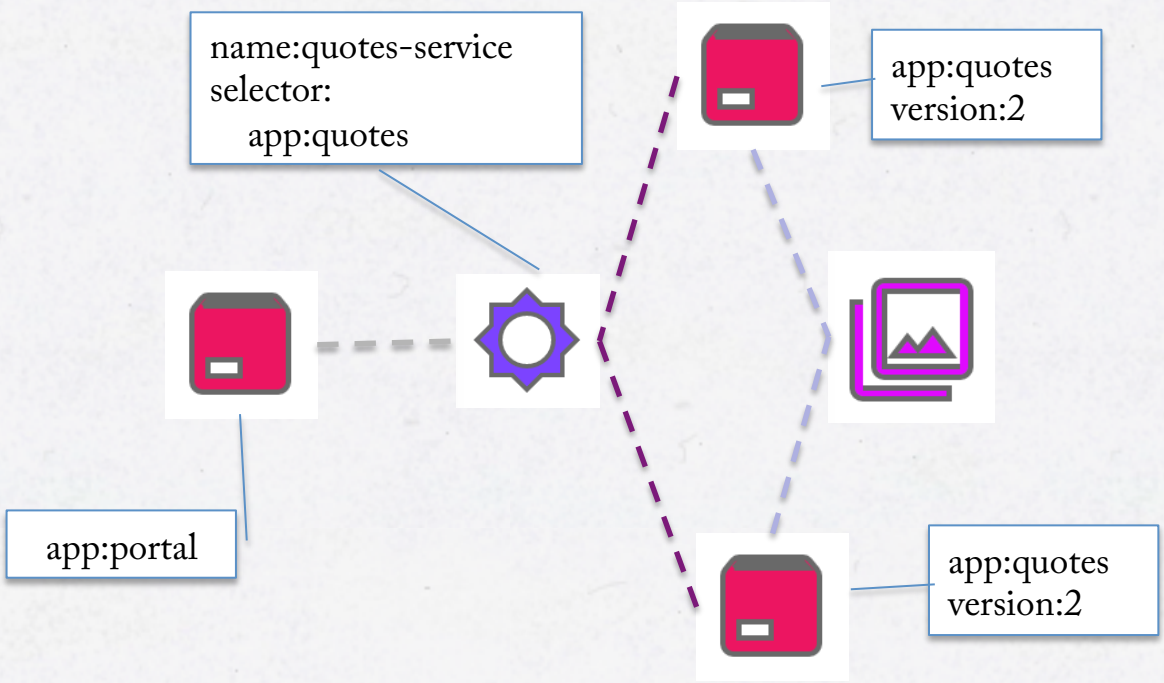
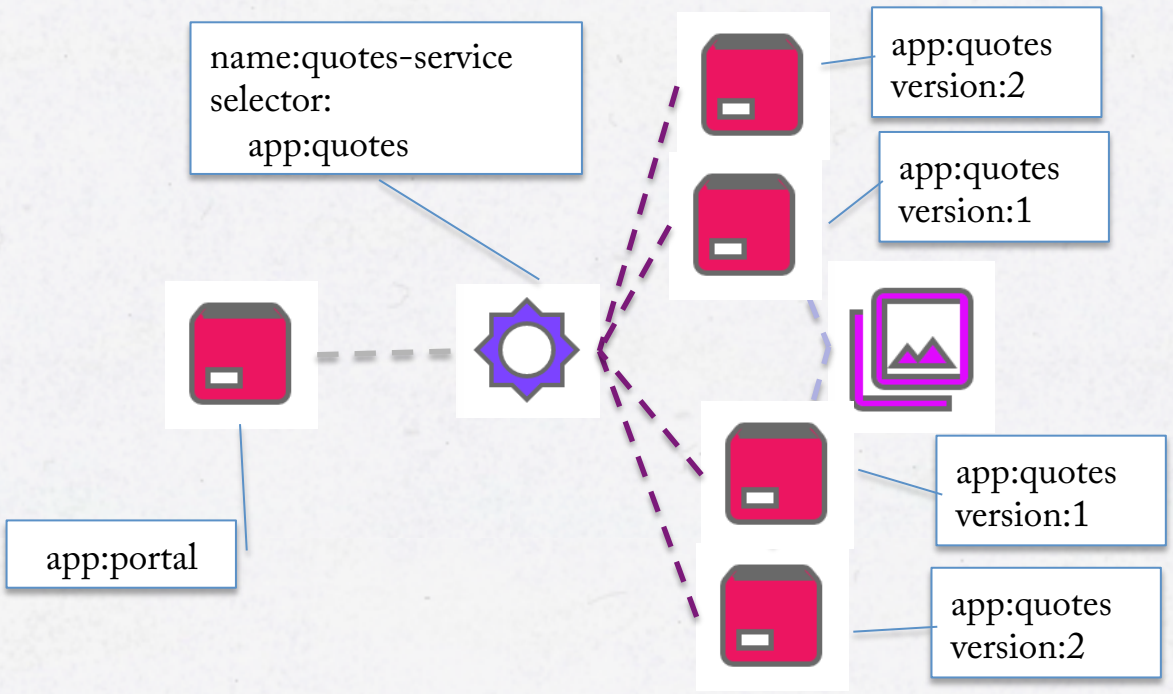
ADVANCED CONCEPTS: ROLLING UPGRADE



ADVANCED CONCEPTS: ROLLING UPGRADE



ADVANCED CONCEPTS: ROLLING UPGRADE



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CONCLUSIONS

- Container Orchestration software like Kubernetes provides highly valuable capabilities for Microservice architectures:
  - Decoupling logical components from each other and from the infrastructure
- Kubernetes is just one of many alternatives (Mesos, Helios, Docker Swarm, …), but its Google background makes it one of the most interesting. Stay tuned!

TIME FOR QUESTIONS?