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Kubernetes, Jenkins, Docker

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About Me

- Senior Operations Engineer – SpinDance
- Passionate about infrastructure automation
- Fascinated about by the DevOps movement
- 6 years at SpinDance
- Love spending time with my family and friends

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SPINDANCE

Systems engineering, software development, and solution hosting, focused on creating and delivering connected smart products.

HOSTING

MOBILE

SYSTEMS

EMBEDDED

CLOUD

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Docker

- An open platform for distributed applications for developers and sysadmins – docker.com
- Allows you to put everything for your app in a container
- Run anywhere that docker engine is
- Immutable infrastructure

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Jenkins

- Open source build server
- Swiss army knife
- Supports continuous delivery model
- Pluggable and extendible
- Rich Ecosystem

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Kubernetes

- Google open source project
- Kubernetes is an open-source system for automating deployment, operations and scaling of containerized operations. – kubernetes.io
- huh?
  - Allows you to dictate how your container infrastructure behaves
- Means – helmsman or pilot

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Kubernetes - Architecture

- Node (Minon)
  - Docker
    - Pulling images
    - Starting containers
  - Kubelet
    - Manages pods
  - Kube-proxy
    - Network Proxy and Load balancer
      - Services

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Kubernetes - Architecture

- Master Node (Control Plane)
  - Currently One node, changing soon
- Multiple components
  - Etcd
    - Master state
  - API Server
    - Interaction
  - Scheduler
    - Schedule pods to nodes
  - Controller Manager Server
    - Cluster level functions

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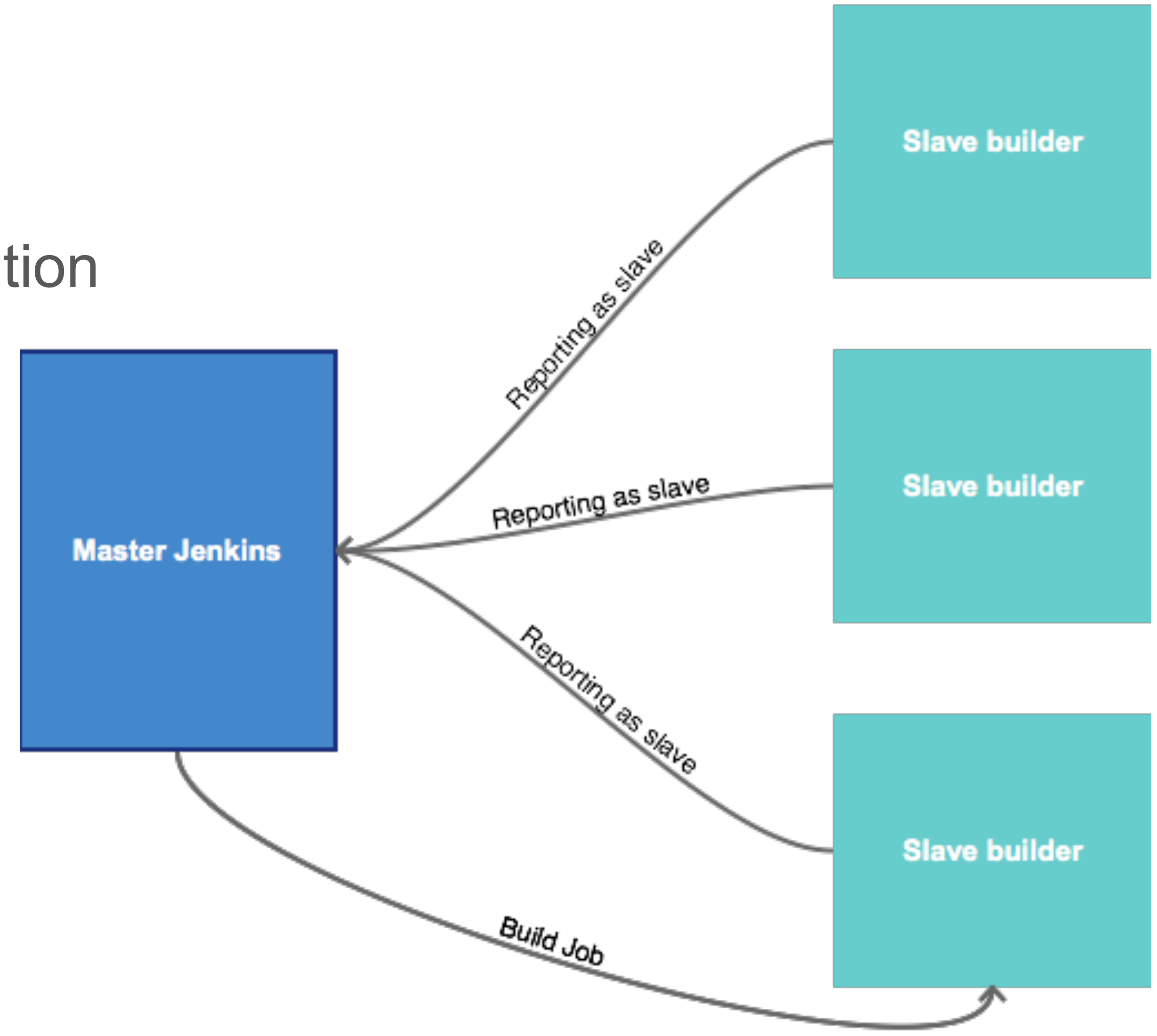
Problem

- So why use all of this?
- Jenkins Master / Slave configuration
  - Usually based on VMs
- Results on wasted resources



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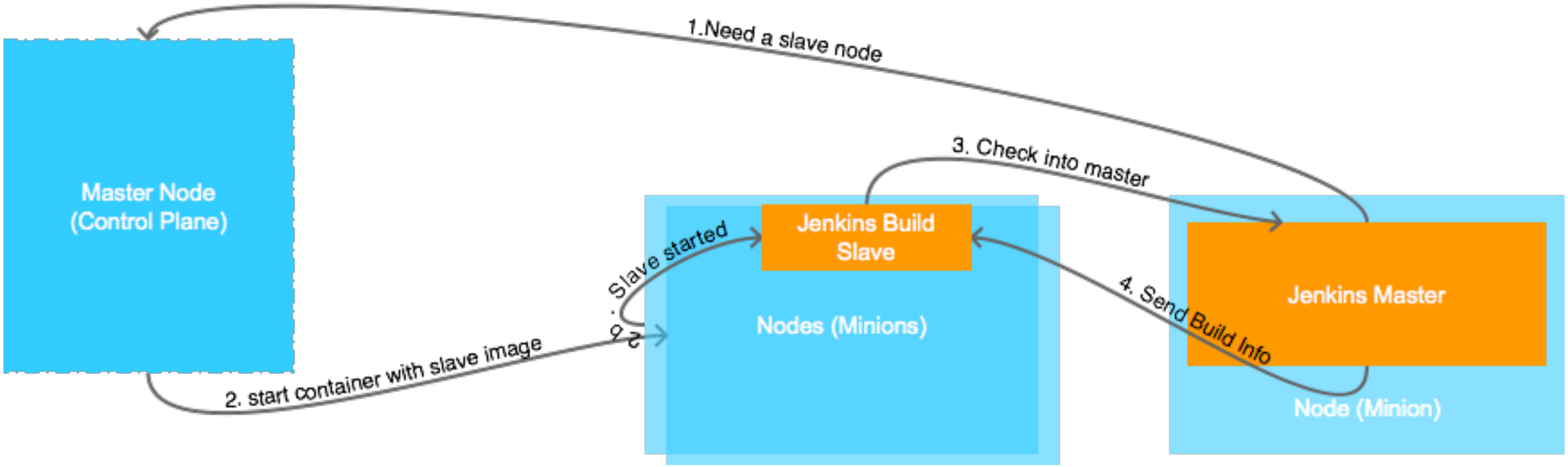
Solution



Lab

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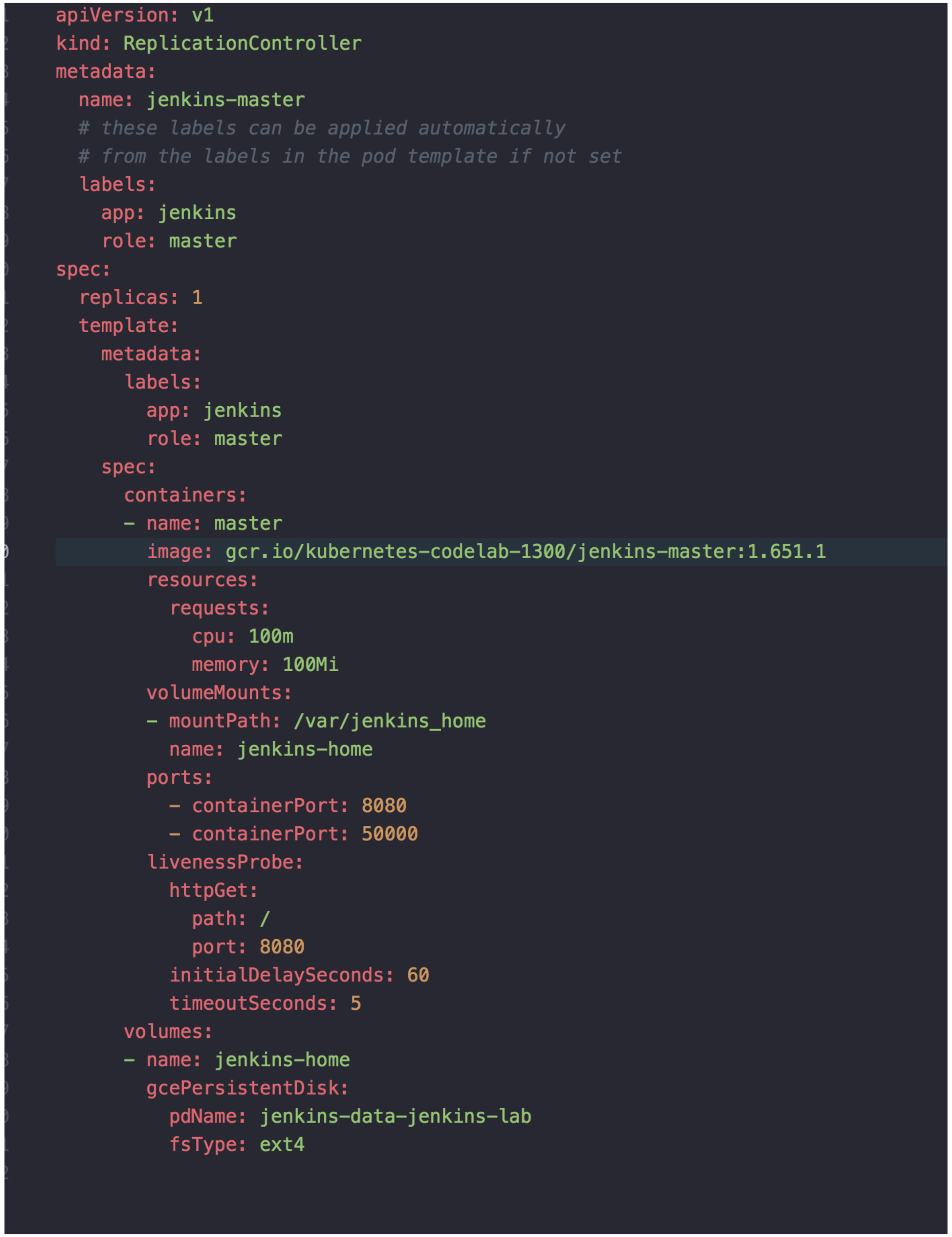

```yaml
apiVersion: v1
kind: ReplicationController
metadata:
  name: jenkins-master
  # these labels can be applied automatically
  # from the labels in the pod template if not set
  labels:
    app: jenkins
    role: master
spec:
  replicas: 1
  template:
    metadata:
      labels:
        app: jenkins
        role: master
    spec:
      containers:
      - name: master
        image: gcr.io/kubernetes-codelab-1300/jenkins-master:1.651.1
        resources:
          requests:
            cpu: 100m
            memory: 100Mi
        volumeMounts:
        - mountPath: /var/jenkins_home
          name: jenkins-home
        ports:
          - containerPort: 8080
          - containerPort: 50000
        livenessProbe:
          httpGet:
            path: /
            port: 8080
          initialDelaySeconds: 60
          timeoutSeconds: 5
      volumes:
      - name: jenkins-home
        gcePersistentDisk:
          pdName: jenkins-data-jenkins-lab
          fsType: ext4
```

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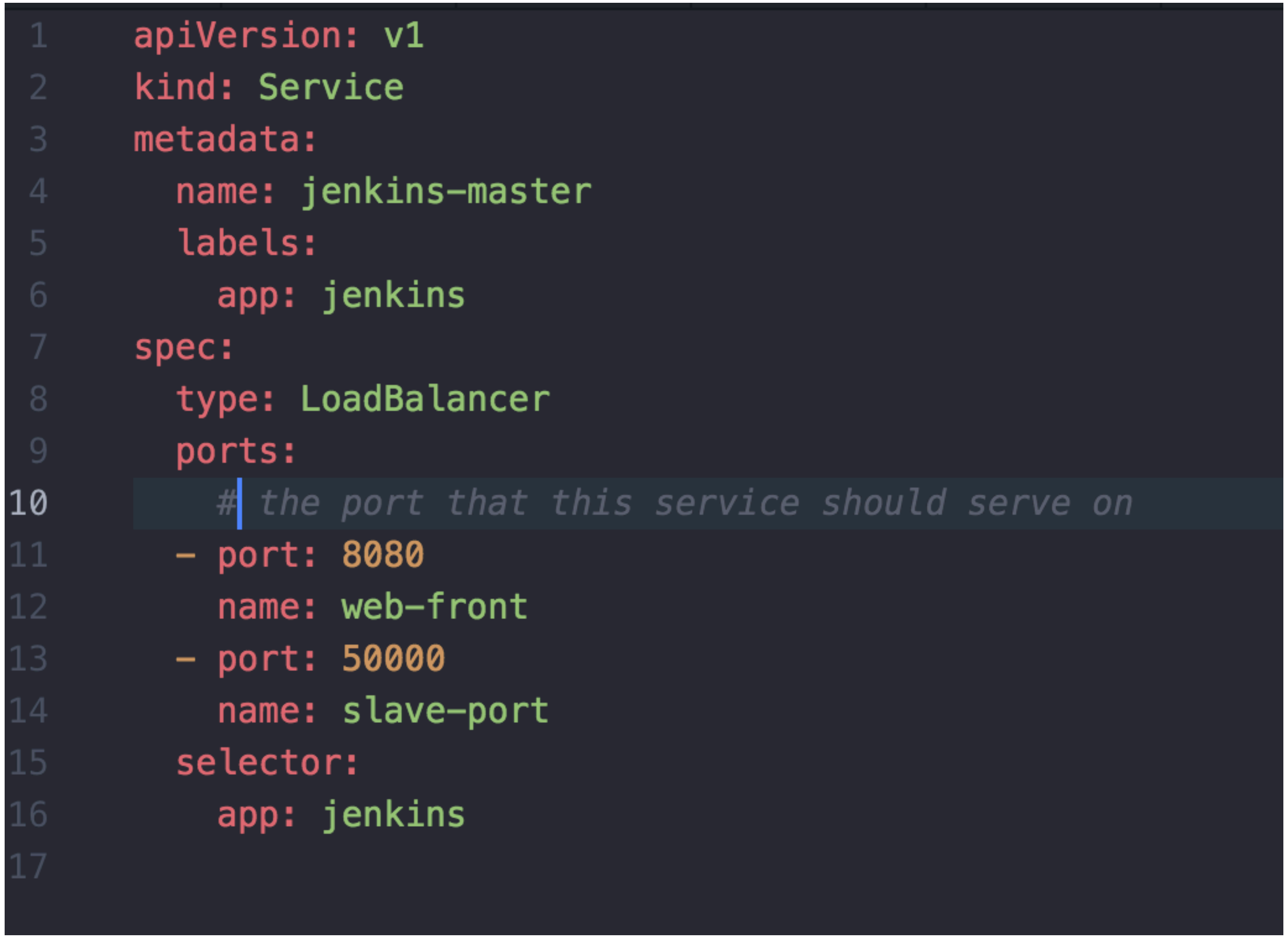
Lab



```yaml
apiVersion: v1
kind: Service
metadata:
  name: jenkins-master
  labels:
    app: jenkins
spec:
  type: LoadBalancer
  ports:
    # the port that this service should serve on
  - port: 8080
    name: web-front
  - port: 50000
    name: slave-port
  selector:
    app: jenkins

```

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Issues

- Testing with embedded hardware would be challenging in this environment
- Multiple builders of the same type seems to be missing from plugin (workaround)
- Windows not supported (https://github.com/kubernetes/kubernetes/issues/22623)
- Permission issue with volumes (https://github.com/kubernetes/kubernetes/issues/2630)

Questions?

- https://github.com/spindance/kubernetes-jenkins-lab
- goo.gl/vRSxix
- @rodrigdav