

DEVNATION FEDERAL

July 28, 2016 | Washington, DC



DEVNATION FEDERAL

Exploring Kubernetes & Openshift

Chakradhar Rao Jonagam

AGENDA

- ① **BUILDING BLOCKS OF KUBERNETES & OPENSIFT**
- ② **KUBERNETES VS OPENSIFT**
- ③ **DEMO .. DEMO .. DEMO...**

WHO ARE YOU ?

DOCKER IS EASY

Docker on your local machine is easy...

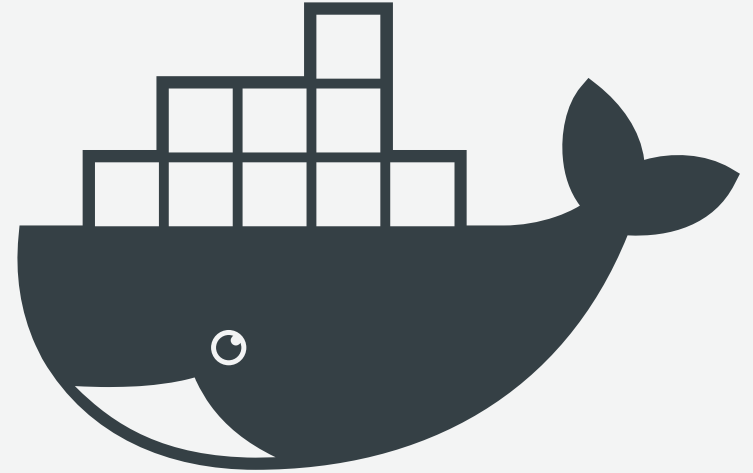
```
docker build
```

```
docker run
```

```
•
```

```
•
```

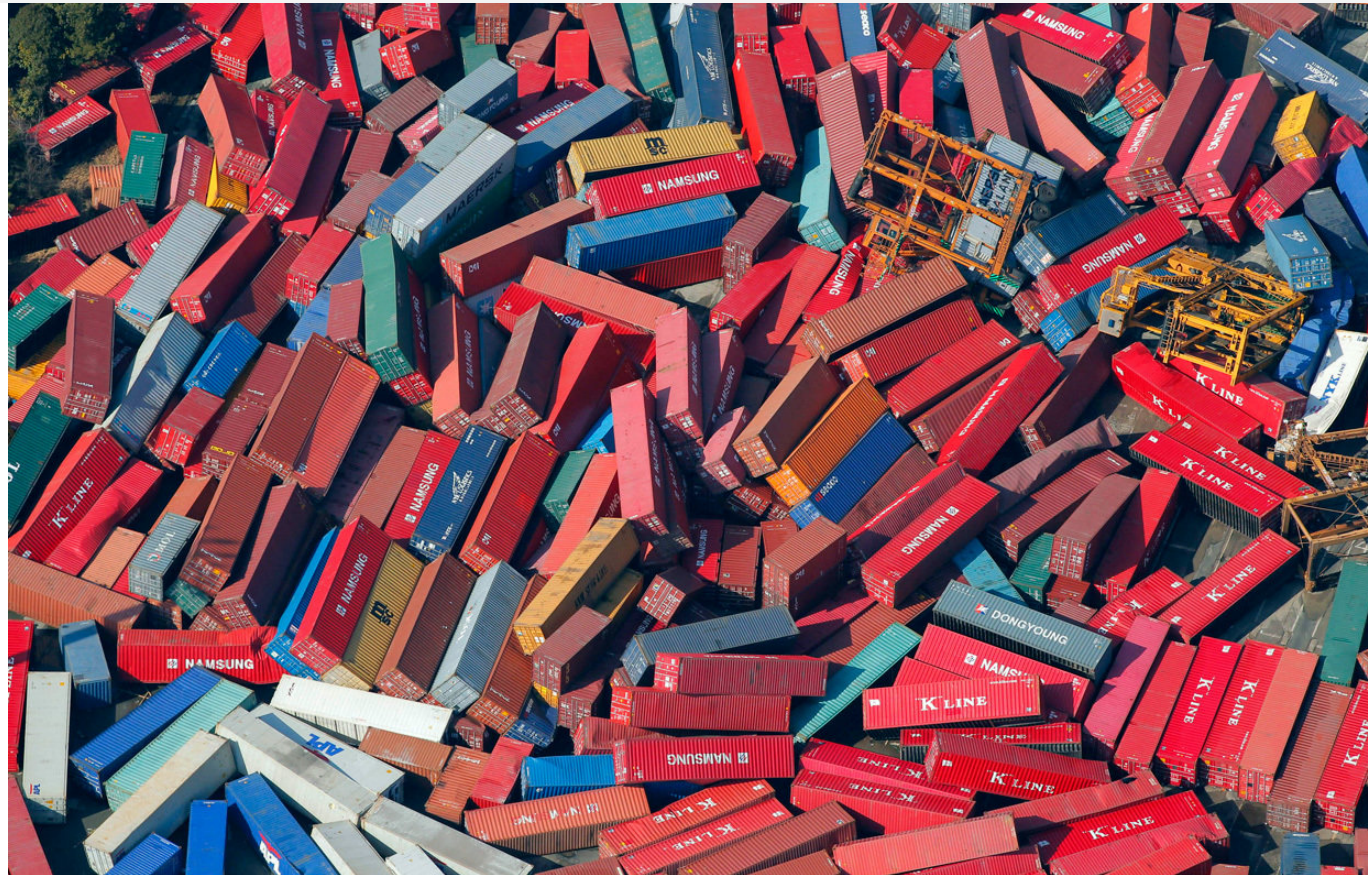
```
Profit
```

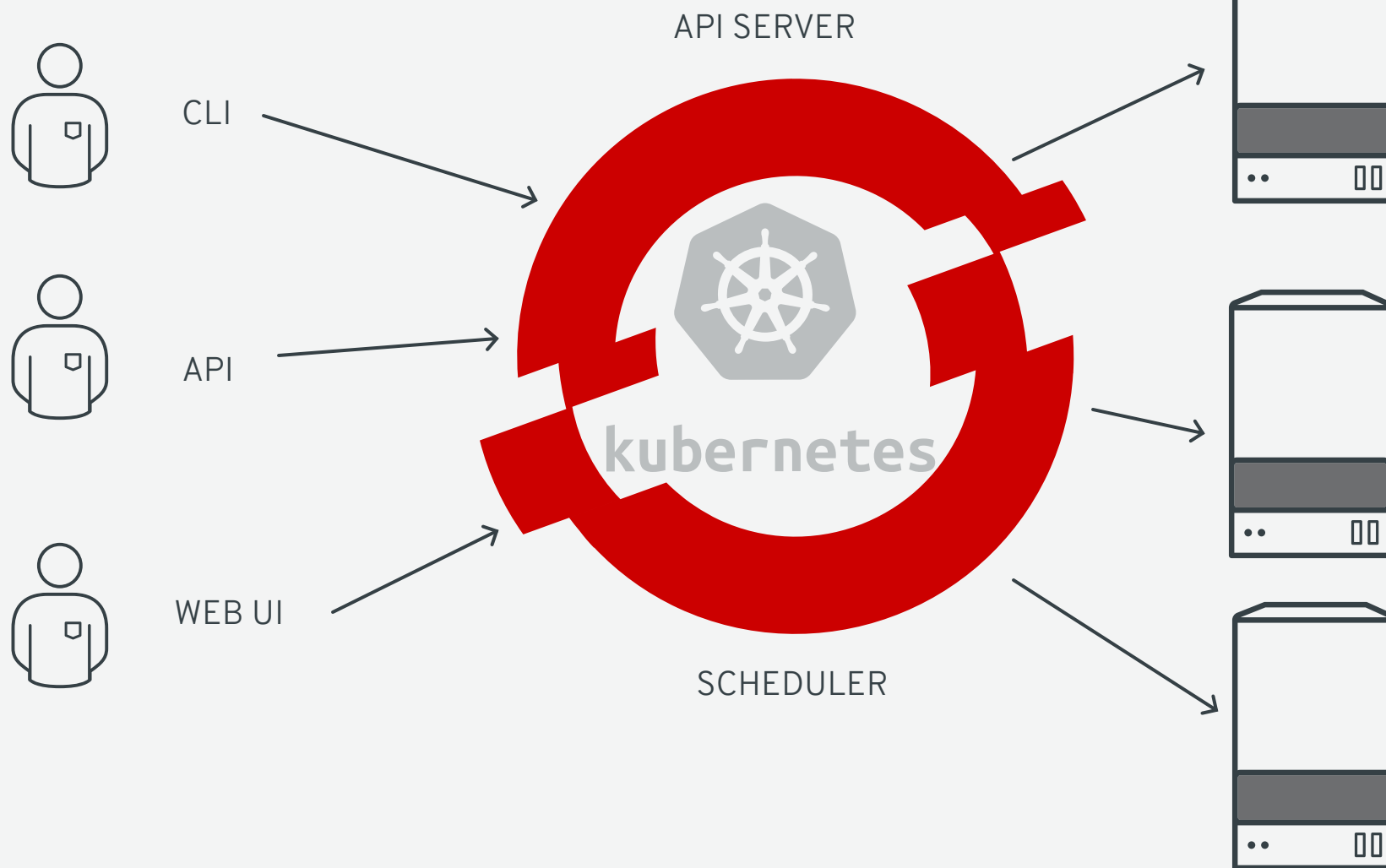


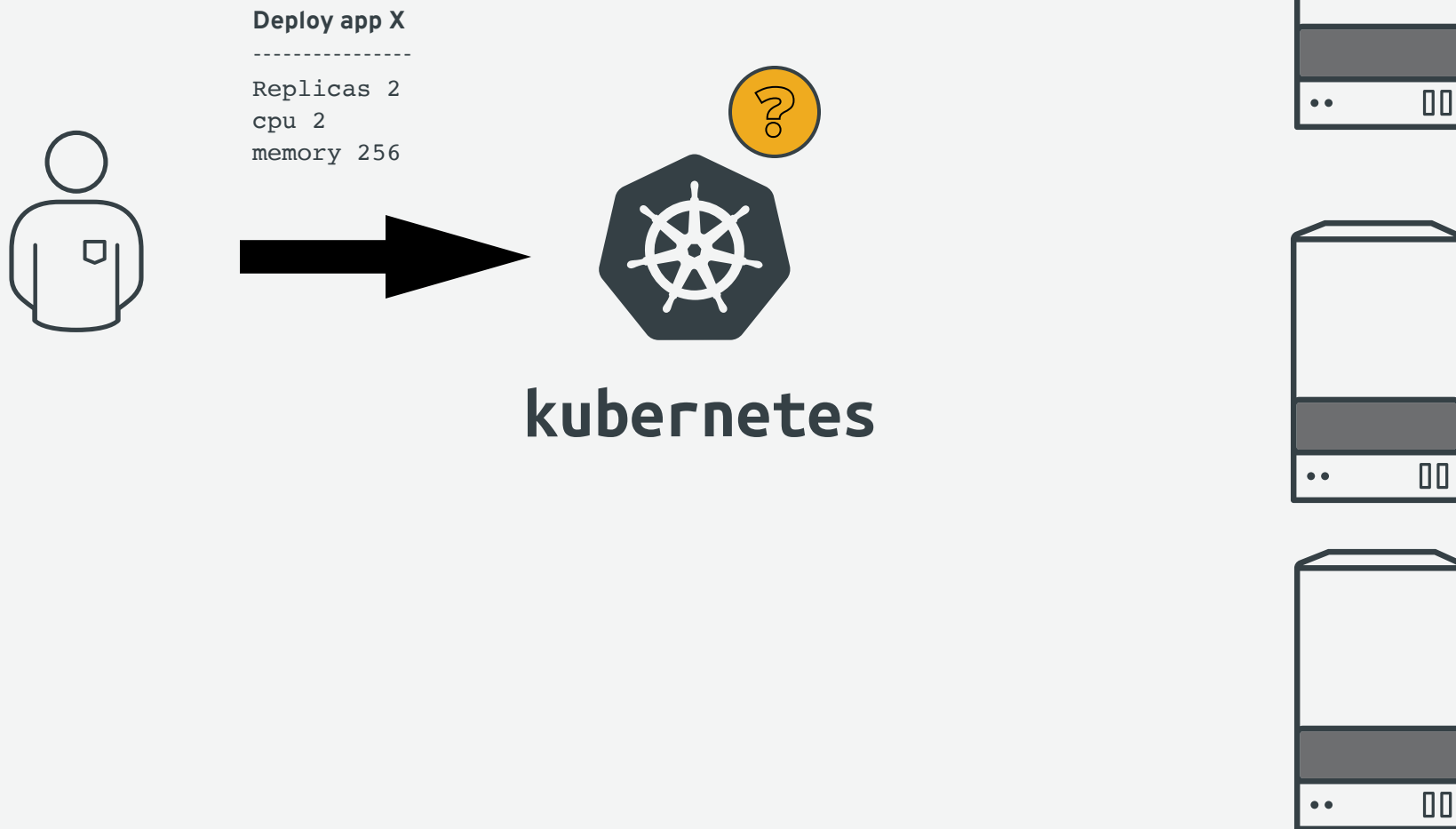
docker

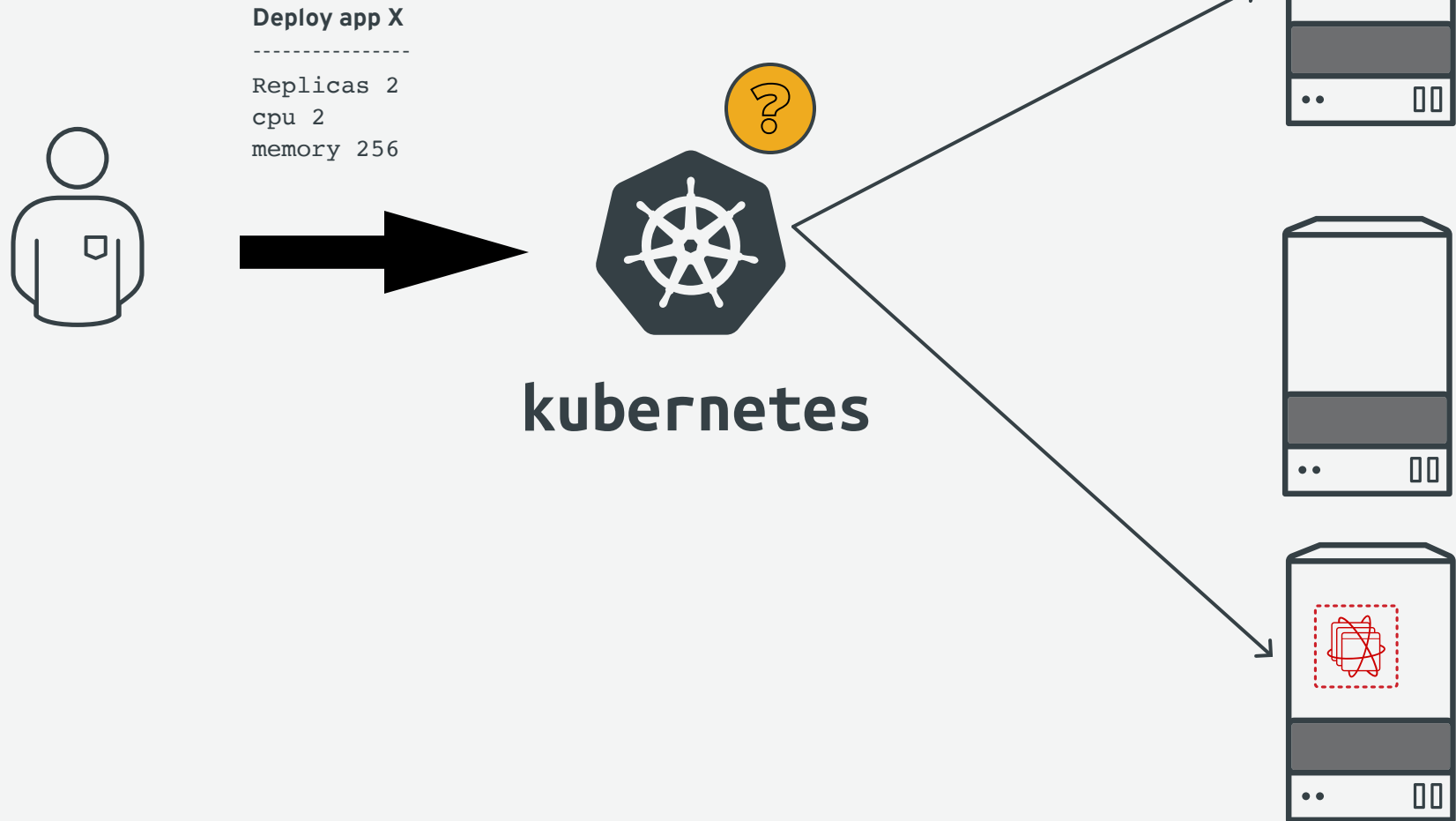
CONTAINERS AT SCALE IS HARD!

Scaling
Networking & Routing
Persistent Data
Platform HA
Application HA
Image security
Deployments









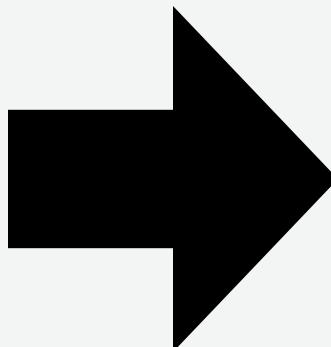
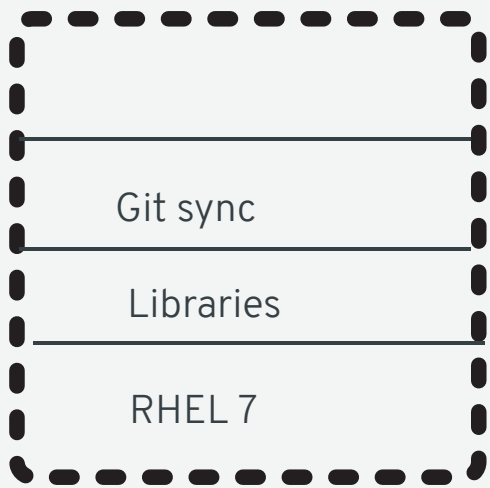
Container



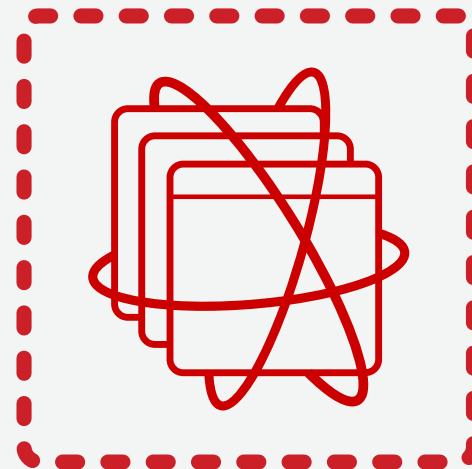
Container



Container



Pod



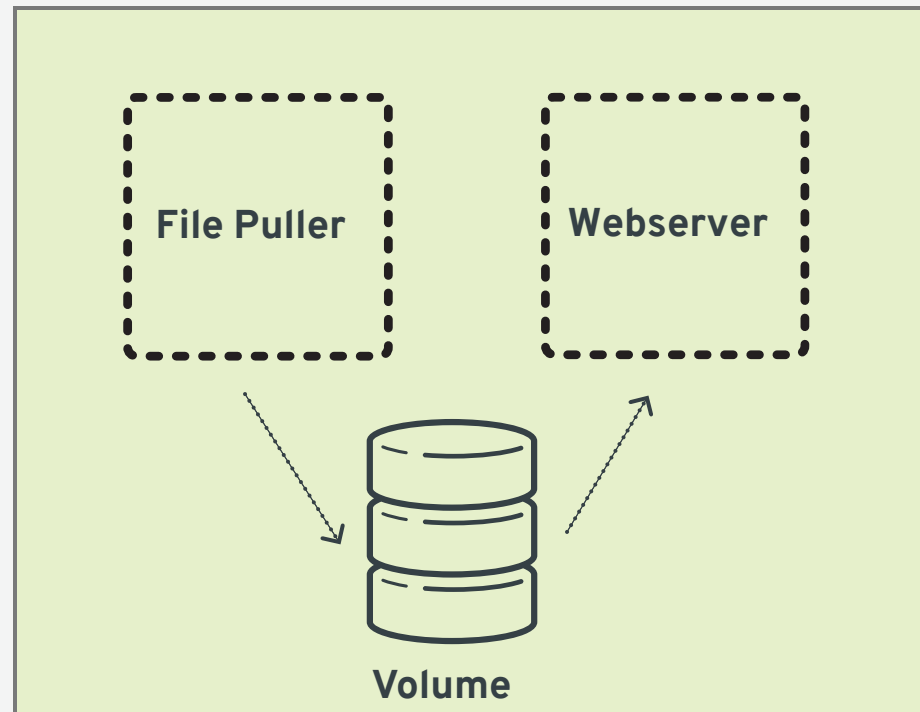
CMS

Consumers



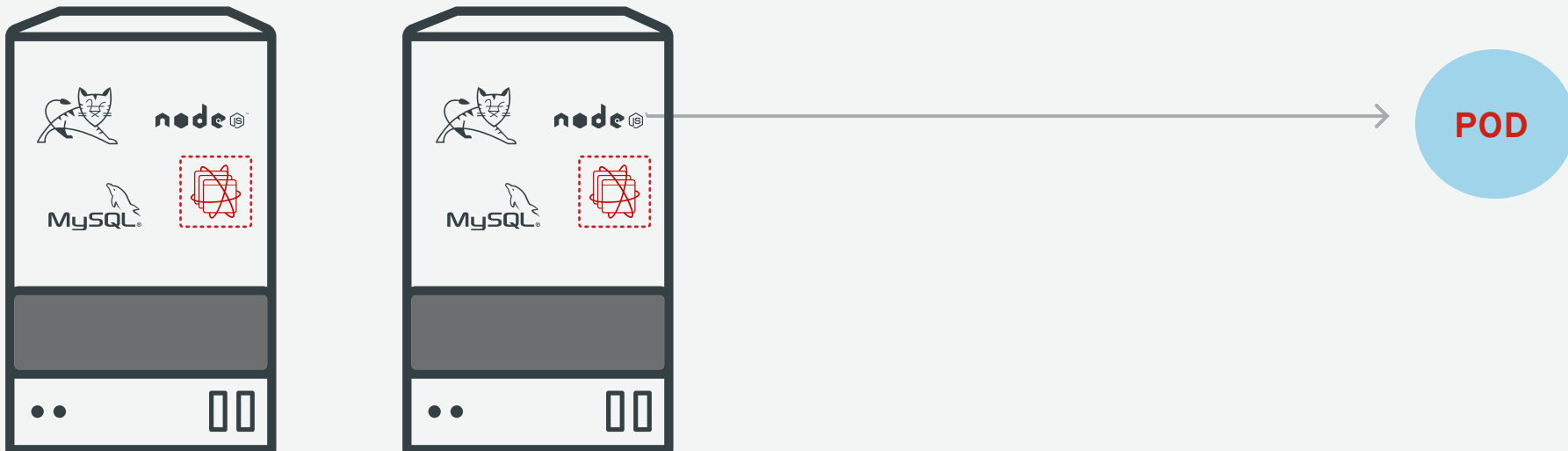
A Kubernetes pod is a group of containers that are deployed together on the same host. They share same network, storage namespace.

If you frequently deploy single containers, you can generally replace the word "pod" with "container" and accurately understand the concept

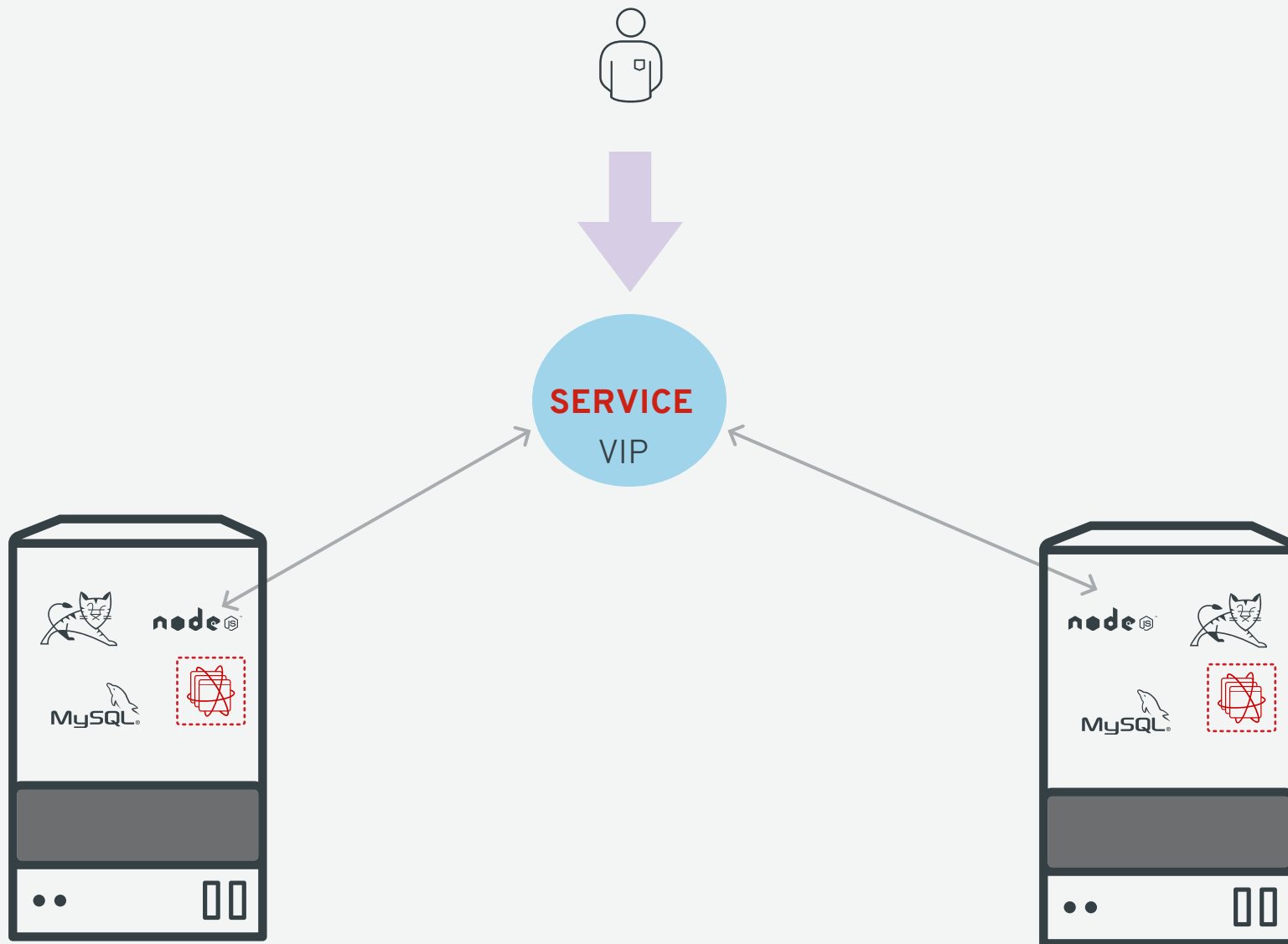
**Pod**

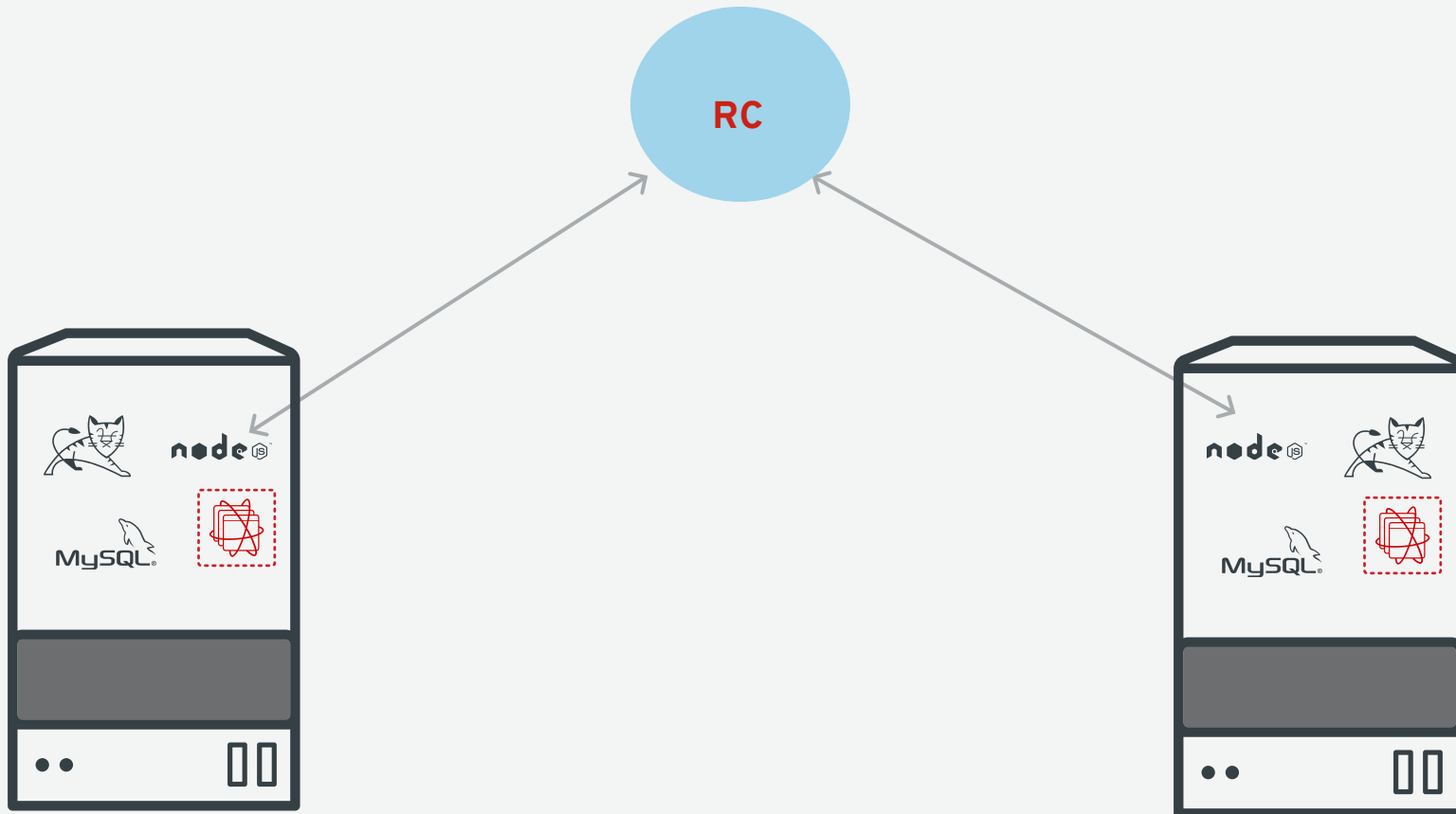
CONCEPT: **POD**

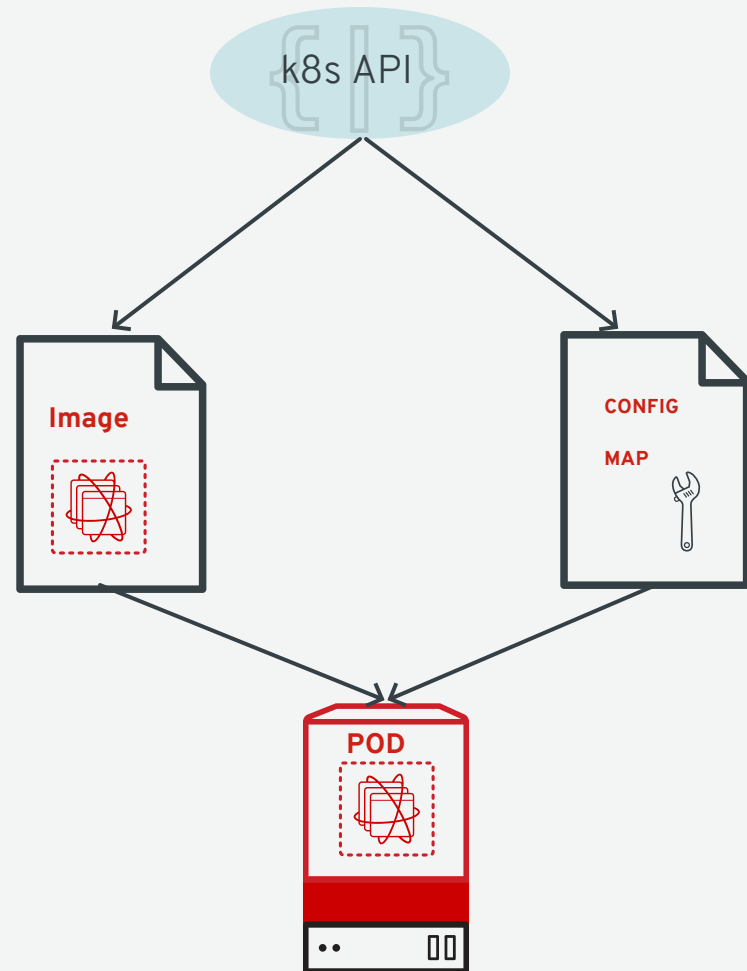
13

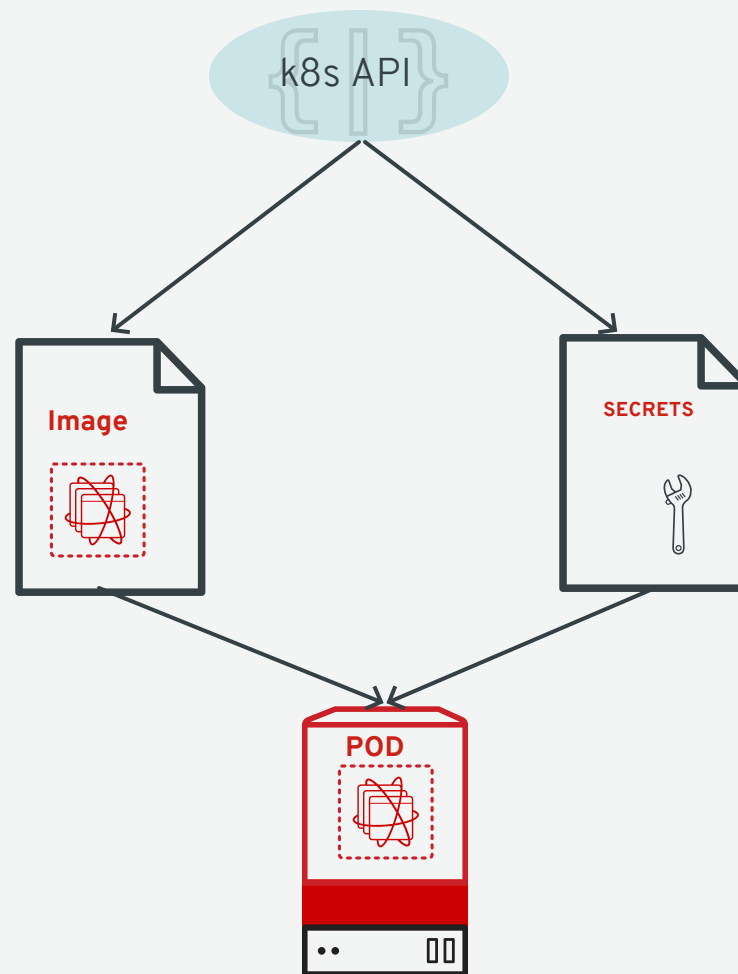


CONCEPT: **SERVICE**









DEMO

Kubernetes

```
#OSX

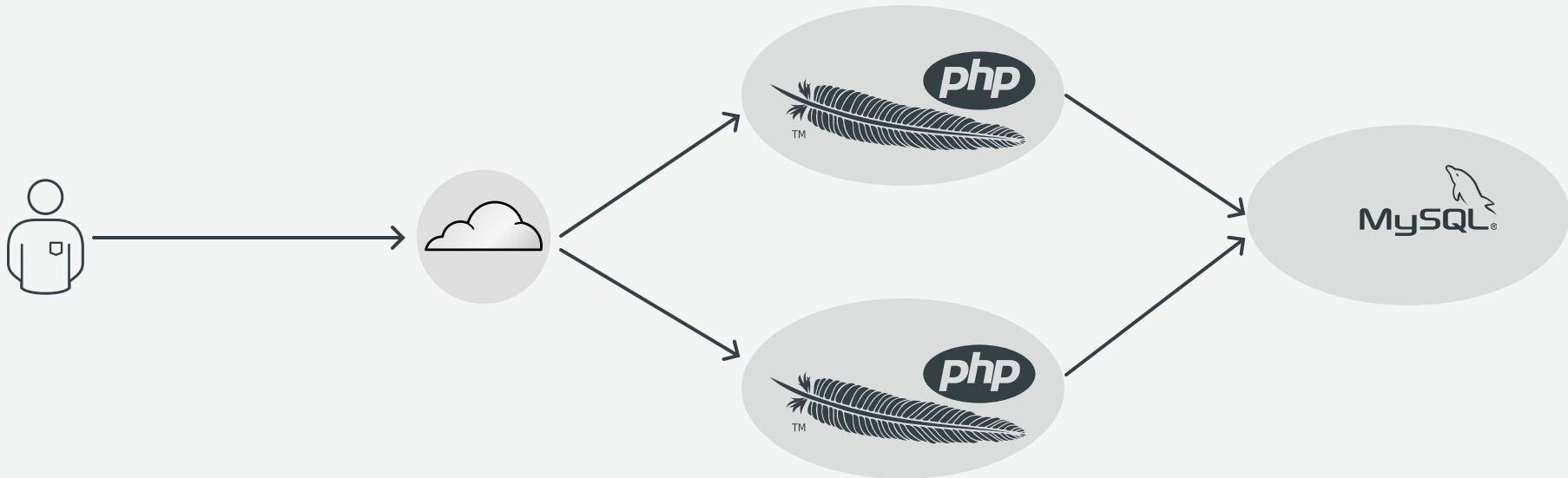
curl -Lo minikube https://storage.googleapis.com/minikube/releases/v0.7.0/minikube-darwin-amd64 \
&& chmod +x minikube \
&& sudo mv minikube /usr/local/bin/
```

Openshift

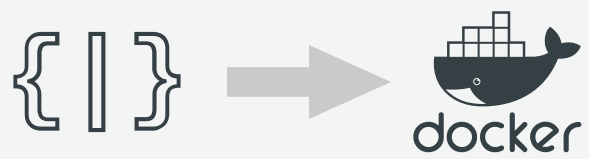
```
vagrant init thesteve0/openshift-origin
vagrant up

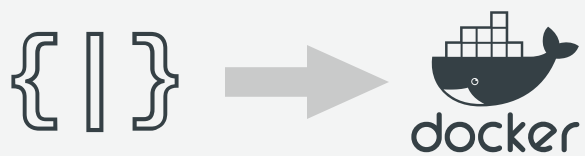
or

brew install openshift-cli
oc cluster up                #(alpha only, build from source)
```



<https://github.com/debianmaster/openshift-welcome.git>

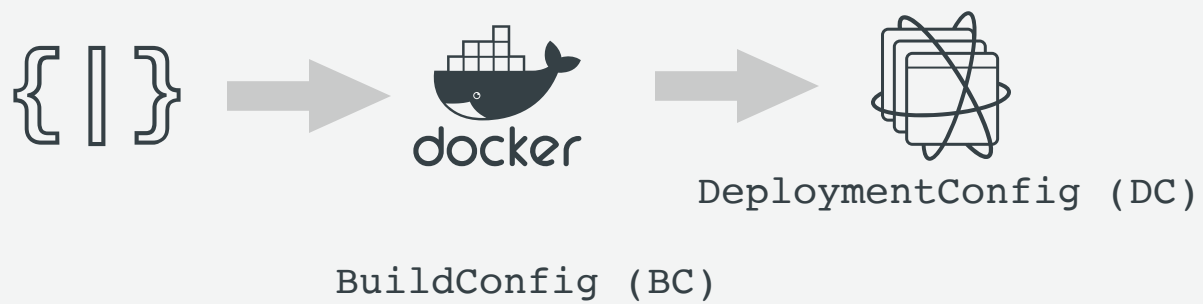


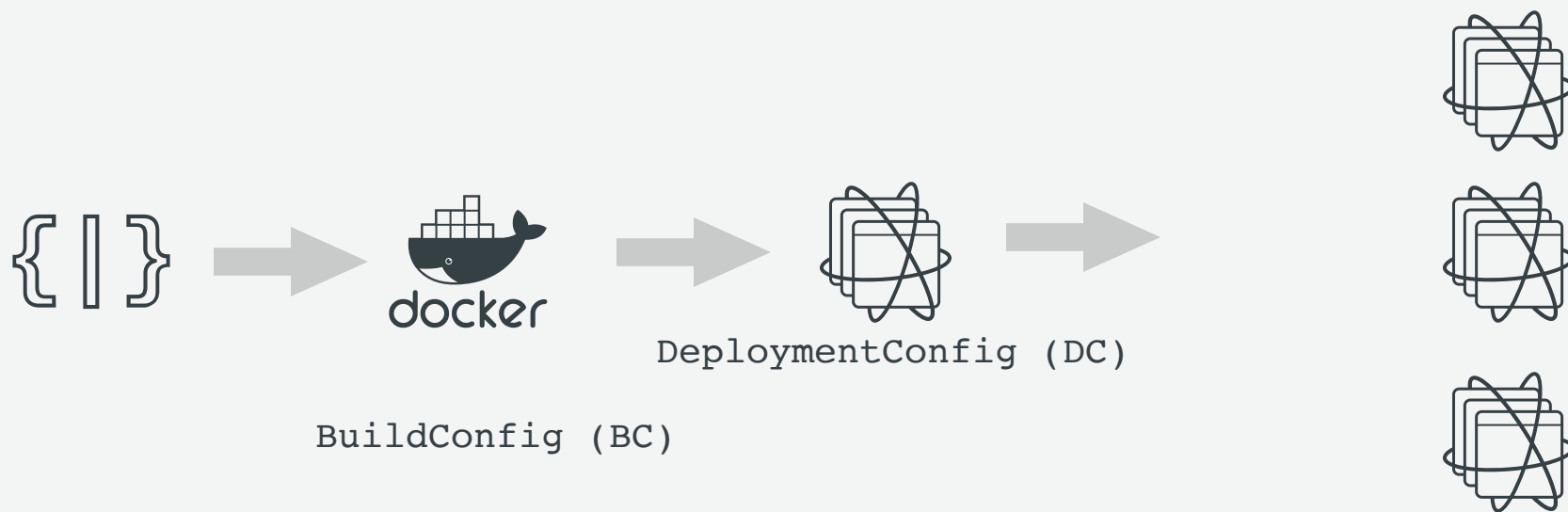


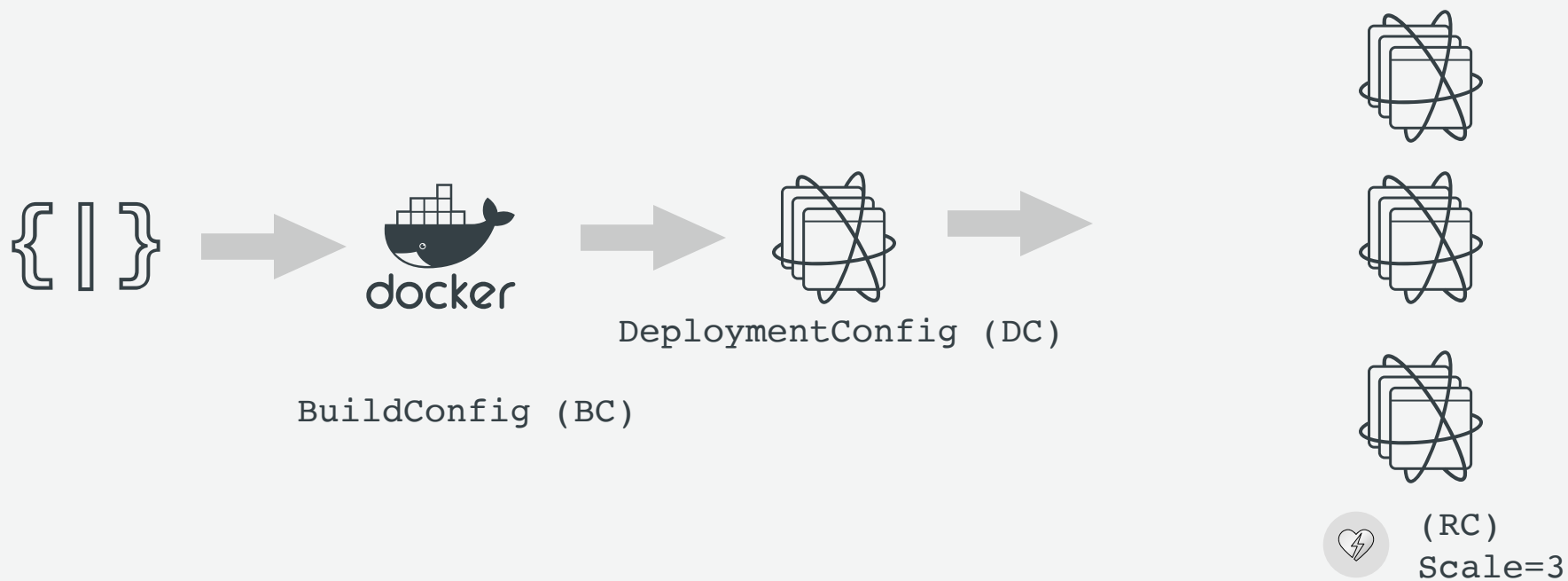
BuildConfig (BC)

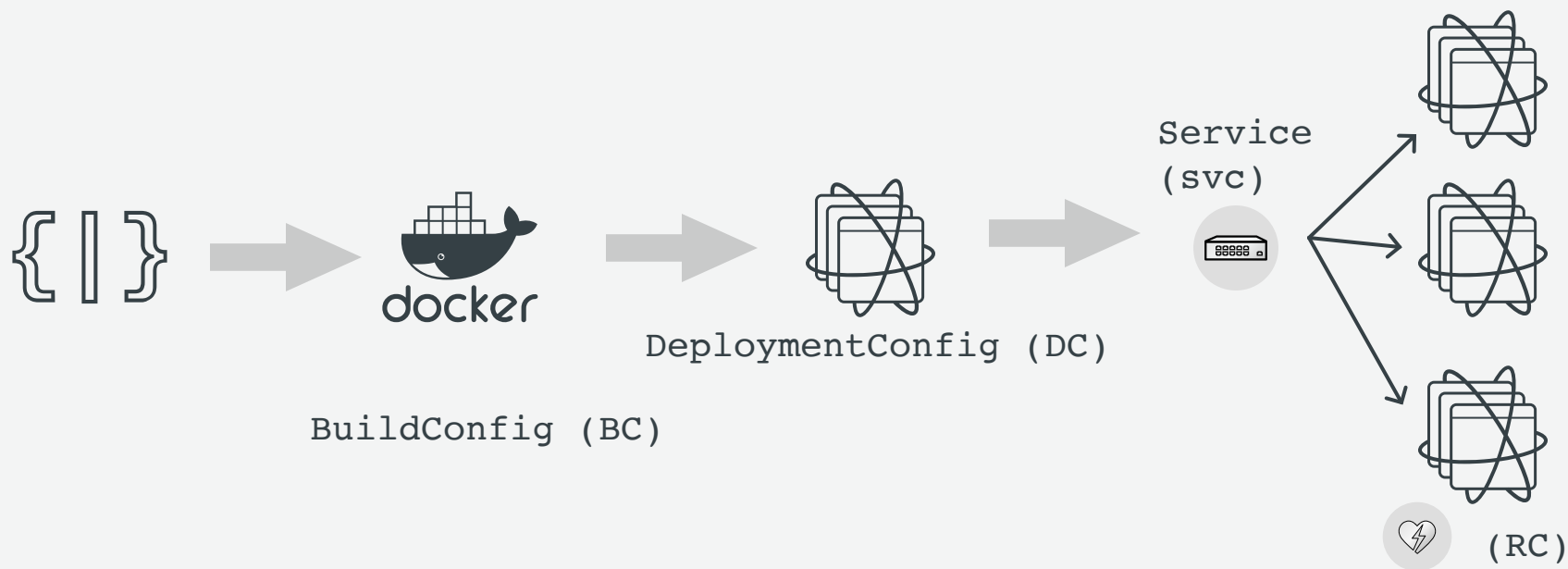


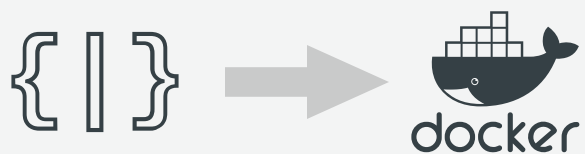
BuildConfig (BC)



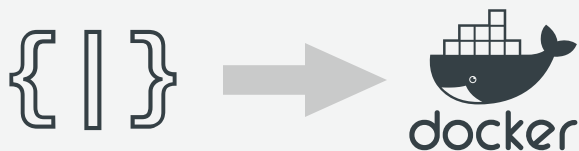






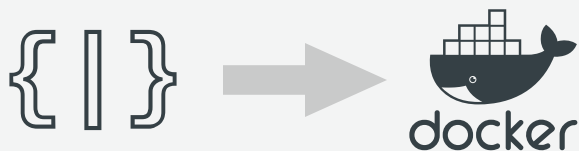


BuildConfig (BC)



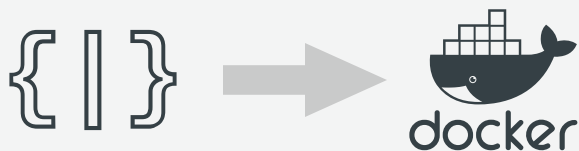
BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
    secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      name: "welcome:latest"
```



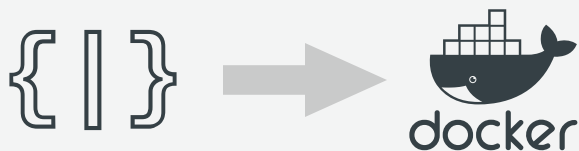
BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
    secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      name: "welcome:latest"
```



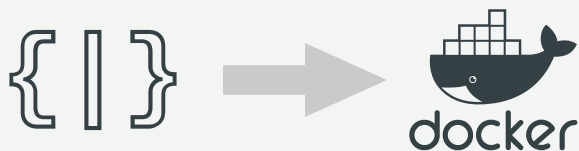
BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
    secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      name: "welcome:latest"
```



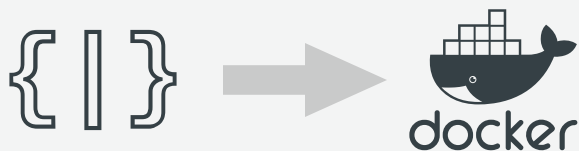
BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
    secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      namespace: "dev"
      name: "welcome:latest"
```



BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
    secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      name: "welcome:latest"
```



BuildConfig (BC)

```
---
apiVersion: "v1"
kind: "BuildConfig"
metadata:
  name: "php-welcome"
  namespace: "sample"
  labels:
    app: "welcome"
spec:
  triggers:
    -
      type: "GitHub"
      github:
        secret: "_1lvbvEDB97pYTGAodMO"
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChange:
        lastTriggeredImageID: "openshift/php:5.5"
  source:
    type: "Git"
    git:
      uri: "https://github.com/debianmaster/openshift-welcome.git"
      secrets: []
  strategy:
    type: "Source"
    sourceStrategy:
      from:
        kind: "ImageStreamTag"
        name: "openshift/php:5.5"
  output:
    to:
      kind: "ImageStreamTag"
      name: "welcome:latest"
```



DeploymentConfig (DC)

BuildConfig (BC)

```

---
apiVersion: "v1"
kind: "DeploymentConfig"
metadata:
  name: "welcome"
  labels:
    app: "welcome"
spec:
  strategy:
    type: "Rolling"
    rollingParams:
      updatePeriodSeconds: 1
      intervalSeconds: 1
      timeoutSeconds: 600
      maxUnavailable: "25%"
      maxSurge: "25%"
  triggers:
    - type: "ConfigChange"
    - type: "ImageChange"
      imageChangeParams:
        automatic: true
        containerNames:
          - "welcome"
        from:
          kind: "ImageStreamTag"
          name: "welcome:latest"
  replicas: 1
  test: false
  template:
    metadata:
      labels:
        app: "welcome"
      deploymentconfig: "welcome"
    spec:
      containers:
        - name: "welcome"
          image: "172.30.200.195:5000/dev/welcome"
          ports:
            - containerPort: 8080
              protocol: "TCP"
          restartPolicy: "Always"
          terminationGracePeriodSeconds: 30

```



DeploymentConfig (DC)

BuildConfig (BC)

```
replicas: 1
test: false
template:
  metadata:
    labels:
      app: "welcome"
      deploymentconfig: "welcome"
spec:
  containers:
  -
    name: "welcome"
    image: "172.30.200.195:5000/dev/welcome"
    ports:
    -
      containerPort: 8080
      protocol: "TCP"
    restartPolicy: "Always"
    terminationGracePeriodSeconds: 30
```




DeploymentConfig (DC)

BuildConfig (BC)

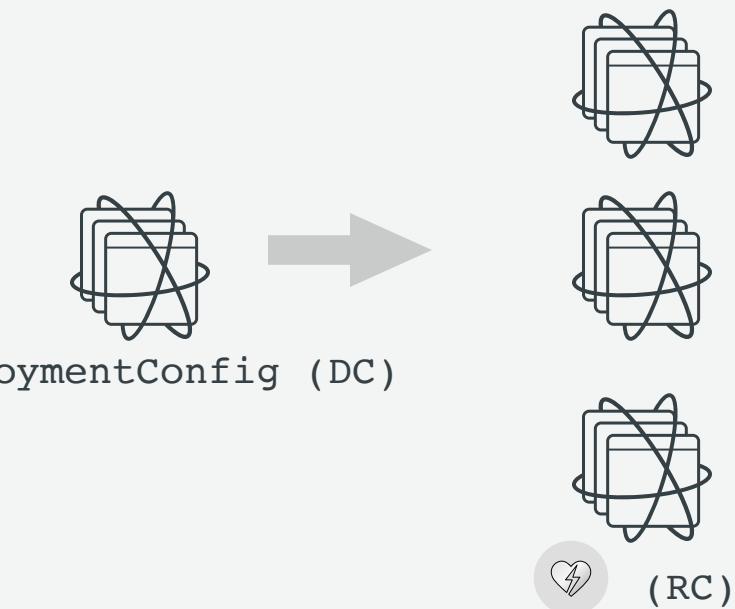
```
---
apiVersion: "v1"
kind: "DeploymentConfig"
metadata:
  name: "welcome"
  labels:
    app: "welcome"
spec:
  strategy:
    type: "Rolling"
    rollingParams:
      updatePeriodSeconds: 1
      intervalSeconds: 1
      timeoutSeconds: 600
      maxUnavailable: "25%"
      maxSurge: "25%"
  triggers:
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChangeParams:
        automatic: true
        containerNames:
          - "welcome"
        from:
          kind: "ImageStreamTag"
          name: "welcome:latest"
  replicas: 1
  test: false
```



DeploymentConfig (DC)

BuildConfig (BC)

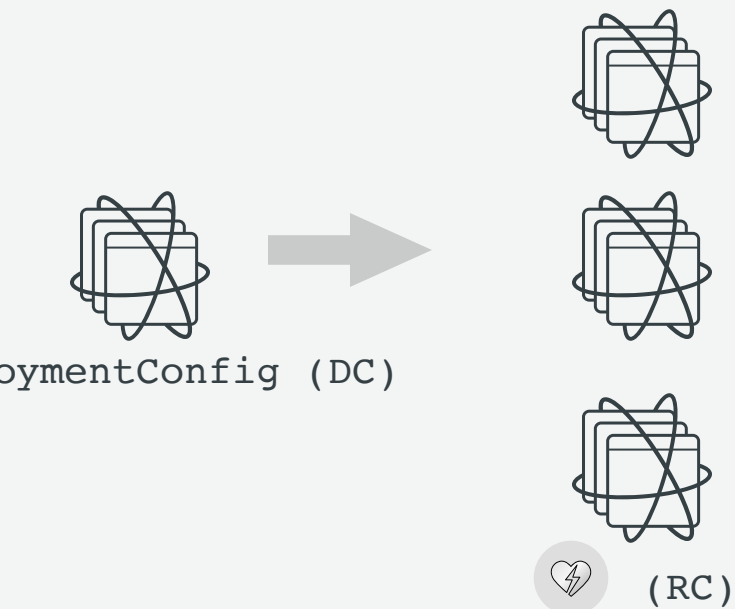
```
---
apiVersion: "v1"
kind: "DeploymentConfig"
metadata:
  name: "welcome"
  labels:
    app: "welcome"
spec:
  strategy:
    type: "Rolling"
    rollingParams:
      updatePeriodSeconds: 1
      intervalSeconds: 1
      timeoutSeconds: 600
      maxUnavailable: "25%"
      maxSurge: "25%"
  triggers:
    -
      type: "ConfigChange"
    -
      type: "ImageChange"
      imageChangeParams:
        automatic: true
        containerNames:
          - "welcome"
        from:
          kind: "ImageStreamTag"
          name: "welcome:latest"
  replicas: 1
  test: false
```



```

apiVersion: v1
kind: ReplicationController
metadata:
  name: welcome-1
spec:
  replicas: 3
  selector:
    app: welcome
    deployment: welcome-1
    deploymentconfig: welcome
  template:
    metadata:
      labels:
        app: welcome
        deployment: welcome-1
        deploymentconfig: welcome
    spec:
      containers:
        - image: dev/welcome
          imagePullPolicy: Always
          name: welcome
          ports:
            - containerPort: 8080
              protocol: TCP
          restartPolicy: Always

```

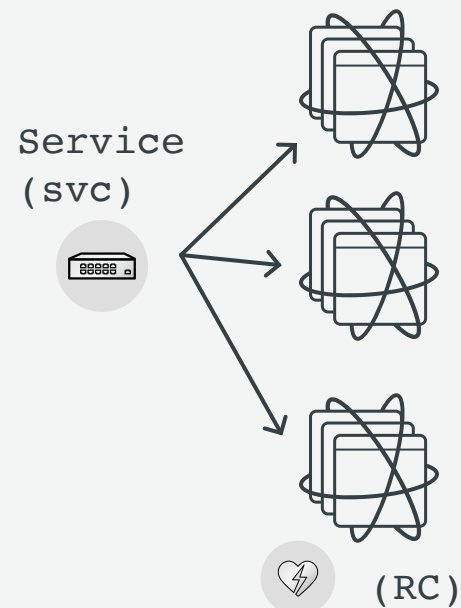


```

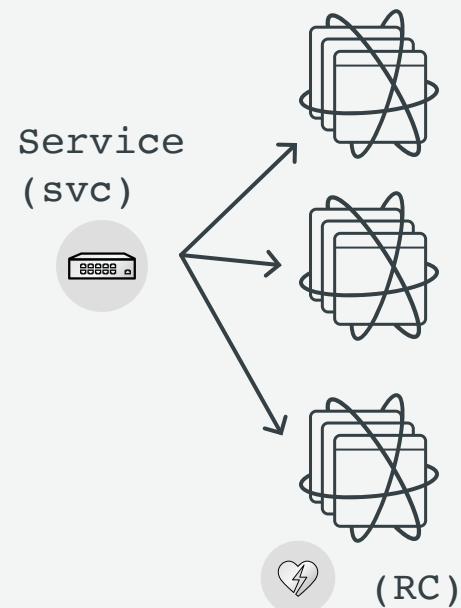
apiVersion: v1
kind: ReplicationController
metadata:
  name: welcome-1
spec:
  replicas: 3
  selector:
    app: welcome
    deployment: welcome-1
    deploymentconfig: welcome
  template:
    metadata:
      labels:
        app: welcome
        deployment: welcome-1
        deploymentconfig: welcome
    spec:
      containers:
      - image: dev/welcome
        imagePullPolicy: Always
        name: welcome
        ports:
        - containerPort: 8080
          protocol: TCP
        restartPolicy: Always

```

```
apiVersion: v1
kind: Service
metadata:
  labels:
    app: welcome
  name: welcome
  namespace: dev
spec:
  clusterIP: 172.30.206.40
  portalIP: 172.30.206.40
  ports:
  - name: 8080-tcp
    port: 8080
    protocol: TCP
    targetPort: 8080
  selector:
    app: welcome
    deploymentconfig: welcome
  sessionAffinity: None
  type: ClusterIP
```



```
apiVersion: v1
kind: Service
metadata:
  labels:
    app: welcome
    name: welcome
    namespace: dev
spec:
  clusterIP: 172.30.206.40
  port: 8080
  ports:
    - name: 8080-tcp
      port: 8080
      protocol: TCP
      targetPort: 8080
  selector:
    app: welcome
    deploymentconfig: welcome
  sessionAffinity: None
  type: ClusterIP
```



```
apiVersion: v1
kind: Service
metadata:
  labels:
    app: welcome
    name: welcome
    namespace: dev
spec:
  clusterIP: 172.30.206.40
  portalIP: 172.30.206.40
  ports:
  - name: 8080-tcp
    port: 8080
    protocol: TCP
    targetPort: 8080
  selector:
    app: welcome
    deploymentconfig: welcome
  sessionAffinity: None
  type: ClusterIP
```

