PODS

Containerization Process

```
Blueprints of        Materialized           Storage and
instructions    →    software binary   →    distribution facility

[Dockerfile]         [Image]                Remote Docker
                                            registry
```

```
        Container   Container   Container
              Runtime Instances
```
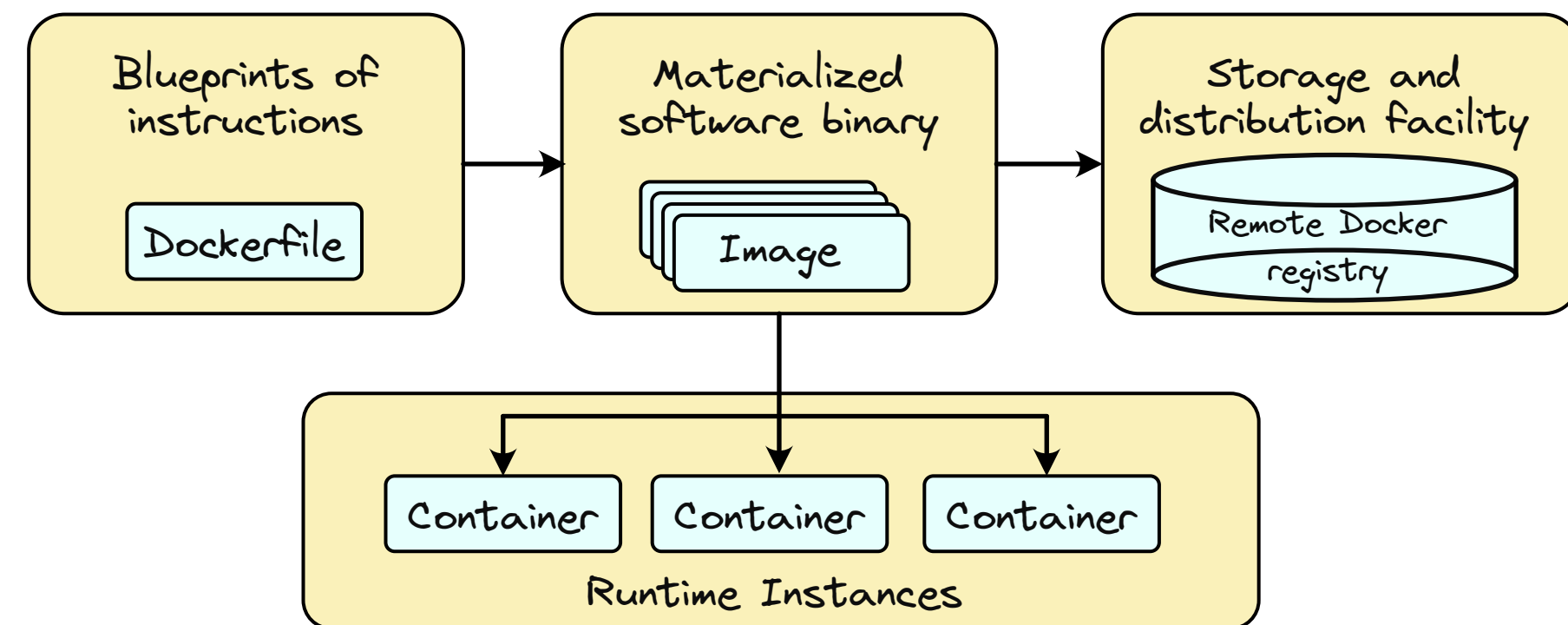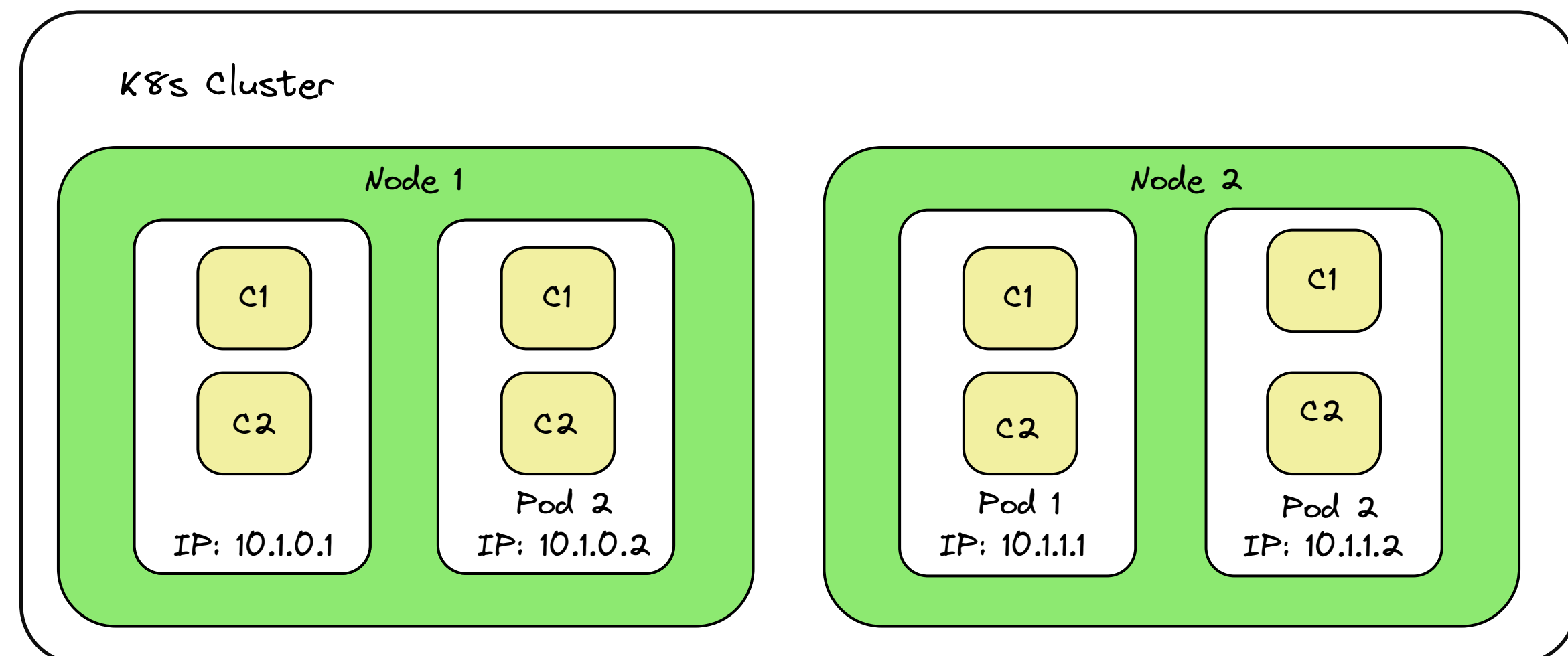
What is a Pod?

Single-container Pod   **Multi-container Pod**

Containers   Containers

K8s Cluster

Node 1

Pod 2
C1
C2
IP: 10.1.0.1

Pod 2
C1
C2
IP: 10.1.0.2

Node 2

Pod 1
C1
C2
IP: 10.1.1.1

Pod 2
C1
C2
IP: 10.1.1.2

What can I do with a Pod?

Node
Pod IP
C1
Nginx
Pod *Nginx*

```
apiVersion: v1 # required
kind: Pod # required
metadata: # required
  name: nginx # required
  labels:
    app: nginx
    service: web
spec: # required
  containers:
  - image: nginx:1.16
    name: nginx
    imagePullPolicy: Always
```
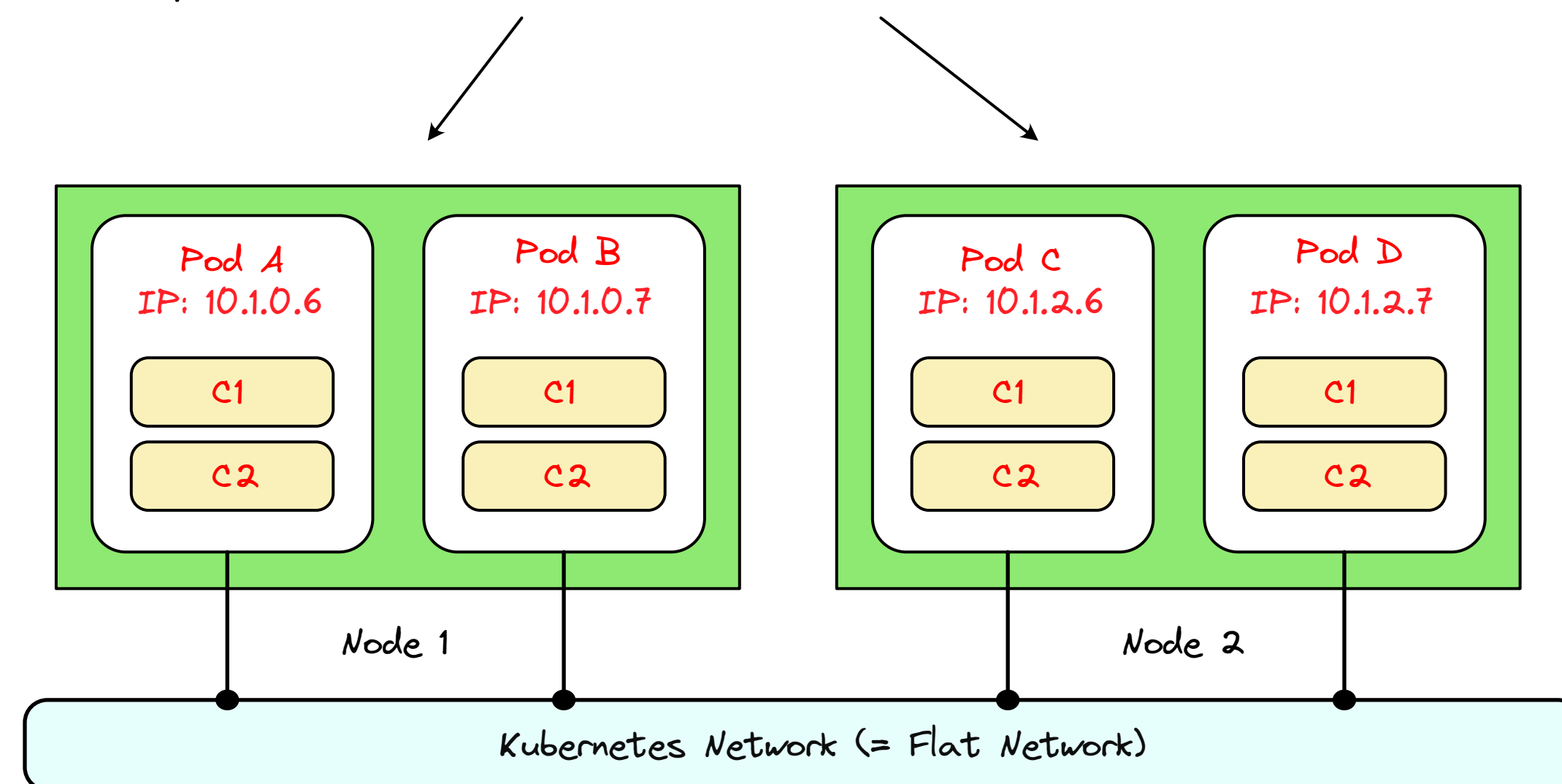
Create, describe, logs, delete, exec, wide
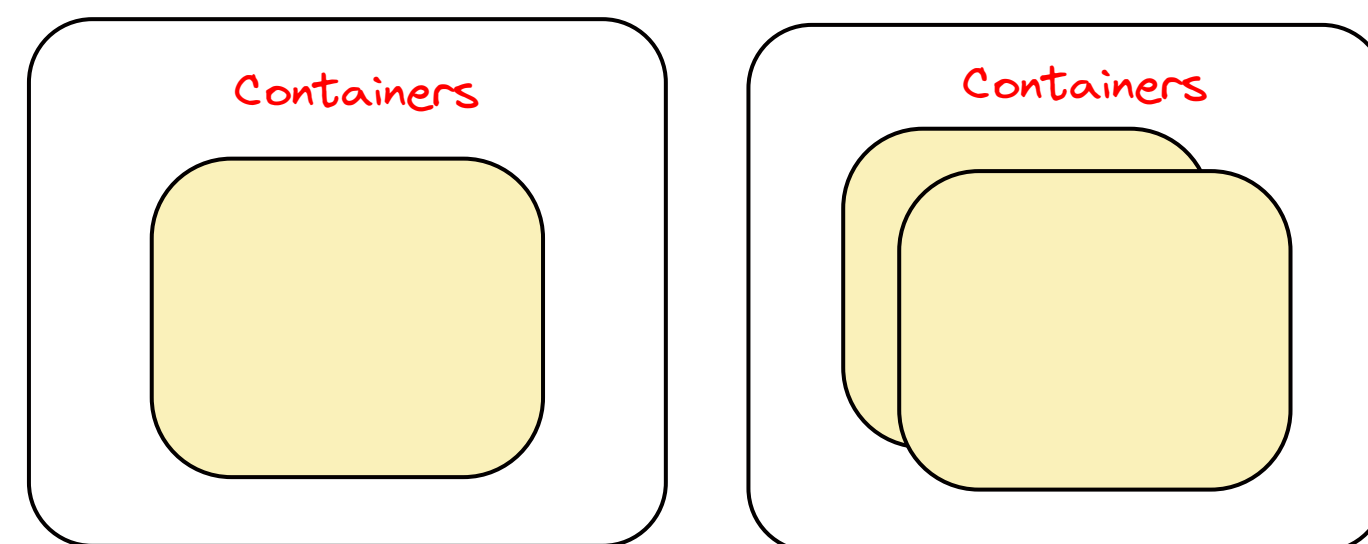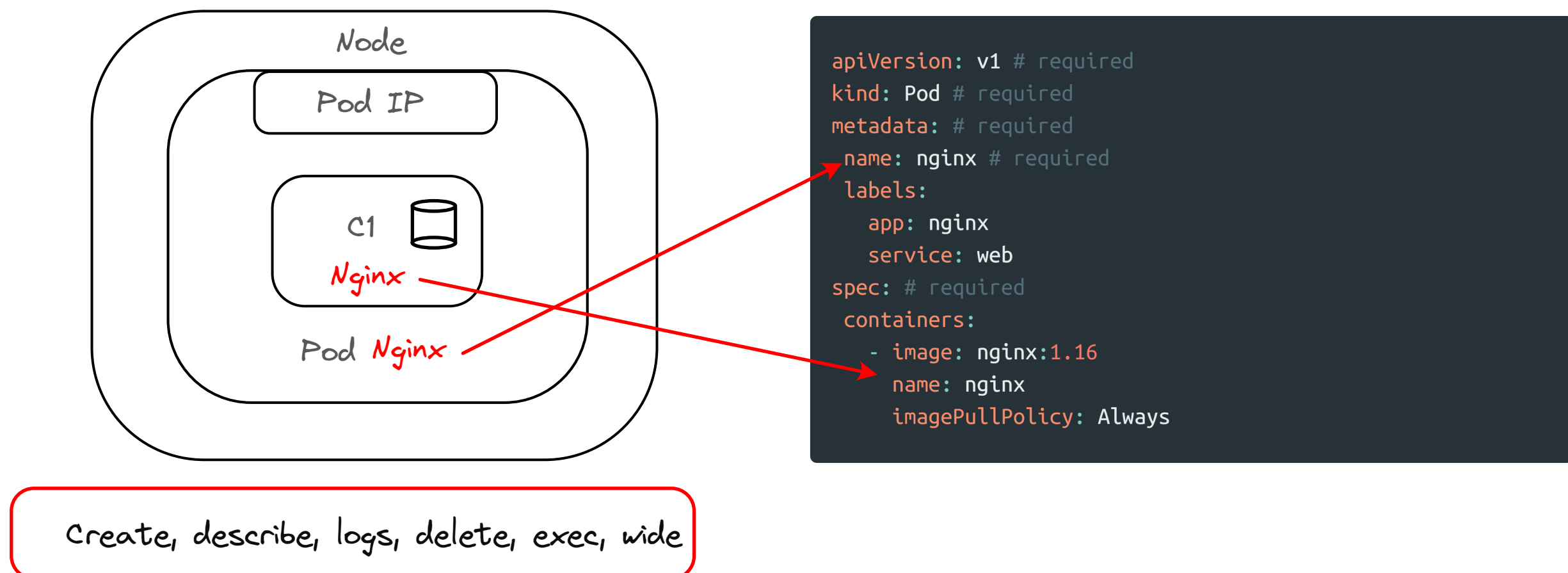
Networking

Every pod has an IP address assigned. All containers in the Pod share that address. If there are multiple containers in the Pod, they can communicate on the localhost address

Node 1

Pod A
IP: 10.1.0.6
C1
C2

Pod B
IP: 10.1.0.7
C1
C2

Node 2

Pod C
IP: 10.1.2.6
C1
C2

Pod D
IP: 10.1.2.7
C1
C2

Kubernetes Network (= Flat Network)

All Pods are connected to the virtual network managed by Kubernetes. They can communicate by IP address, even if they are running on different nodes in the cluster. *NO NAT* gateways exist between them. When two pods send network packets between each other, they'll each see the actual IP address of the other as the source IP in the packet (*Flat Network*)

Multiple containers in a Pod

Pod

Container 1
Container 2
Lo (127.0.0.1)
eth0
:80
:95

Main container
Supporting container 1
Supporting container 2

Multi-container Pod