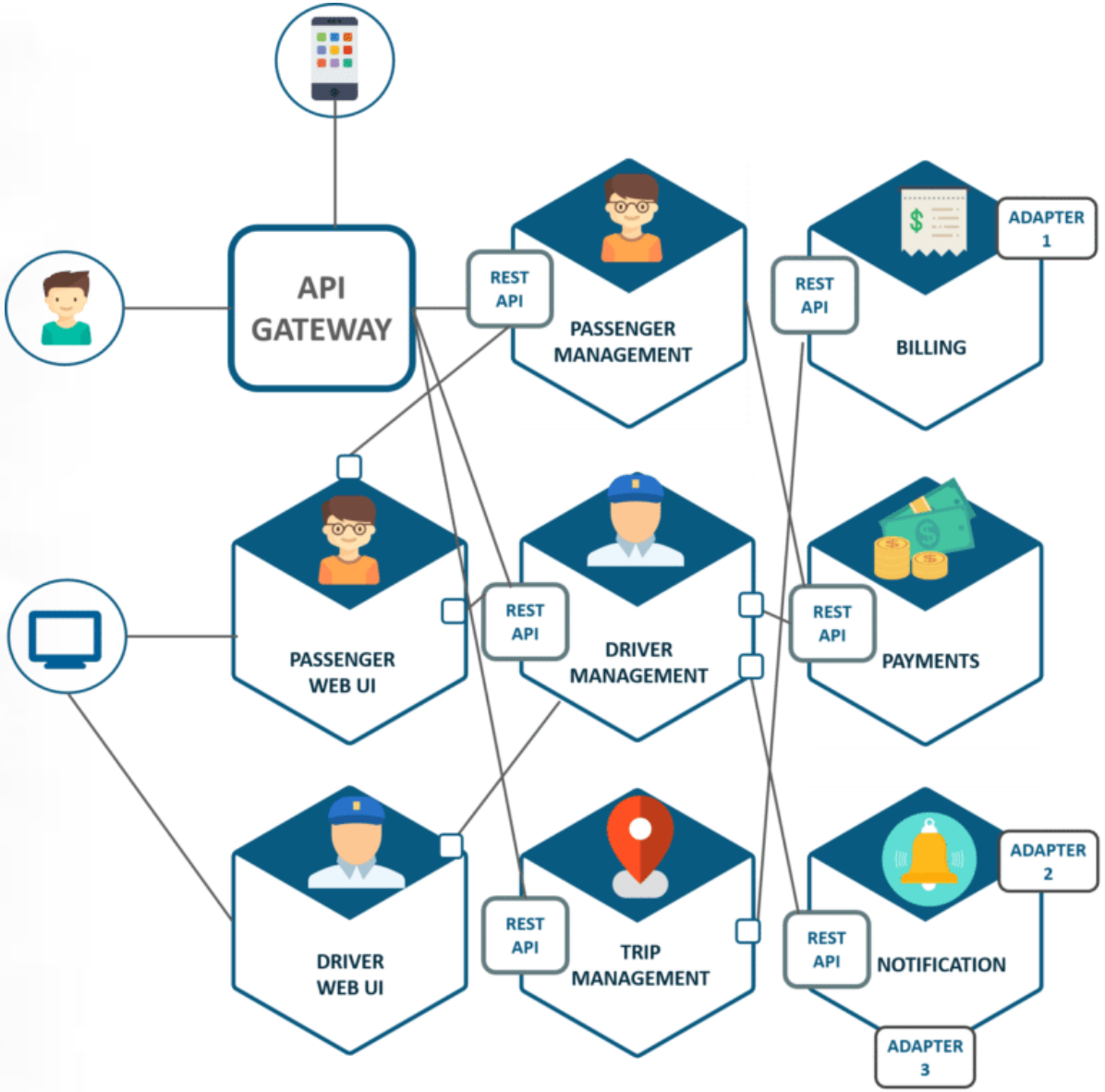
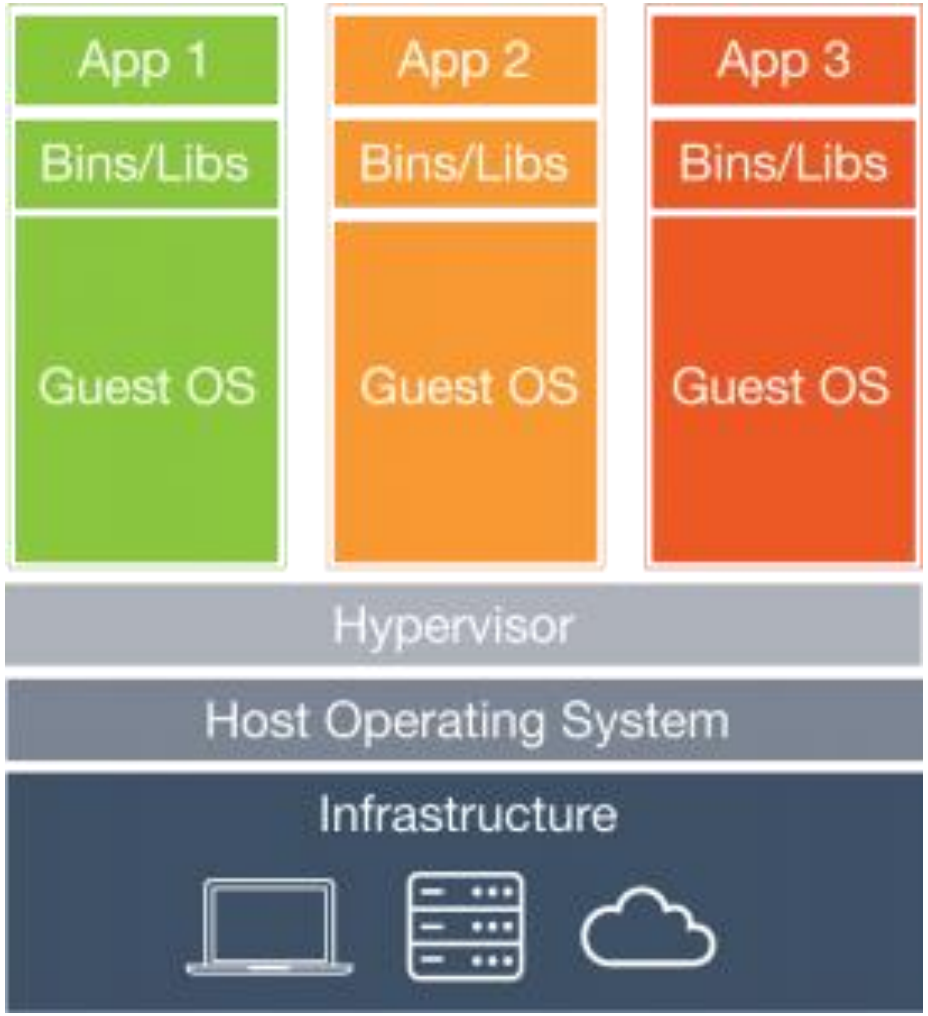
Docker

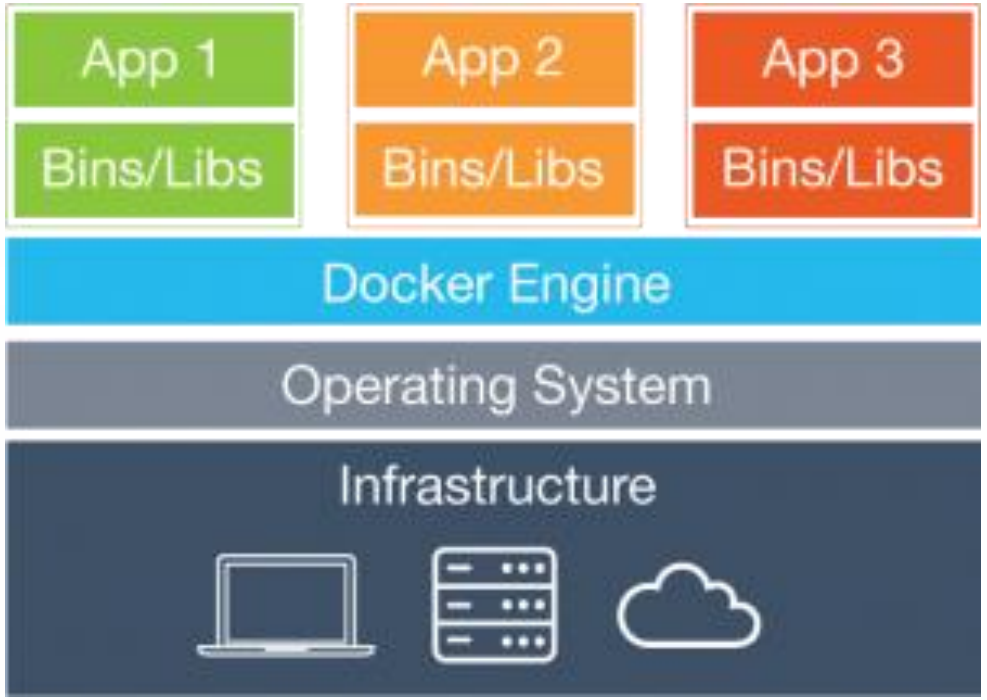
IT system


API
GATEWAY
REST
API
PASSENGER
MANAGEMENT
REST
API
BILLING
ADAPTER
1
PASSENGER
WEB UI
REST
API
DRIVER
MANAGEMENT
REST
API
PAYMENTS
DRIVER
WEB UI
REST
API
TRIP
MANAGEMENT
REST
API
NOTIFICATION
ADAPTER
2
ADAPTER
3

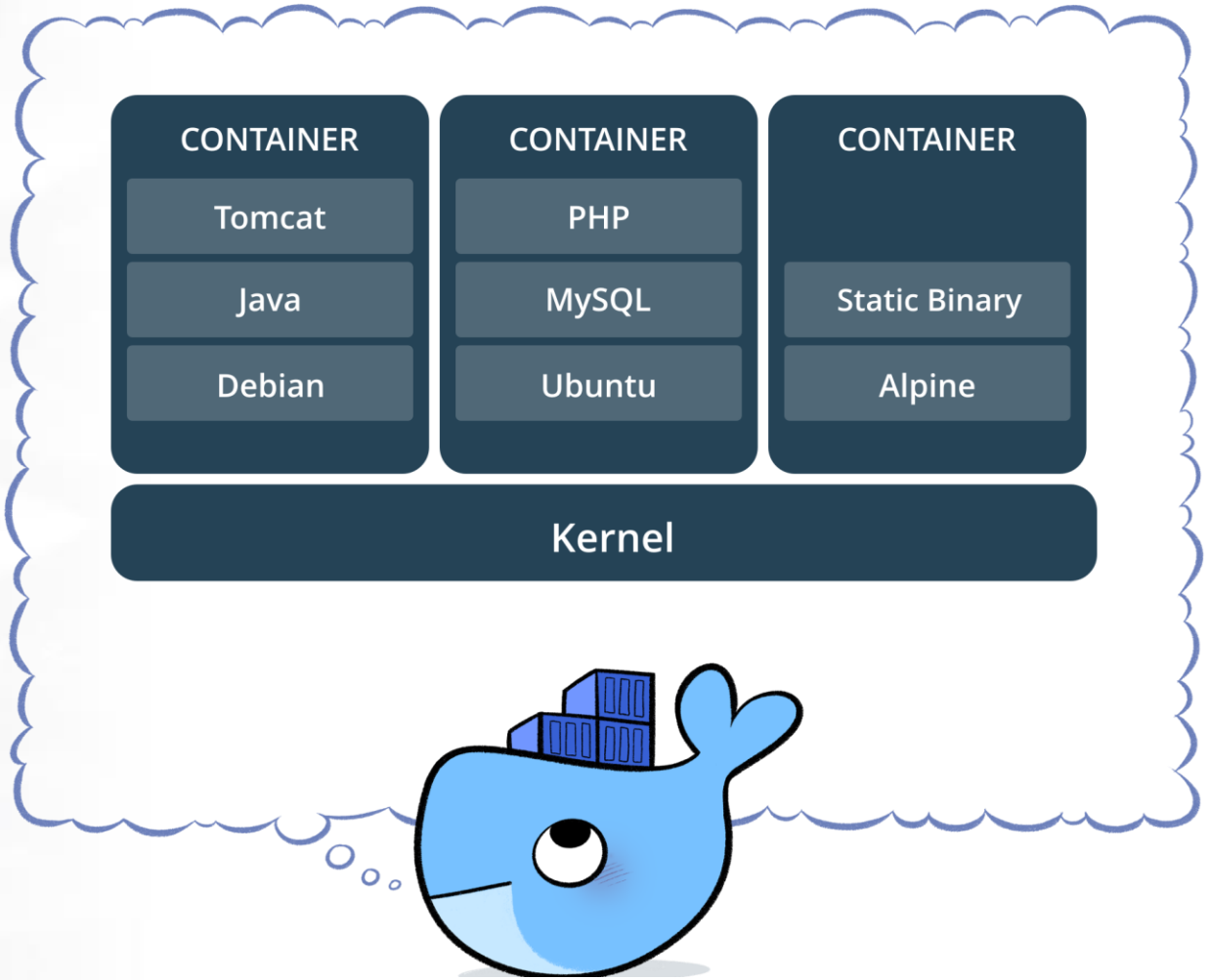
Virtualization



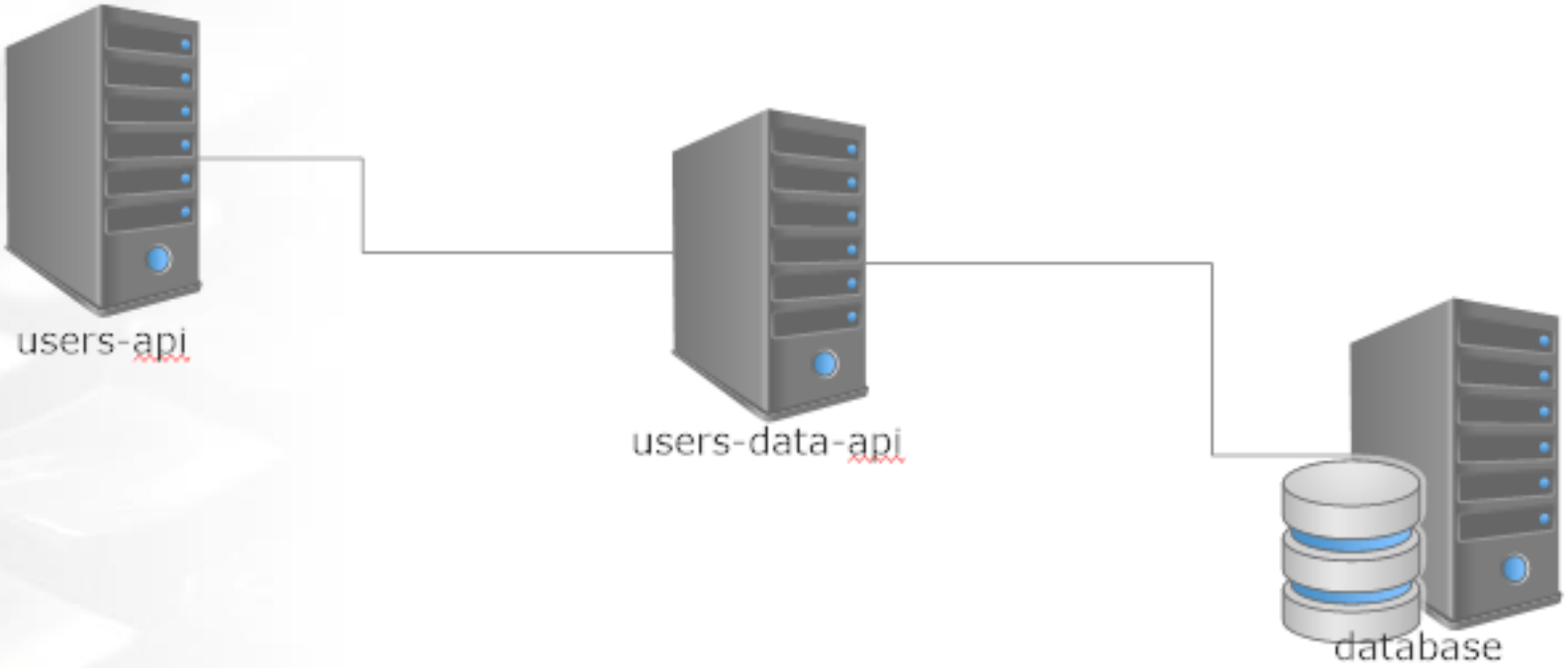
Containerization - Docker



Docker


CONTAINER
Tomcat
Java
Debian
CONTAINER
PHP
MySQL
Ubuntu
CONTAINER
Static Binary
Alpine
Kernel

Working example



Components

- Images
- Containers
- Volumes
- Registries

Image

- Definition of a container
- Something like class in programming

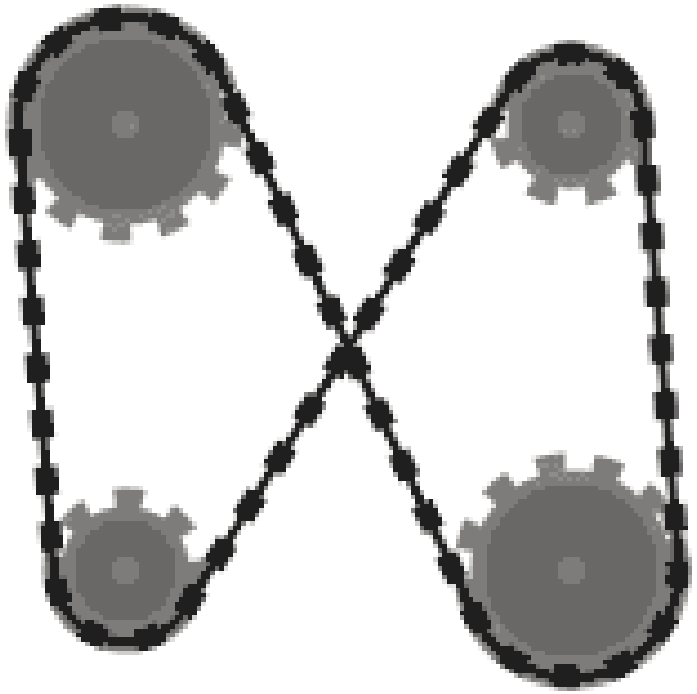
Dockerfile

- FROM
- RUN
- ADD
- EXPOSE
- WORKDIR
- ENTRYPOINT

Image building

docker build ….

Container



image

container

Container running

docker run …..

docker start ….

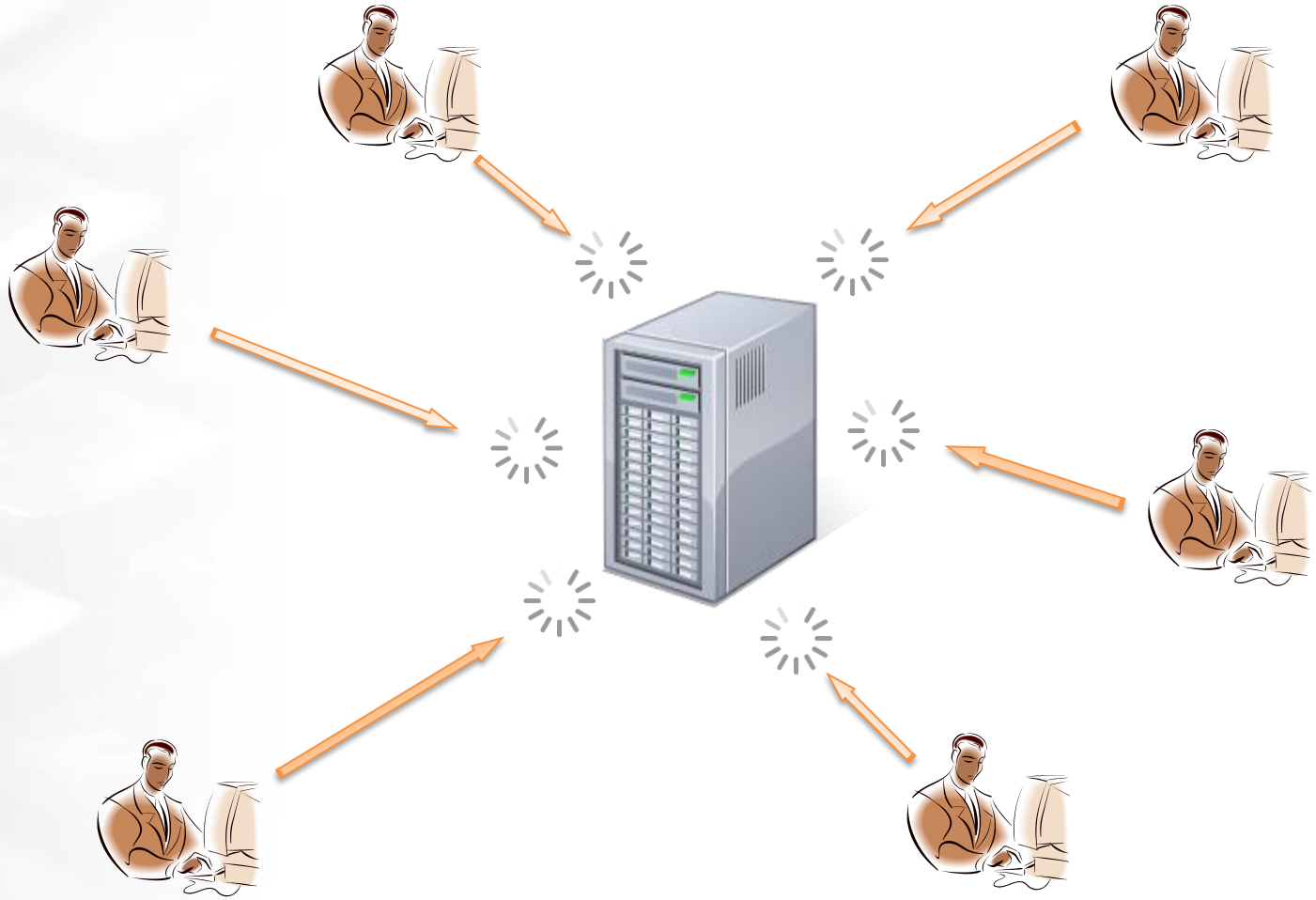
docker create ….

Docker compose

Kubernetes

basics

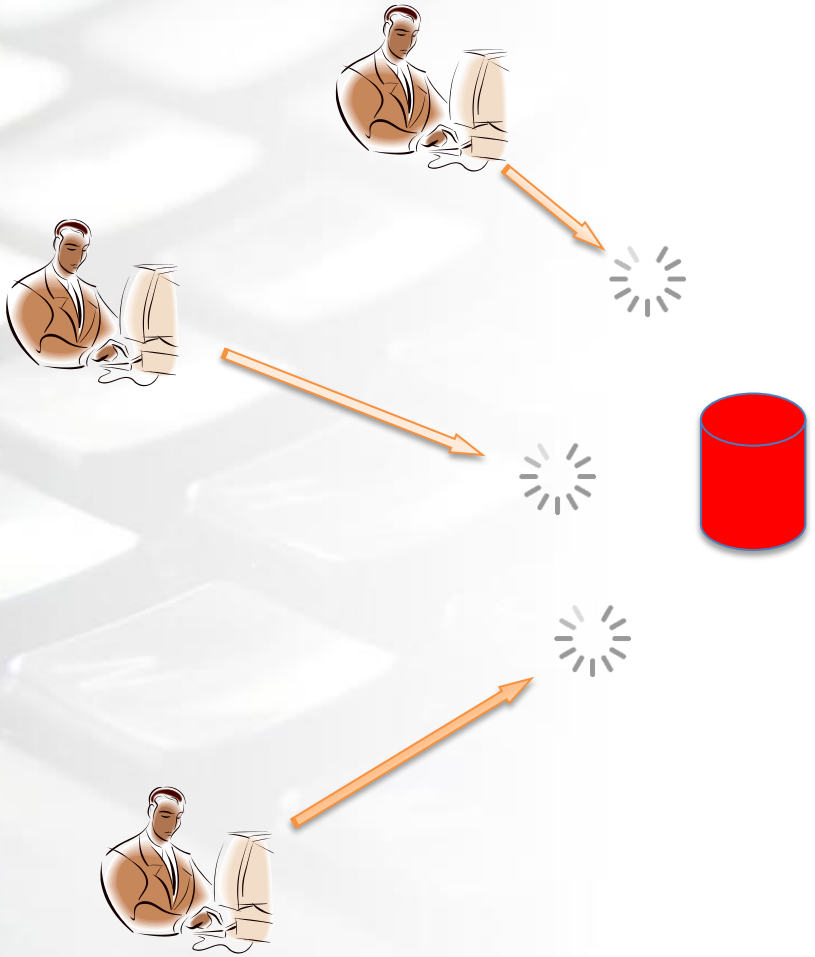
application



Docker

at the begining was Docker (or different container system)

but what if…



- Container fails?
- Load grows?
- Loads decreases?

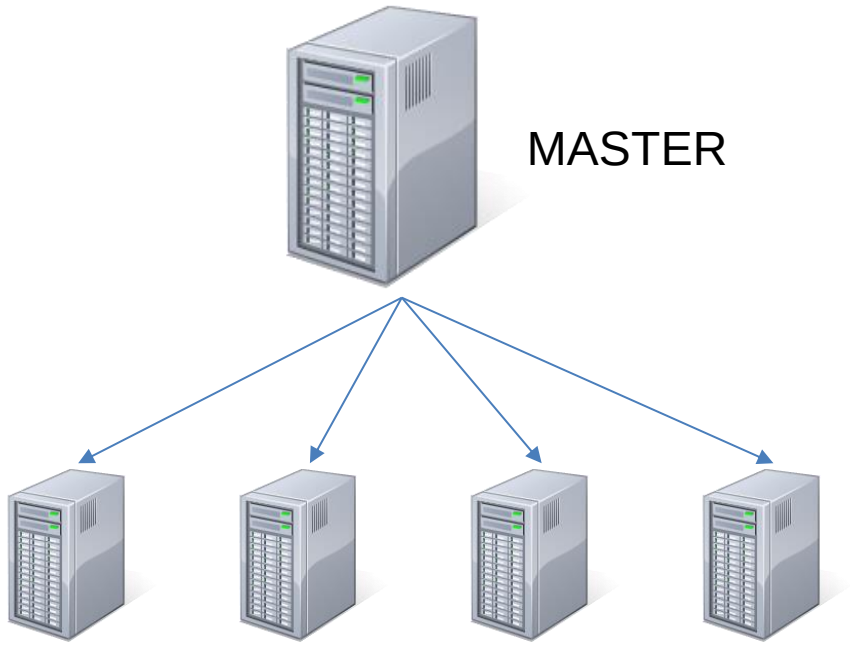
We need to have something to handle those situations

Kubernetes

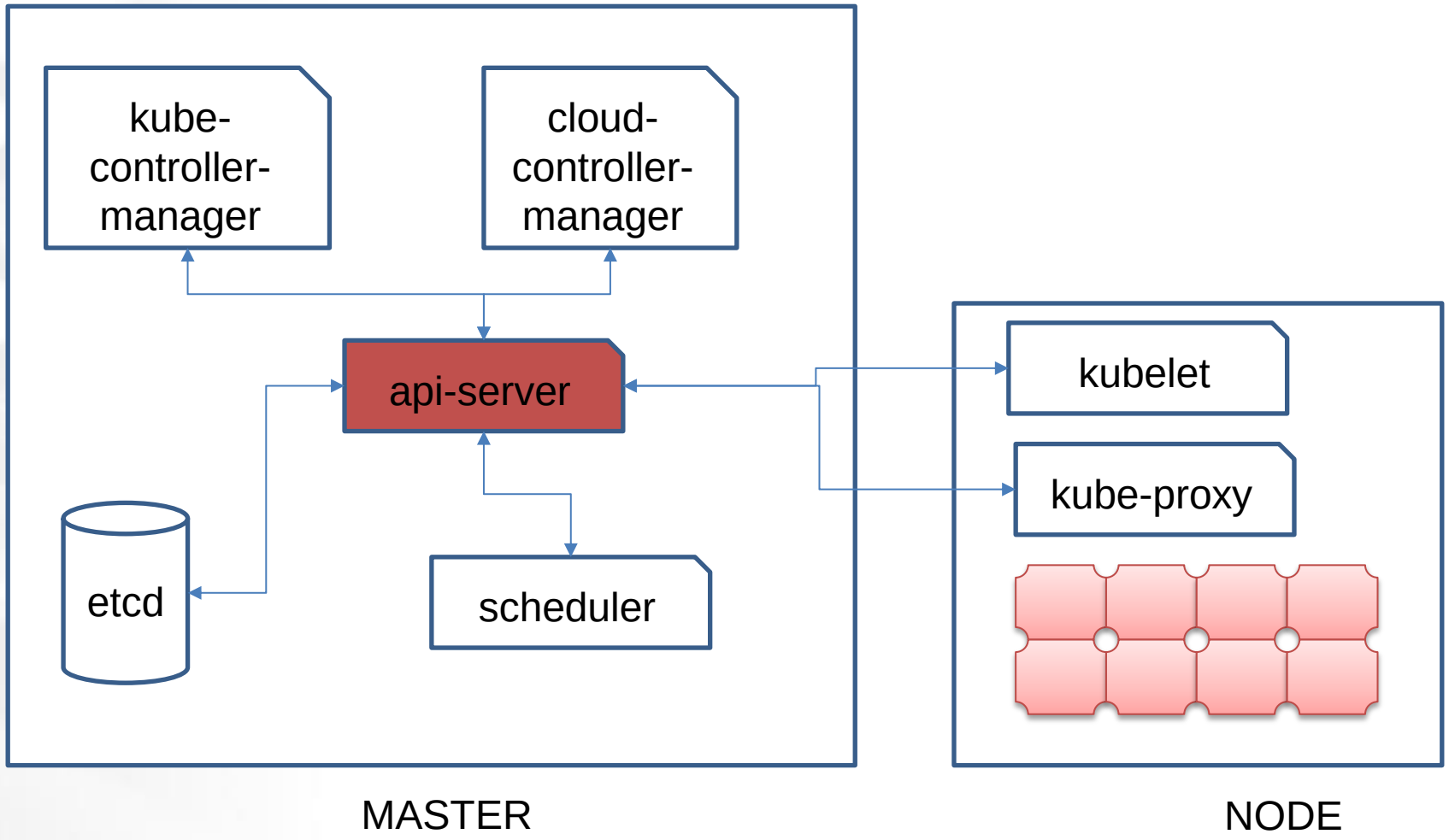
- Kubernetes (K8s) is an open-source system for automating deployment, scaling, and management of containerized applications.

- For local testing
  - minikube
  - Docker Desktop

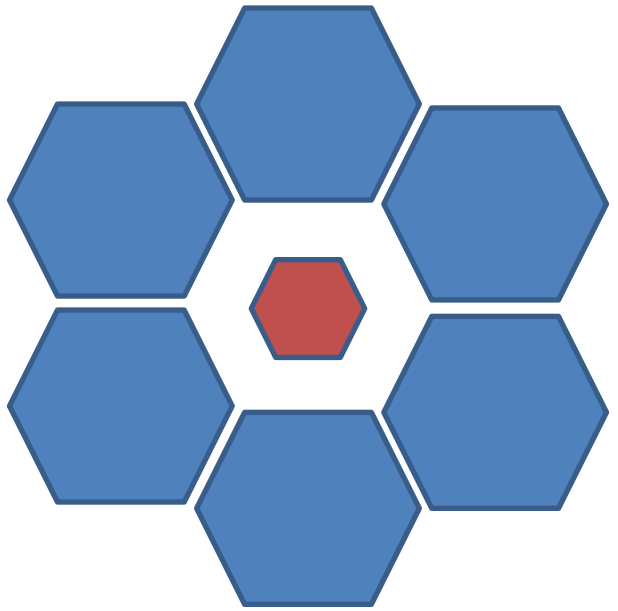
Architecture



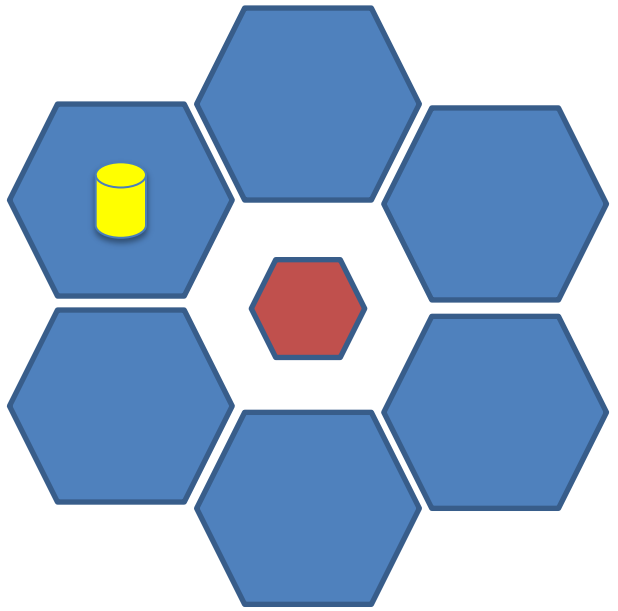
Architecture – more deeply



Kubernetes cluster



Kubernetes cluster – deploy app



Basic Kubernetes elements

- Pods
- Services
- Volumes
- Labels
- Selectors
- Namespaces
- ….

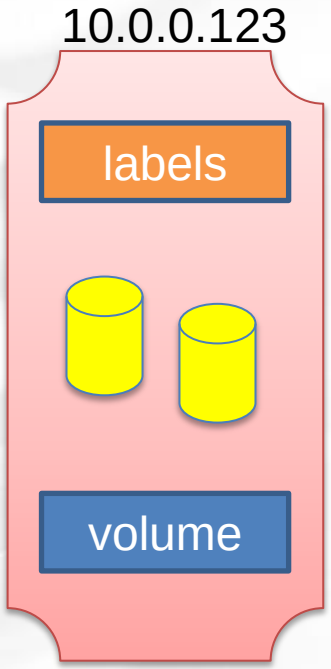
kubectl

- Command line tool for manage of Kubernetes
- You can use direct parameters or YAML or JSON files for example for more complex configuration

namespace

- groups objects/resources/pods/…. under one name
- for example
  - dev
  - test
  - prod

pod



- simpliest execution unit of Kubernetes system
- encapsulates volumes, network and optionss
- pod can run one or more containers

- most common container system for pod is Docker, but you can use different one

service

- abstraction that defines a logical set of pods