CONTAINER ORCHESTRATION

KUBERNETES®

* * *

WHAT IS KUBERNETES?

in Michele Mastropietro

in Federico Fiordoliva

Kubernetes

Kubernetes®

Google released K8s in 2015 and made a donation to the Cloud Native Computing Foundation (CNCF). Microsoft and Amazon released their version of kubernetes. Written in go.

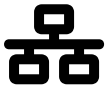
WEB SITE:	https://kubernetes.io
LEARNING:	https://kubernetes.io
COMMUNITY:	https://kubernetes.io/community/
DOCUMENTATIONS:	https://kubernetes.io/docs/home/

in Michele Mastropietro
in Federico Fiordoliva

WHAT DOES IT DO?

Container Orchestration

Workload Placement



Infrastructure Abstraction

Desiderate State

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in Federico Fiordoliva

K8S PRINCIPLES

Desiderate State

Controllers

API Servers

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API OBJECTS

Pods

Controllers

Services

Storage

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How k8s manages my Pods

Michele Mastropietro

Federico Fiordoliva

Controllers

Create and manage Pods for you

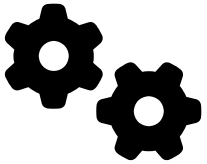
Define your desired state

`ReplicaSet` : number of replicas

`Deployment` : Manage rollout of `ReplicaSet`

Many more...

Services



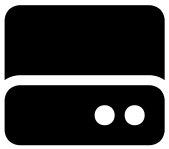
Add presistency

Networking abstraction for Pod access

IP and DNS name for services

Redeploys Pods automatically with update

Load Balancing



Storage

Persistent Volumes

Dynamic Volumes

CLUSTER COMPONENTS

Master Nodes

Worker Nodes

Scheduled/Add Ons

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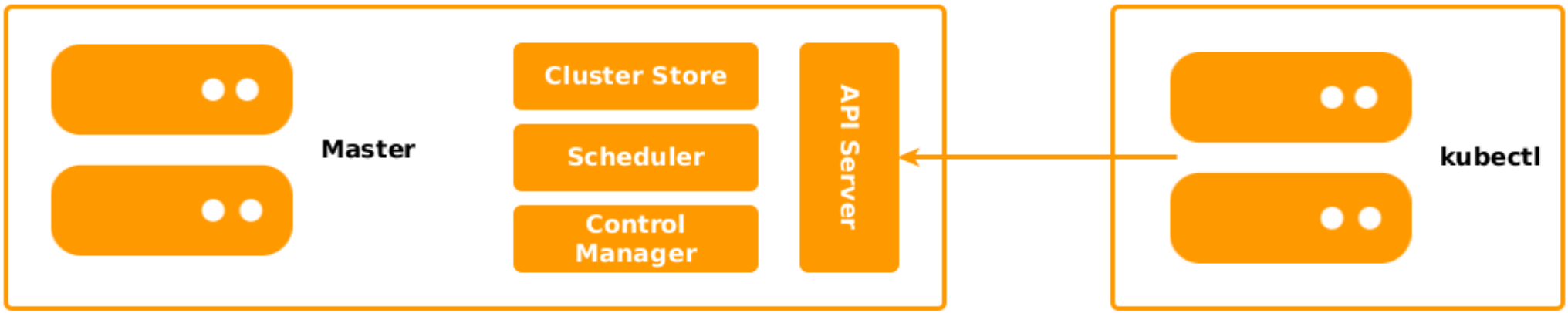
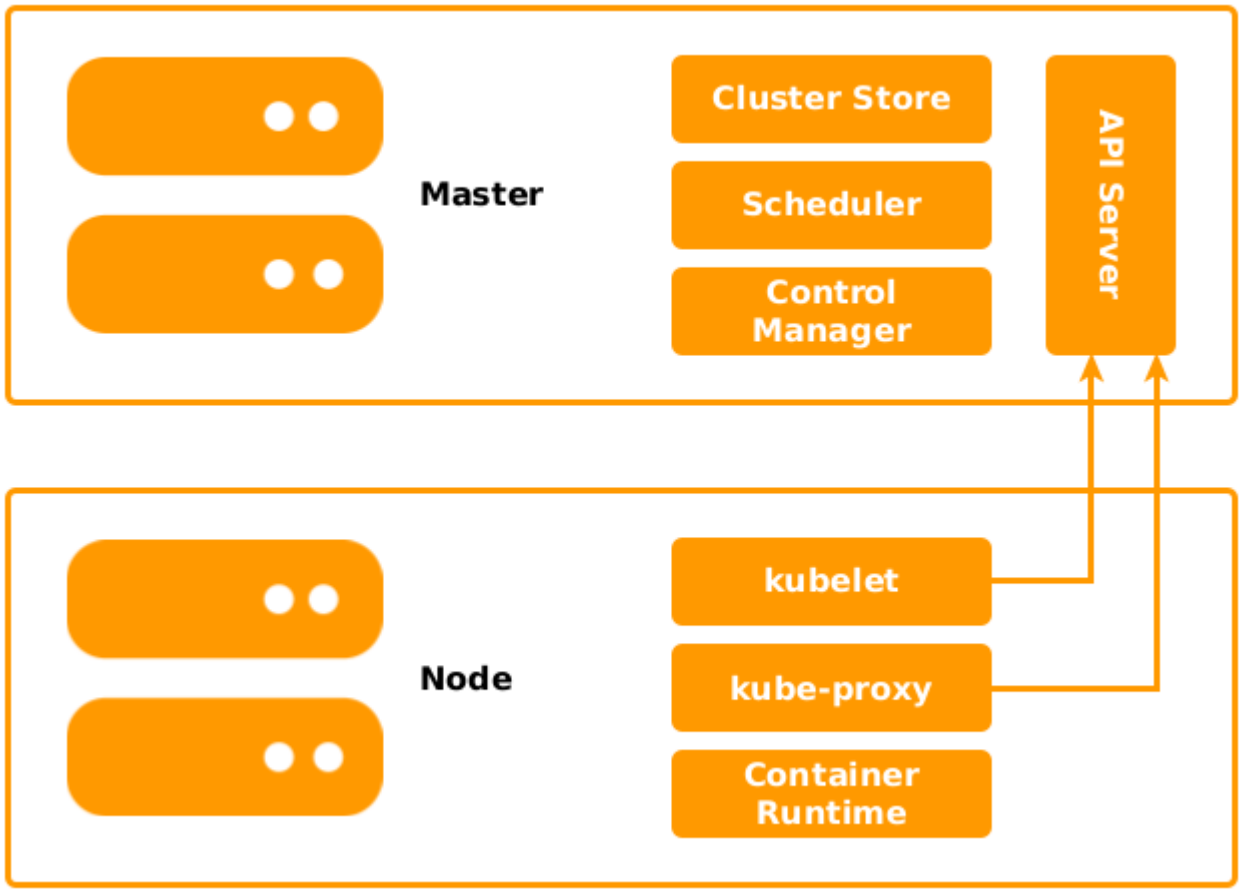
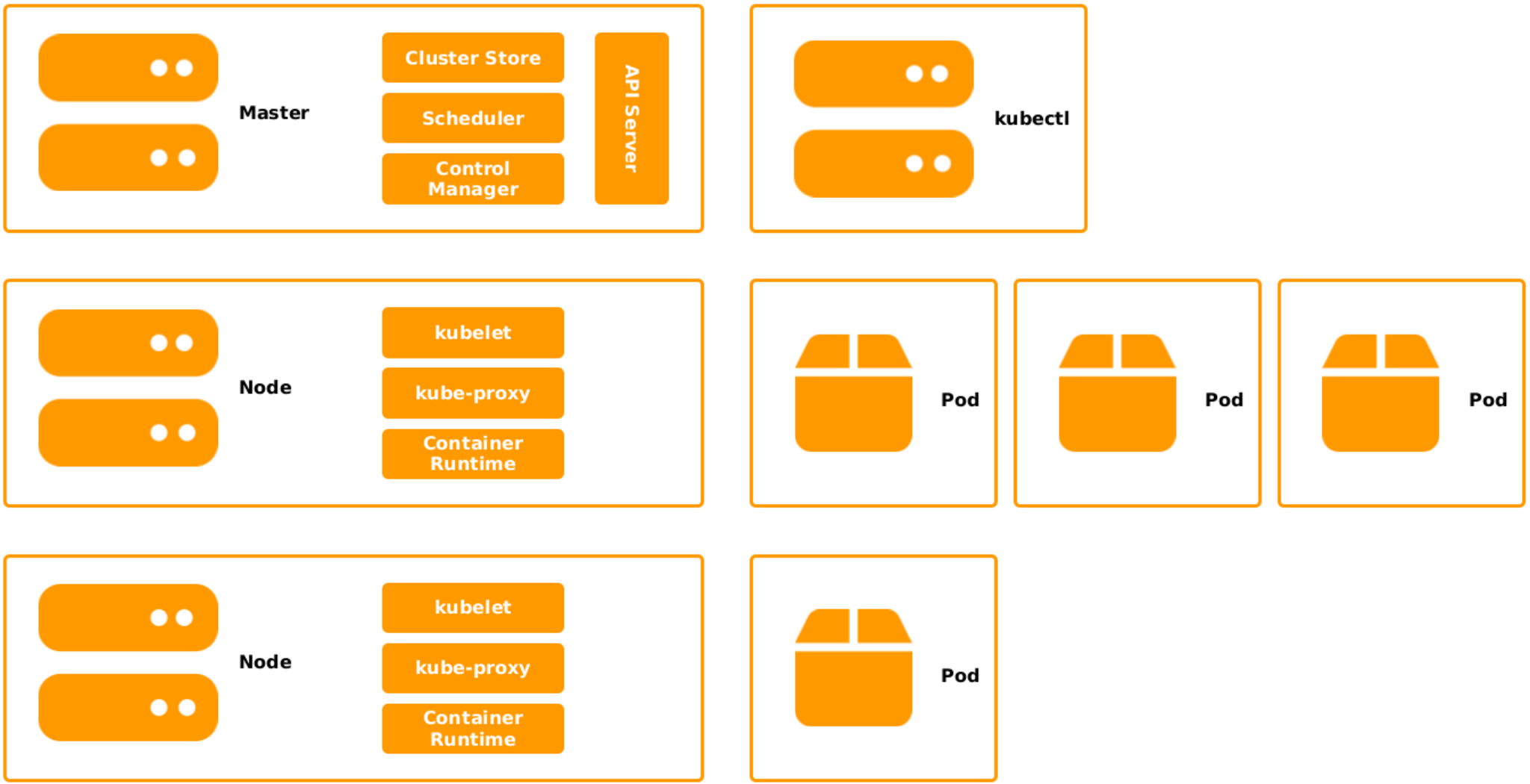


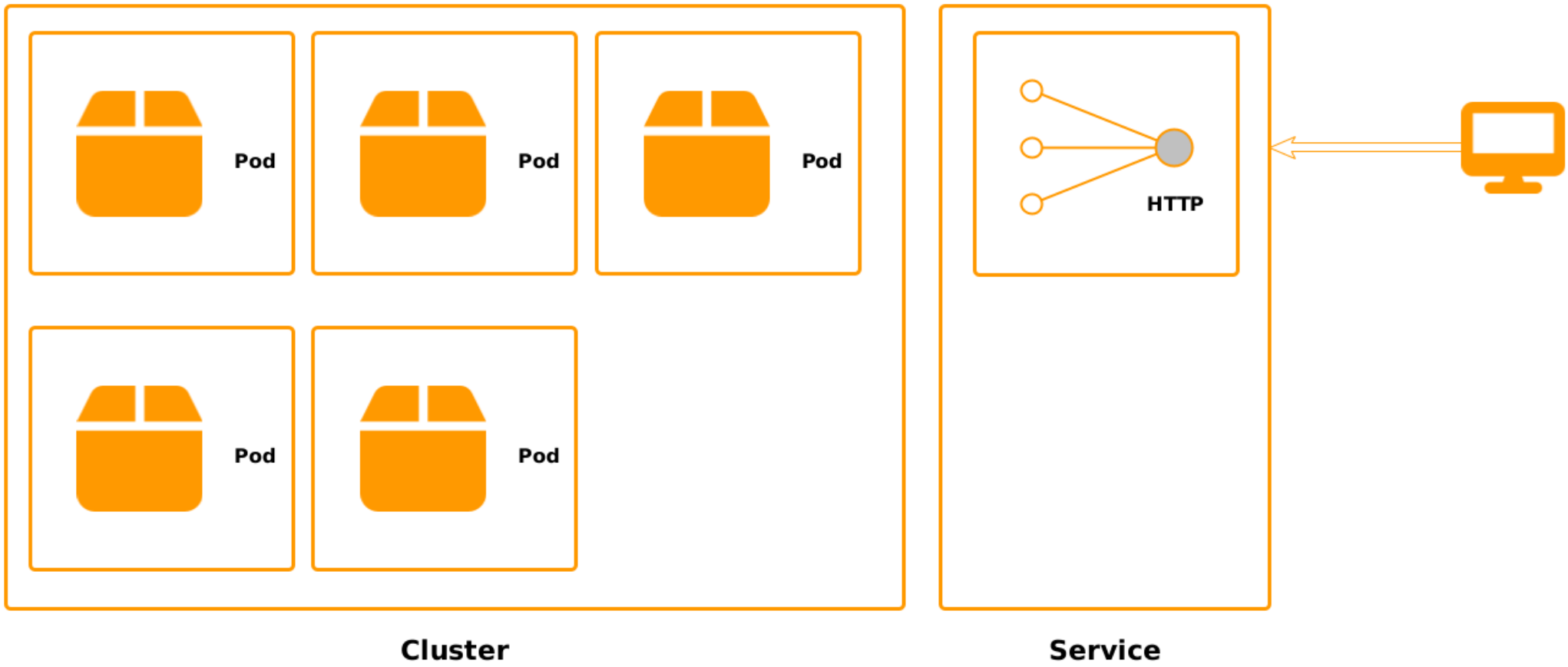
Master - Control Plane Components


Master
Cluster Store
Scheduler
Control Manager
API Server
Node
kubelet
kube-proxy
Container Runtime

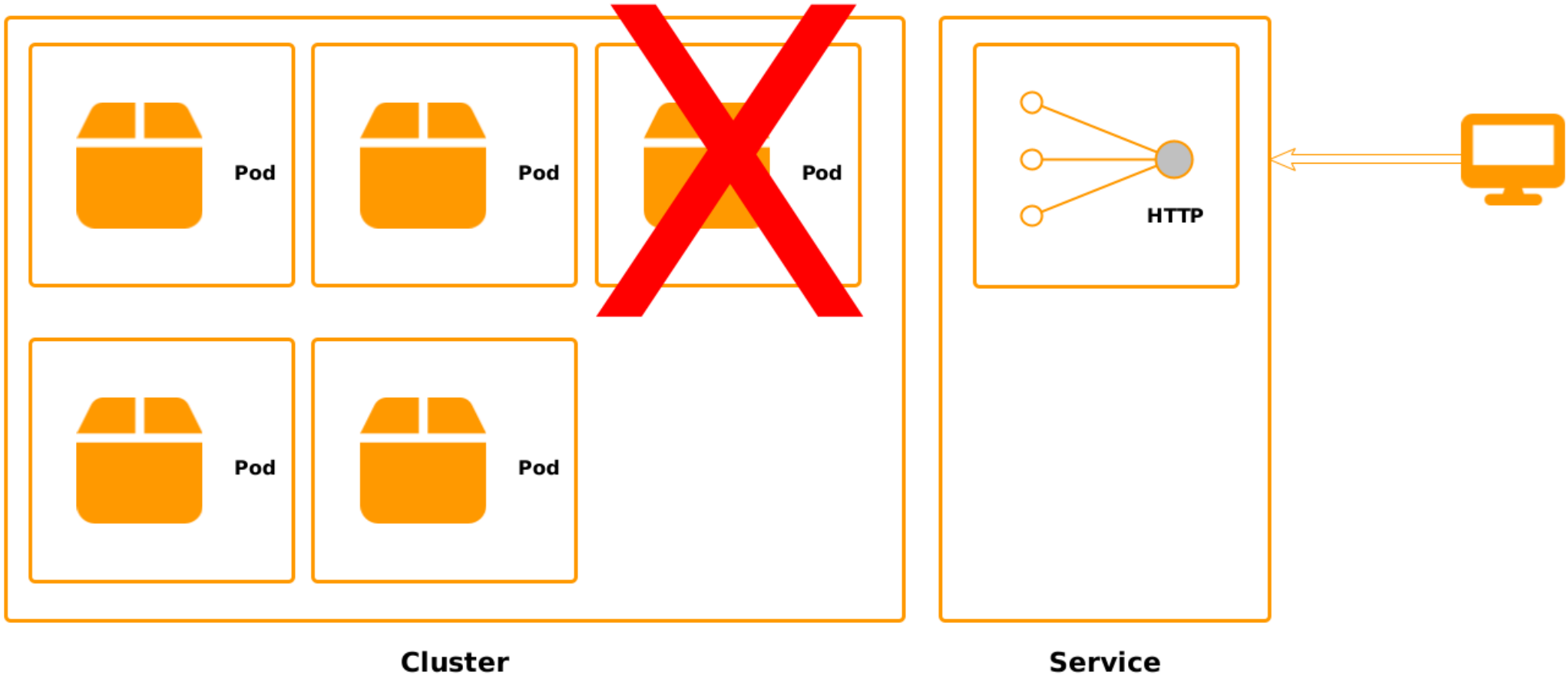
Nodes


Master
Cluster Store
Scheduler
Control Manager
API Server
kubectl
Node
kubelet
kube-proxy
Container Runtime
Pod
Pod
Pod
Node
kubelet
kube-proxy
Container Runtime
Pod

Pods

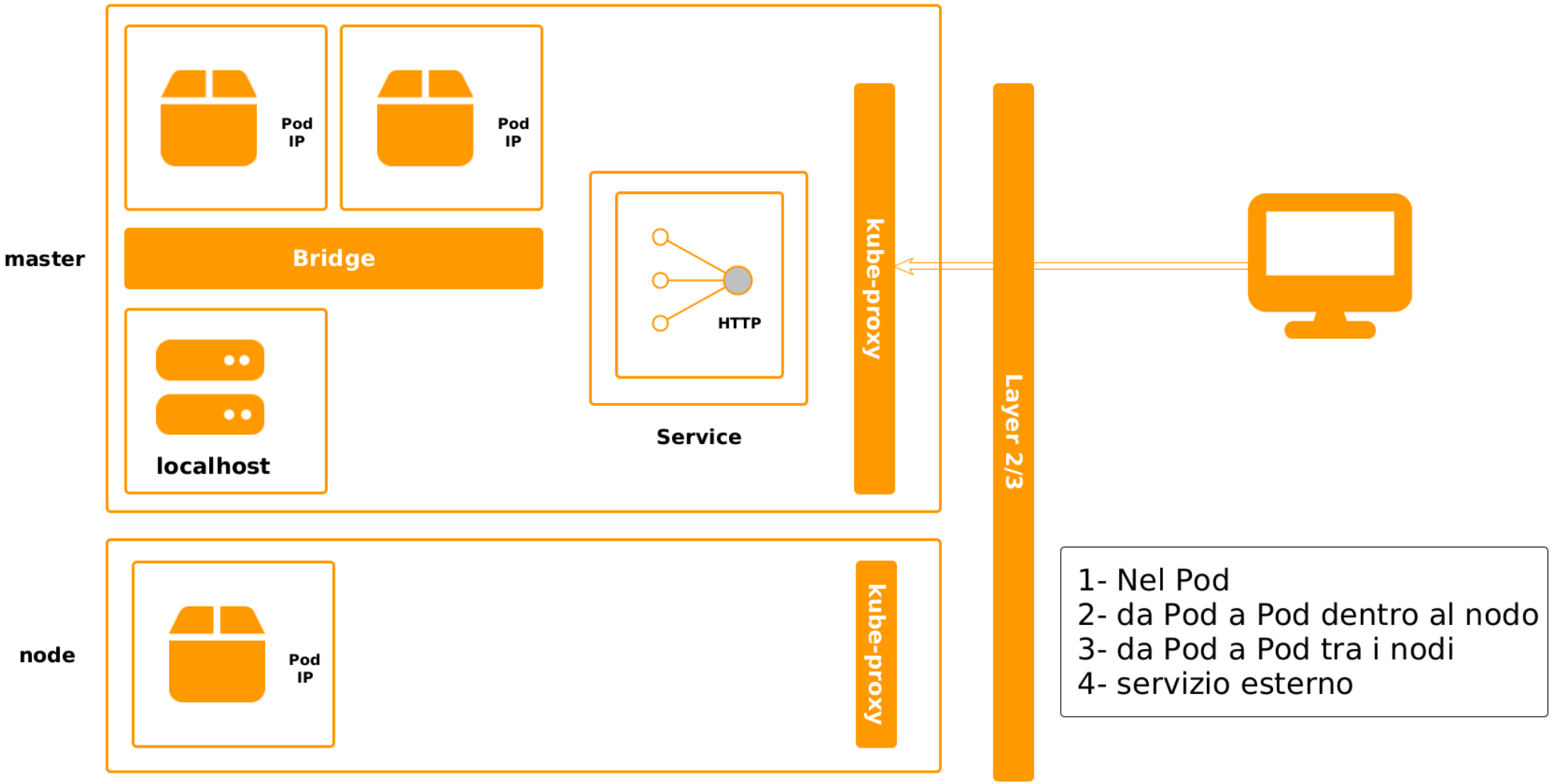


Services



Services

Networking Foundamentals


master
Pod
IP
Pod
IP
Bridge
localhost
HTTP
Service
kube-proxy
Layer 2/3
node
Pod
IP
kube-proxy
1- Nel Pod
2- da Pod a Pod dentro al nodo
3- da Pod a Pod tra i nodi
4- servizio esterno

Networking

Installation

Kubernetes Official

There are some tools for installation

WEB SITE:	kubernetes.io/
INSTALLATION:	kubernetes.io/docs/tasks/tools/
DOCUMENTATION	kubernetes.io/docs/home/

⚙ RKE2 - Rancher Kubernetes Engine v2

Simplifyng the installations of all components

WEB SITE:	docs.rke2.io/
INSTALLATION:	docs.rke2.io/install/quickstart
HIGH AVAILABILITY:	docs.rke2.io/install/ha
ARCHITECTURE:	docs.rke2.io/architecture

KillerCoda

Virtual lab for K8S

WEB SITE:	killercoda.com/k8s-inaf
LOGIN:	make login with cloud or email
SCENARIOS:	Guided Exercises

Questions??

“Tutte le cose eccellenti sono tanto difficili quanto rare.”

— *Baruch Spinoza*

GRAZIE

Federico Fiordoliva.