

OpenShift

Jens Kühnel

About Me

- Longtime Student (HIS)
- Freelancing since 2000
- Linux-Trainer
 - From 2000 to 2008 primarily for Red Hat
 - #8 RHCA 2nd in Europe
- Author
 - Samba 3 – Wandere zwischen den Welten
- Administrator
 - Freelancing from 2000 – 2016
 - Deutsche Börse 2008-2016
- Since 2017
 - 10% Freelancing
 - 90% Employed Sysadmin @
Deutschen Börse AG, Frankfurt

Platform as a service

Truth

- There is no Cloud,
only other peoples computer
- Container are not designed to be secure

RedHat Centos Fedora

- Upstream – Downstream

- Fedora
- RedHat
- Centos
- CoreOS



- All are 100% OpenSource
- Centos / Fedora are influenced by Red Hat
- Trademark owned by Red Hat

Container

- Normal processes, run in a contained way
 - chroot
 - namespaces
 - Capabilities
 - Cgroups
 - SELinux
- Filesystem Layers (empheral)
- Persistence data is a problem
- Should fix the „works for me“ problem.
- Container standard = OCI
- Missing: Handling large number of containers

History

- **Container are not new**
- 1979 chroot syscall in Unix v7
- 1982 Chroot command in 4.2BSD
- 2000 Jails in FreeBSD (inkl. Extra IP)
- 2001 Vserver for Linux (FS, network, Mem)
- 2005 OpenVZ (+ resource mgmt, checkpoint)
- 2005 Zones in Solaris (+ Cloning)
- 2008 lxc in Linux (included in vanilla kernel)

Docker

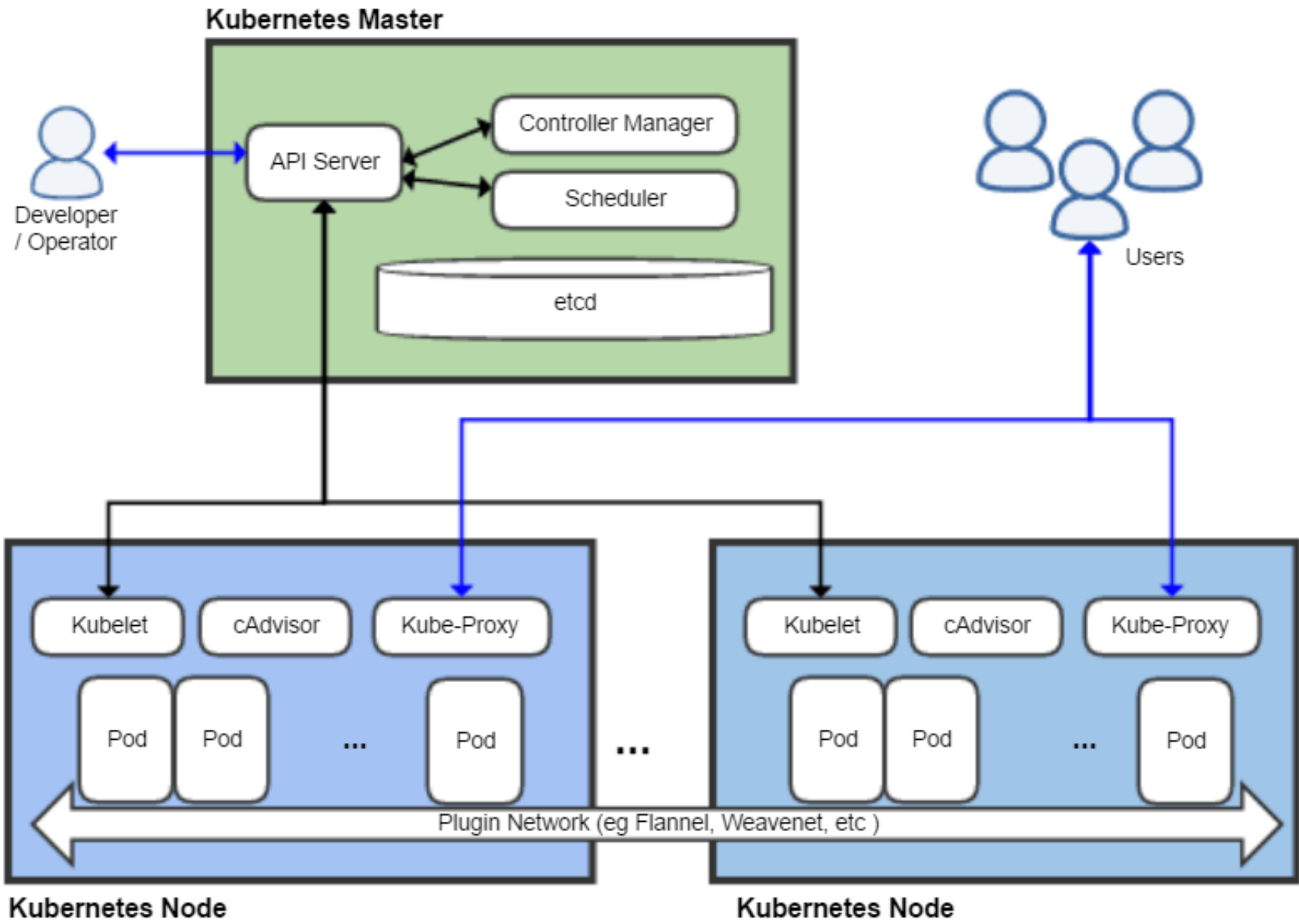


- Created 2013
- New: Easy to use file system layers
- Only the best known container tool
- One big daemon, does everything, runs as root
- Will be replaced
 - by CRI-O (podman) or rkt
 - with a lot of single purpose tools (Unix Style).



Kubernetes

- Kubernetes is greek for Pilot or Helmsman
- Google used a tool called Borg, re-implemented with Codename Seven (nicer Borg), seven sticks on the wheel.
- Now Cloud Native Foundation (Linux Foundation)
- Used with Rancher Labs, Azure, CoreOS Tectonic, Mirantis, openshift, ...



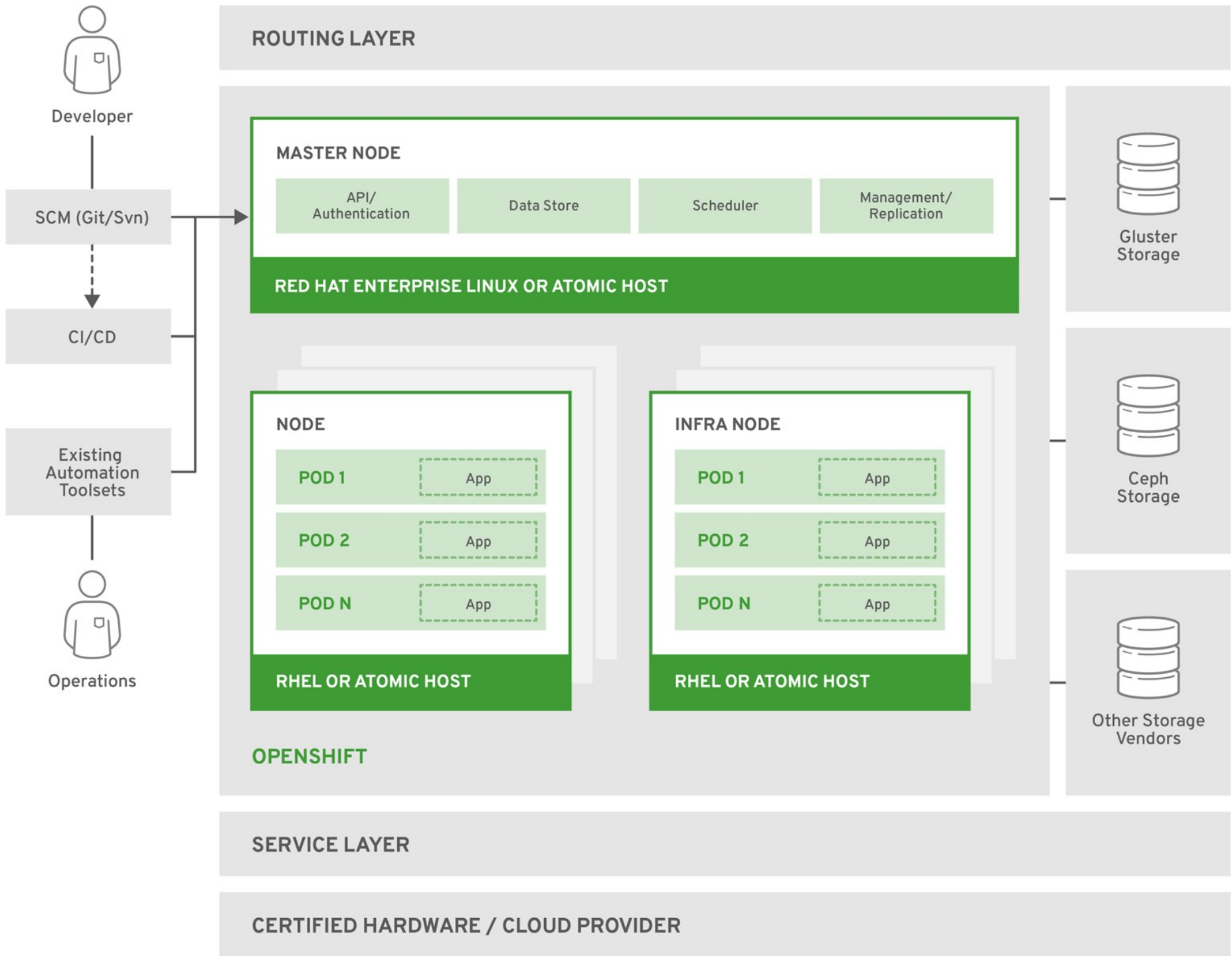
Kubernetes

- Pods (Running Container)
 - Nodes (Machine that runs Container)
 - Project (multiple container, secluded)
 - Controller Manager
 - Master
 - Etcd (from CoreOS)
-
- Readyness vs. Liveness Probe
 - Missing: Network, Storage and a GUI

Openshift



- Editions
 - OKD (OpenSource upstream, was OpenShift Origin)
 - Dedicated (Private Instance on Public Cloud)
 - Container Platform (On Premise Privat Cloud, former OpenShift Enterprise)
 - Online (open public Cloud)
- Runs on
 - Bare-Metal
 - Latest Redhat, Centos or Fedora normal install
 - Or Atomic Host (Minimal Installaion with atomic updates)
 - Or Fedora CoreOS
 - Virtual Machines (KVM, VMWare, VirtualBox)
 - Public Clouds (AWS, Azure, OpenStack, Google Compute)
- Creates a platform independent layer



OpenShift

- Gluster (Cloud Native Storage)
- Monitoring/Logs integrated
- Network Layer (flannel)
- Extendable by addons

Node selections

- 1 Possible (Minishift/RedHat CDK)
- 4 = Master + 3 Nodes
- Real HA Setups:
 - 2 Loadbalancer
 - 3 Master (HA)
 - 3 ETCD Nodes
 - 3 Infrastructure Nodes
 - 4 Infrastructure Storage Nodes
 - 4 App Storage Nodes
 - 3++ App Nodes

DEMO Minishift

Problems of Container

- Where comes the Container from
- What is the configuration of the Container
- A lot of new concepts = High learning curve

Why Openshift?

- Can Create complete Cloud Independence
- Based on OpenSource
- No Single point of Failure (Cross Cloud not possible yet ...)

OpenShift 4

- Completely new version
- Only really usable with 4.3
- No upgrade
 - backup/restore used for migration
- Completely Operator Driven
 - The Operator knows how to setup/run/upgrade/destroy services
 - Used for
 - OpenShift Nodes
 - OpenShift Internal Services
 - Databases etc...
 - See list at: <https://operatorhub.io/>
 - Gluster → Ceph (4 → 5 minimum Storage nodes)

Questions

Thanks for all the Fish

Image Sources

- <https://de.wikipedia.org/wiki/Datei:Kubernetes.png>
- https://github.com/openshift/openshift-docs/blob/master/architecture/images/architecture_overview.png