

Kubernetes from Scratch

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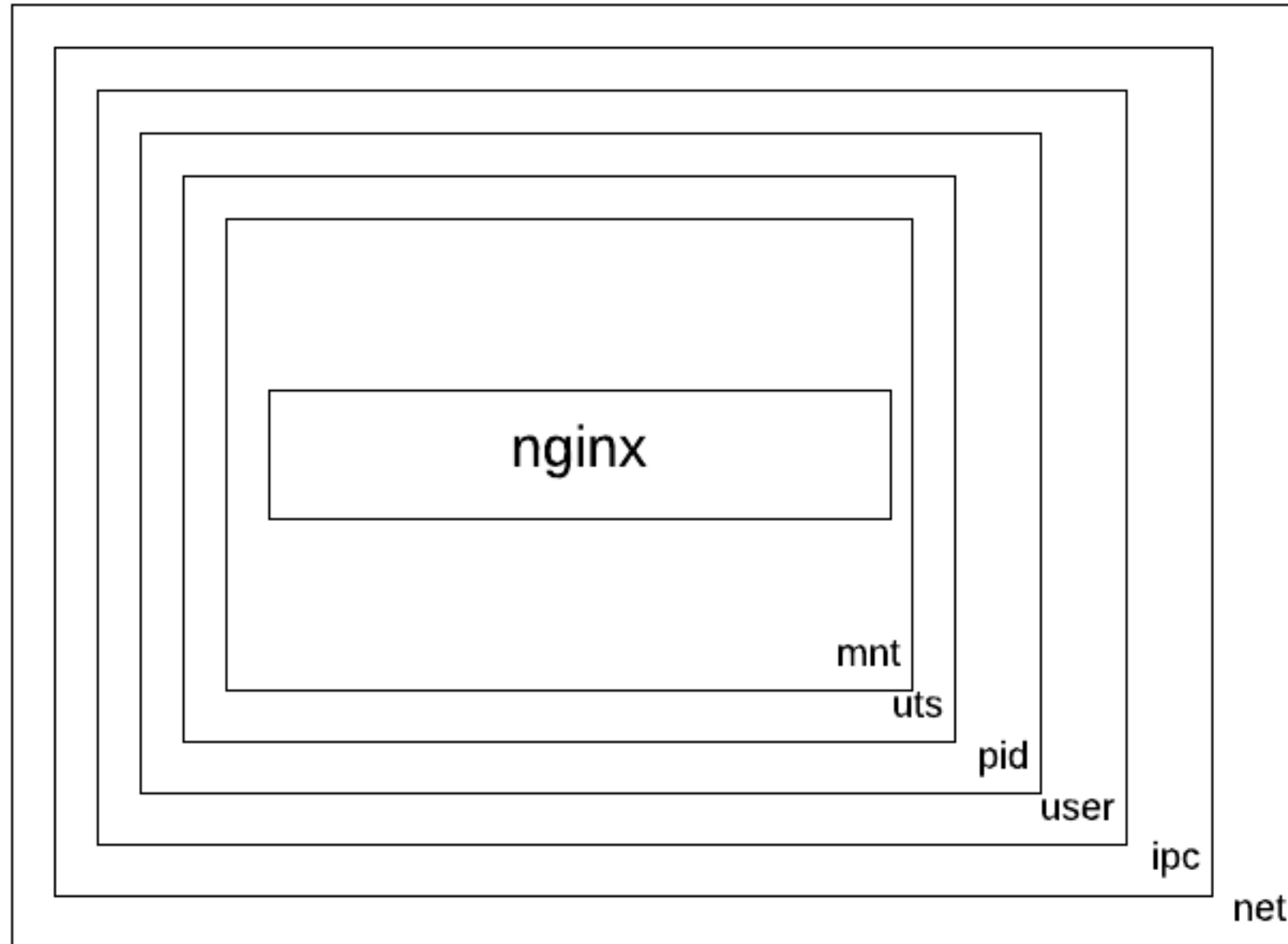
About Me

- Technical lead at the ultimate software's multi-cloud strategy team (a.k.a Stratosphere)
- Kubernetes contributor

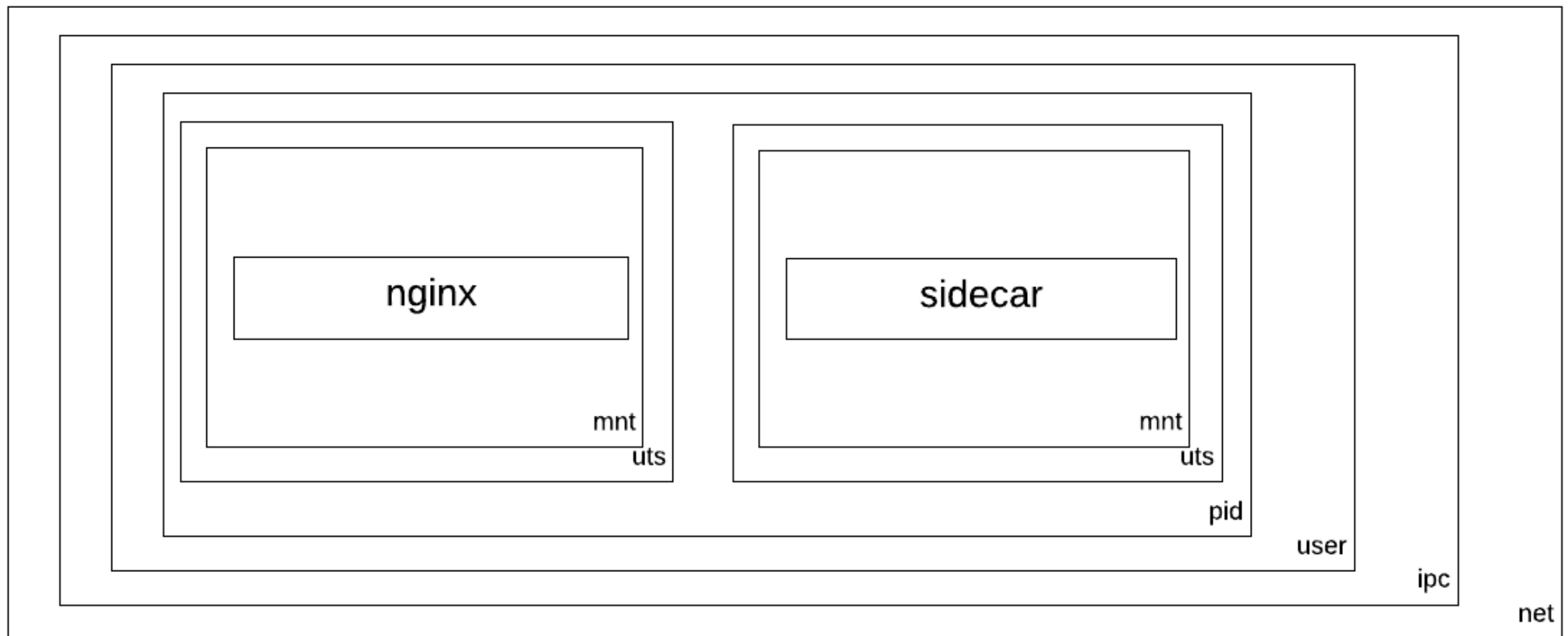
Goals

- Gain a deeper understating of each Kubernetes
- Build a mental model of reasoning about and debugging Kubernetes resources.

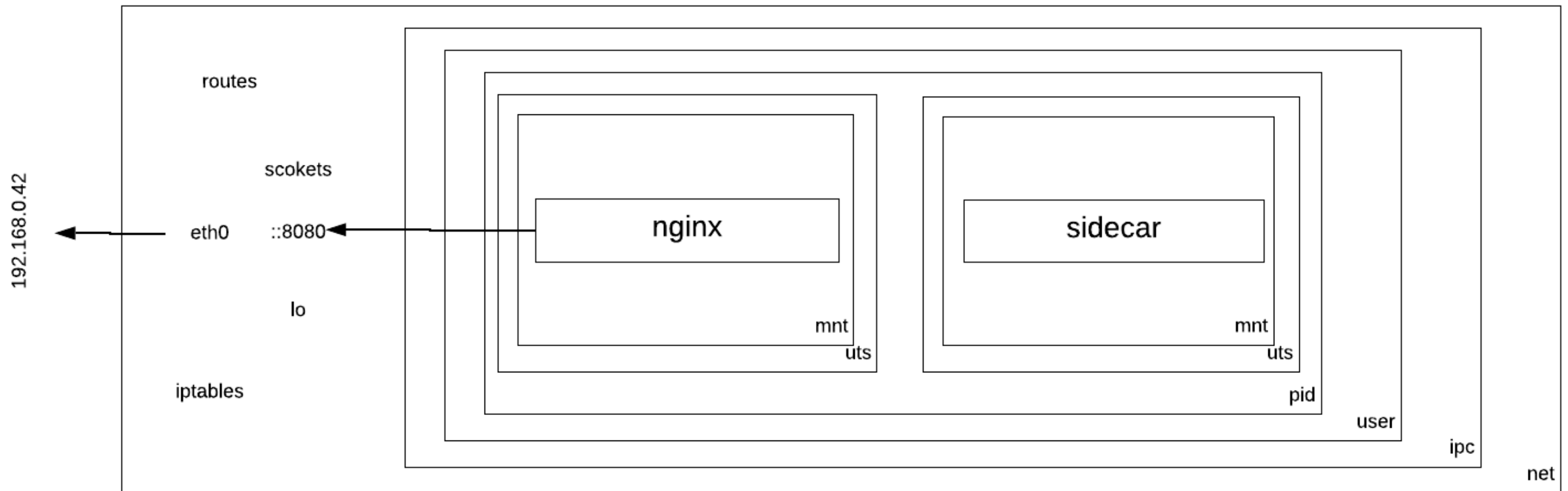
“Containers”



Kubernetes Pods



Kubernetes Pods



Pod

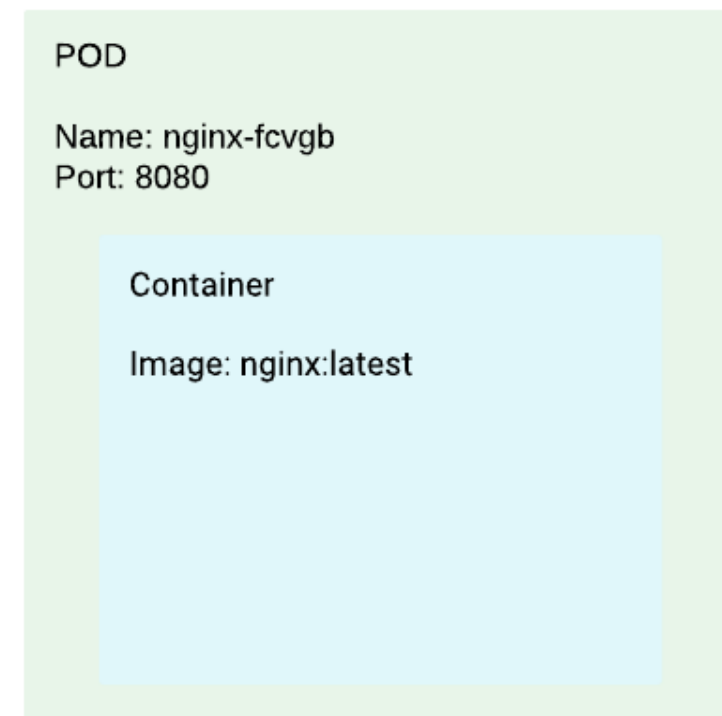
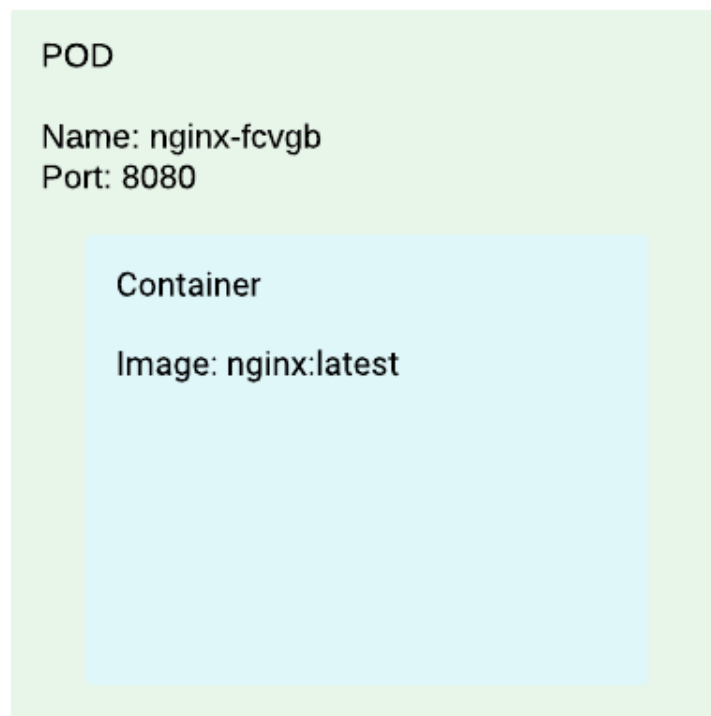
POD

Name: nginx-fcvgb
Port: 8080

Container

Image: nginx:latest

Pod



Deployment

Deployment

Name: foo

Selector: app=nginx, tier=web

Image: nginx:1.7.9

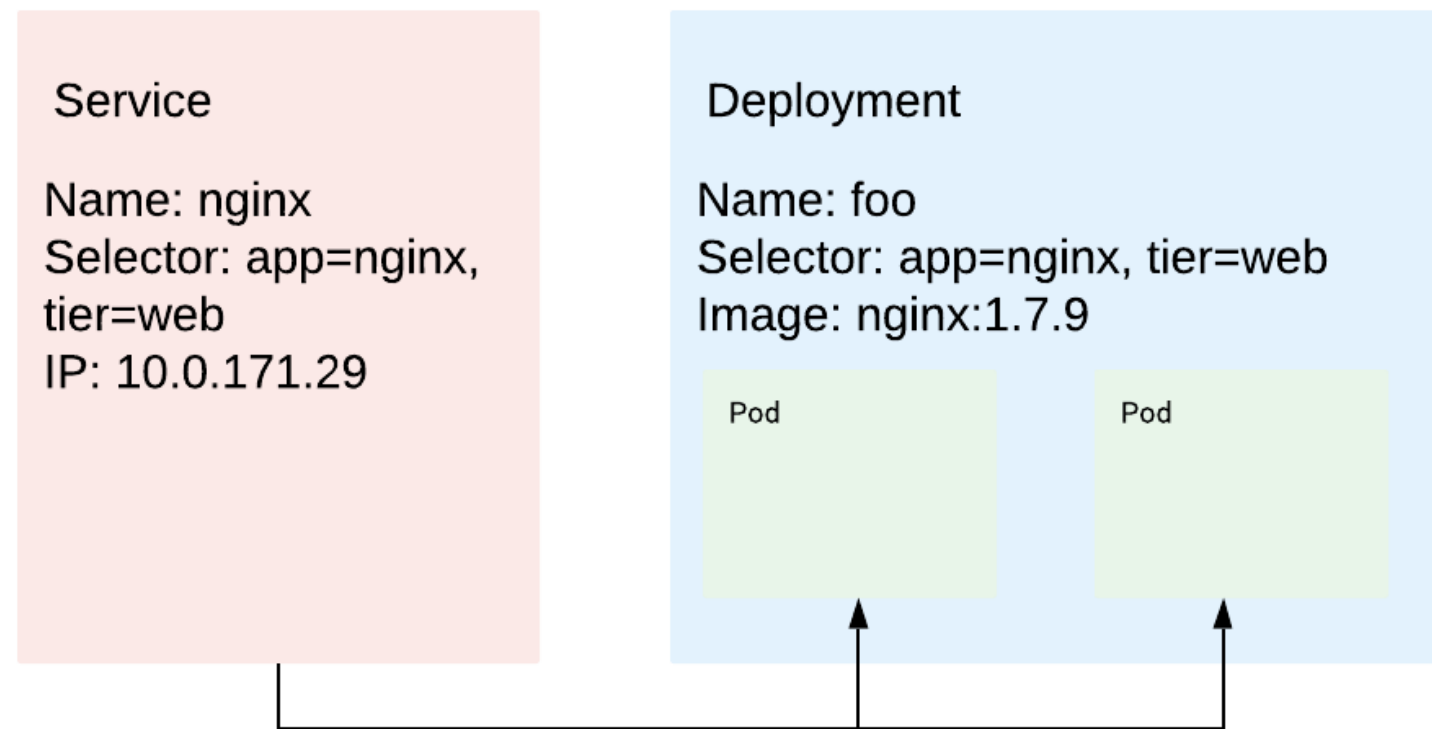
POD

Name: nginx-fcvgb
Port: 8080

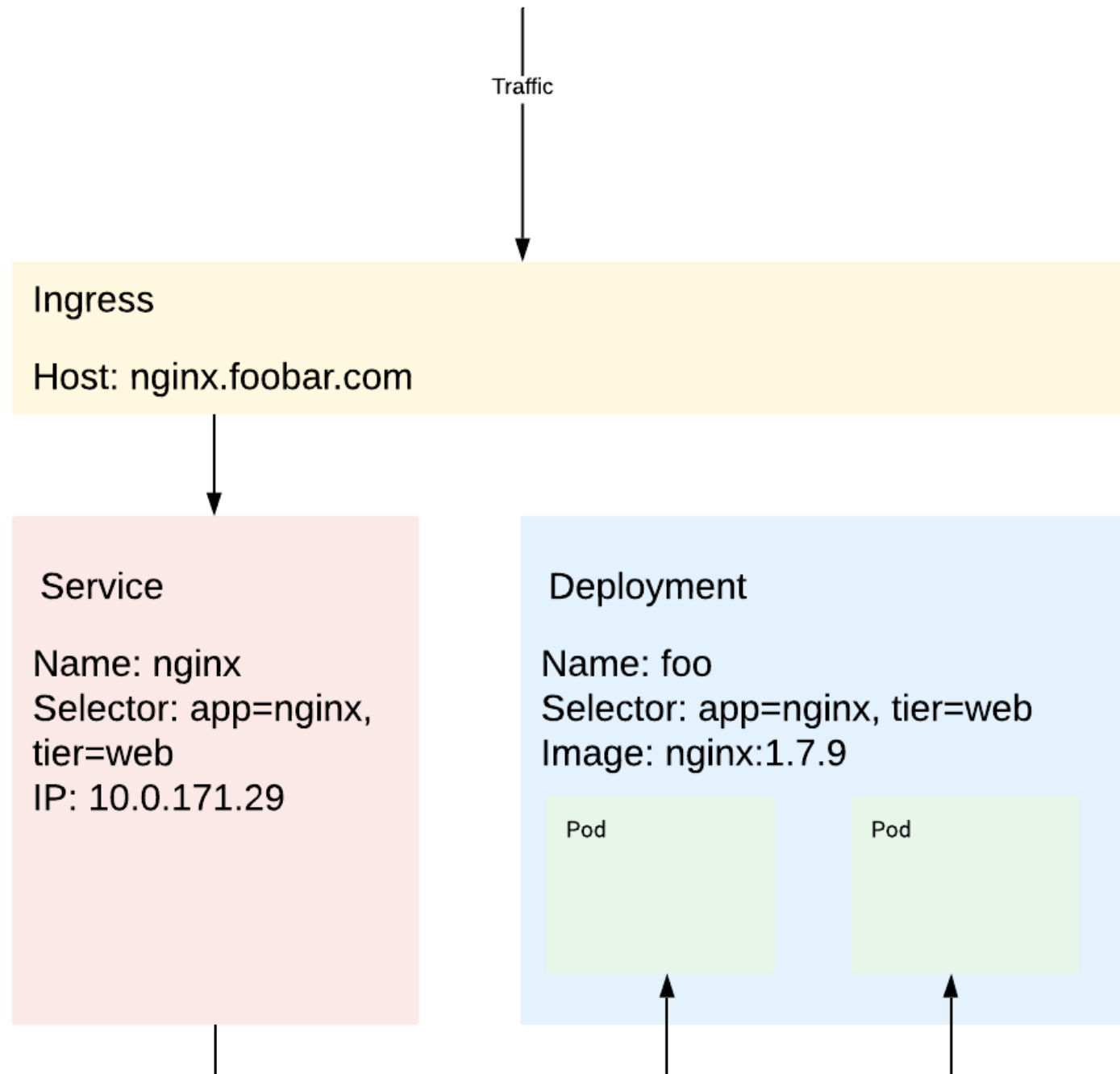
POD

Name: nginx-anbgt
Port: 8080

Service



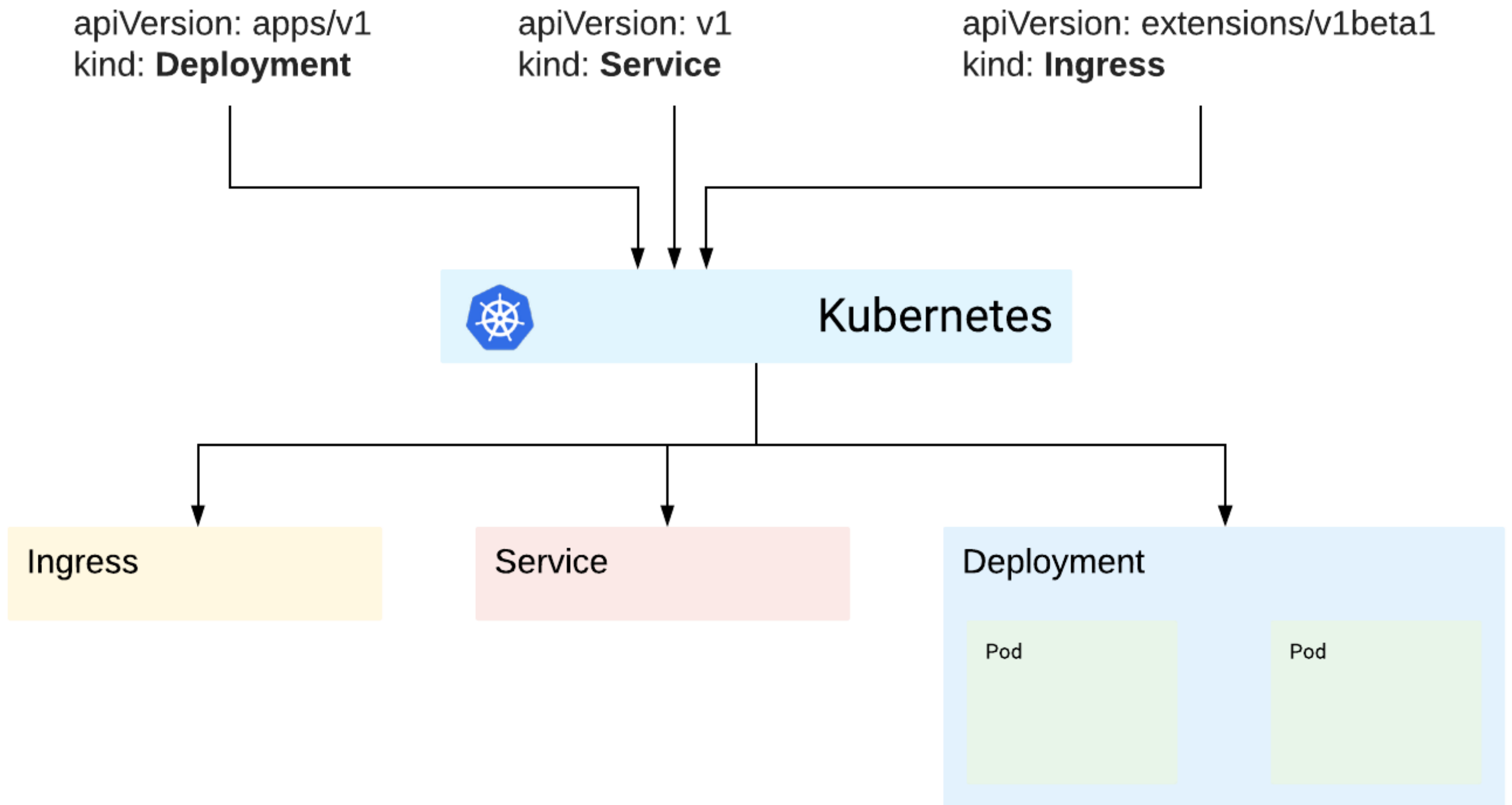
Ingress



```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  labels:
    app: nginx
spec:
  replicas: 2
  selector:
    matchLabels:
      app: nginx
      tier: web
  template:
    metadata:
      labels:
        app: nginx
        tier: web
    spec:
      containers:
        - name: nginx
          image: nginx:1.7.9
          ports:
            - containerPort: 80
```

```
apiVersion: v1
kind: Service
metadata:
  name: nginx
spec:
  selector:
    app: nginx
    tier: web
  ports:
    - protocol: TCP
      port: 80
      targetPort: 80
```

```
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: nginx
spec:
  backend:
    serviceName: nginx
    servicePort: 80
```





Kubernetes



kube-apiserver



kube-scheduler



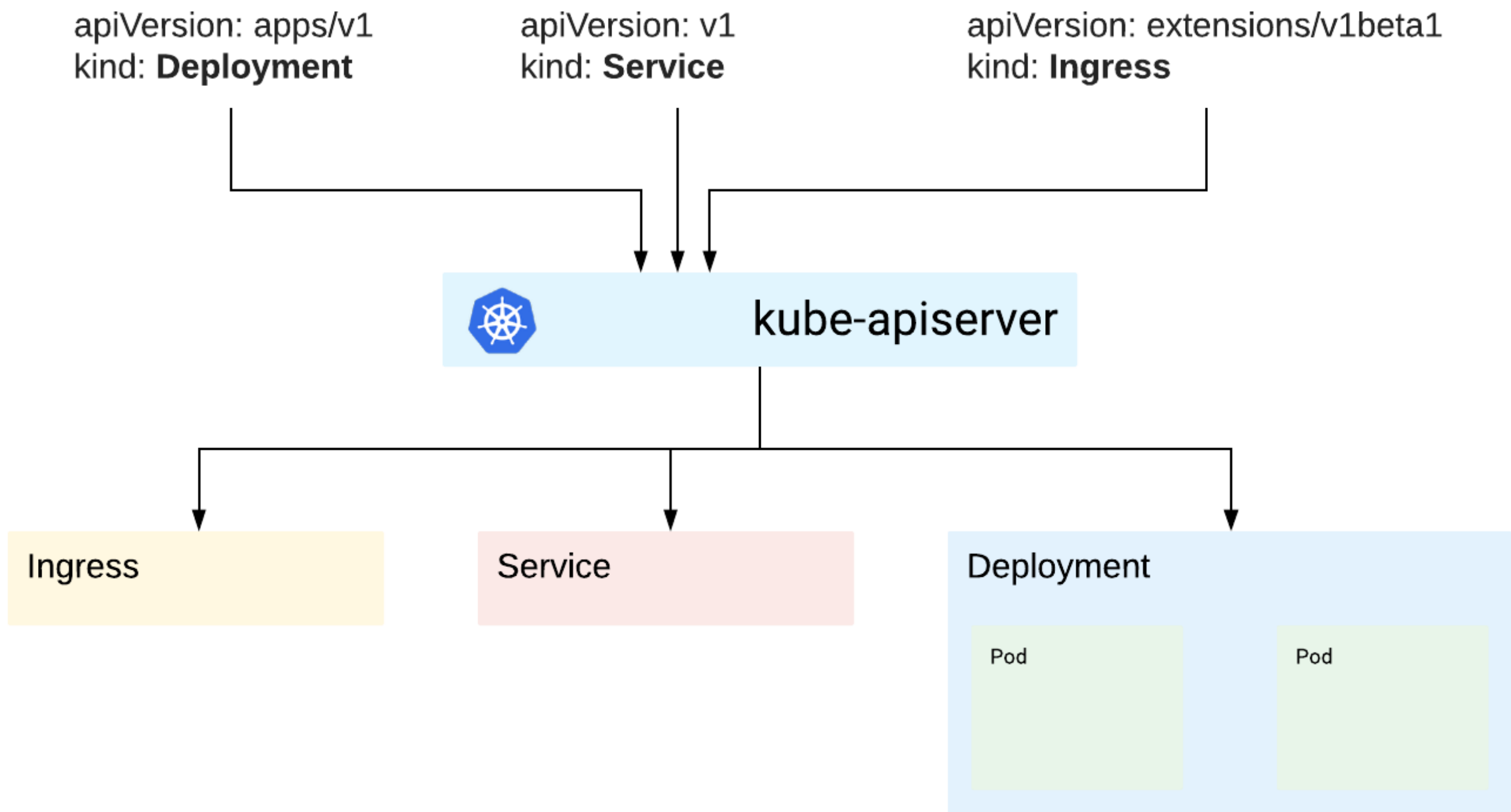
kube-controller-manager



kubelet



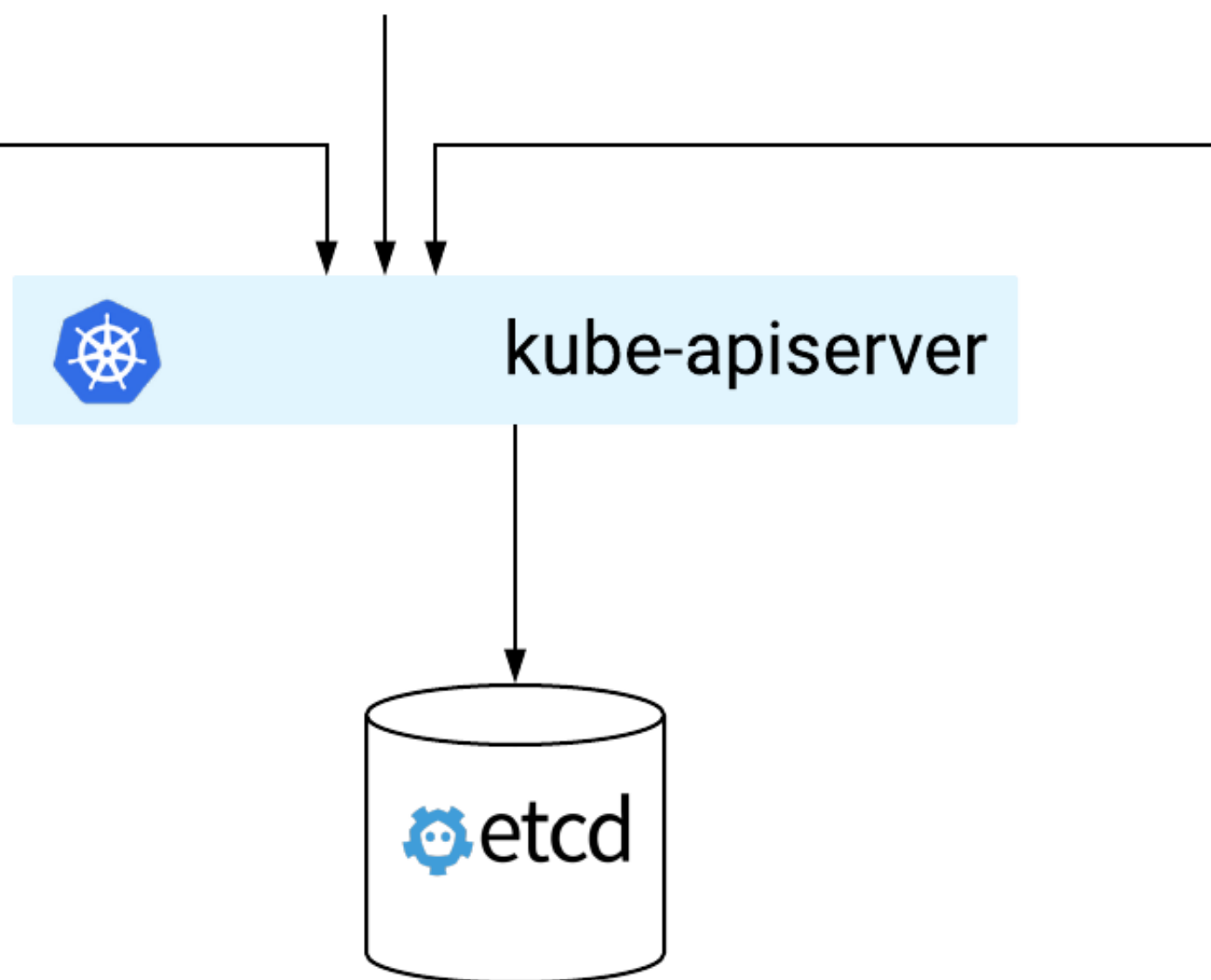
kube-proxy

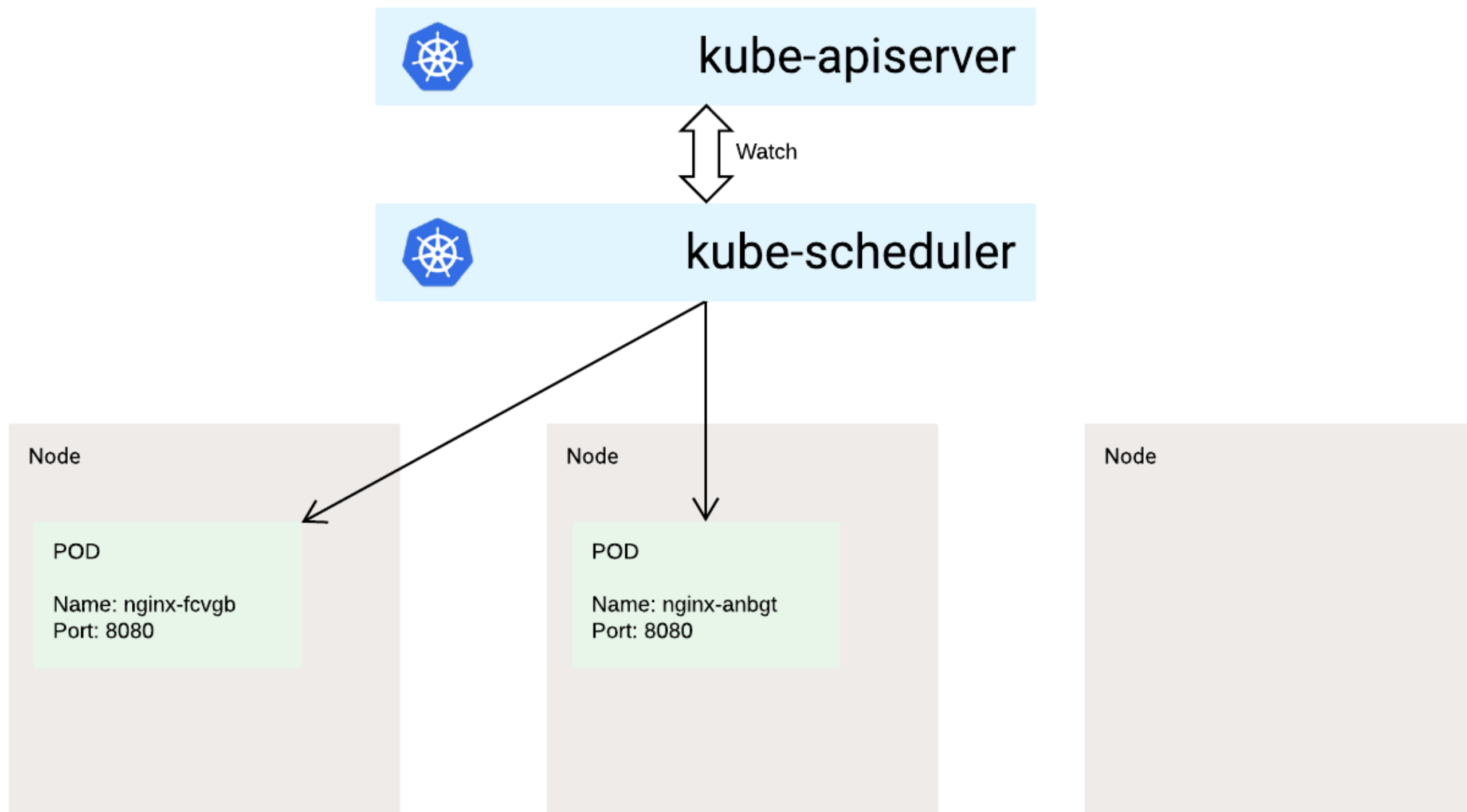


apiVersion: apps/v1
kind: **Deployment**

apiVersion: v1
kind: **Service**

apiVersion: extensions/v1beta1
kind: **Ingress**







kube-apiserver



kube-controller-manager

Namespace

Deployment

Name: nginx

Replicaset

Name: nginx-rs

Service account

Name: nginx

Secret

Name: nginx

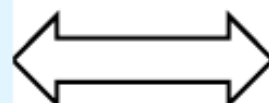


kube-apiserver



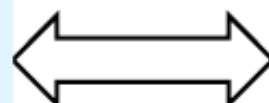
kube-controller-manager

namespaces



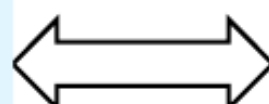
namespace-controller

deployment



deployment-controller

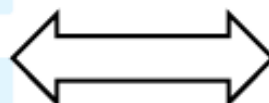
replicasets



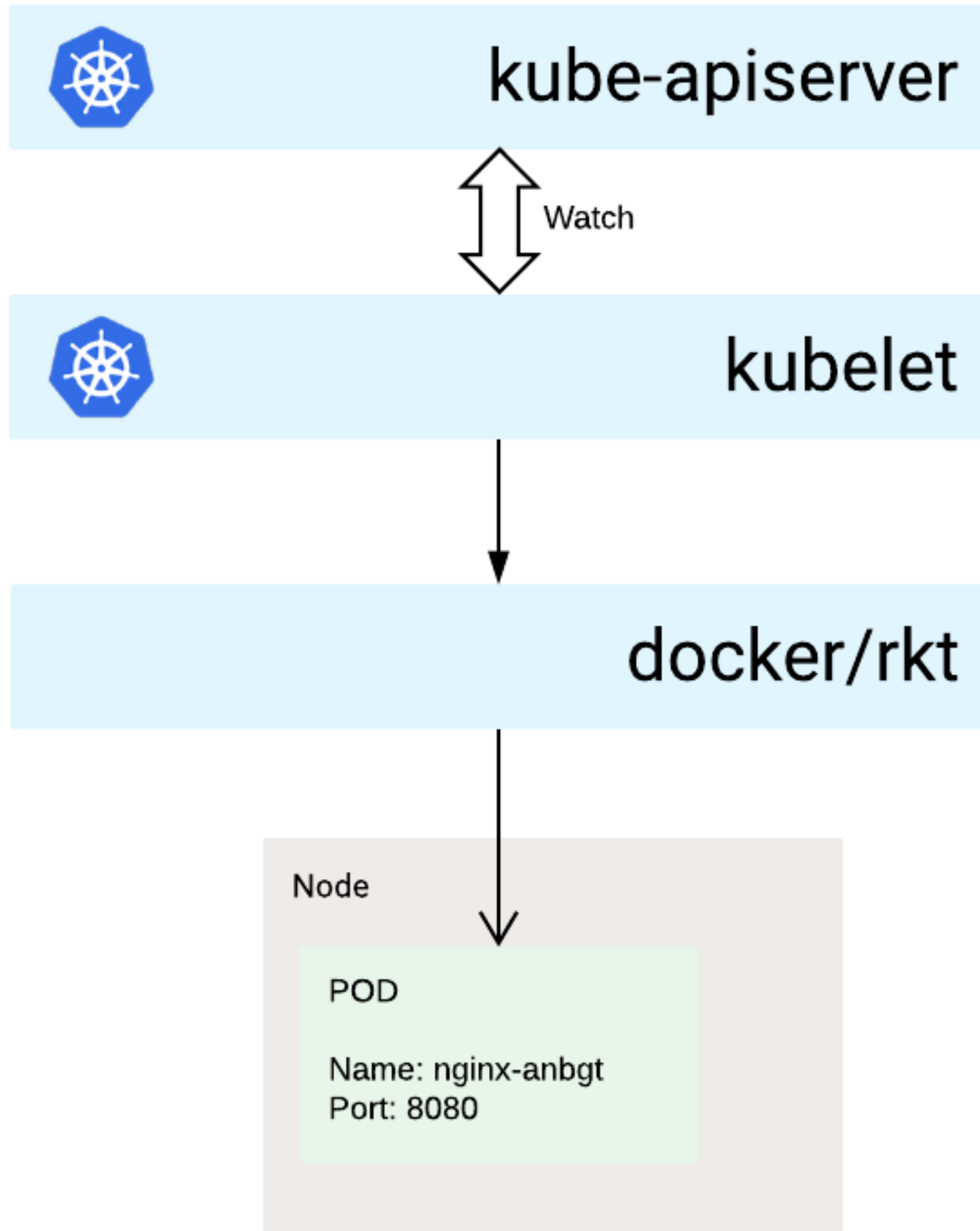
replicaset-controller

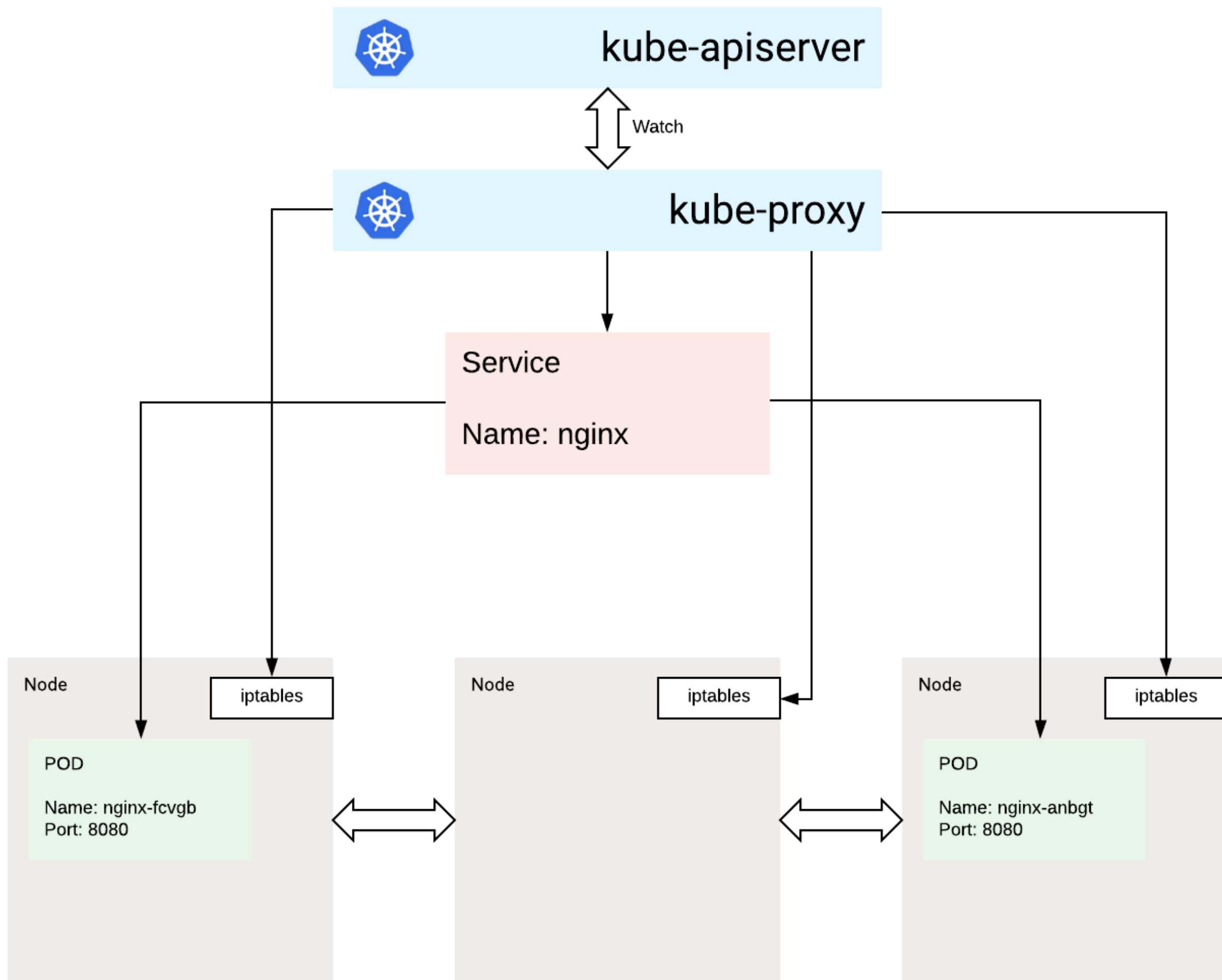
pods

secrets



operators





Further reading

- AntiAffinity / NodeSelectors - <https://kubernetes.io/docs/concepts/configuration/assign-pod-node/>
- Network policies - <https://kubernetes.io/docs/concepts/services-networking/network-policies/>
- Taints/Tolerations - <https://kubernetes.io/docs/concepts/configuration/taint-and-toleration/>
- Reservations/Limits - <https://kubernetes.io/docs/concepts/configuration/manage-compute-resources-container/>

Inspirations for this talk

- Kubernetes Deconstructed: Understanding Kubernetes by Breaking It Down - Carson Anderson - <https://www.youtube.com/watch?v=90kZRyPcRZw>
- Kubernetes the hard way - Kelsey Hightower - <https://github.com/kelseyhightower/kubernetes-the-hard-way>
- Istio - The Packet's-Eye View - Matt Turner - <https://www.youtube.com/watch?v=zJnYuFsLHfY>

Thanks!