

Konténerek orkesztrálása - Kubernetes

Simon Csaba

MOTIVÁCIÓ

Motiváció - orkesztráció

- » Mi hiányzik egy teljes Docker rendszerhez?
 - » Orkesztráció
 - » Amit a felhők nyújtanak
 - » Cél: automatizált konténer telepítés és menedzsment multi-host környezetben (incl. skálázódás vezérlése)
- » Egyik megoldás: nyilvános felhőkben Docker
 - » Amazon Web Services, Google Cloud, Microsoft Azure
- » Másik megoldás: Docker + OpenStack
 - » OpenStack Magnum
- » Harmadik megoldás: Docker orkesztráció
 - » Apache Mesos (2010)
 - » Google Kubernetes (2014)
 - » Docker Swarm Mode (2016)

Cloud Native Computing Foundation

- » Mikroszervíz ökoszisztéma
 - » Konténerek orkesztrálásával
 - » Google támogatja
 - » rkt-t javasolják a Docker helyett

[About](#)[Projects](#)[Certification](#)[People](#)[Community](#)[Newsroom](#)[Jobs](#)


Sustaining and Integrating Open Source Technologies


The Cloud Native Computing Foundation builds sustainable ecosystems and fosters a community around a constellation of high-quality projects that orchestrate containers as part of a microservices architecture.


KUBERNETES

Kubernetes - kezdetek


- » Deklaratív konténer csoport kezelés @ google
- » Konténer csoport: ugyanaz a hálózati névtér és kötetek (volume)


**Initial import**
proppey committed on May 16, 2014

**Merge pull request #12 from jbeda**
jbeda committed on Jun 8, 2014

**Add a deprecation notice**
thockin committed on Jun 20, 2014

Kubernetes:

**First commit**
jbeda committed on Jun 7, 2014

 **googlearchive / container-agent** Watch 103 Star 206 Fork 16


Code Issues 2 Pull requests 2 Pulse Graphs

Simple agent for running containers based on a declarative manifest.

13 commits 1 branch 0 releases 7 contributors

Branch: master New pull request

New file Find file SSH git@github.com:googlearchive/co Download ZIP

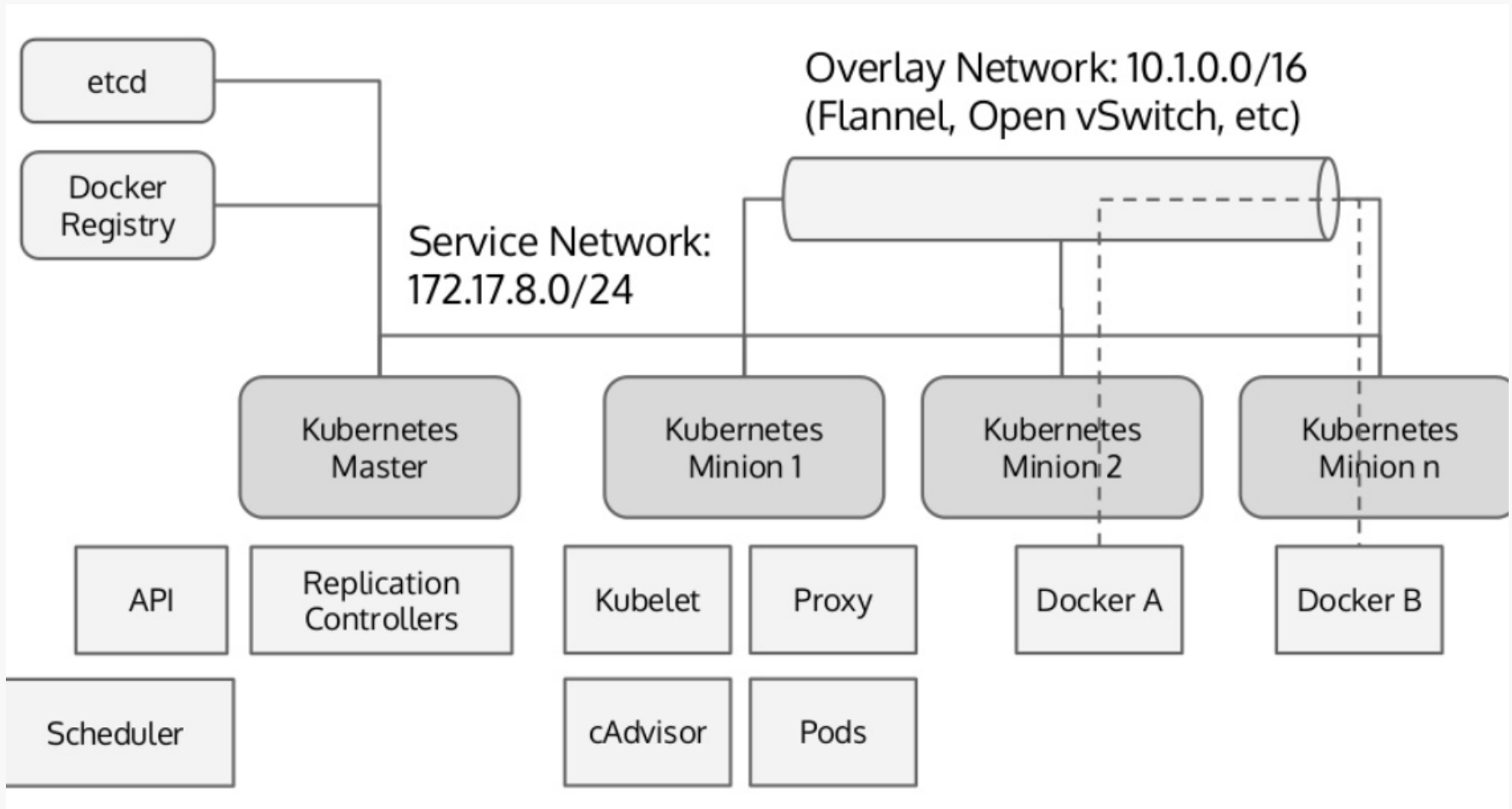
 **elbixby** Merge pull request #19 from jonparrott/patch-1 Latest commit c6cead2 on Sep 23, 2015

container_agent	initial import	2 years ago
manifests	initial import	2 years ago
tests	initial import	2 years ago
.gitignore	initial import	2 years ago
.travis.yml	Enable automated testing with Python 3.4	2 years ago

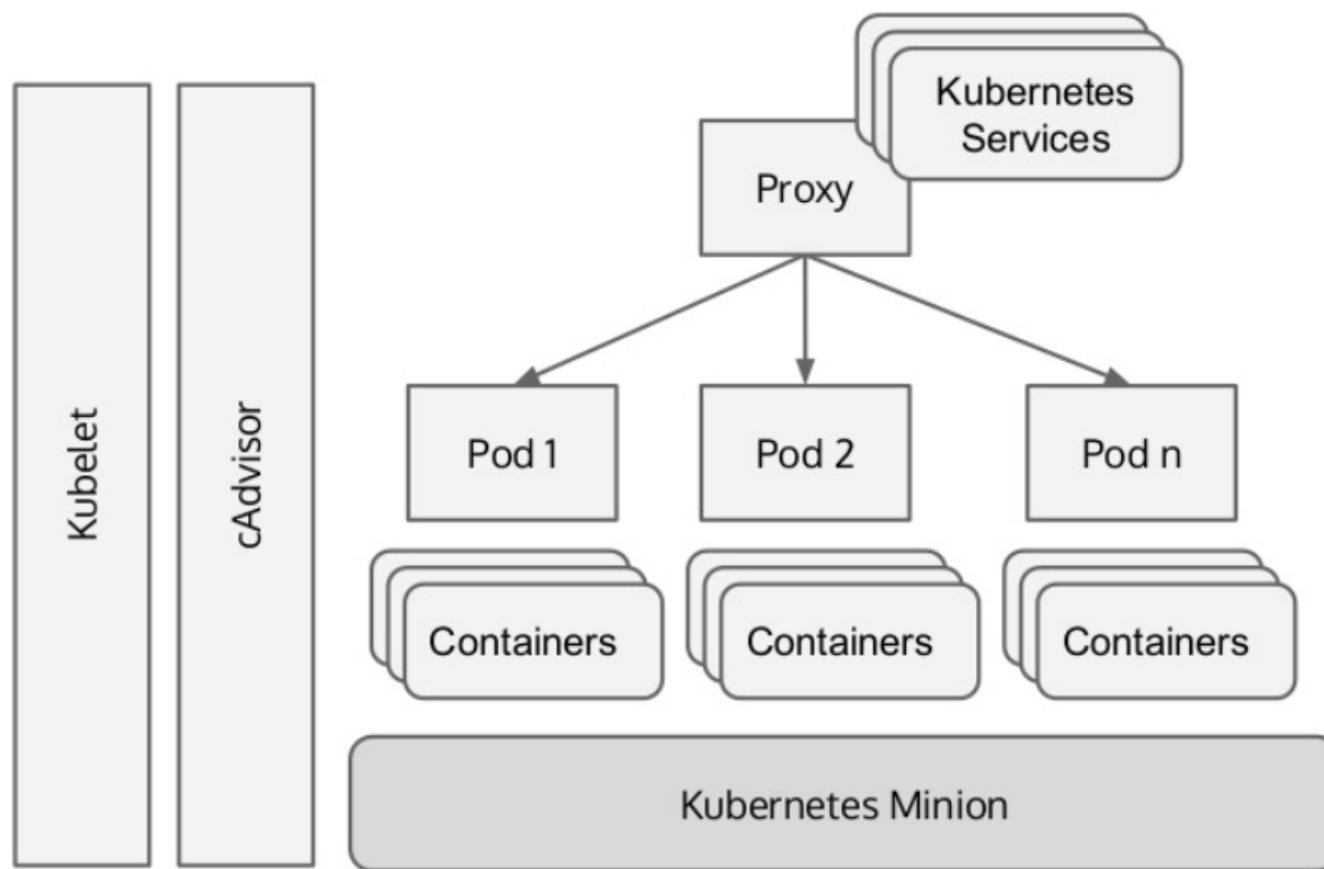
Kubernetes – main components

- **Pod** - A group of Containers
- **Labels** - Labels for identifying pods
- **Kubelet** - Container Agent
- **Proxy** - A load balancer for Pods
- **etcd** - A metadata service
- **cAdvisor** - Container Advisor provides resource usage/performance statistics
- **Replication Controller** - Manages replication of pods
- **Scheduler** - Schedules pods in worker nodes
- **API Server** - Kubernetes API server

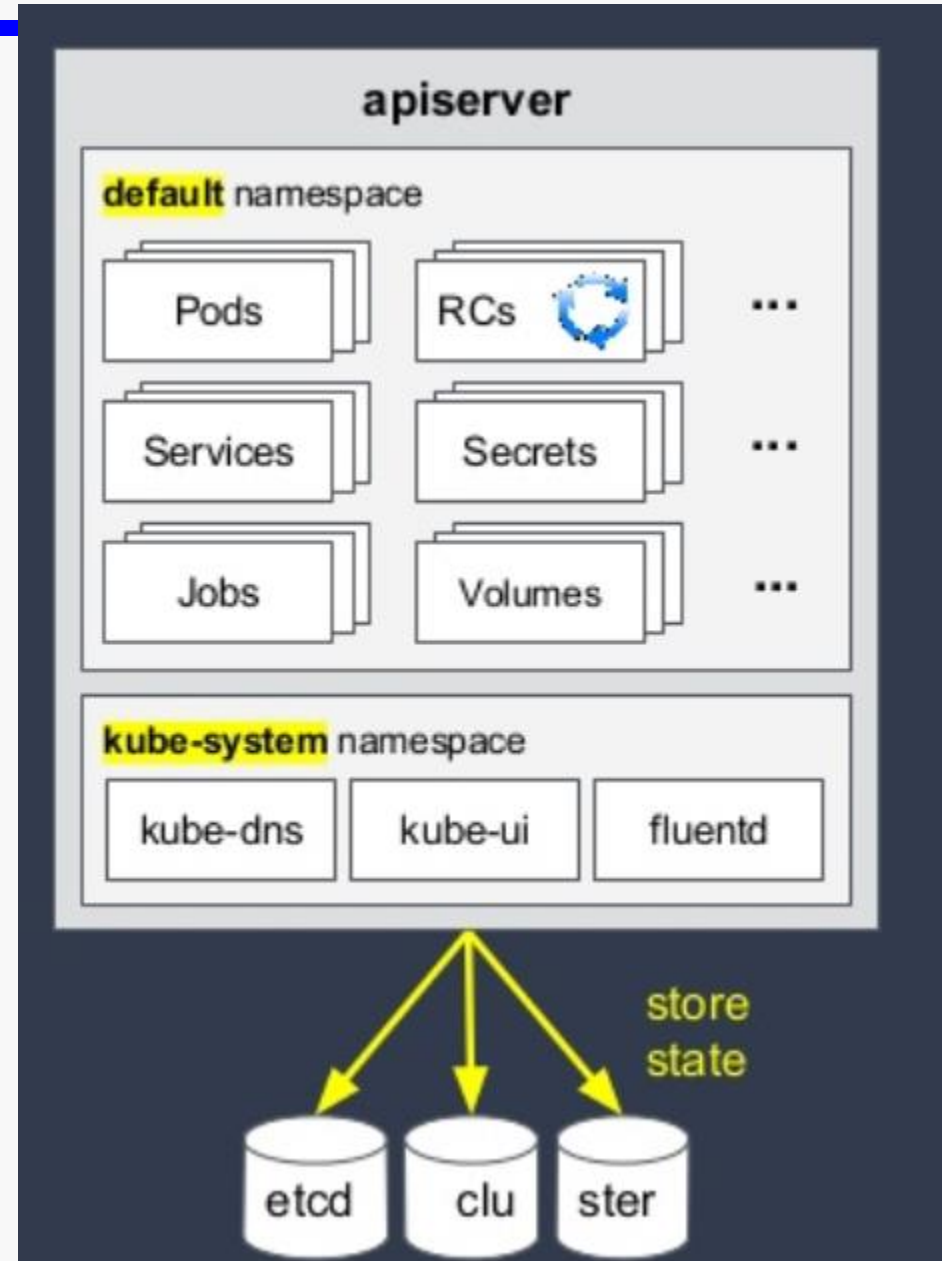
Kubernetes deployment



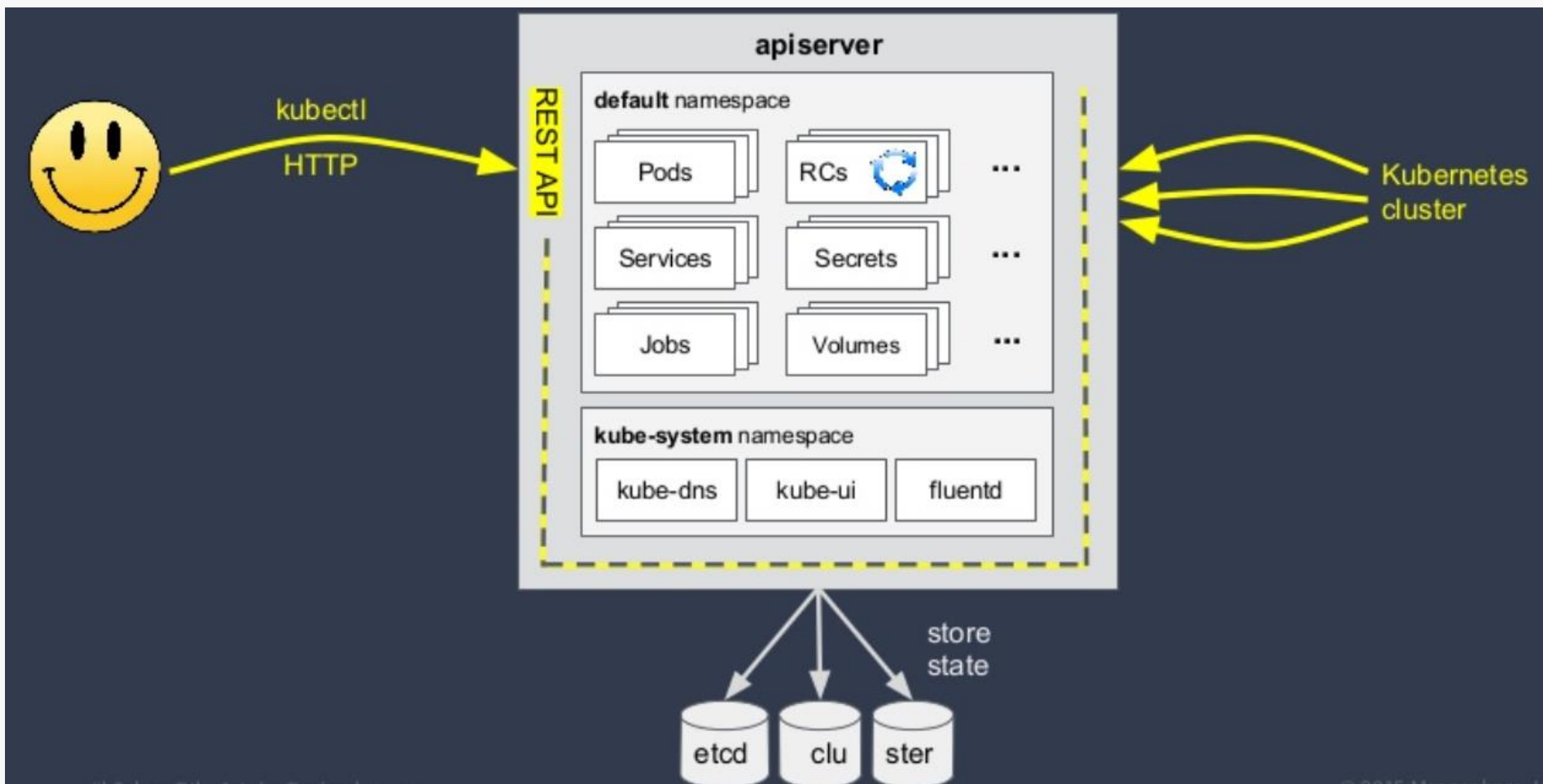
Worker node = minion



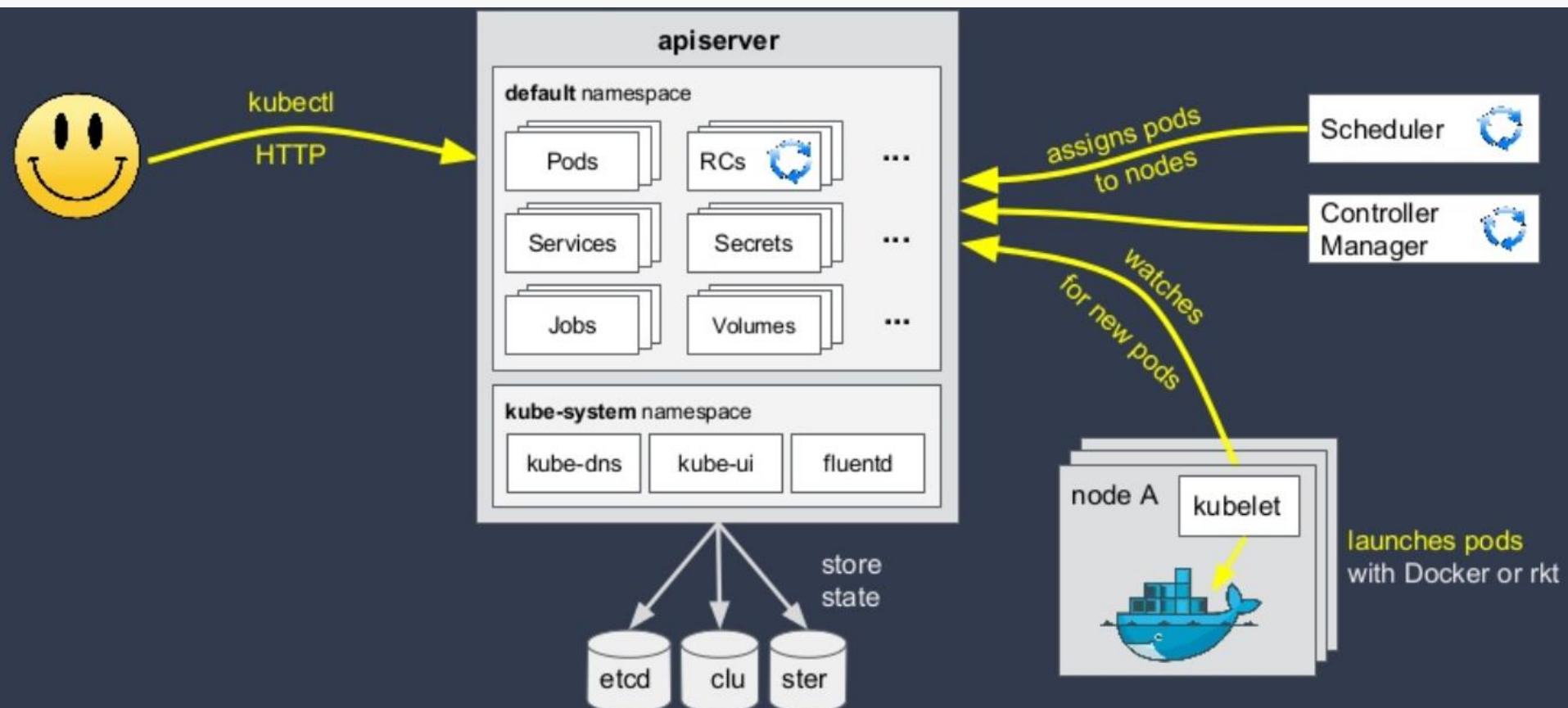
API szerver



API szerver kapcsolatai



A kube-system szolgáltatásai

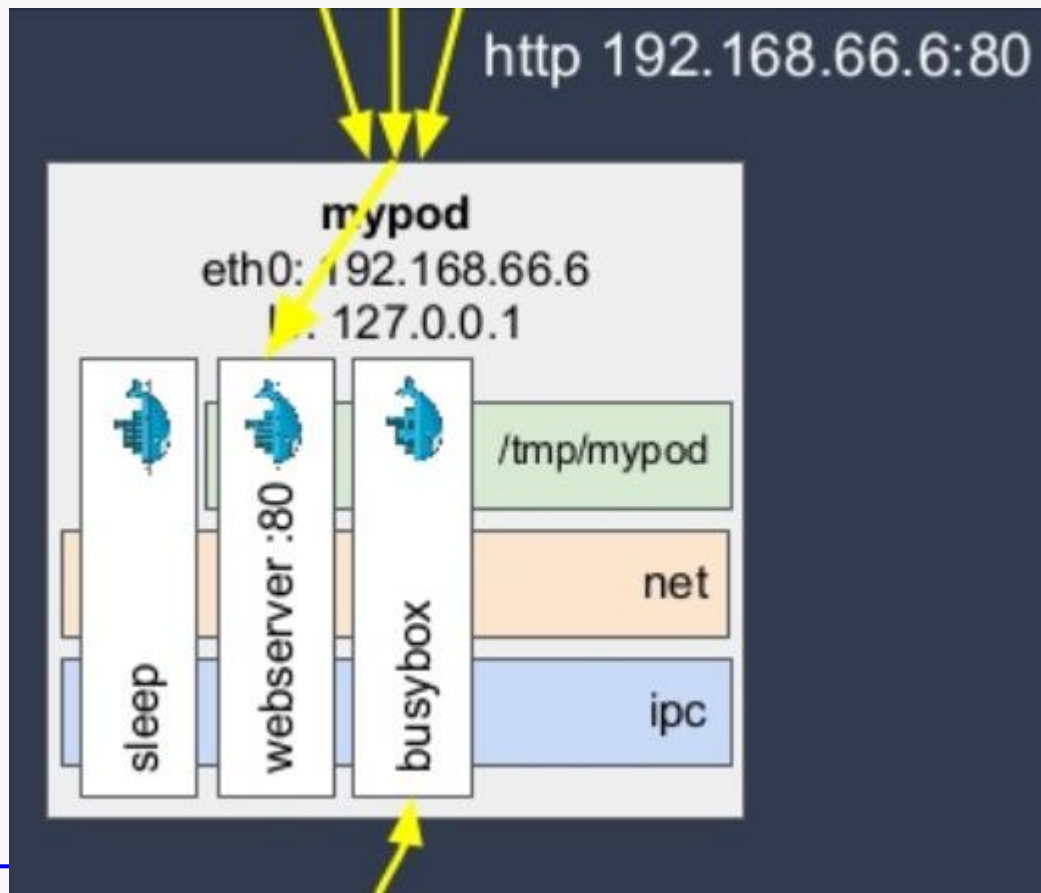


Kubernetes network

- » At Pod level every container is in the same namespace
 - » Pro: can reach each other via localhost
 - » Consequence: mind the port assignment within a Pod (2 containers cannot use the same port)
- » Hosts must communicate with containers without NATs
- » Typical solutions:
 - » Flannel: own solution, flat overlay
 - » OVS: Open VSwitch – generic solution, widely used in the industry
 - » Lots of alternatives:
<https://kubernetes.io/docs/concepts/cluster-administration/networking/#how-to-achieve-this>

Ha én (csak) Docker volnék...

- » Elvileg docker konténerekkel is meg lehet valósítani, azt, amit egy Kubernetes pod tud...



Logical structure of a Kubernetes cluster

- » Control by the master
- » Service offers access to users
 - » Handled by a load balancer (the Replication Controller)
 - » The request is answered by one Pod

