

Openshift Installation und Administration





Openshift bei Heinlein

- Openshift Origin 3 (OKD)
- OKD 4
- RHOSCP - Openshift 4 (4.13)
- 4 Cluster

Tag 1

Einführung

Cluster Konzeption und Anforderungen

Installation

CLI und Console

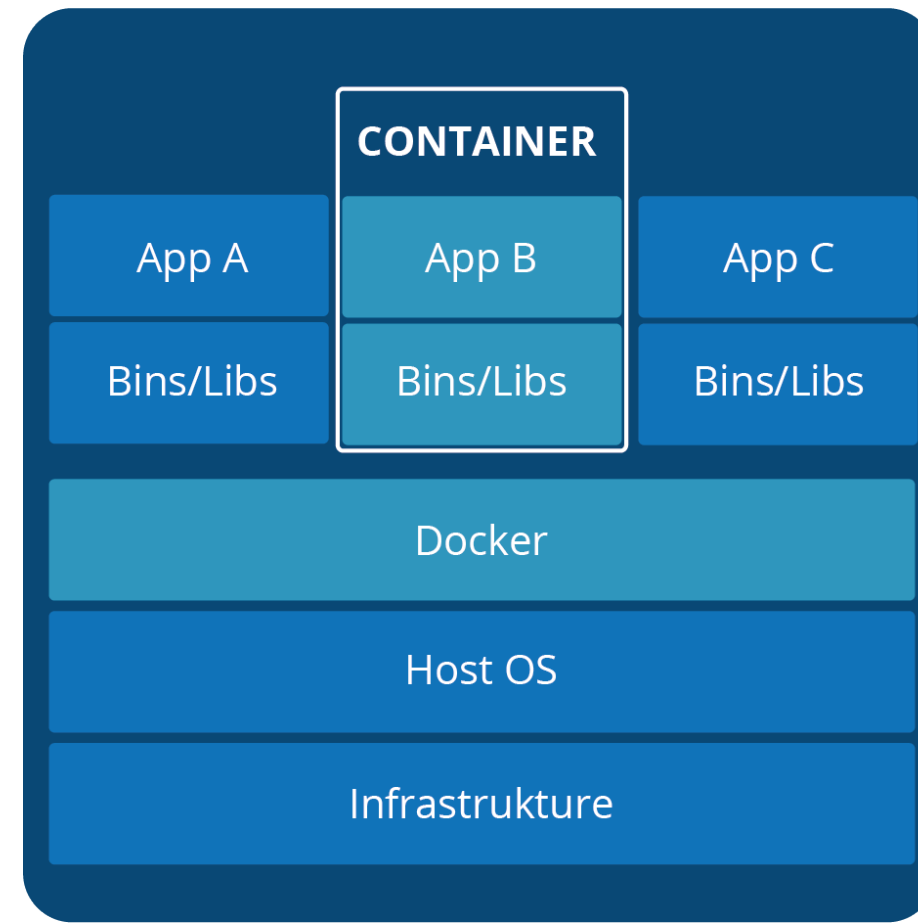
Cluster Updates

Eine kurze Geschichte der Container

- 1982 chroot
- 2000 FreeBSD Jails
- 2007 Linux Kernel cgroups
- 2008 Linux Containers LXC
- 2013 Docker
- 2018 Podman / Containerd

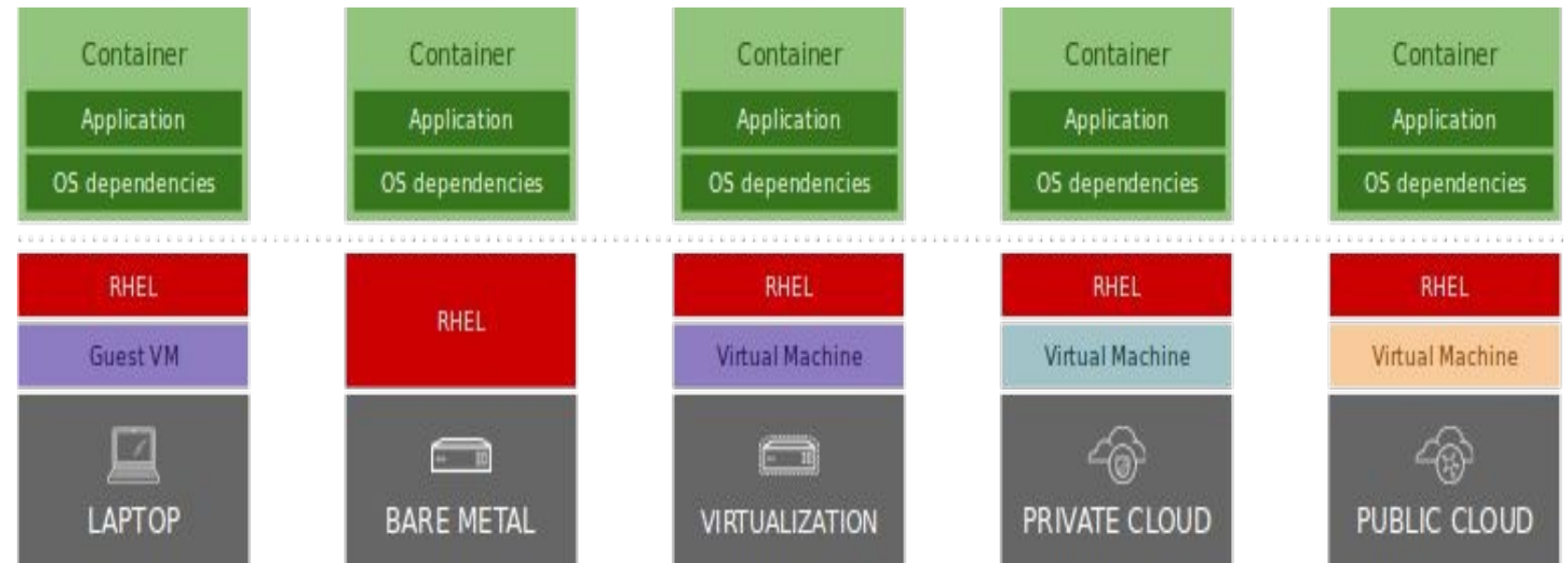
Was ist ein Container?

- Container Image
- **ein** Prozess
- cgroup Isolation
- bestimmter User



Und warum Container?

- Portabilität
- Isolation
- Skalierbarkeit
- schnelles Deployment
- Konsistenz
- Deklarativ
- DevOps



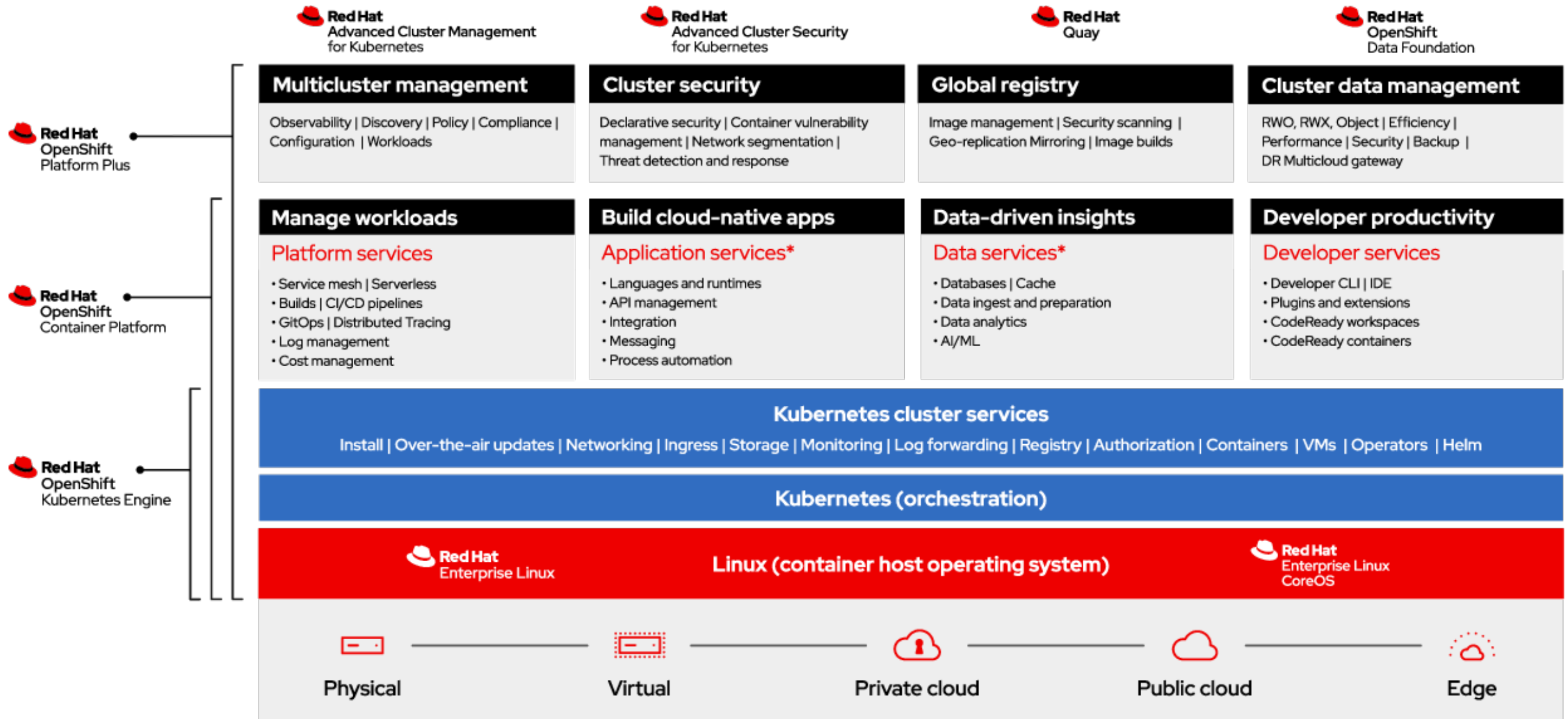
Container Orchestrierung

Automatisierung und Verwaltung von:

- Provisionierung und Deployment
- Konfiguration und Planung
- Ressourcenzuweisung
- Container-Verfügbarkeit
- Skalieren von Containern
- Load Balancing und Traffic Routing
- Überwachen des Containerzustands
- Sichern von Interaktionen zwischen Containern

Openshift - Kubernetes plus

- Routing
- Monitoring
- Logging
- Web Console (GUI)
- Image Builds
- Image Registry
- Built-in security
- Networking



* Red Hat® OpenShift® includes supported runtimes for popular languages, /frameworks, and /databases.
Additional capabilities listed are from the Red Hat Application Services and Red Hat Data Services portfolios.

Konzeption

Node Roles

Controlplane Nodes

- Kubernetes API
- Controller
- etcd
- Kubernetes Scheduler
- Openshift OAuth

Worker Nodes

- Compute Nodes
- User Workload
- Ingress Controller ?

Infra Nodes (optional)

- extra Label
- nicht in Subscriptions
- Cluster-Monitoring, Router, Registry

Number of worker nodes	Cluster-density (namespaces)	CPU cores	Memory (GB)
24	500	4	16
120	1000	8	32
252	4000	16, but 24 if using the OVN-Kubernetes network plug-in	64, but 128 if using the OVN-Kubernetes network plug-in
501, but untested with the OVN-Kubernetes network plug-in	4000	16	96

Empfohlene Anforderungen

Bootstrap Node:

- 4 vCPU
- 16 GB Memory
- 120 GB Storage

Master Nodes:

- 3 Nodes
- 4 vCPU
- 16 GB Memory
- 120 GB Storage

Worker Nodes:

- mind. 2 Nodes
- 4 vCPU
- 16 GB Memory
- 120 GB Storage

Und wirklich?

- erwarteter Workload / Anforderung der Applikationen
- Hochverfügbarkeit
- automatische Skalierung
- Cluster Updates
- Capacity Reserven

Installation

IPI Installation

- Maschinen werden vom Installer erstellt und gestartet
- Infrastruktur Automatisierung
- Vorbereitung → Doku!
- Automaten aus dem Cluster über entsprechende API (Storage, Scaling, Health Checks etc)

UPI Installation

- manuelles Provisionieren aller Komponenten
- Installer generiert Ignition-Configs
- Nodes mit CoreOs Image starten

Installation Type

Interactive

- Assisted Installer
- Webbasiert
- connected

Automated

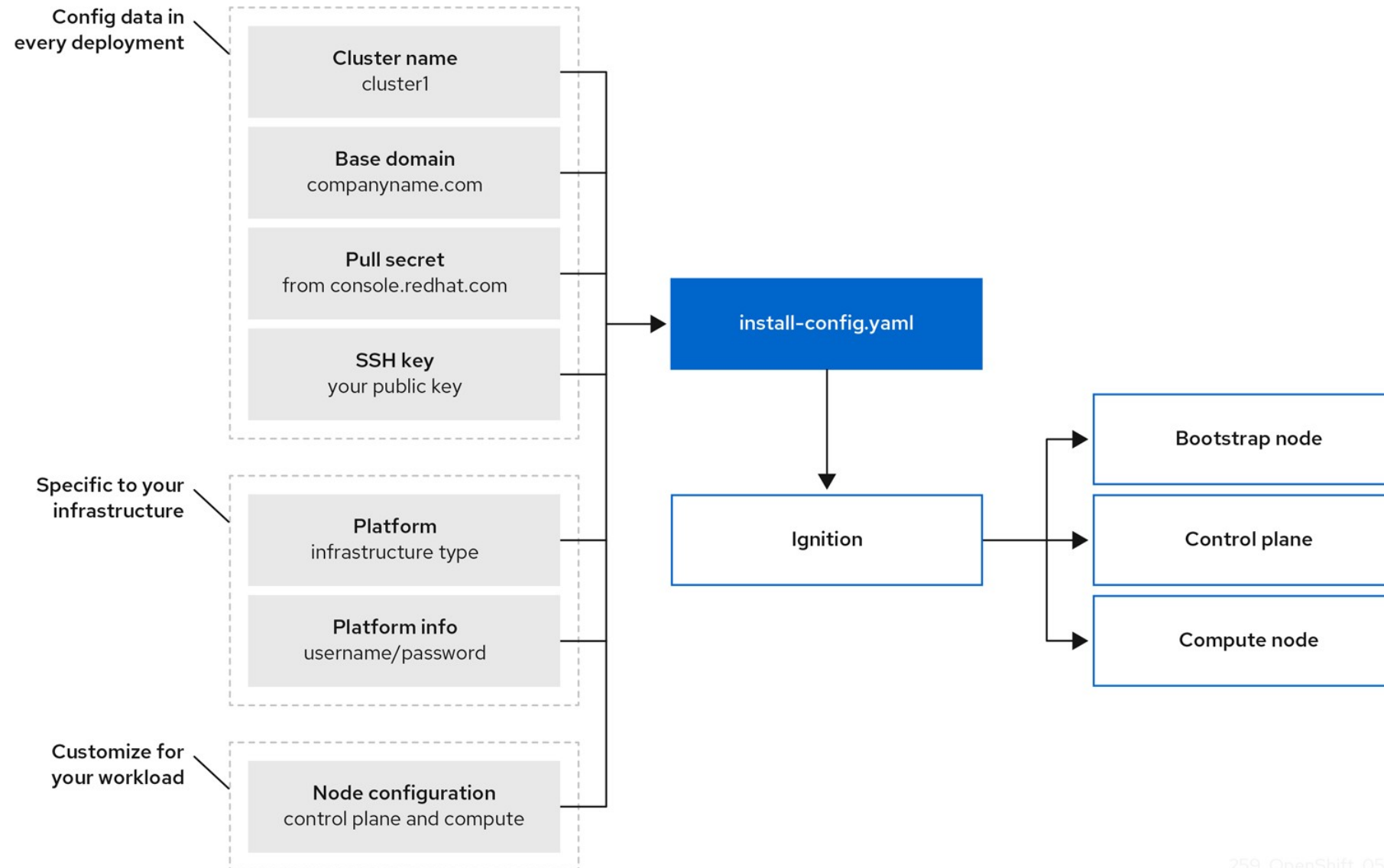
- Installer provisioned
- connected und disconnected Umgebungen

Local Agent-based

- Agent-based Installer
- ISO
- ideal für disconnected Umgebungen

Full Control

- User provisioned
- maximale Konfigurierbarkeit



```
apiVersion: v1
baseDomain: example.com ❶
compute: ❷
  name: worker
  replicas: 3
  platform:
    vsphere: ❸
      cpus: 2
      coresPerSocket: 2
      memoryMB: 8192
      osDisk:
        diskSizeGB: 120
controlPlane: ❷
  name: master
  replicas: 3
  platform:
    vsphere: ❸
      cpus: 4
      coresPerSocket: 2
      memoryMB: 16384
      osDisk:
        diskSizeGB: 120
metadata:
  name: cluster ❹
platform:
  vsphere:
    vcenter: your.vcenter.server
    username: username
    password: password
    datacenter: datacenter
    defaultDatastore: datastore
    folder: folder
    resourcePool: resource_pool ❺
    diskType: thin ❻
    network: VM_Network
    cluster: vsphere_cluster_name ❼
  apiVIPs:
    - api_vip
  ingressVIPs:
    - ingress_vip
fips: false
pullSecret: '{"auths": ...}'
sshKey: 'ssh-ed25519 AAAA...'
```

Installer Commands

- openshift-install create cluster
- openshift-install create install-config
- openshift-install create manifests
- openshift-install create ignition-configs
- openshift-install wait-for bootstrap-complete
- openshift-install wait-for install-complete
- openshift-install destroy bootstrap
- openshift-install destroy cluster

Pitfalls

- Installation muss innerhalb von 24 Stunden nach Generierung der Ignition Configs erfolgen
- Der Cluster darf die ersten 24 Stunden nicht ausgeschaltet werden
- Installationskonfiguration wird vom Installer geschluckt
- zu kleine IP Range für Node Networks (hostPrefix)

Übung

- Cluster Installation

Doku: <https://docs.openshift.com/container-platform/4.13>

Web Console

CLI

Update

Update Channels

- stable
- fast
- candidate

Update Graph

Channel *

fast-4.14

Architecture *

x86_64

☒ Include hotfix versions

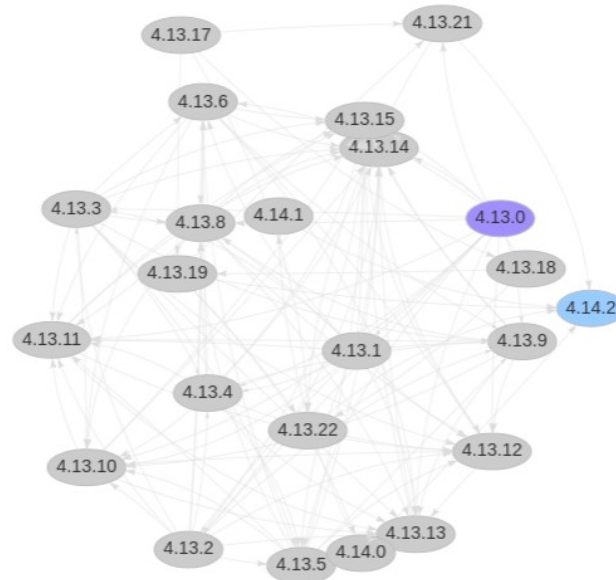
Note

Your cluster will warn you of [any matched known issues](#).

fast-4.14

Legend

- Lowest version in the channel
- Highest version in the channel



Übung

- Cluster Update

Doku: <https://docs.openshift.com/container-platform/4.13>

Operatoren

Cluster Operatoren

- apiserver-operator
- etcd-operator
- network-operator
- machine-config-operator

User Operatoren

OperatorHub

Discover Operators from the Kubernetes community and Red Hat partners, curated by Red Hat. You can purchase commercial software through [Red Hat Marketplace](#). You can install Operators on your clusters to provide op services to your developers. After installation, the Operator capabilities will appear in the [Developer Catalog](#) providing a self-service experience.

All Items

AI/Machine Learning

Application Runtime

Big Data

Cloud Provider

Database

Developer Tools

Development Tools

Drivers and plugins

Integration & Delivery

Logging & Tracing

Modernization & Migration

Monitoring

Networking

OpenShift Optional

Security

Storage

Streaming & Messaging

Other

Source

☐ Red Hat (102)

☐ Certified (156)

☐ Community (225)

☐ Marketplace (50)

Provider

☐ Red Hat (143)

☐ APIMatic.io (1)

☐ Ab Initio (1)


☐ Accuknox (1)

☐ Aerospike (2)

All Items

Q

Filter by keyword...




Community

3scale API Management

provided by Red Hat

3scale Operator to provision 3scale and publish/manage API




Community

[DEPRECATED] KEDA

provided by KEDA Community

[DEPRECATED] Use Custom Metrics Autoscaler Operator instead




Marketplace

ABot

provided by Rebaca Technologies Pvt Ltd

A Helm based operator for deploying Abot application in Openshift cluster. The ABot Test...




Red Hat

Advanced Cluster Management for Kubernetes

provided by Red Hat

Advanced provisioning and management of OpenShift and Kubernetes clusters




Red Hat

Advanced Cluster Security for Kubernetes

provided by Red Hat

Red Hat Advanced Cluster Security (RHACS) operator provisions the services necessar...




Marketplace

Aerospike Kubernetes Operator

provided by Aerospike

The Aerospike Kubernetes Operator automates the deployment and management o...




Community

Aerospike Kubernetes Operator

provided by Aerospike

The Aerospike Kubernetes Operator automates the deployment and management o...




Community

Airflow Helm Operator

provided by opdev

An experimental operator that installs Apache Airflow.




Certified

AKO Operator

provided by VMware

Operator to manage the artifacts of the AKO Controller




Certified

Alloy

provided by QuestLabs

Alloy is platform to build trusted data in OSDU, available on-premise or in the cloud. It is...




Community

Alvearie Imaging Ingestion Operator

provided by Alvearie

The Alvearie Imaging Ingestion provides a collection of components for extending...



Red Hat

AMQ Streams

provided by Red Hat

Red Hat AMQ Streams is a massively scalable, distributed, and high performance data...

Linux höchstpersönlich