# Demystifying the Nuts & Bolts of Kubernetes Architecture

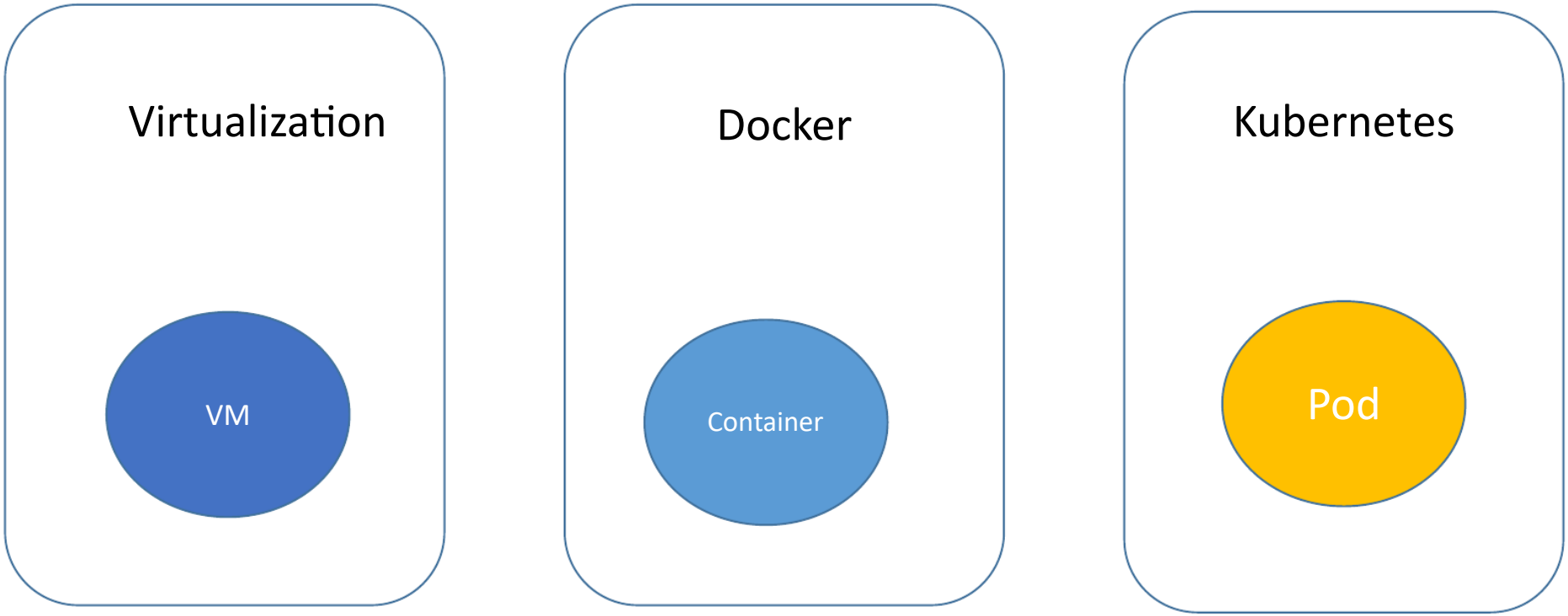
## Pods101

docker

# Pod - Concepts

- What is Pod?
- Pod Deployment
- Multi-Container
- Pod Networking
- Inter-Pod & Intra-Pod Networking
- Pod Lifecycle
- Pod Manifest File
- A Typical Pod creation Workflow

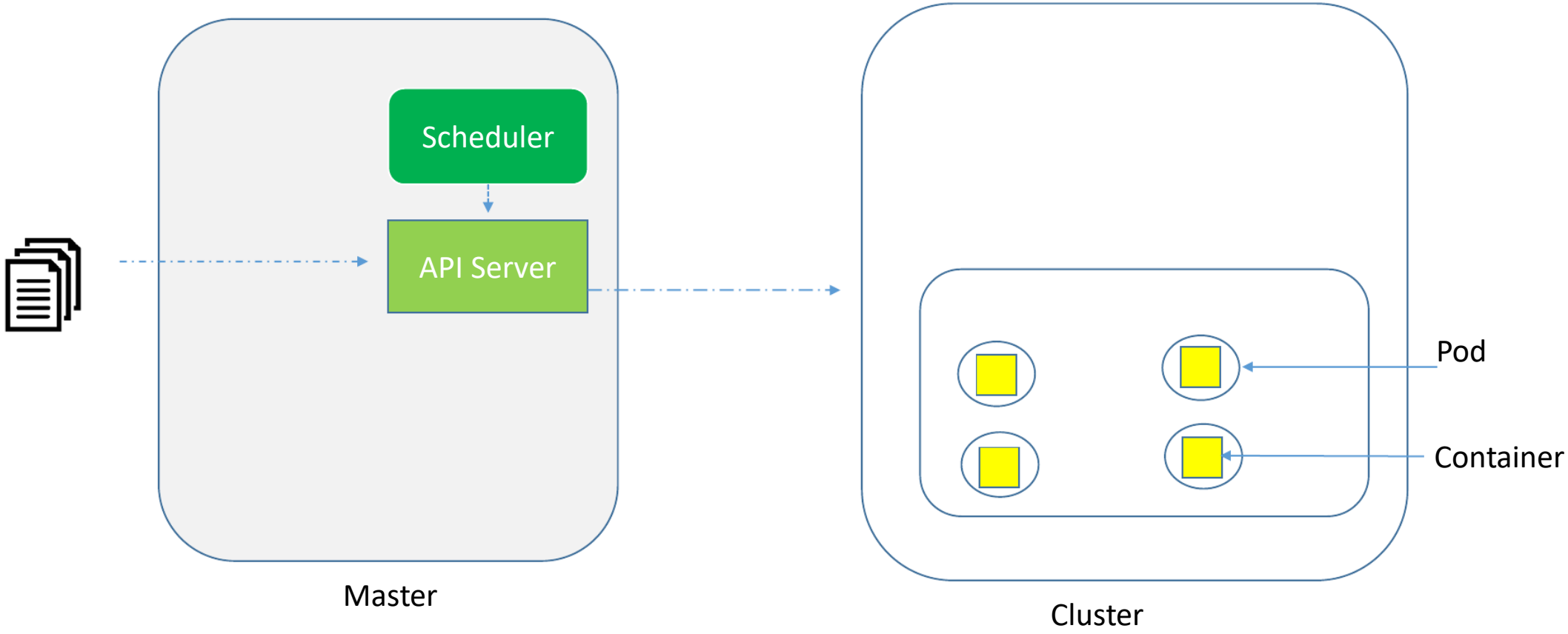
# Atomic Unit of Scheduling






docker

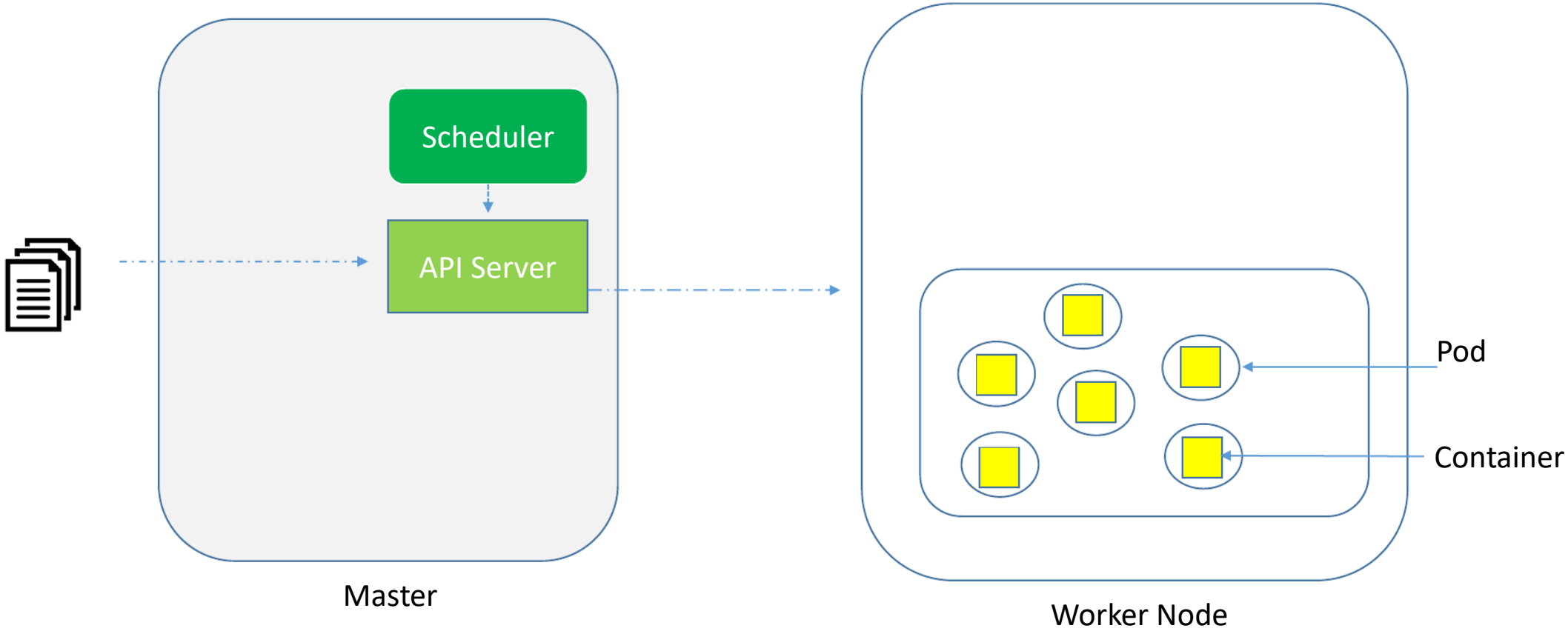
# How Pods are deployed?






docker

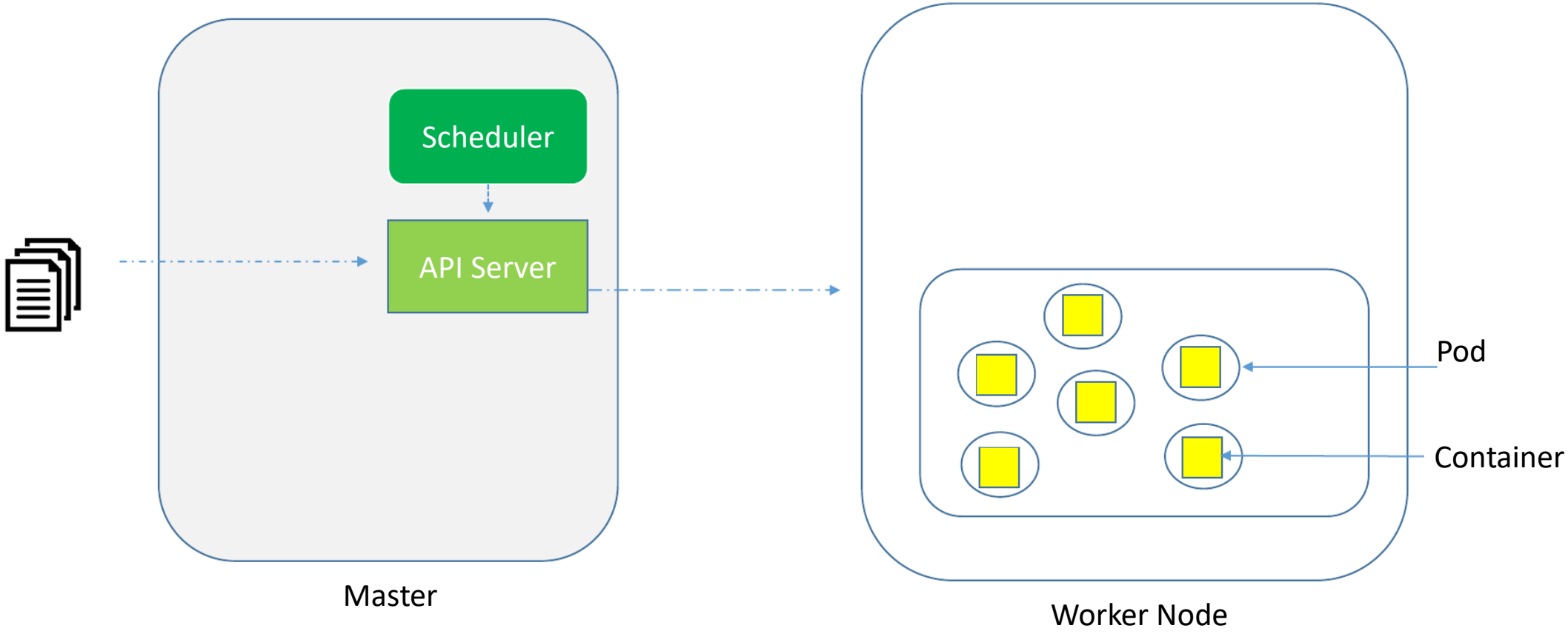
# Scaling the Pods to accommodate increasing traffic






docker

# What if node resources is getting insufficient?






docker

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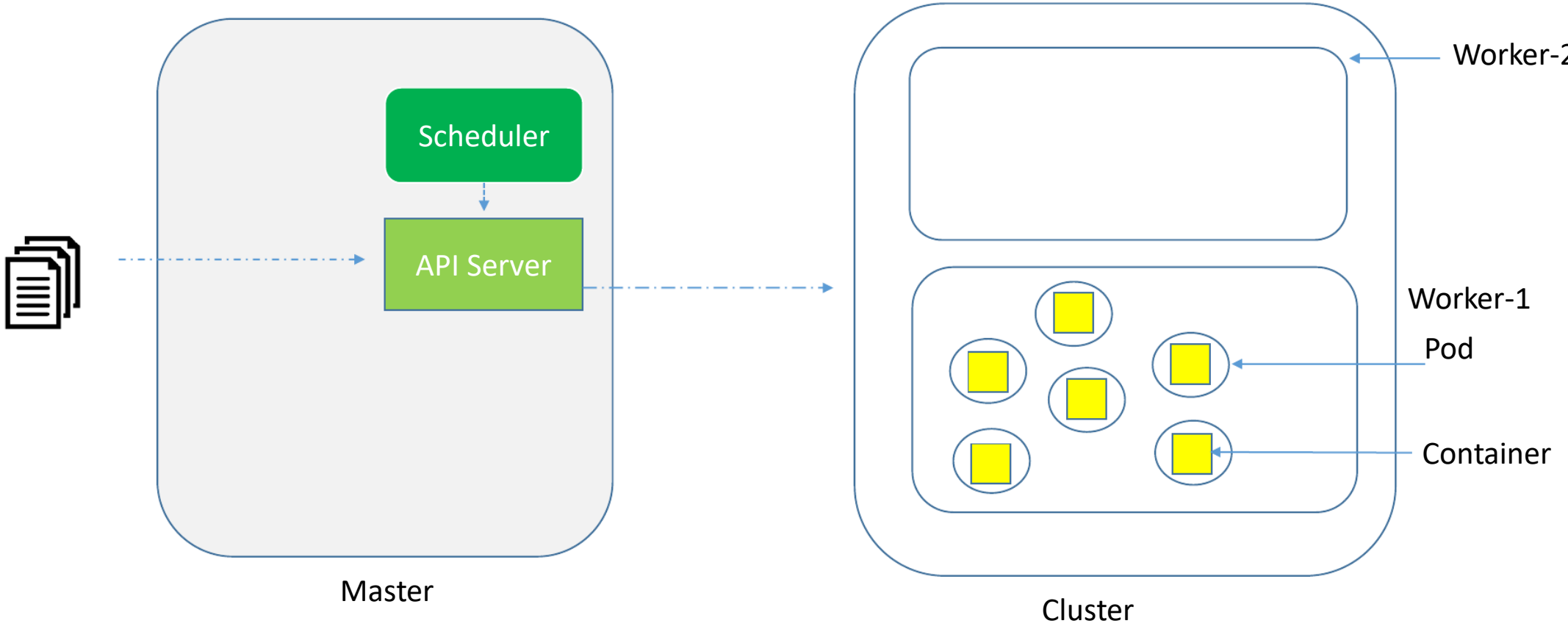




docker

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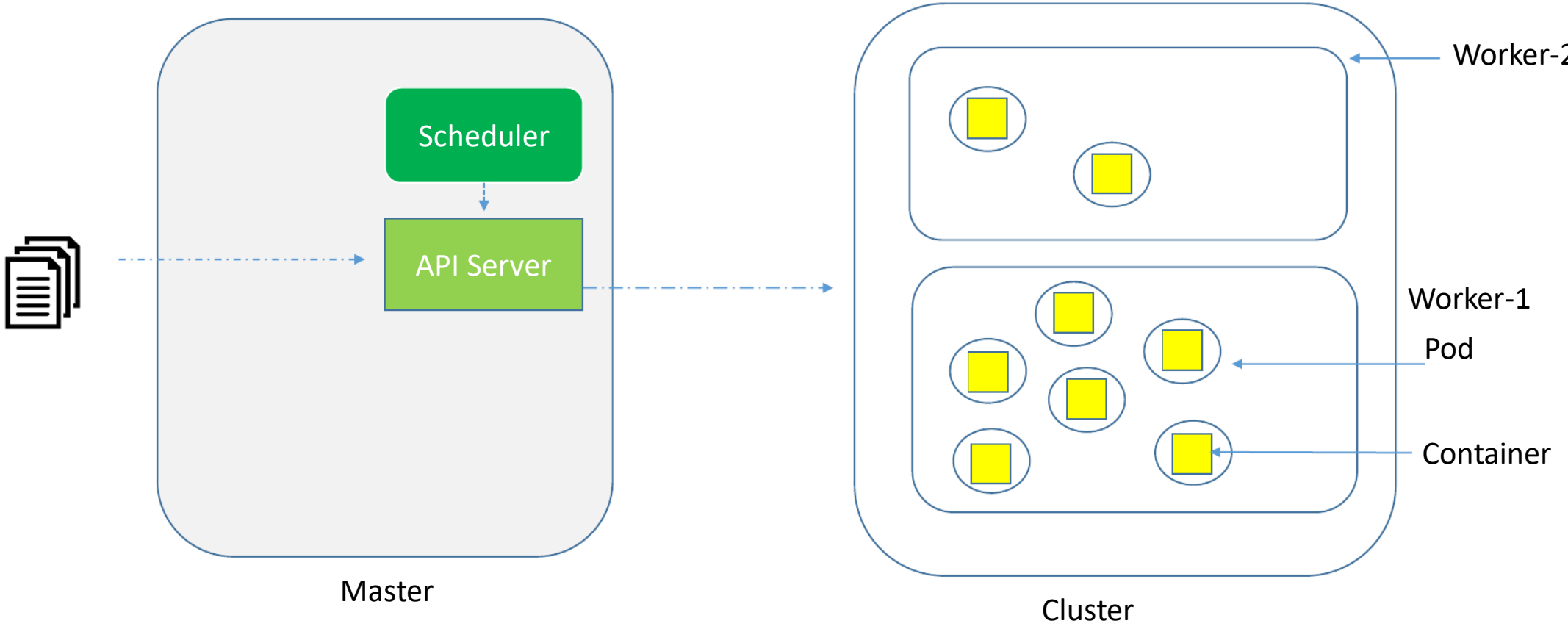
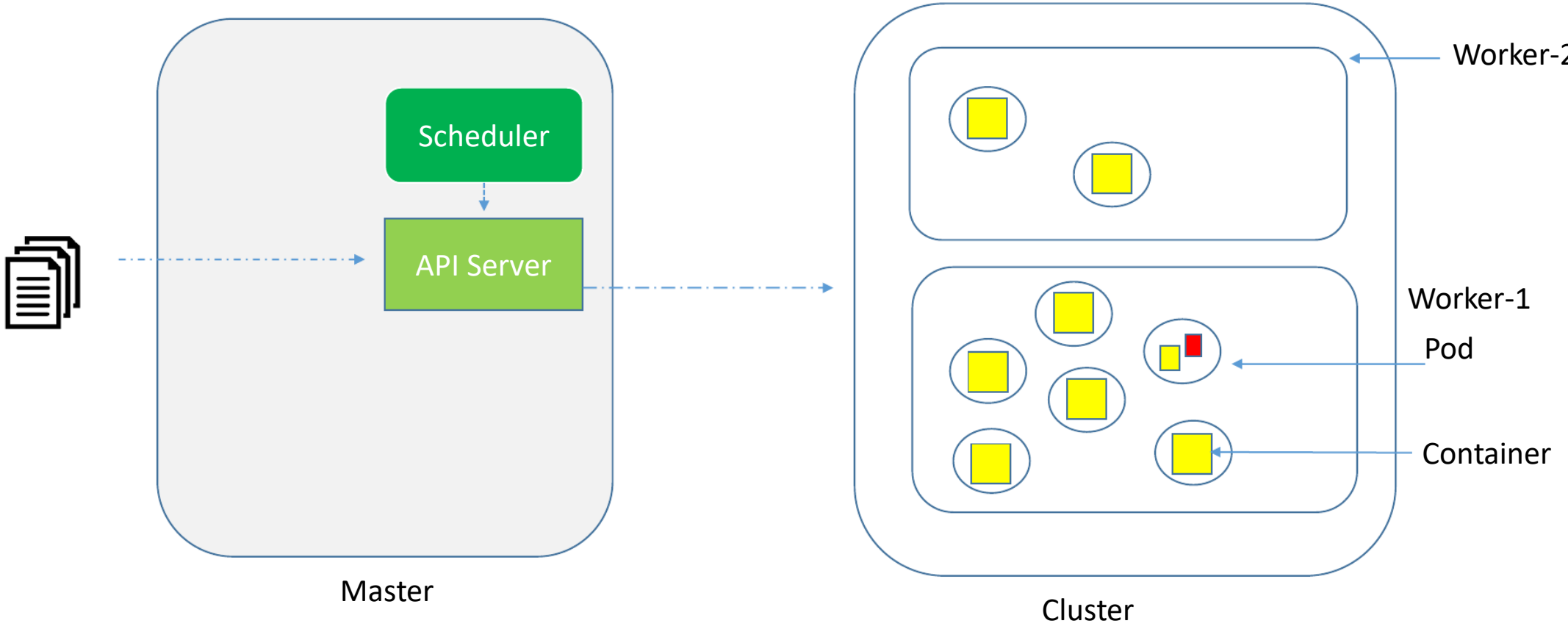





docker

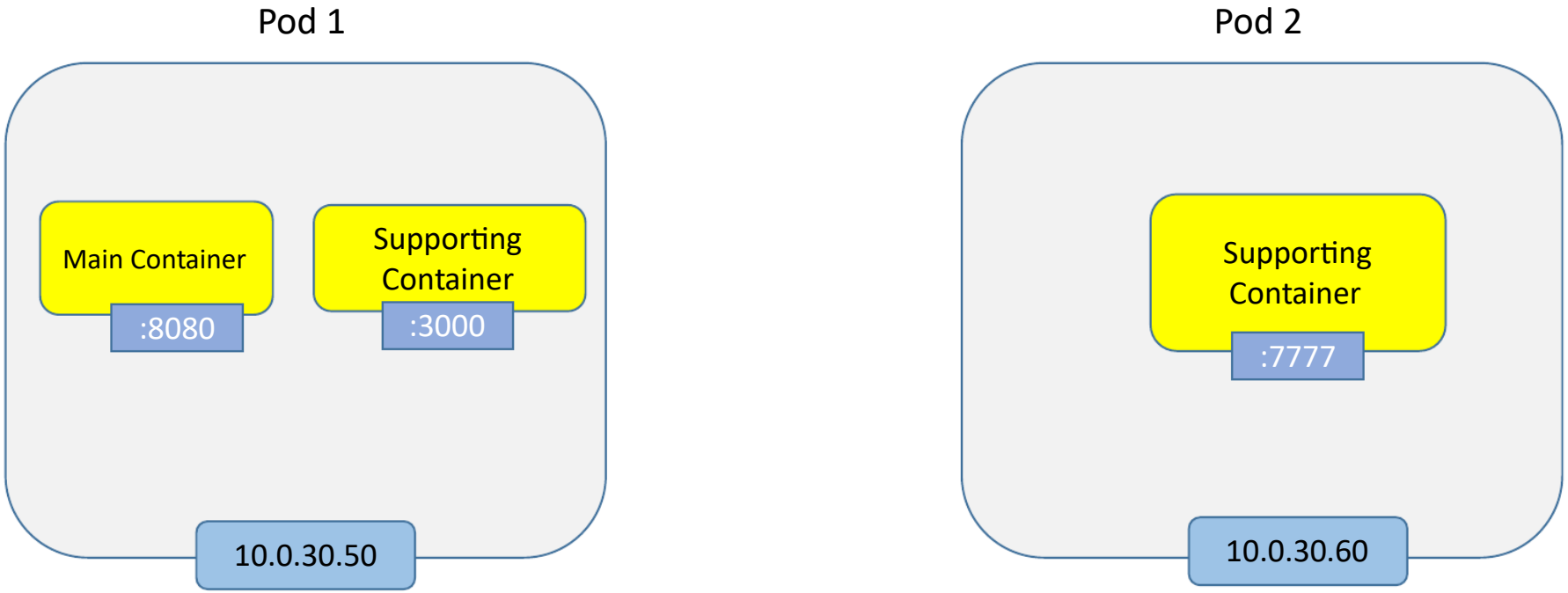
# 2 Containers in a same Pod






docker

# Pod Networking

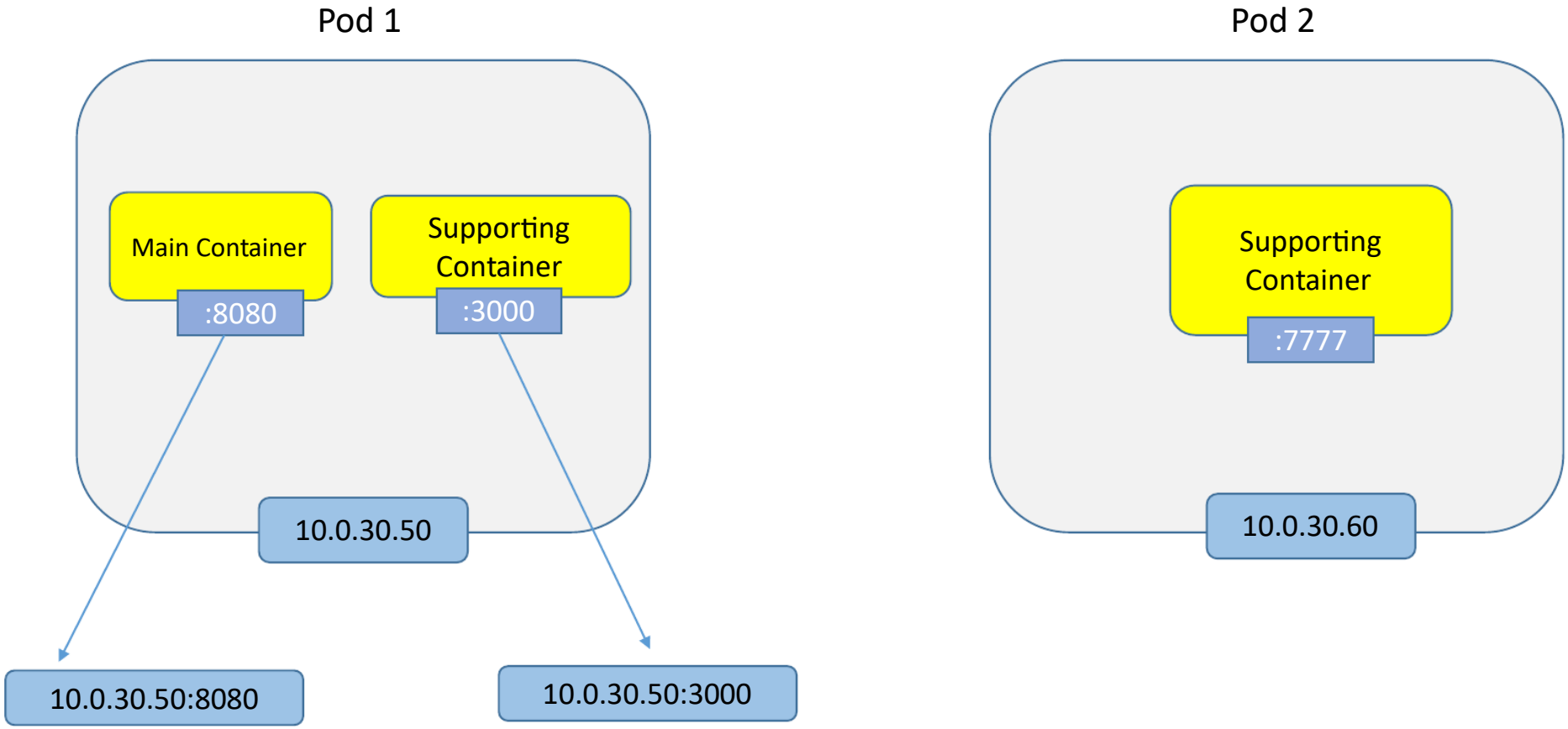





docker

# How does these containers inside Pods communicate with External World?

# Network Namespace



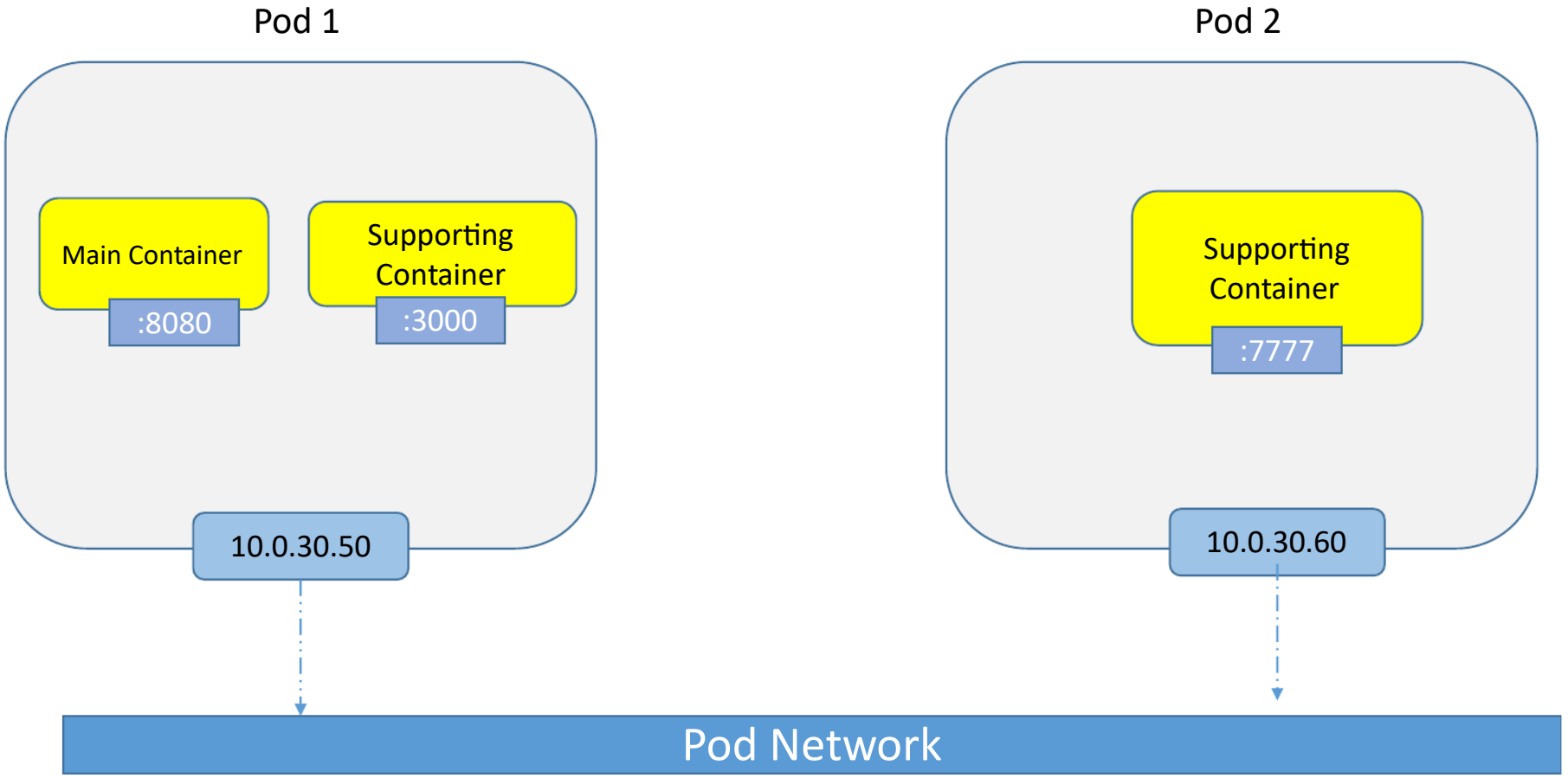



docker

# How does one Pod talk to another Pod?

Welcome to Inter-Pod Communication..

# Pod Networking

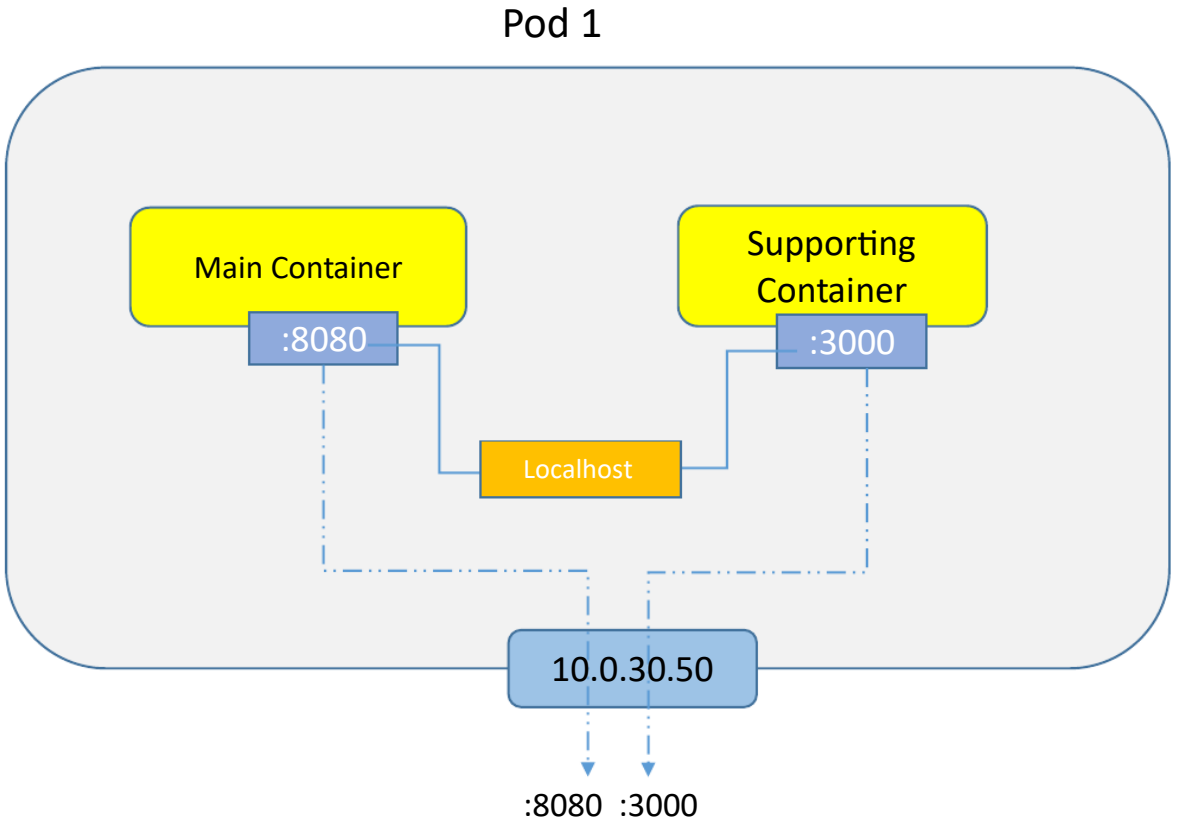





docker

# How does Intra-Pod communication take place?

# Intra-Pod Communication






docker

# A Look at Pod Manifest

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
  labels:
    name: nginx-pod
spec:
  containers:
  - name: nginx
    image: nginx:latest
    ports:
    - containerPort: 80
```

Create the pod as shown below:

```
$ kubectl create -f templates/pod.yaml
pod "nginx-pod" created
```

Get the list of pod:

```
$ kubectl get pods
NAME        READY     STATUS    RESTARTS   AGE
nginx-pod   1/1       Running   0          22s
```

# Get a shell to a running Container

```
[node1 lab01-creating-nginx-pod]$ kubectl get po
NAME        READY   STATUS    RESTARTS   AGE
nginx-pod   1/1     Running   0          3m22s
[node1 lab01-creating-nginx-pod]$ kubectl exec -it nginx-pod -- /bin/bash
```

## Verifying the Operating System

```
root@nginx-pod:/# ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr
root@nginx-pod:/# cat /etc/os-release
PRETTY_NAME="Debian GNU/Linux 9 (stretch)"
NAME="Debian GNU/Linux"
VERSION_ID="9"
VERSION="9 (stretch)"
ID=debian
HOME_URL="https://www.debian.org/"
SUPPORT_URL="https://www.debian.org/support"
BUG_REPORT_URL="https://bugs.debian.org/"
```

# Get a shell to a running Container

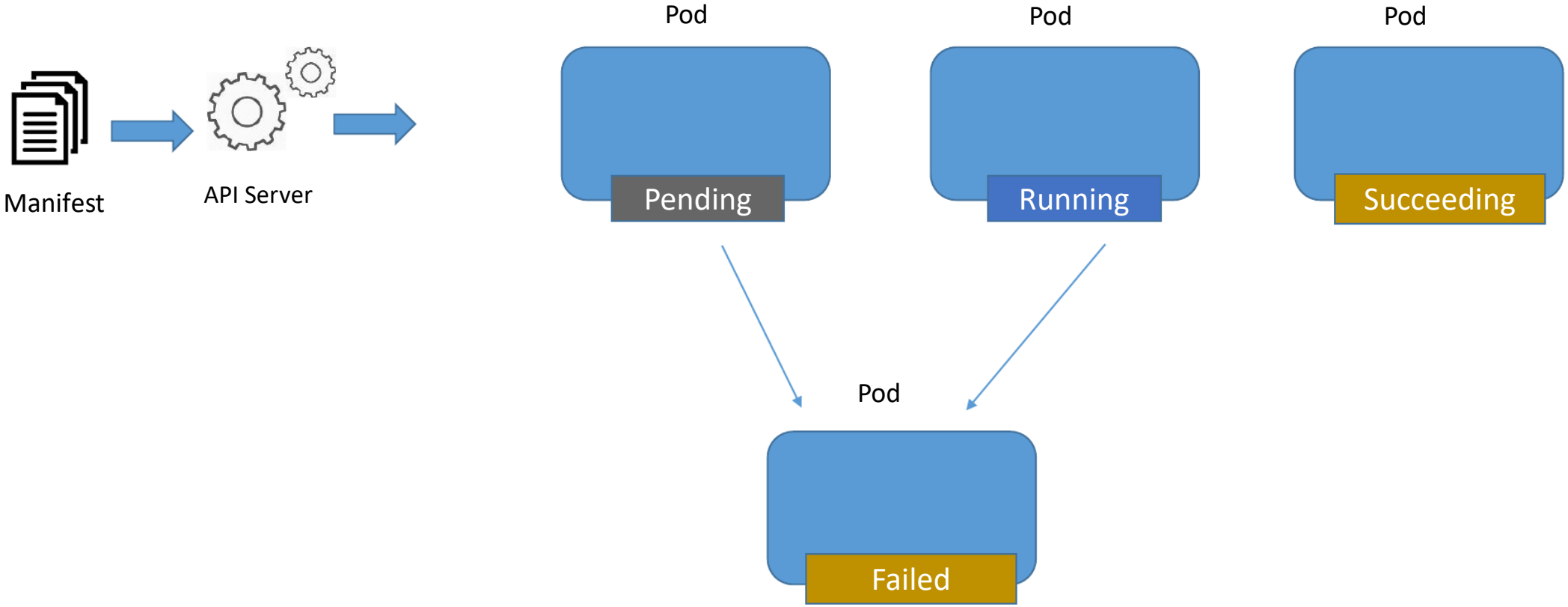
```
root@nginx-pod:/# echo Hello shell demo > /usr/share/nginx/html/index.html
```

# Verifying the index page

```
[node1 lab01-creating-nginx-pod]$ kubectl get po
NAME        READY   STATUS    RESTARTS   AGE
nginx-pod   1/1     Running   0          13m
[node1 lab01-creating-nginx-pod]$ kubectl get po -o wide
NAME        READY   STATUS    RESTARTS   AGE   IP          NODE    NOMINATED NODE   READINESS GATES
nginx-pod   1/1     Running   0          13m   10.44.0.1   node2   <none>           <none>
[node1 lab01-creating-nginx-pod]$ curl 10.44.0.1:80
Hello shell demo
[node1 lab01-creating-nginx-pod]$
```

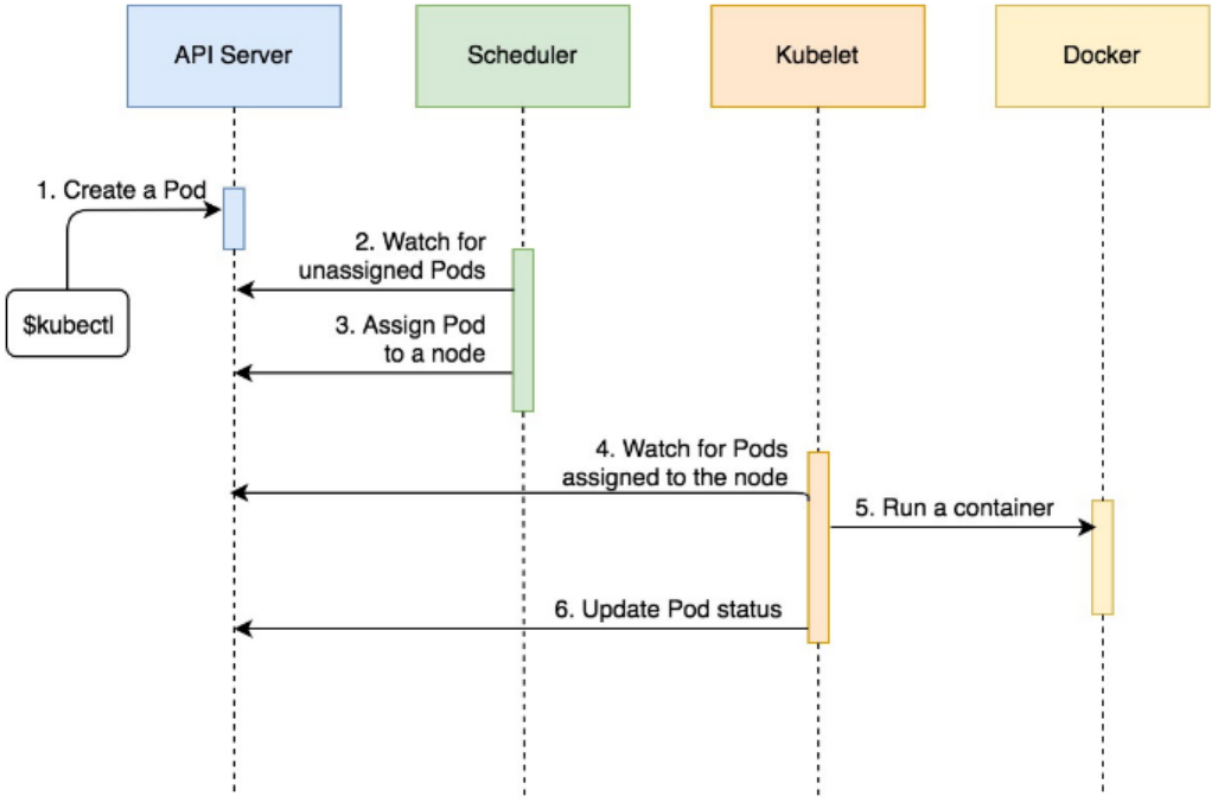
# Stages of Life Cycle of Pod

# Lifecycle of a Pod




docker

# A Typical Pod Creation WorkFlow




Credits: Viktor Farcic

docker

# Thank You