



Innovation without limitation

Bring big ideas to life with the hybrid cloud platform
open to any app, team, or infrastructure

Kok Hui Lew
Specialist Solution Architect



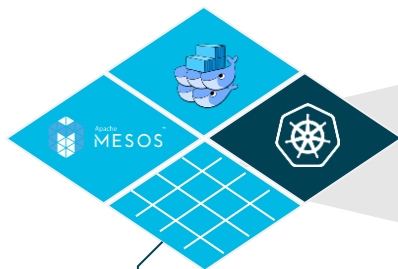


OpenShift is the platform
built for cloud native
application development and
deployment across the hybrid
cloud

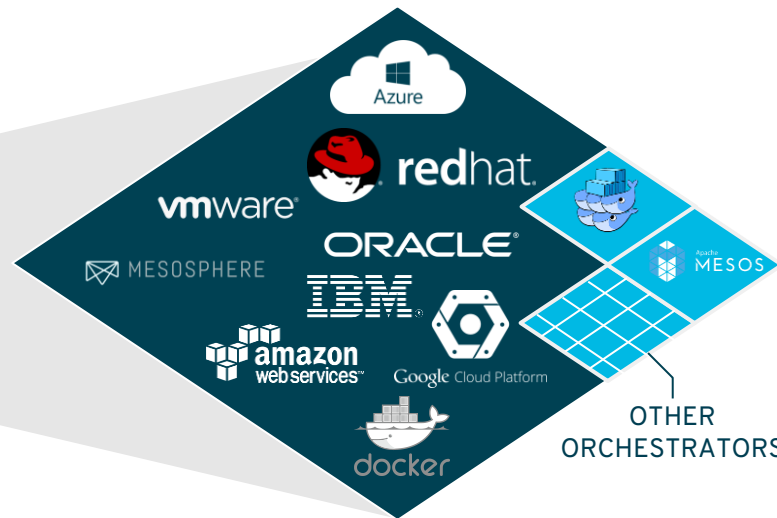
Red Hat bet early on Kubernetes

6 YEARS AGO

Fragmented landscape

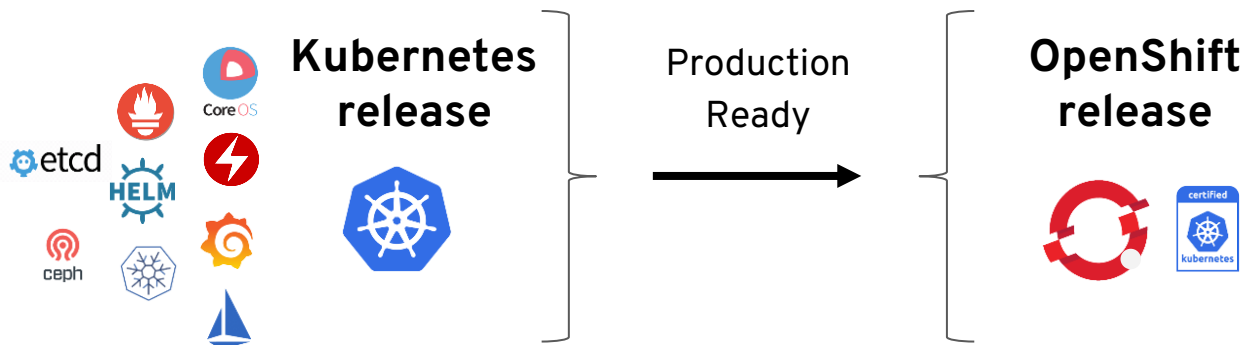


OTHER ORCHESTRATORS
(Cloud Foundry Diego,
Nomad, Blox, etc.)



OTHER
ORCHESTRATORS

OpenShift is trusted enterprise Kubernetes



Hundreds of defect and performance fixes

200+ validated integrations

Certified container ecosystem

9-year enterprise life-cycle management

Red Hat is a leading Kubernetes contributor since day 1

Container Intro

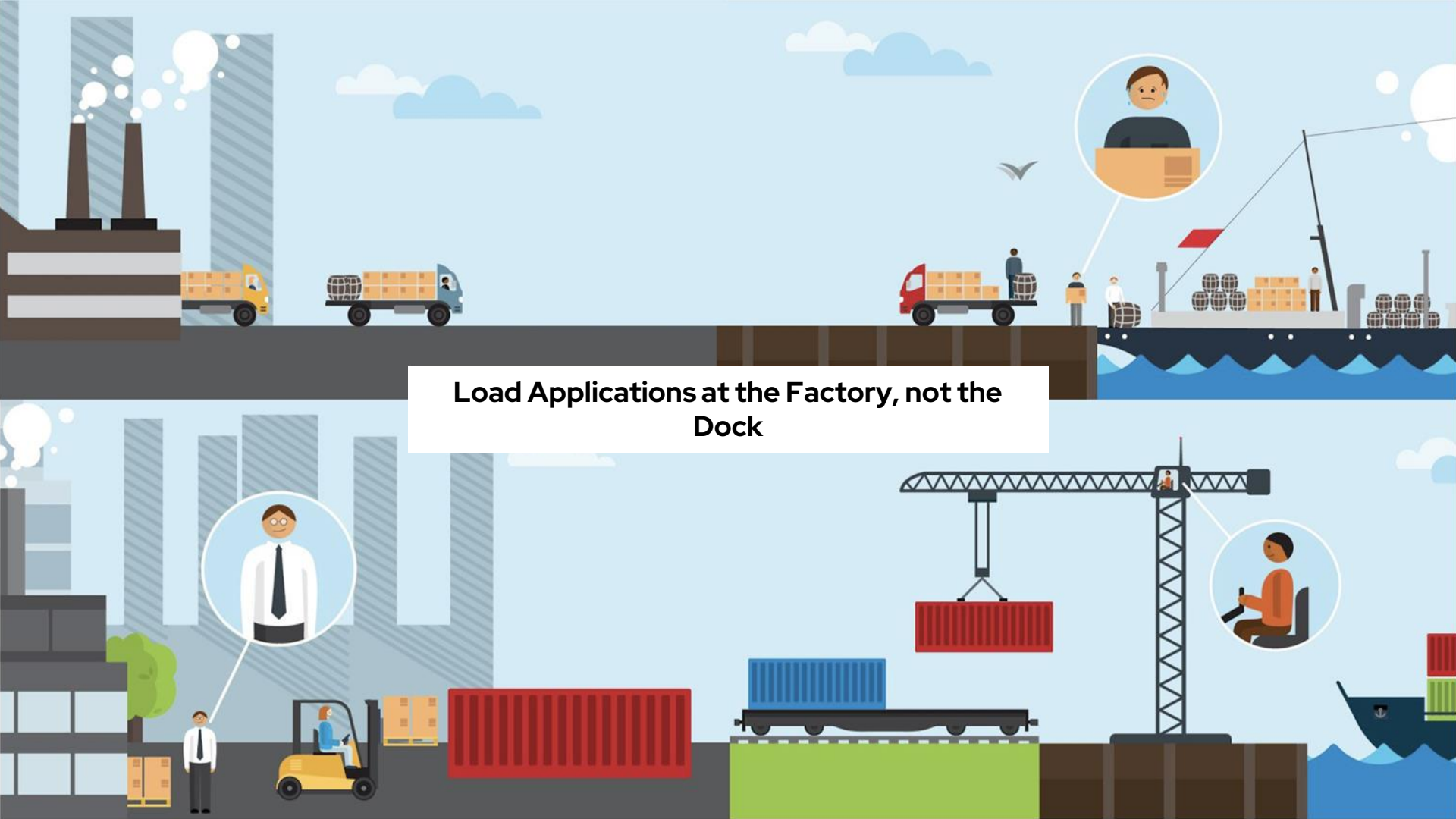
The Problem



The Problem

Applications require complicated installation and integration every time they are deployed





Load Applications at the Factory, not the Dock

The Solution

Adopting a container strategy will allow applications to be easily shared and deployed.



Setup Once, Run Anywhere!

What are Containers?

It depends who you ask...



INFRASTRUCTURE

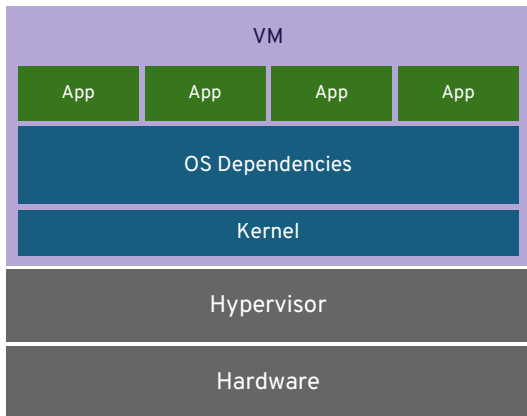
APPLICATIONS

- Sandboxed application processes on a shared Linux OS kernel
- Simpler, lighter, and denser than virtual machines
- Portable across different environments

- Package my application and all of its dependencies
- Deploy to any environment in seconds and enable CI/CD
- Easily access and share containerized components

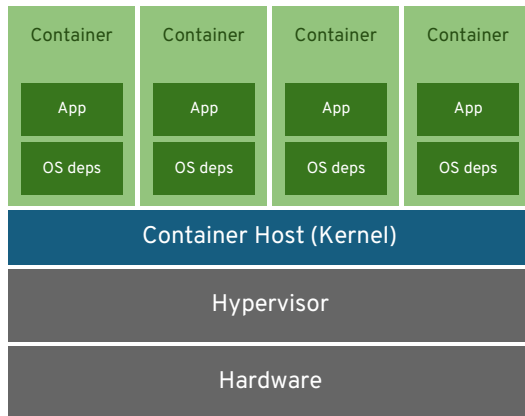
VIRTUAL MACHINES AND CONTAINERS

VIRTUAL MACHINES



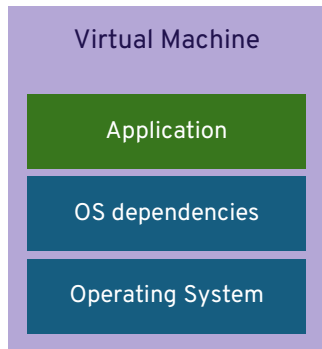
VM isolates the hardware

CONTAINERS

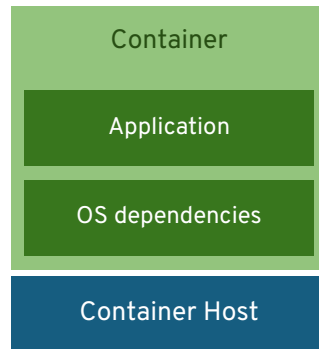


Container isolates the process

VIRTUAL MACHINES AND CONTAINERS

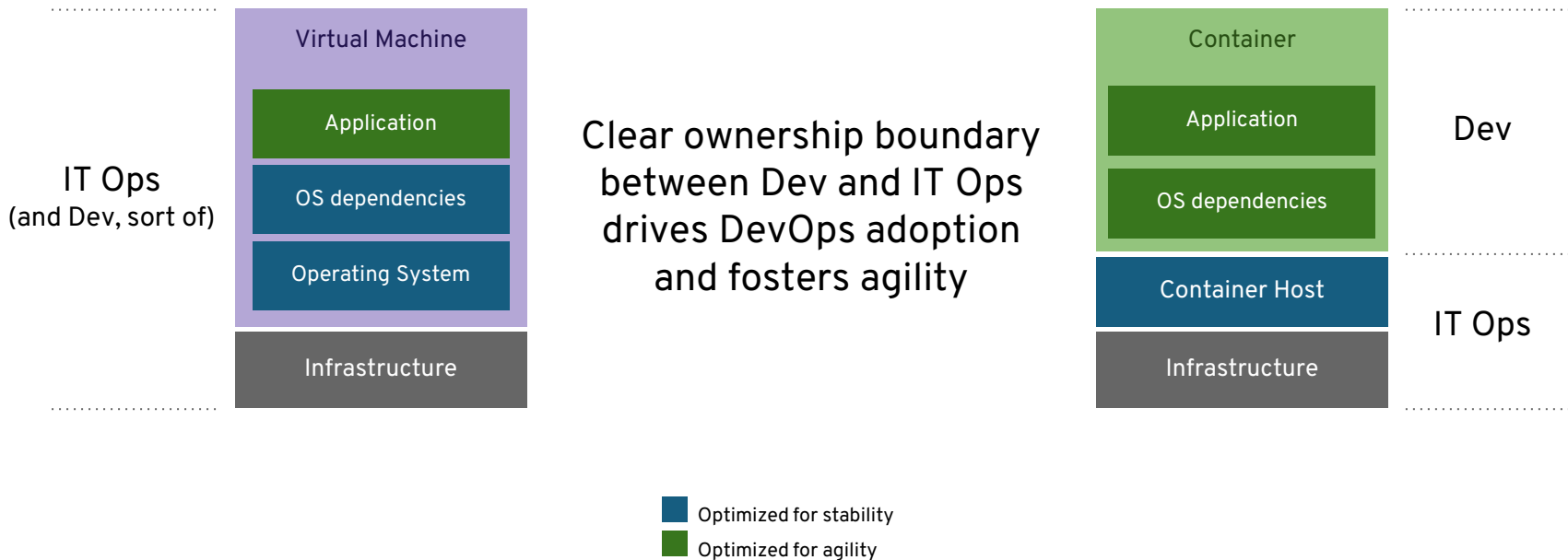


- + VM Isolation
- Complete OS
- Static Compute
- Static Memory
- High Resource Usage



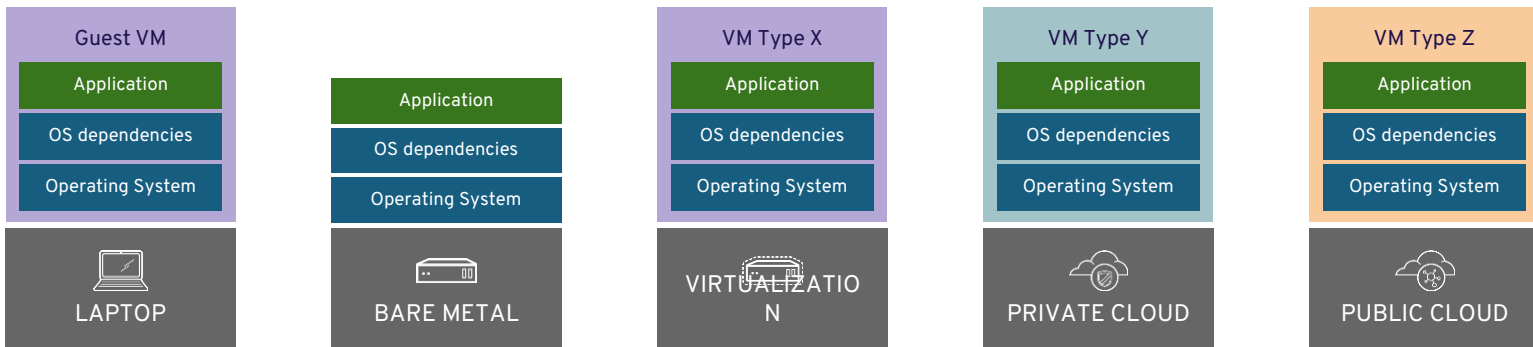
- + Container Isolation
- + Shared Kernel
- + Burstable Compute
- + Burstable Memory
- + Low Resource Usage

VIRTUAL MACHINES AND CONTAINERS



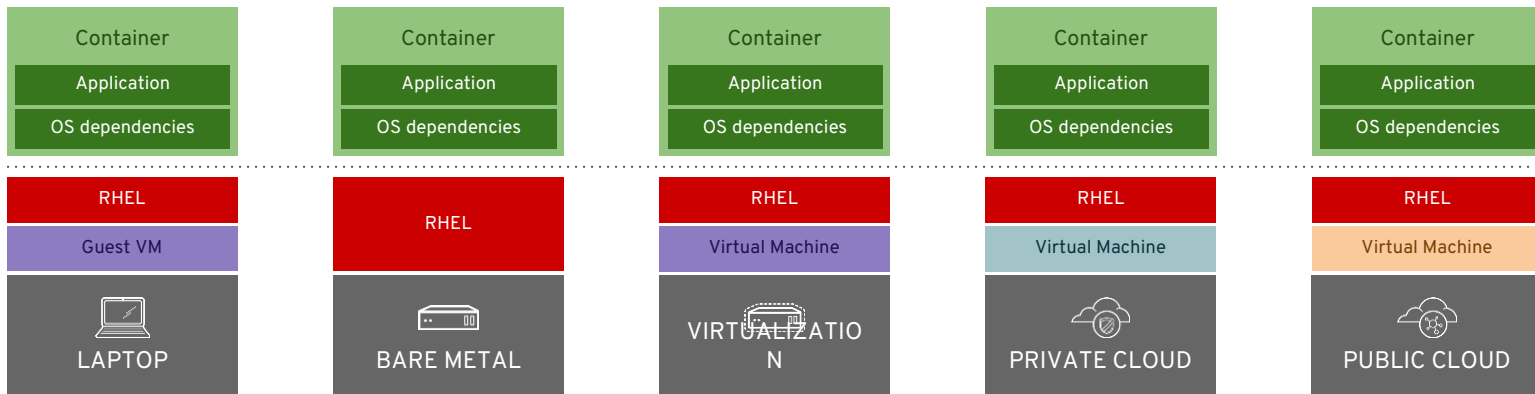
APPLICATION PORTABILITY WITH VM

Virtual machines are **NOT** portable across hypervisor and do **NOT** provide portable packaging for applications



APPLICATION PORTABILITY WITH CONTAINERS

RHEL Containers + RHEL Host = Guaranteed Portability
Across Any Infrastructure

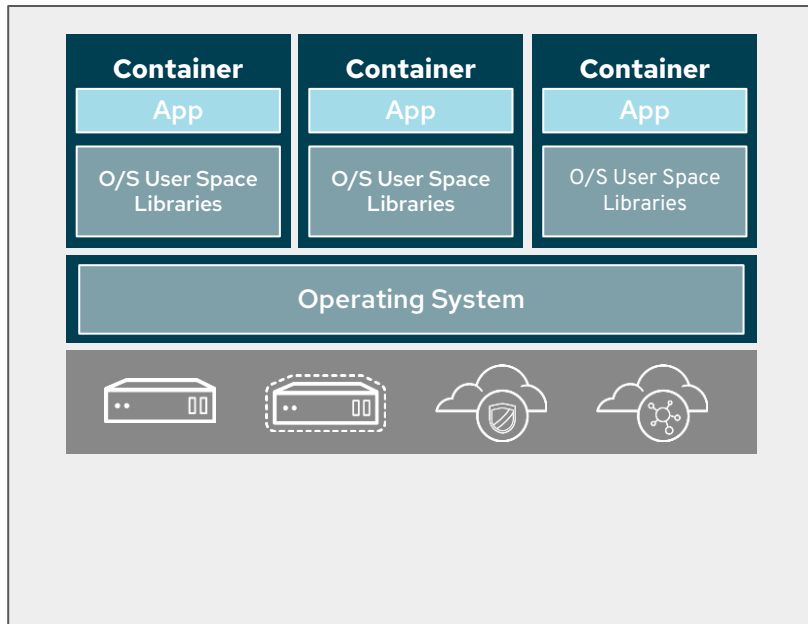


Container starts with Linux

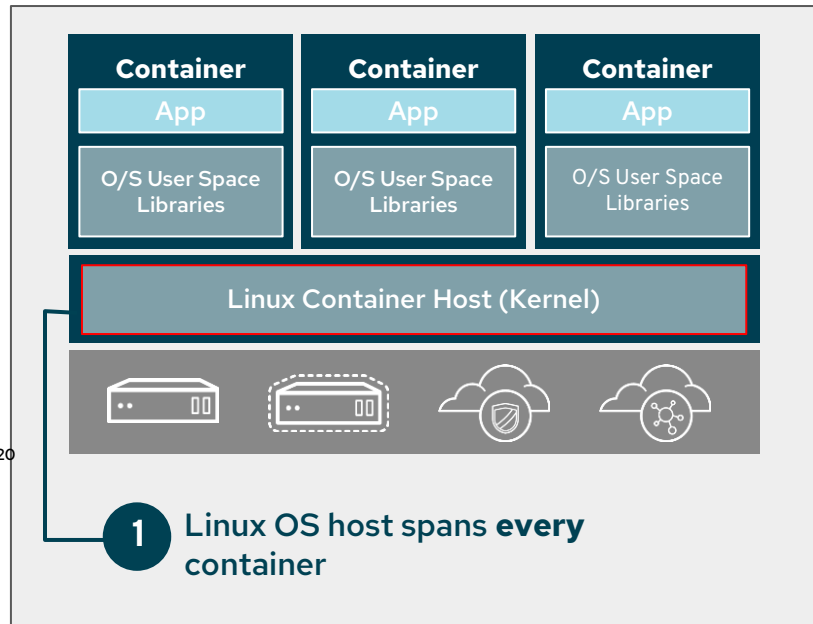
Linux and containers

What
How
Who
Why

The Linux OS matters. Choose wisely.



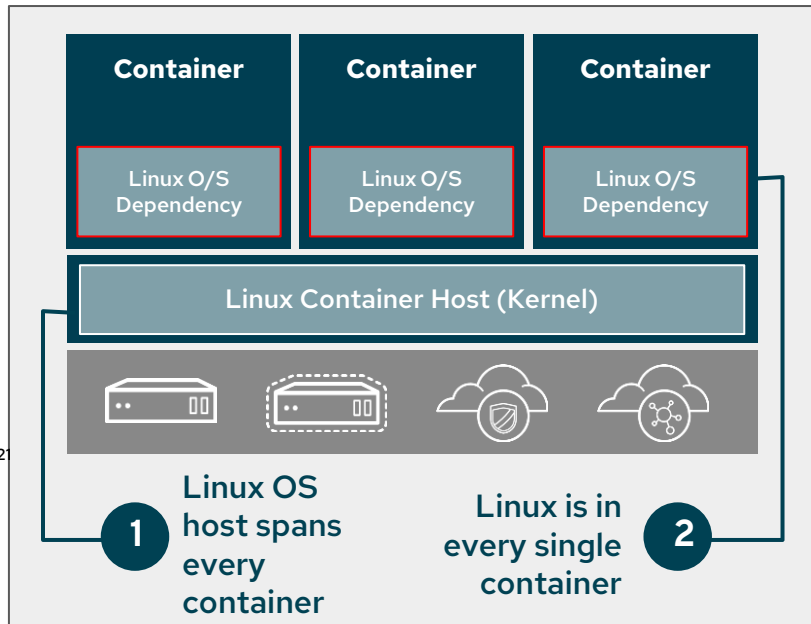
Containers start with Linux



Linux is foundational to containers

- Containers run on a Linux Container Host OS

Containers start with Linux

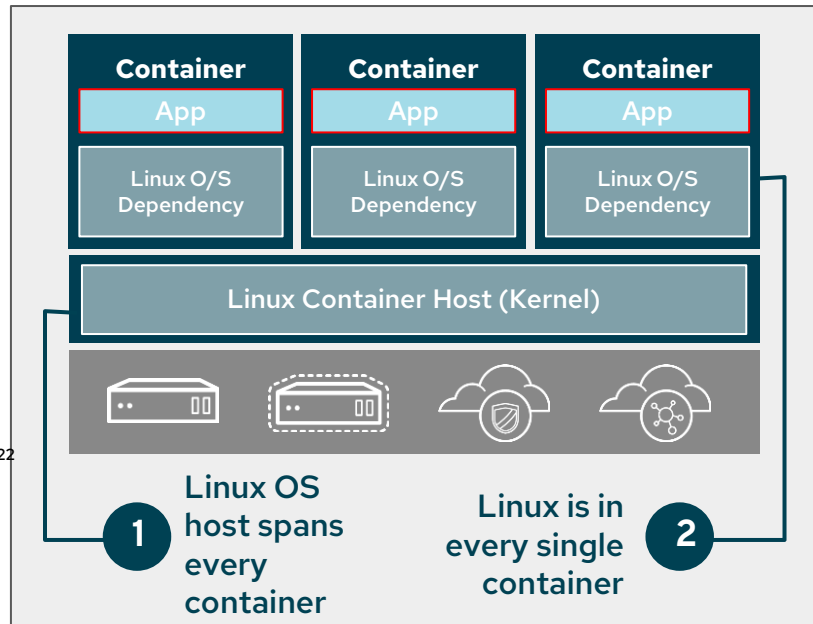


Containers depend on Linux features

- Linux (O/S User Space) is inside every container

Linux is foundational to containers

Containers start with Linux

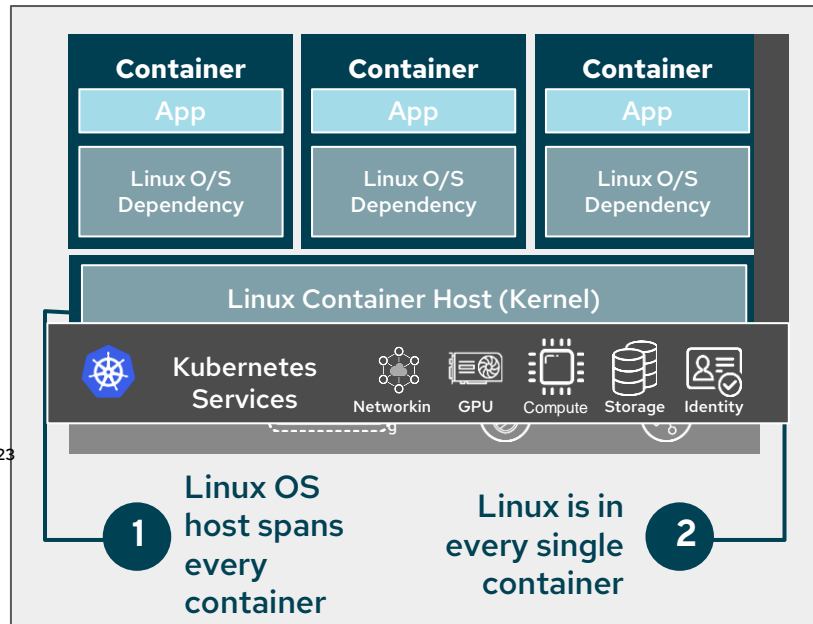


Apps in containers are running in Linux

Containers depend on Linux features

Linux is foundational to containers

Containers starts with Linux



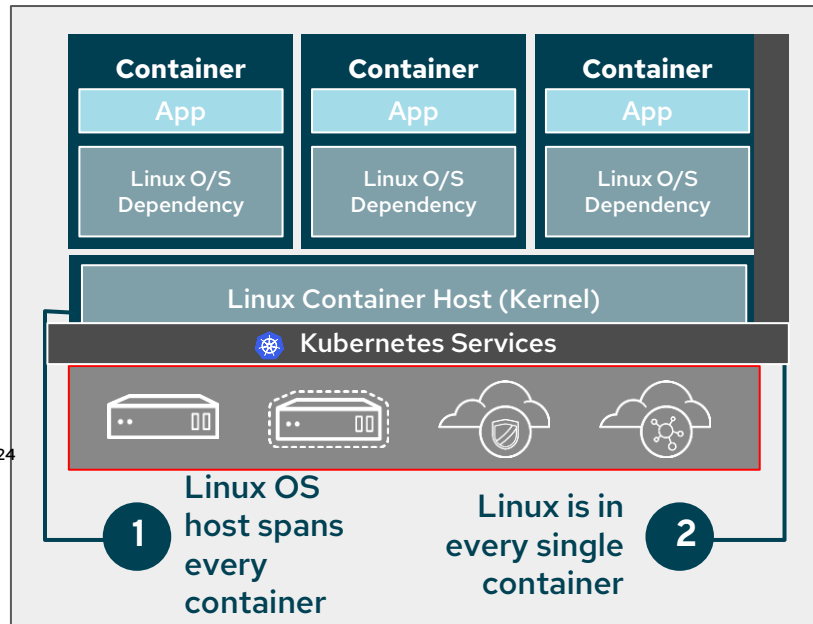
Apps in containers are running in Linux

Containers depend on Linux features

Linux is foundational to containers

Kubernetes uses Linux to manage resources

Expertise in containers is expertise in **Linux**



Apps in containers are running in Linux

Containers depend on Linux features

Linux is foundational to containers

Kubernetes uses Linux to manage resources

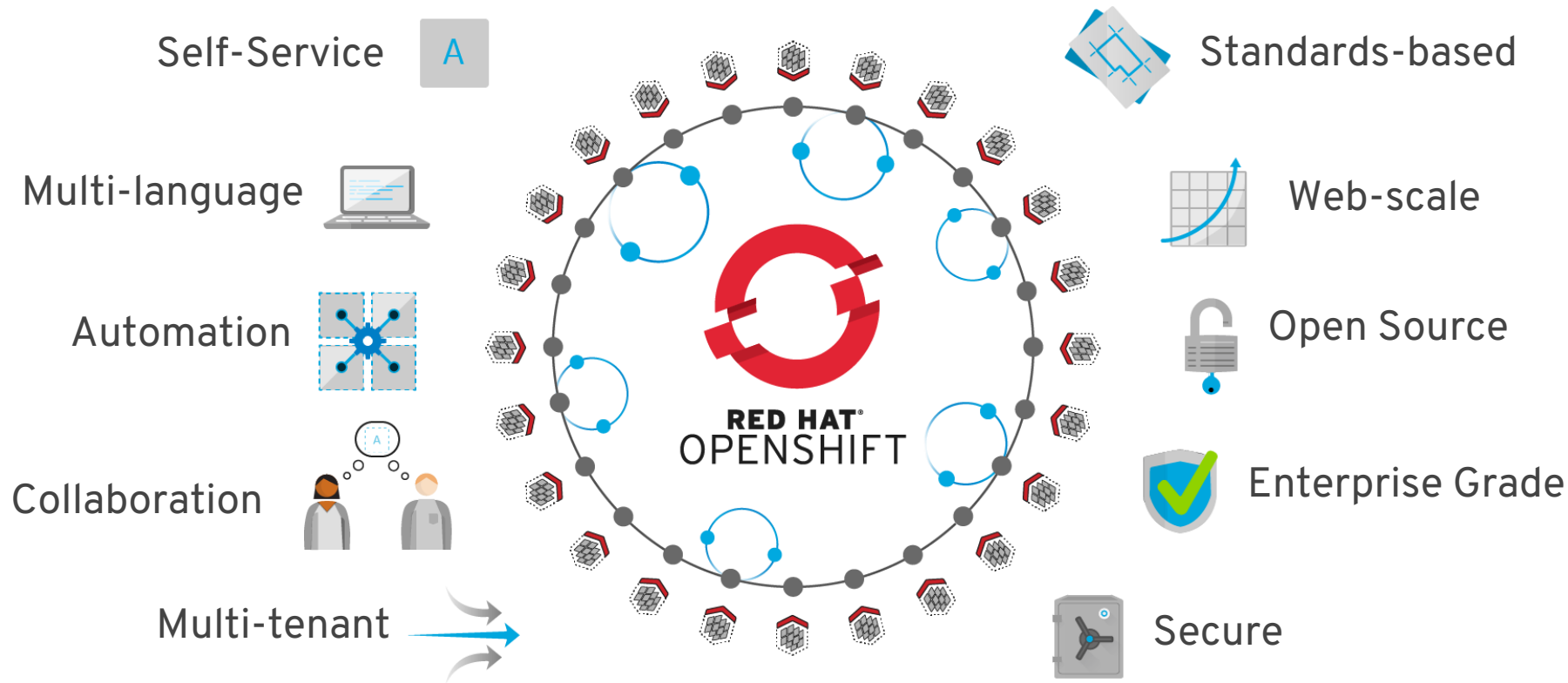
RHEL is the leading Linux for the enterprise

➤ Across all footprints from bare metal to cloud

Red Hat Openshift



Functional overview





The value of OpenShift

Foundation is Red Hat Enterprise Linux

Containers are Linux

- OpenShift built from RHEL CoreOS

Security is at the heart of the Linux platform that OpenShift is built upon

- Linux namespaces, SELinux, CGroups, and Secure Computing Mode to isolate and protect containers

Red Hat Enterprise Linux & RHEL CoreOS

Full installation integration with Kubernetes

- Immutable infrastructure is the foundation to OpenShift

Built with certified Kubernetes



Fully compliant, upstream Kubernetes

- Red Hat is one of the leading contributors to Kubernetes

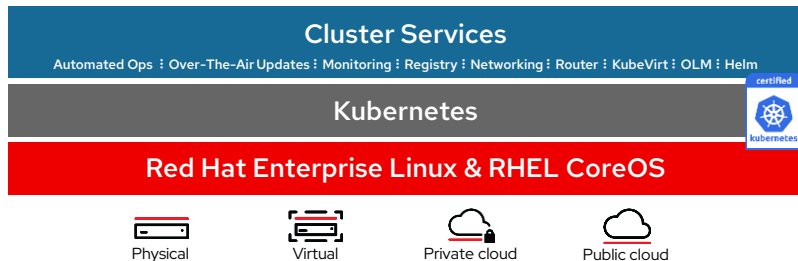
Enterprise lifecycle support

- Each release includes defect, performance, and security fixes

Fully integrated enhancements

- Deployed with the components you need to build, deploy and manage containerized applications

Automated installation on hybrid cloud infrastructures



Fully automated installation, anywhere

- Operator model maintains immutable installation and updates

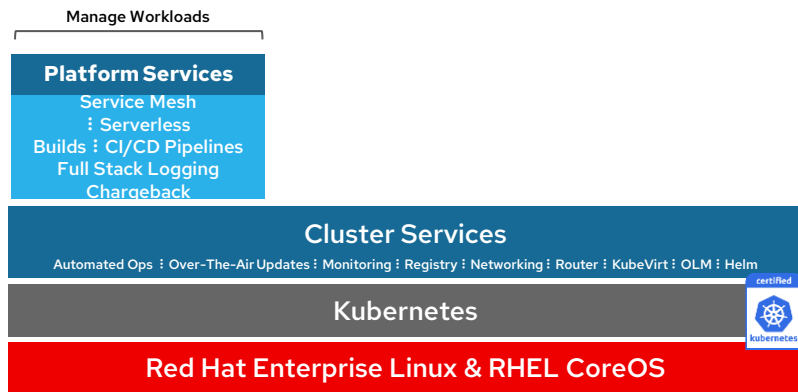
Core Cluster services deployed using operators

- Monitoring, Registry, Networking, Router, OpenShift Virtualization, Helm

Foundation of a Kubernetes installation

- Stable, secure installation to support deployment of containers

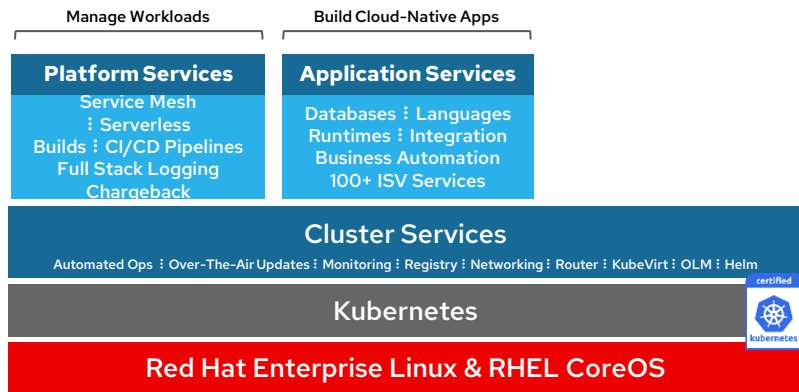
Expanded platform services capabilities included



Expanded Platform services

- OpenShift Service Mesh (Istio)
- OpenShift Serverless (Knative)
- OpenShift Pipelines (Tekton)
- Jenkins CI/CD service
- Full Stack Log Management
- Metering

Integrated services for deploying cloud-native applications

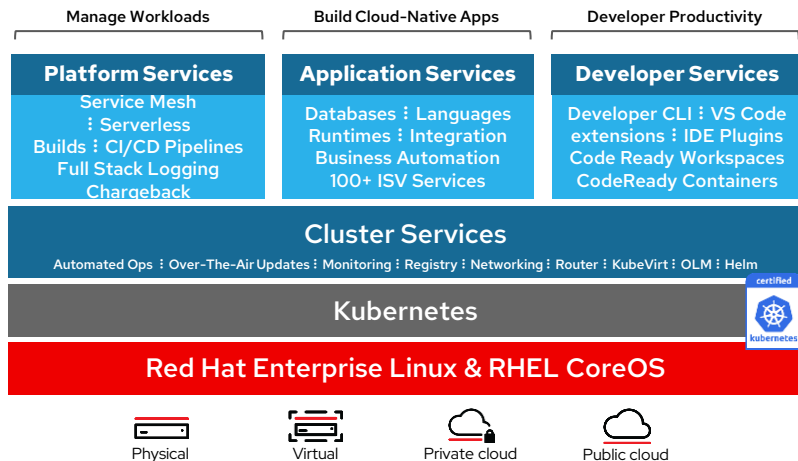


Enhanced Application services

- Supported SCL image runtimes for popular programming languages, runtimes and databases (Java, Tomcat, Python, Node.js, Postgres, Ruby, MariaDB & more)
- Ability to add advanced middleware services via Red Hat and IBM (requires additional add-on bundles)
- Certified Operator-based services from our ISV ecosystem

OpenShift

Platform of choice for cloud-native developers



Integrated Developer services

- OpenShift Developer Console and `odo` CLI to simplify developer usage
- CodeReady Workspaces on OCP for cloud native app dev & collaboration
- CodeReady Containers to provide an OCP local experience on your laptop
- OCP IDE plugins for popular IDEs like VSCode and IntelliJ



Big ideas drive... business innovation

.....

Every organization in every geography and in every industry can innovate and create more customer value and differentiation with open source technologies and an open culture.



Red Hat OpenShift is for every innovator



Ready for IT operators

- ▶ Automate processes. Reduce complexity.
- ▶ Operate more securely from end to end.



Empowering developers

- ▶ Code fast with familiar tools.
- ▶ Rapidly deliver without roadblocks.



Proven for business leaders

- ▶ Choose a platform to power business today.
- ▶ Create a cloud strategy for the future.

Delivering innovation that can transform your business



100x

Cost reduction for
operating infrastructure



5x

Faster revenue growth
attributed to enabling developer
velocity



Automated, full
stack installation



Seamless Kubernetes
deployments



Auto-scaling
of resources

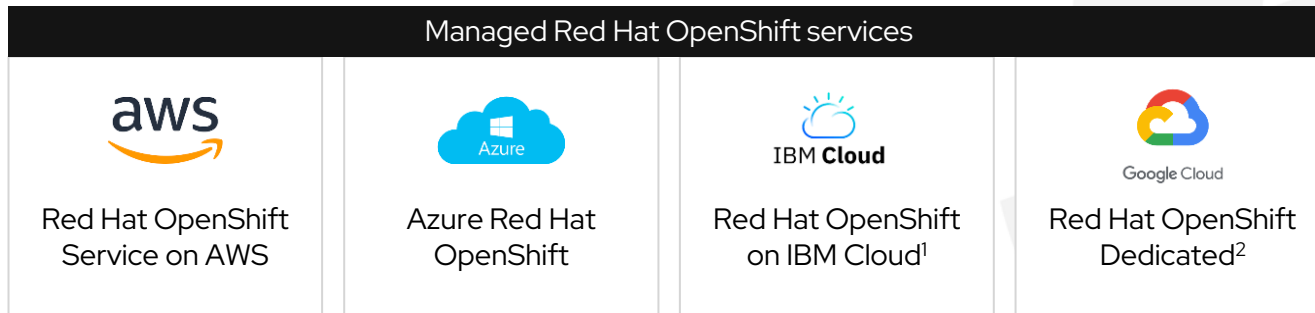


One-click
life-cycle management

Supporting hybrid usage and buying patterns

A consistent platform no matter how or where you run

Start quickly, we
manage it for you



You manage it, for
control and flexibility



Your choice of OpenShift

Self-managed Red Hat OpenShift editions



Red Hat OpenShift Kubernetes Engine

Essential enterprise
Kubernetes Infrastructure

Includes:

- Enterprise Kubernetes runtime
- Red Hat Enterprise Linux CoreOS immutable container OS
- Administrator console
- OpenShift Virtualization



Red Hat OpenShift Container Platform

Opinionated application
development platform

Adds:

- Developer console
- Log management and metering/cost management
- Red Hat OpenShift Serverless (Knative)
- Red Hat OpenShift Service Mesh (Istio)
- Red Hat OpenShift Pipelines & Red Hat OpenShift Gitops (Tekton, ArgoCD)



Red Hat OpenShift Platform Plus

Manageability and consistency across
hybrid and multi cloud with advanced
security for DevSecOps

Adds:

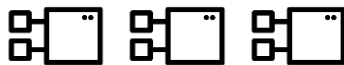
- Red Hat Advanced Cluster Management for Kubernetes
- Red Hat Advanced Cluster Security for Kubernetes
- Red Hat Quay

Delivering consistency and flexibility

Traditional apps



Cloud-native apps



AI/ML, Functions



Communities of Innovation | Ecosystems of Solutions



Secure & Automated Infrastructure and Operations



Physical



Virtual



Private cloud



Public cloud



Edge

With a broad partner ecosystem



And the services and partners to guide you to success

RED HAT OPEN INNOVATION LABS



EXPERIMENT

Rapidly build prototypes, do DevOps, and be agile.



CATALYZE INNOVATION

Bring modern application development back to your team.



IMMERSE YOUR TEAM

Work side by side with experts in a residency-style engagement.

RED HAT CONTAINER ADOPTION PROGRAM



FRAMEWORK FOR SUCCESSFUL CONTAINER ADOPTION AND I.T. TRANSFORMATION

Mentoring, training, and side-by-side collaboration

SYSTEM INTEGRATORS

Or work with our ecosystem of certified systems integrators, including...



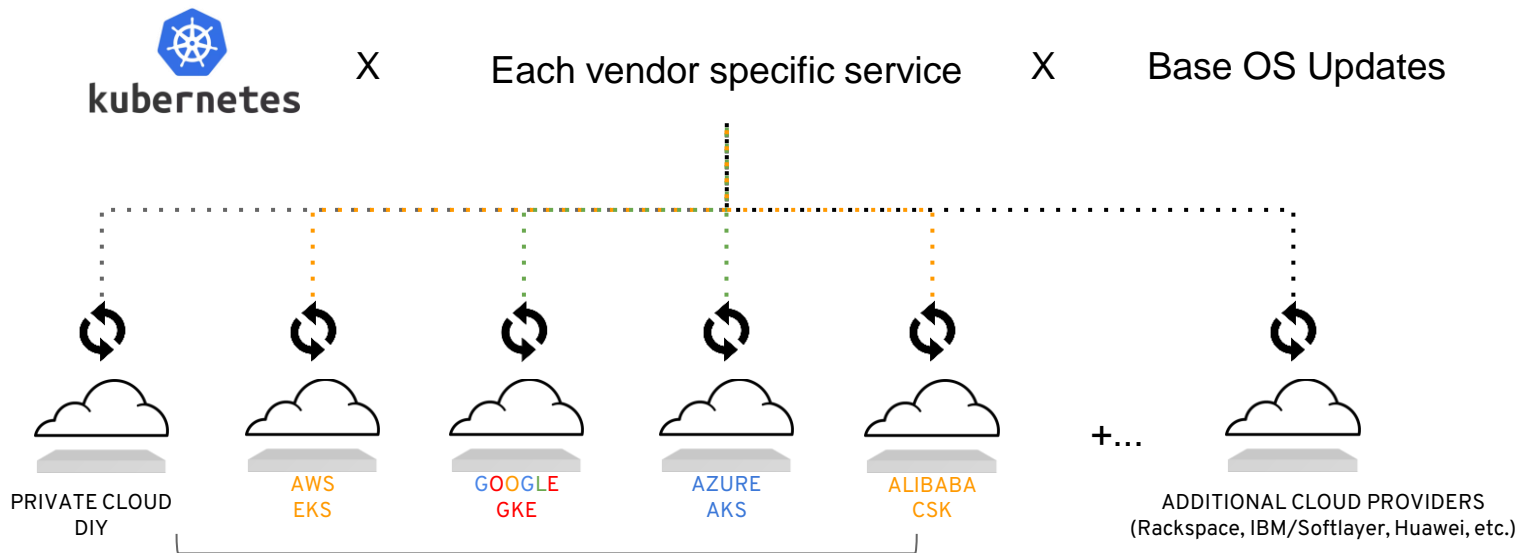
Bringing results to customers across industries and use cases



How is OpenShift different
from other Kubernetes
offerings like AKS, EKS or
even vanilla/DIY options?

How does it look without OpenShift

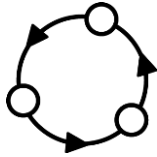
Must manage against lowest common denominator in a rapidly changing ecosystem



No compatibility or version guarantees - each version will be unique, & evolve uniquely

The vanilla Kubernetes Myth

Why IT shops swoon over “Vanilla” Kubernetes and its perceived value



Ultimate portability across Kubernetes Clusters



No “vendor lock-in”



Always on latest version

The vanilla Kubernetes reality

“Vanilla” Kubernetes is not really vanilla at all



Every vendor configures their Kubernetes distribution differently



Every vendor operates Kubernetes differently; this matters



No vendor is in lockstep with the latest upstream

* <https://medium.com/@jzelinskie/youre-not-running-vanilla-kubernetes-2f2359666bf9>

Database

Streaming & Messaging

Application Definition & Image Build

Continuous Integration & Delivery

Platform

Observability and Analysis

App Definition and Development



Orchestration & Management



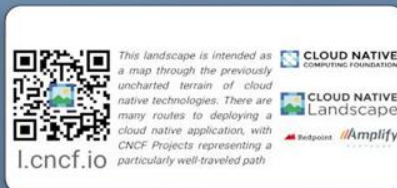
Runtime



Provisioning

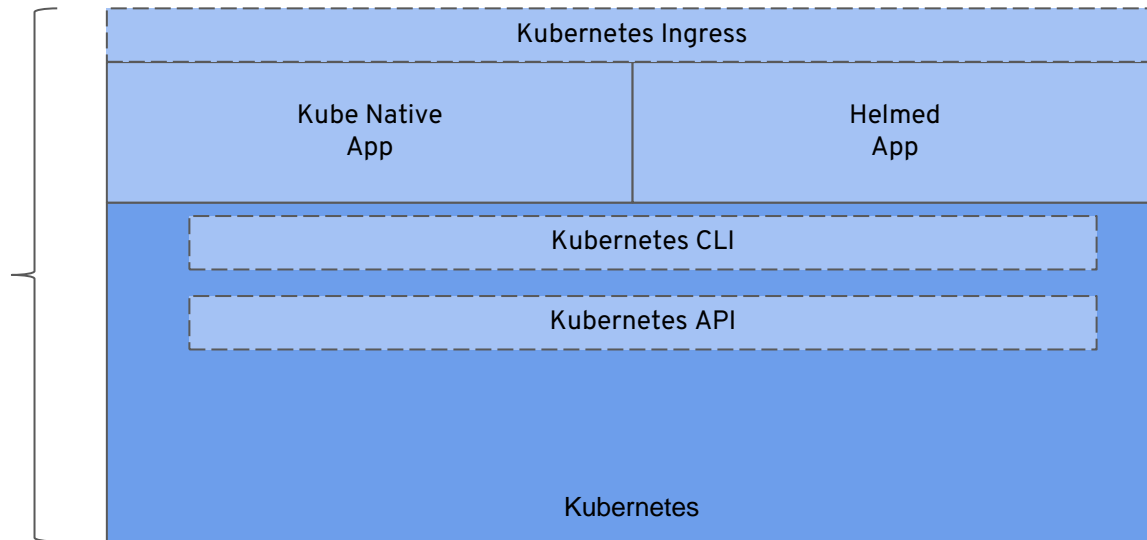


Cloud



Upstream Kubernetes

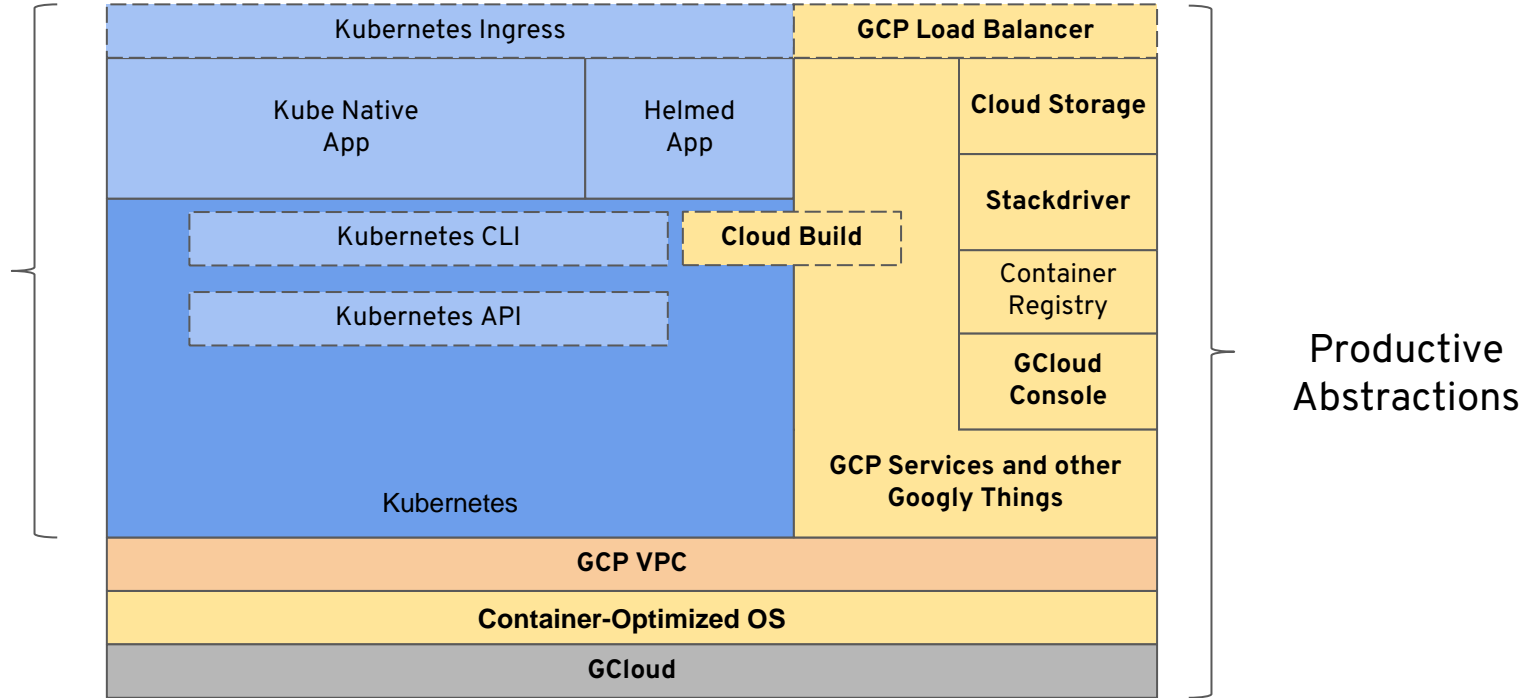
Upstream is closest to “Vanilla”



* Not comprehensive. Not even close.

GKE

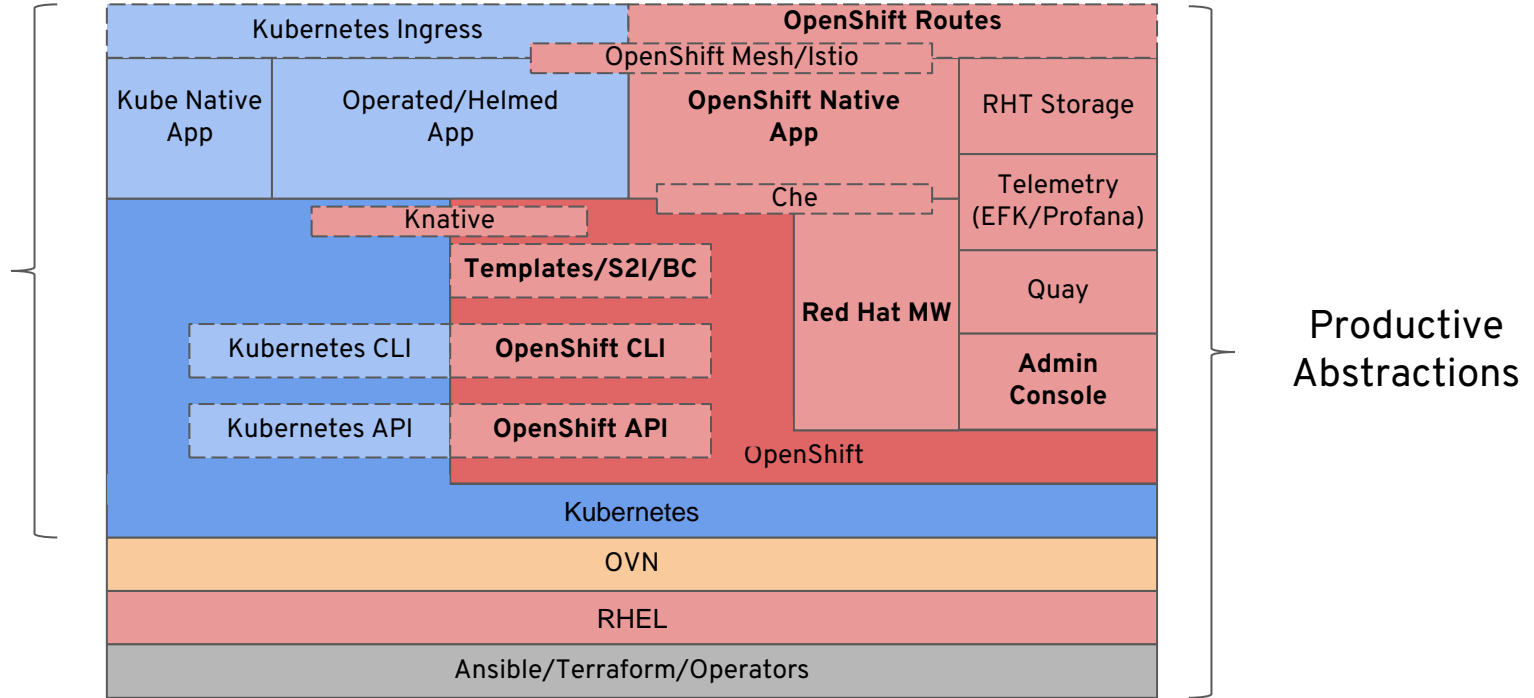
Even one of the Kube founders is not “Vanilla”



* Not comprehensive. Not even close. GCP only APIs in **bold**.

OpenShift

Certified “Pure” Kubernetes and productive abstractions



* Not comprehensive. Not even close. Red Hat or OpenShift only APIs in **bold**.



OpenShift managed services: AWS, Azure, IBM Cloud

Red Hat OpenShift Everywhere

A consistent platform no matter how or where you run

Red Hat OpenShift Managed Services

Start quickly, we manage it for you



Red Hat OpenShift
Service on AWS



Google Cloud

Red Hat OpenShift
Dedicated



Azure Red Hat
OpenShift



IBM Cloud

Red Hat OpenShift on
IBM Cloud

Managed by Red Hat

Red Hat OpenShift Container Platform

You manage it, for control and flexibility



Red Hat
OpenShift
Container Platform

On public cloud, or on-
premises on
physical or virtual
infrastructure¹

Red Hat OpenShift Managed Services Features



Self-Service Deployment

- Provision fully-managed clusters in minutes
- Use OpenShift Cluster Manager for creating & viewing clusters
- Flexible consumption-based pricing
- Scale clusters on demand



Support & Security

- Fully monitored, managed and updated from infrastructure to daily operations
- Managed upgrades & patching
- Financially backed 99.95% SLA
- 24x7 support from industry leading SRE team
- Enterprise-grade security & compliance



Service/Tools Integration

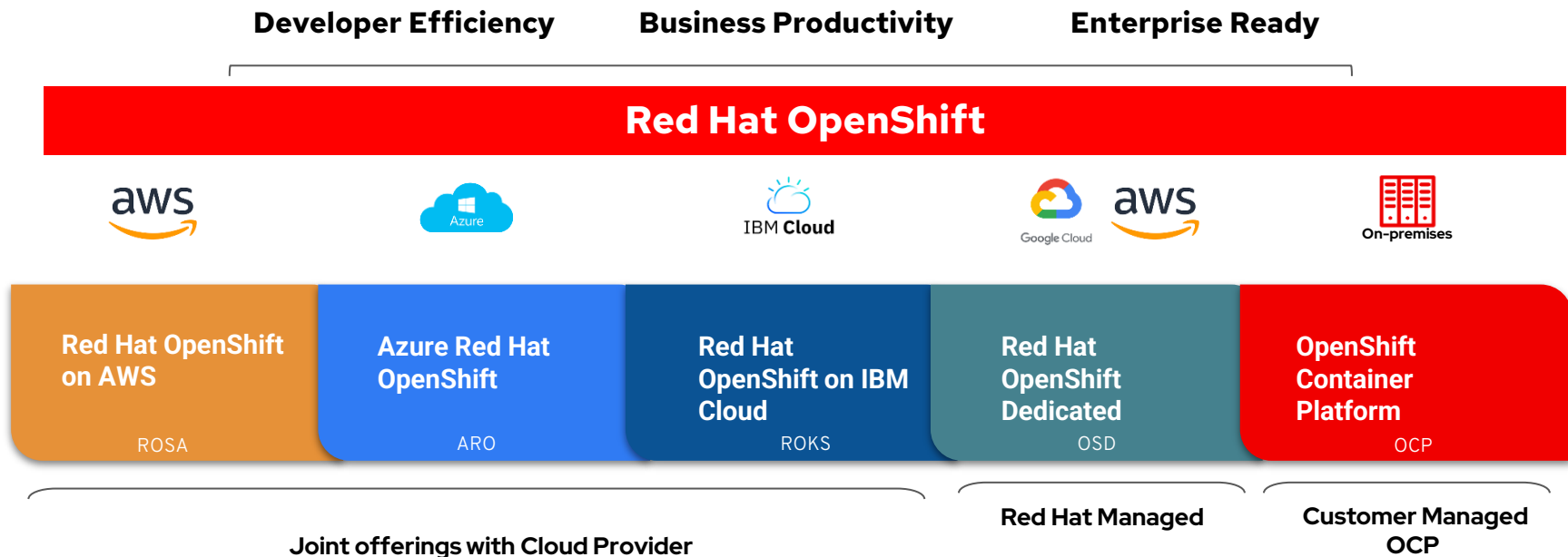
- Cluster services such as monitoring, logging, networking, etc. available
- Native service integration with Azure (ARO) & AWS (ROSA)
- Developer productivity tools; Service Mesh, CodeReady Workspaces, serverless etc.



Cloud Choice & Flexibility

- Managed Kubernetes offerings on major public clouds
- Native joint offerings on Azure, AWS & IBM Cloud
- Consistent OpenShift experience across clouds
- Lower "ramp-up" by using familiar cloud technology

OpenShift offers the broadest set of hybrid cloud services



Offered as a Native Console offering on equal parity with cloud provider
Kubernetes service

or

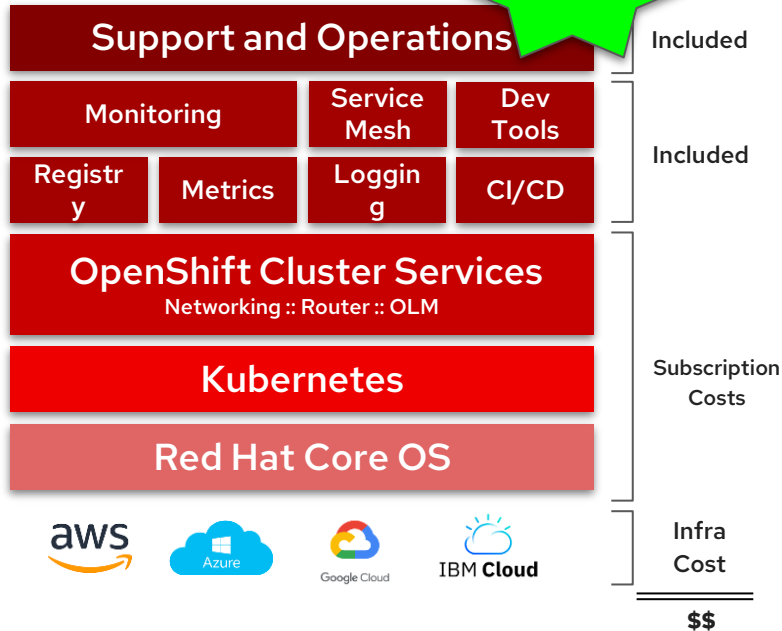
Customer Managed OCP

Managed OpenShift or Kubernetes stack comparison

Components purposely engineered to work together

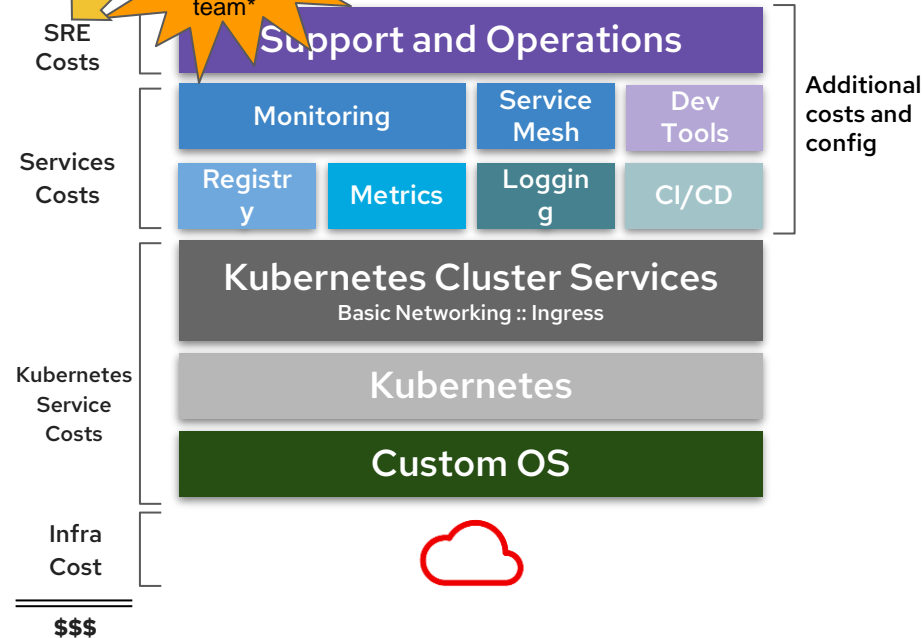
Red Hat OpenShift Managed

SRE team included



Kubernetes Services

Managed by your team*

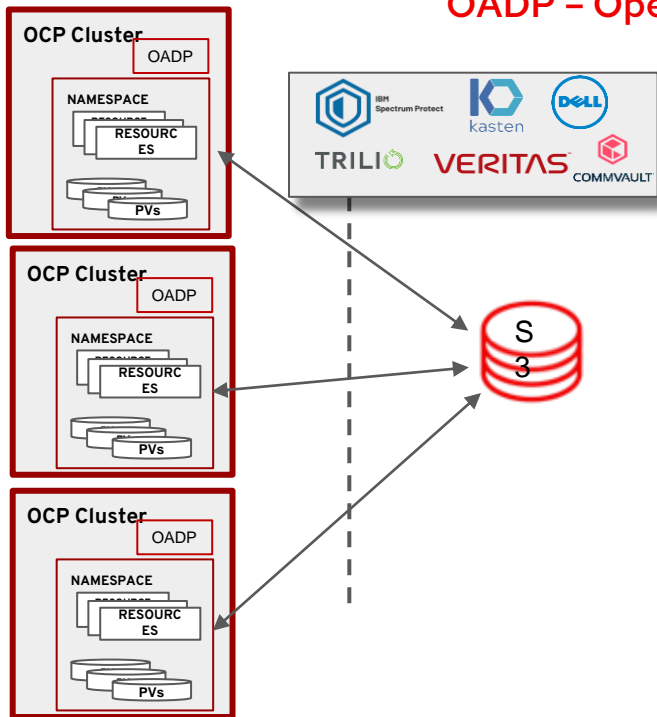


*Operations: Conservative estimate of 0.5 FTE

OADP

OpenShift Backup Solution

OADP – OpenShift API for Data Protection

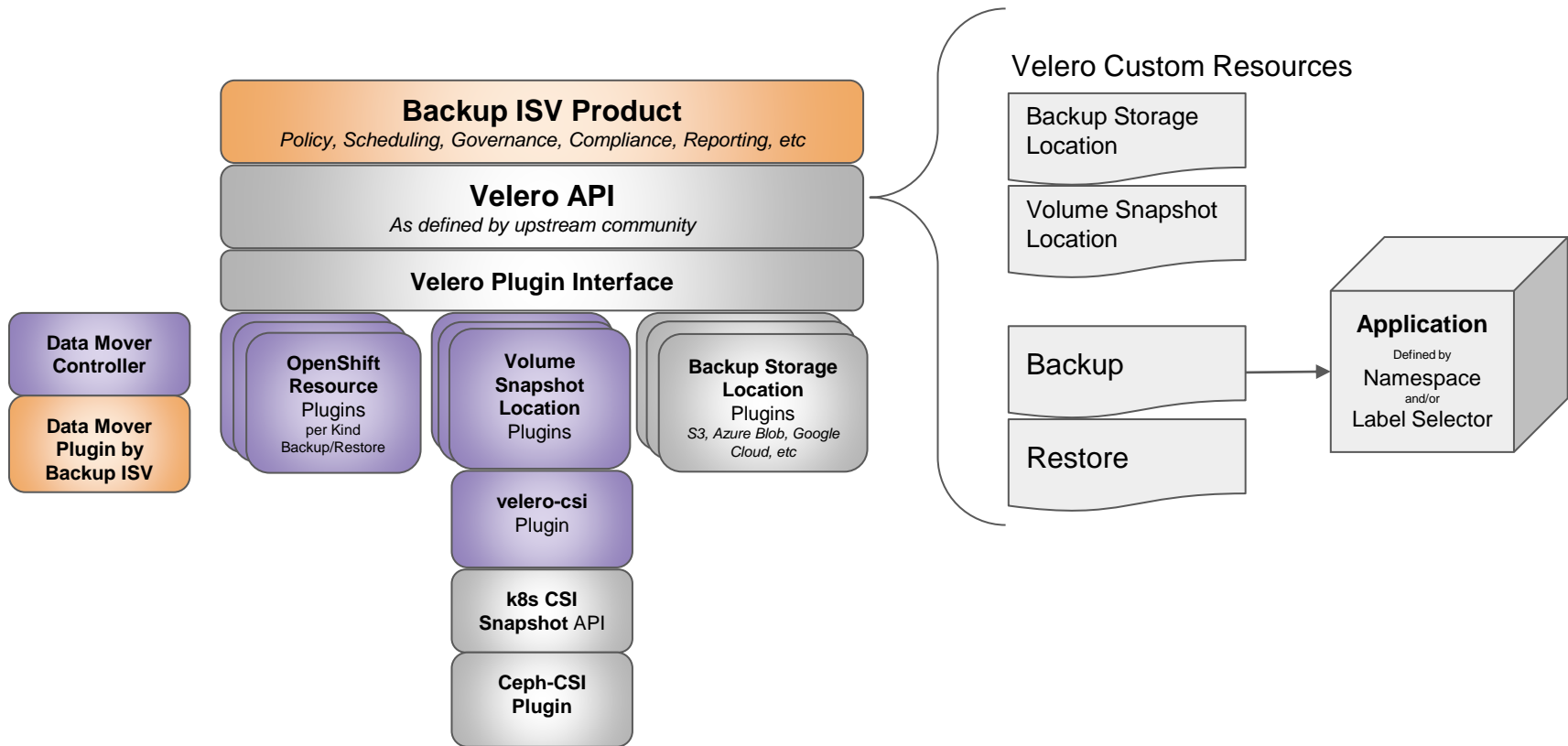


- ▶ Application granular, cluster consistent backups with OADP
- ▶ OpenShift App backup protection with eco-system of broad Backup Partner ISV partners
- ▶ Snapshots with CSI interface from ODF ensures backups with open standards

Architecture

OpenShift API Data Protection (OADP) Architecture

CONFIDENTIAL designator



OpenShift 4 Installation

Two new paradigms
for deploying clusters

Installation Paradigms

OPENSIFT CONTAINER PLATFORM

Full Stack Automated

Simplified opinionated “Best Practices” for cluster provisioning

Fully automated installation and updates including host container OS.



Pre-existing Infrastructure

Customer managed resources & infrastructure provisioning

Plug into existing DNS and security boundaries



HOSTED OPENSIFT

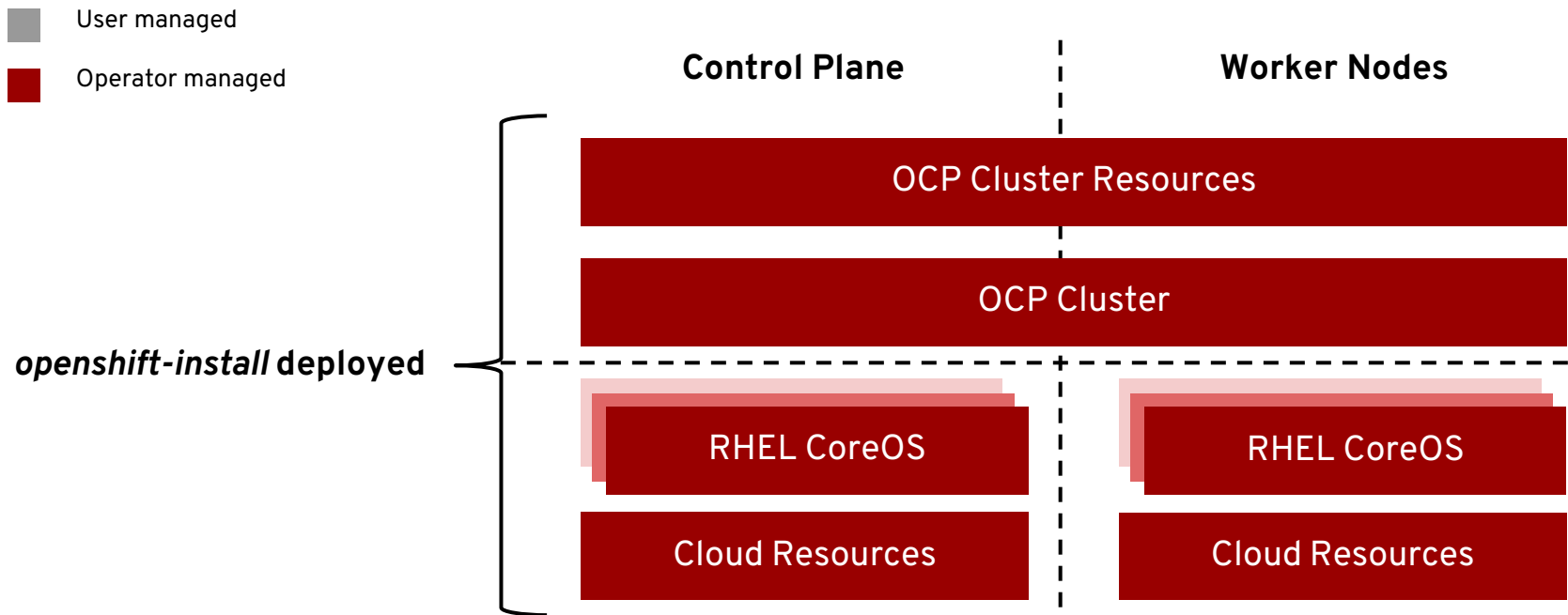
Azure Red Hat OpenShift

Deploy directly from the Azure console. Jointly managed by Red Hat and Microsoft Azure engineers.

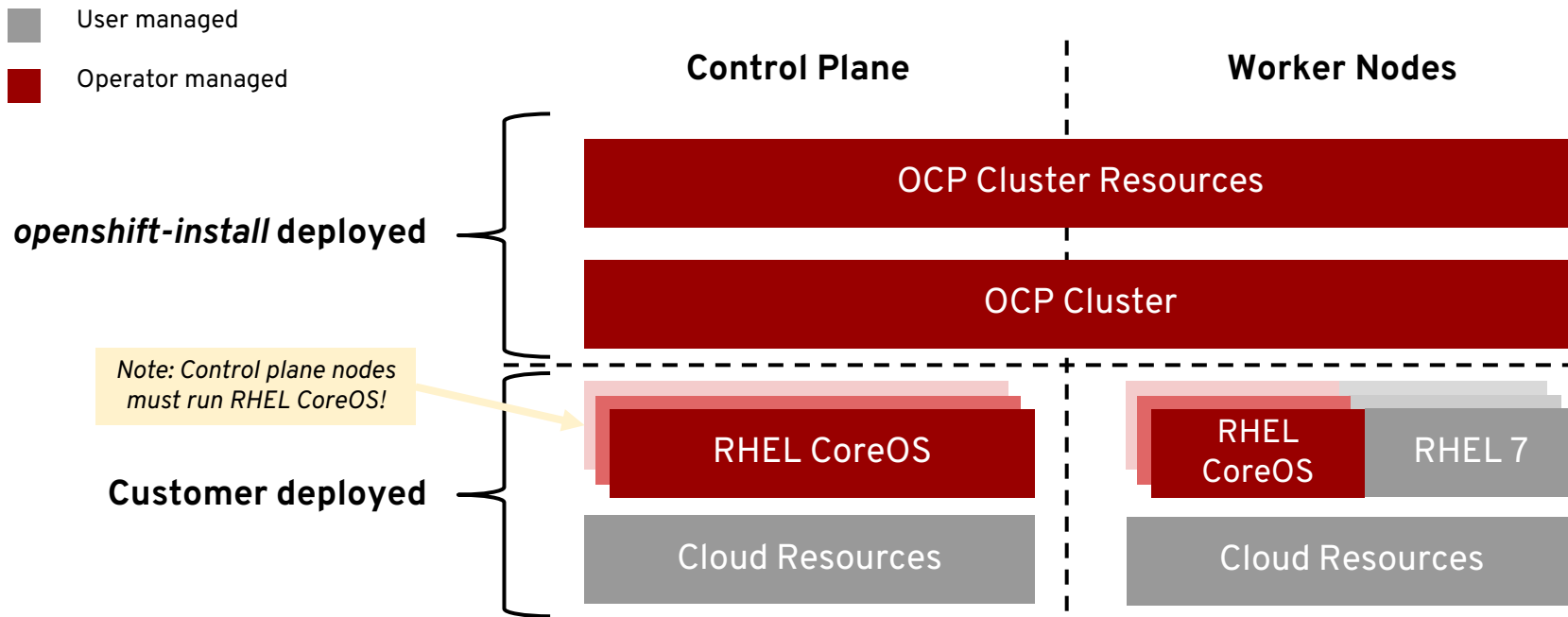
OpenShift Dedicated

Get a powerful cluster, fully Managed by Red Hat engineers and support.

Full-stack Automated Installation



Pre-existing Infrastructure Installation



Comparison of Paradigms

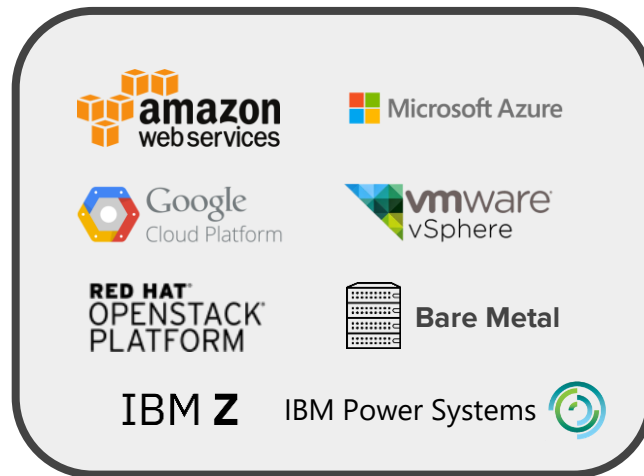
	Full Stack Automation	Pre-existing Infrastructure
Build Network	Installer	User
Setup Load Balancers	Installer	User
Configure DNS	Installer	User
Hardware/VM Provisioning	Installer	User
OS Installation	Installer	User
Generate Ignition Configs	Installer	Installer
OS Support	Installer: RHEL CoreOS	User: RHEL CoreOS + RHEL 7
Node Provisioning / Autoscaling	Yes	Only for providers with OpenShift Machine API support

Supported Infrastructures for Red Hat OpenShift 4.6

Full Stack Automation (IPI)



Pre-existing Infrastructure (UPI)



OpenShift installation methods have more in common than differences

UPI is the most flexible method and only requires one optional extra service for automation

01 OpenShift Installation Requirements

	UPI Installation	IPI Installation	Assisted Installer
DHCP Services	Optional but recommended	Required	Required
DNS	Since 4.8, only API and Ingress needed	Only API and Ingress needed	Only API and Ingress needed
Load Balancer	External	Internal by default, can be external	Internal by default, can be external
IP Address Requirements	One per host One per LB VIP	One per host One per LB VIP	One per host One per LB VIP
PXE Infrastructure	Optional but recommended	PXE on Bootstrap or VirtualMedia on iDRAC 9 or iLO 5	Not required, can use any available boot media
Hybrid Deployments	Yes, out-of-box	Only the targeted platform	Yes (current TP)
Disconnected or Air-gapped	Yes (Since 4.2)	Yes (Since 4.7)	Only with Single Node OpenShift

UPI (User Provisioned Infrastructure)

Flexible Installation Methods and Platform Support

UPI installation is not the oldest but possibly the most common installation type for customers today. Why this installation method may be preferred can be related to either constraints or benefits.

- ▶ Supports manual, semi-automated, and fully automated installations
- ▶ Treats all bare metal hosts and virtual machines equally
- ▶ Configured using MachineConfigs and MachineConfigPools
- ▶ Differs only in the DHCP configuration and PXE services
- ▶ Since 4.5 supports MachineSet automation with UPI deployments

IPI (Installer Provisioned Infrastructure)

Partial or Complete Infrastructure Automation

When deploying to a single platform, IPI installation makes the most and best use of the hardware, cloud, or hypervisor features. This method can be faster using more existing infrastructure and management methods.

- ▶ Generally supports one and only one platform or hardware type
- ▶ Works best with platform-specific features on supported platforms
- ▶ Uses templates or images to deploy and scale on demand
- ▶ In a multi-vendor strategy, best to deploy different clusters to different platforms or use a UPI approach to automation

Assisted Installer

Technology Preview in 4.7 through 4.9

The guided web interface removes the need for a bastion, provisioner, bootstrap, and other nodes (ephemeral, shared, or otherwise) and uses generated install media for discovery and installation.

- ▶ Best differentiated by the ISO generation and Web UI for installation
- ▶ Currently supports only connected installations with exception of Single Node OpenShift with a provision in-place installer image
- ▶ For on-demand installations, has very few on-site prerequisites.
- ▶ Presents similarly to an IPI installation without tight platform

Assisted Installer

Technology Preview in 4.7 through 4.9

The guided web interface removes the need for bastion, provisioner, bootstrap, and other nodes and uses generated installation media for discovery and point-and-click installation.

- ▶ Best differentiated by the ISO generation and Web UI for installation
- ▶ For on-demand installations, has very few on-site prerequisites
- ▶ After installation, supported as a bare metal IPI installation
- ▶ Currently supports only connected installations due to the interface and images being hosted by Red Hat today for developer preview

Suggested Installation Methods

UPI and IPI are not mutually exclusive

UPI is recommended for PoCs and installations that cannot meet the automation requirements or use external orchestration and automation

- ▶ UPI supports physical media installations and configurations for static machine addressing
- ▶ Existing VM or Bare Metal automation can work with UPI installations quite well
- ▶ Future flexibility for hybrid deployments or multi-vendor support within the same cluster

IPI can be a powerful alternative when there is no existing infrastructure automation or blockers to meet the preferred requirements.

- ▶ Automation can cover the entire lifecycle of a supported platform deployment
- ▶ Built-in conveniences reduce dependencies on external infrastructure
- ▶ One can move between installation methods freely when and where it makes sense



OpenShift 4 Architecture

your choice of infrastructure

COMPUTE

NETWORK

STORAGE

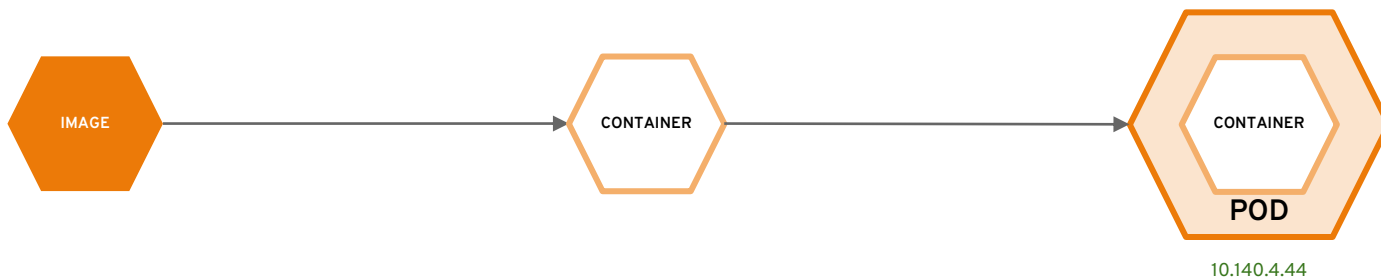
workers run workloads



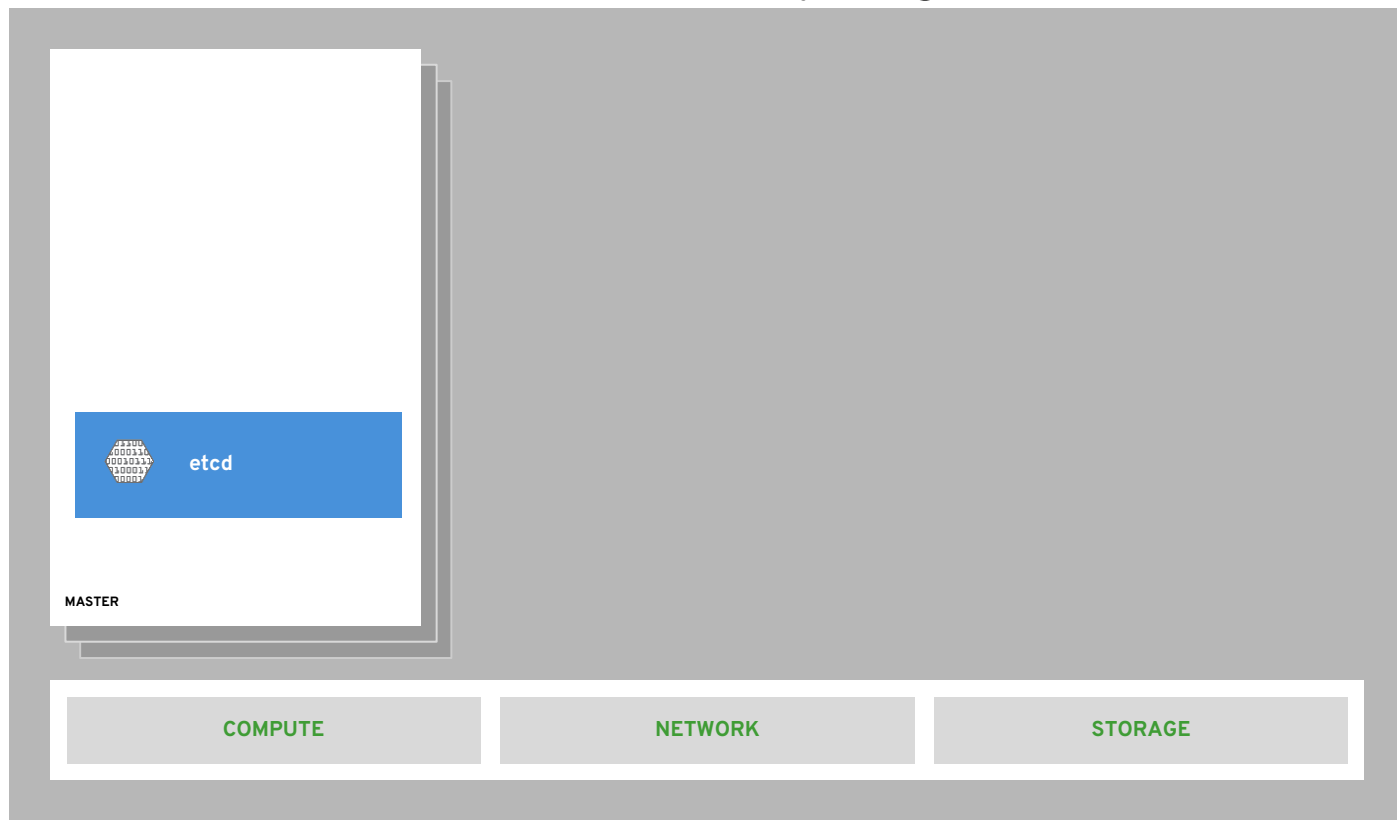
masters are the control plane



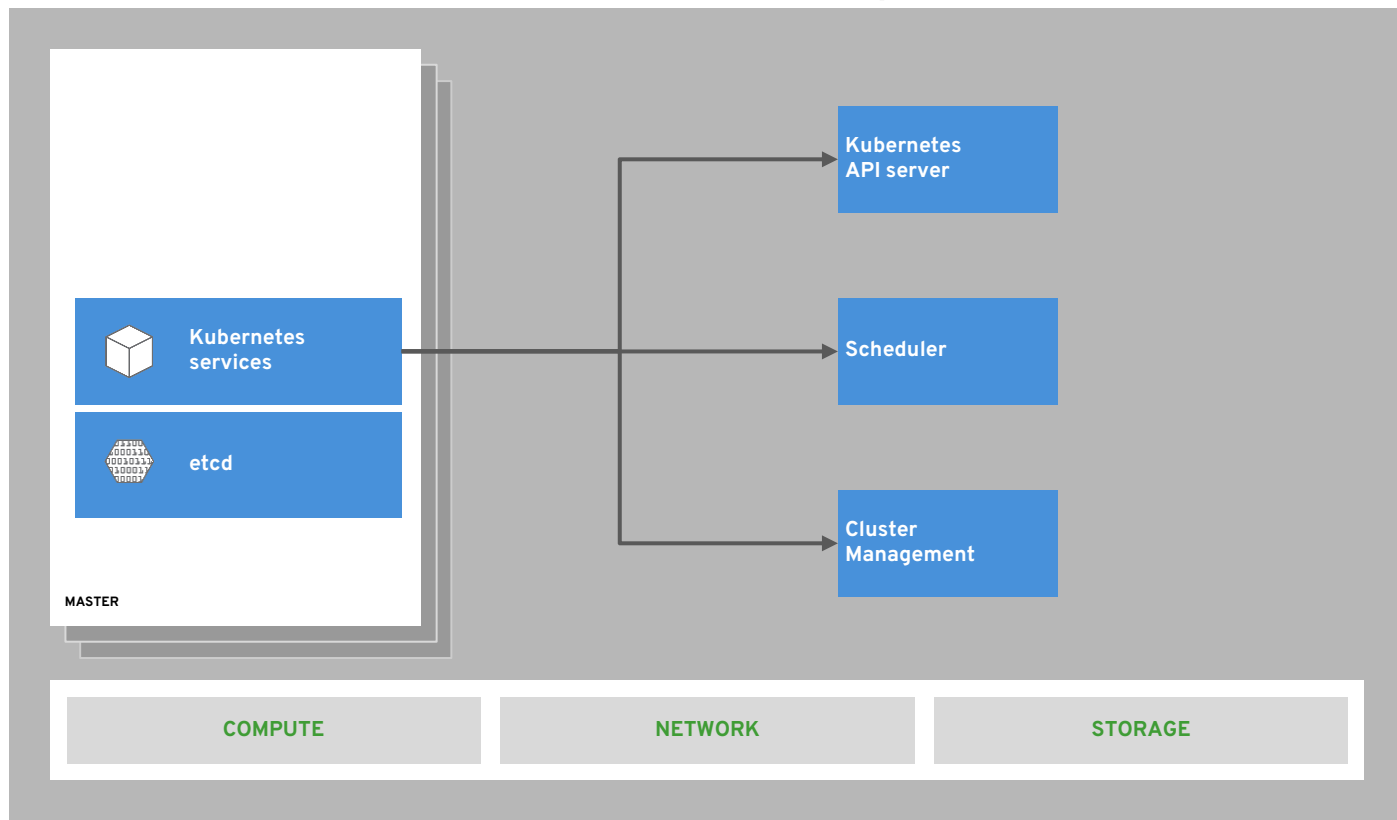
everything runs in pods



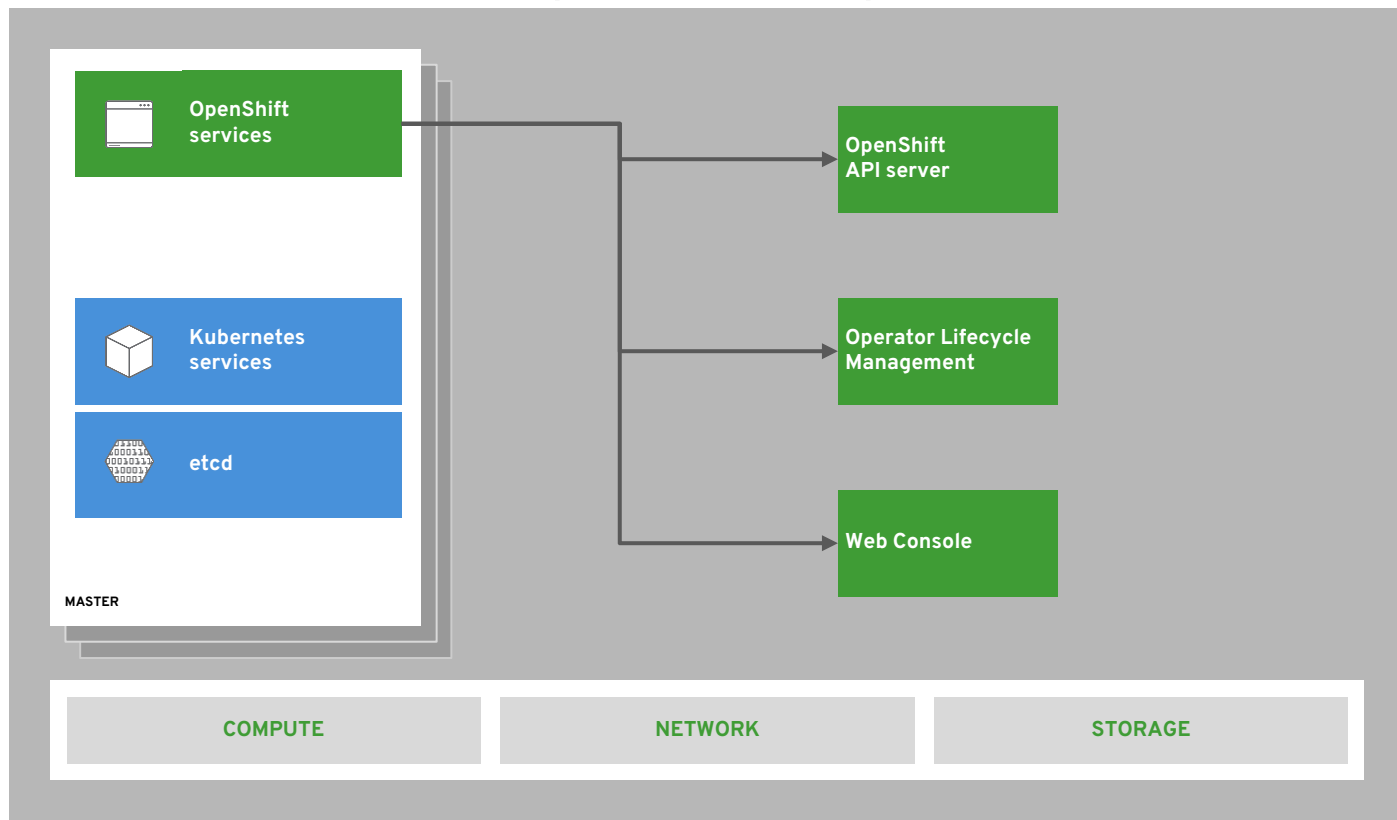
state of everything



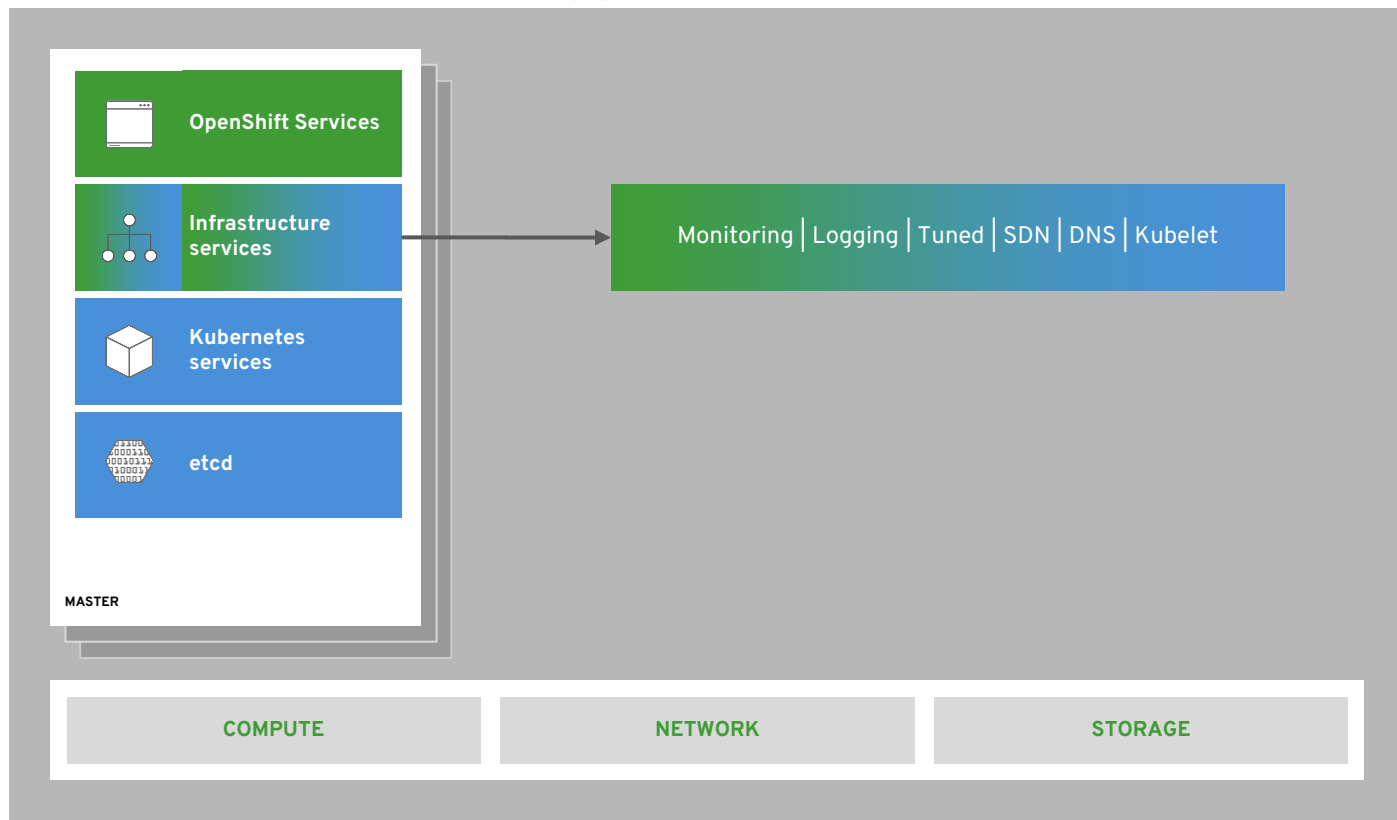
core kubernetes components



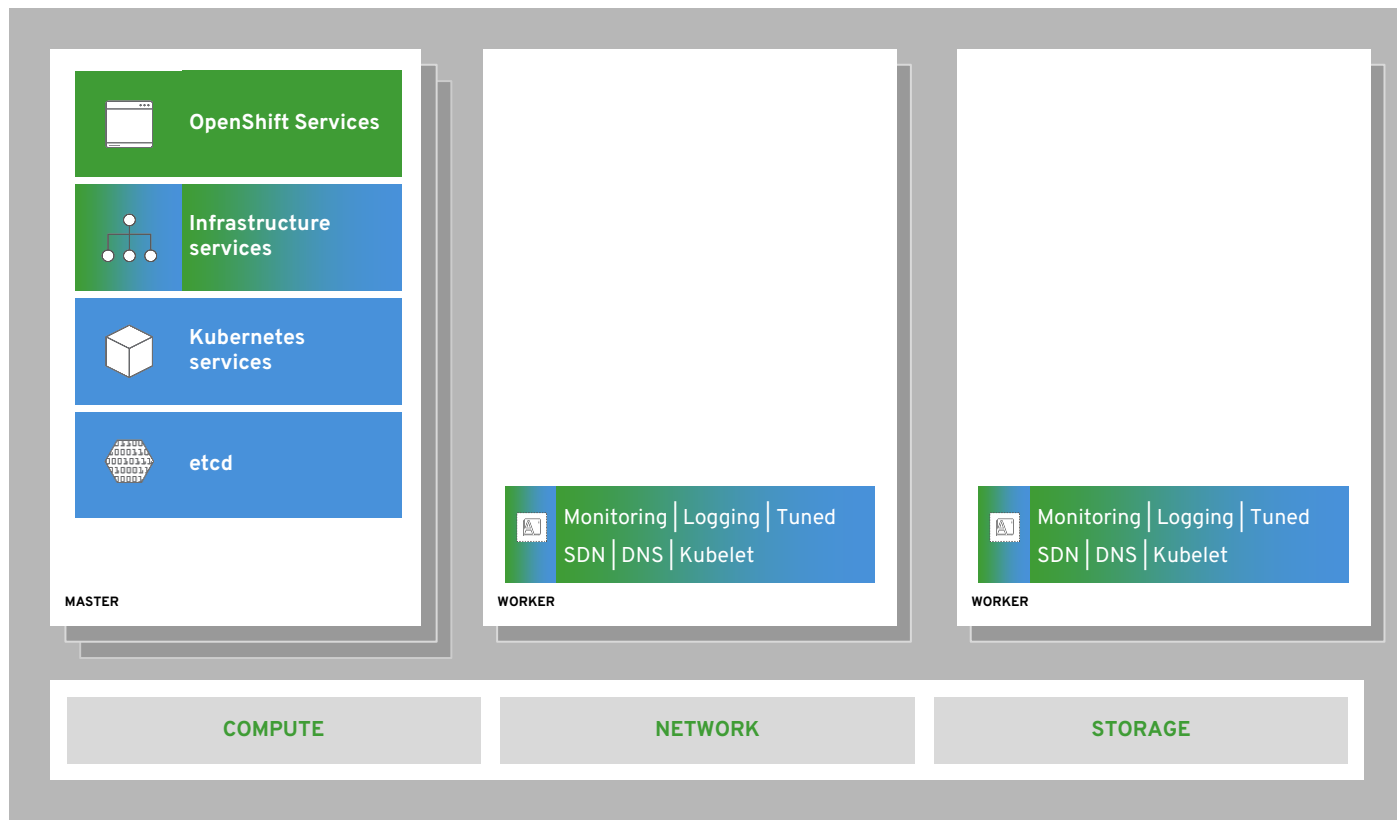
core OpenShift components



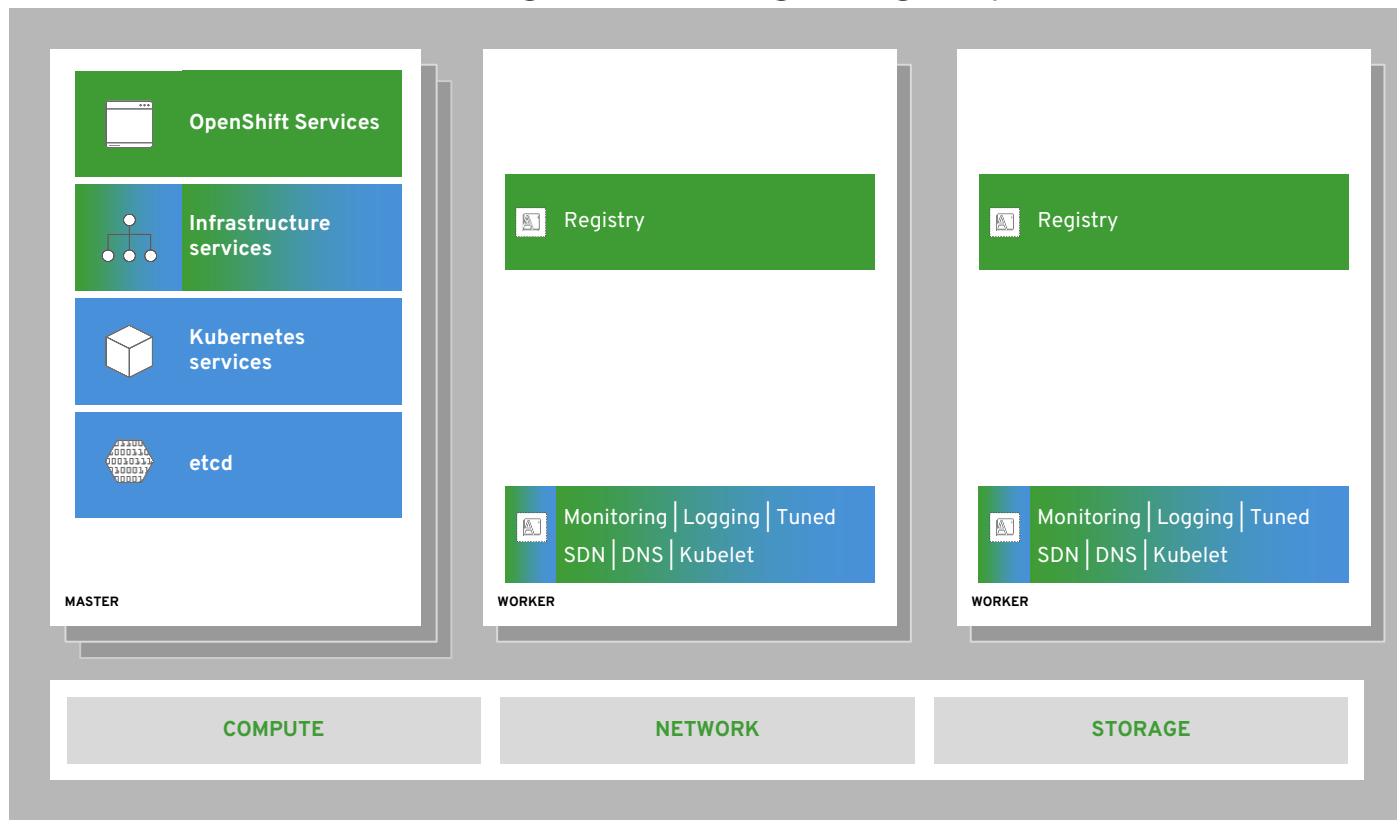
internal and support infrastructure services



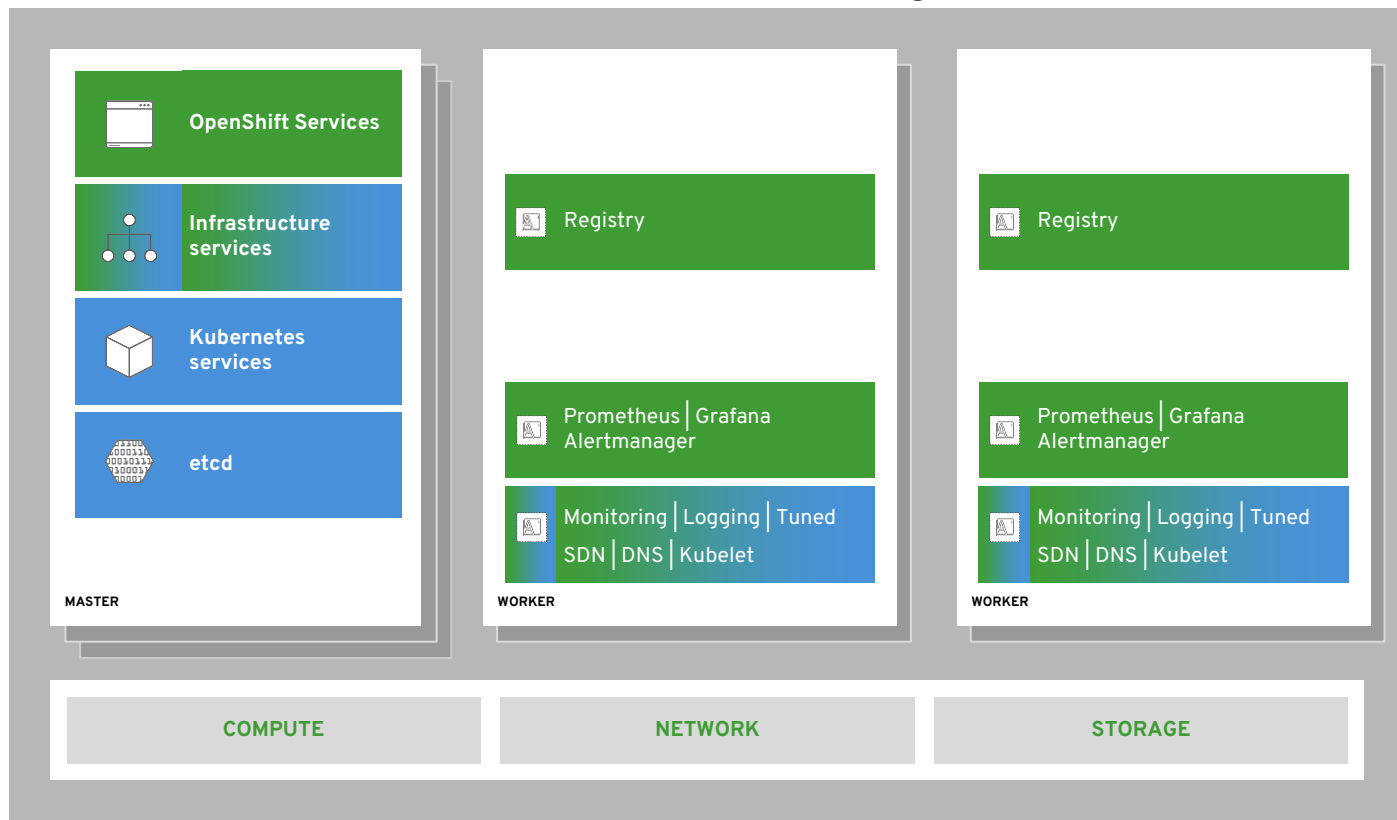
run on all hosts



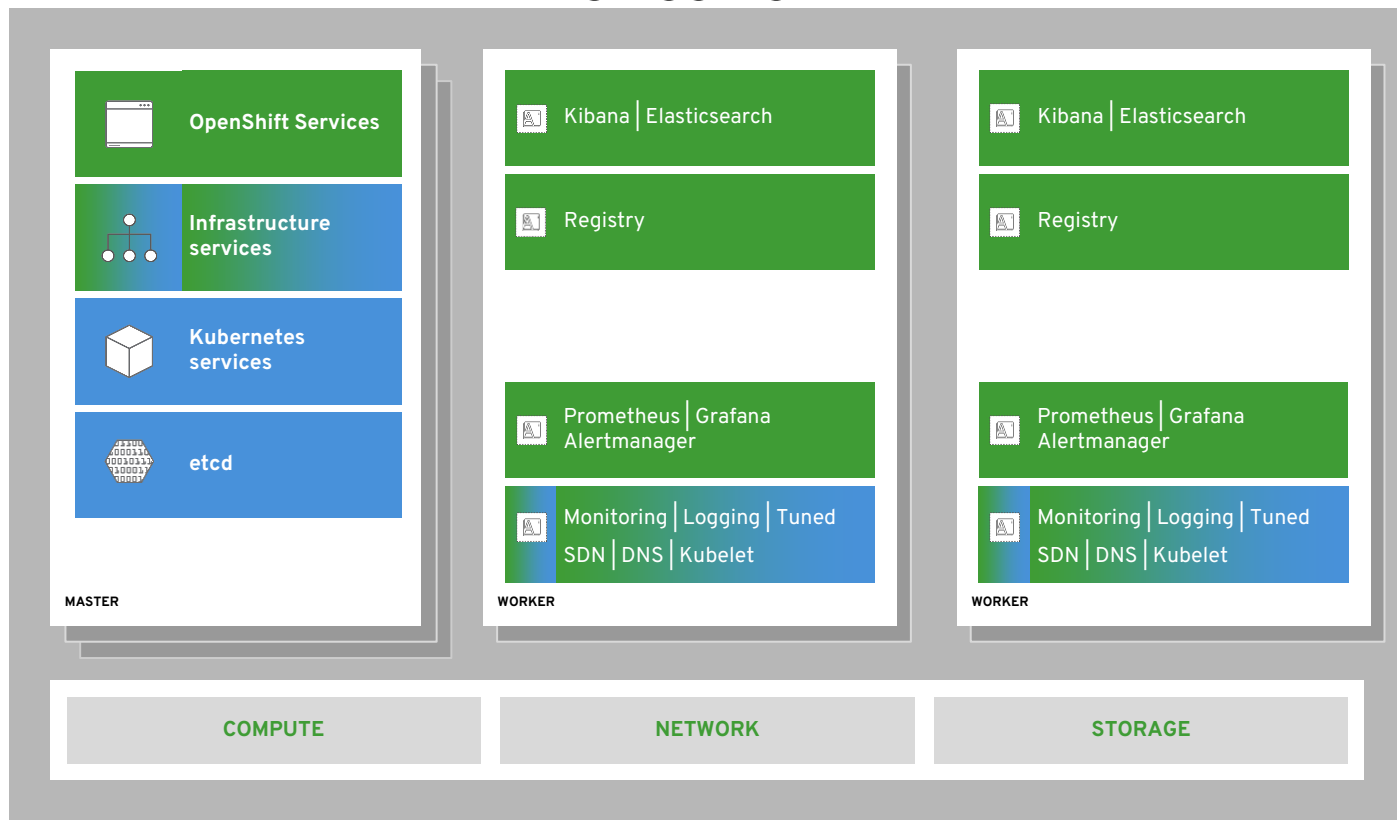
integrated image registry



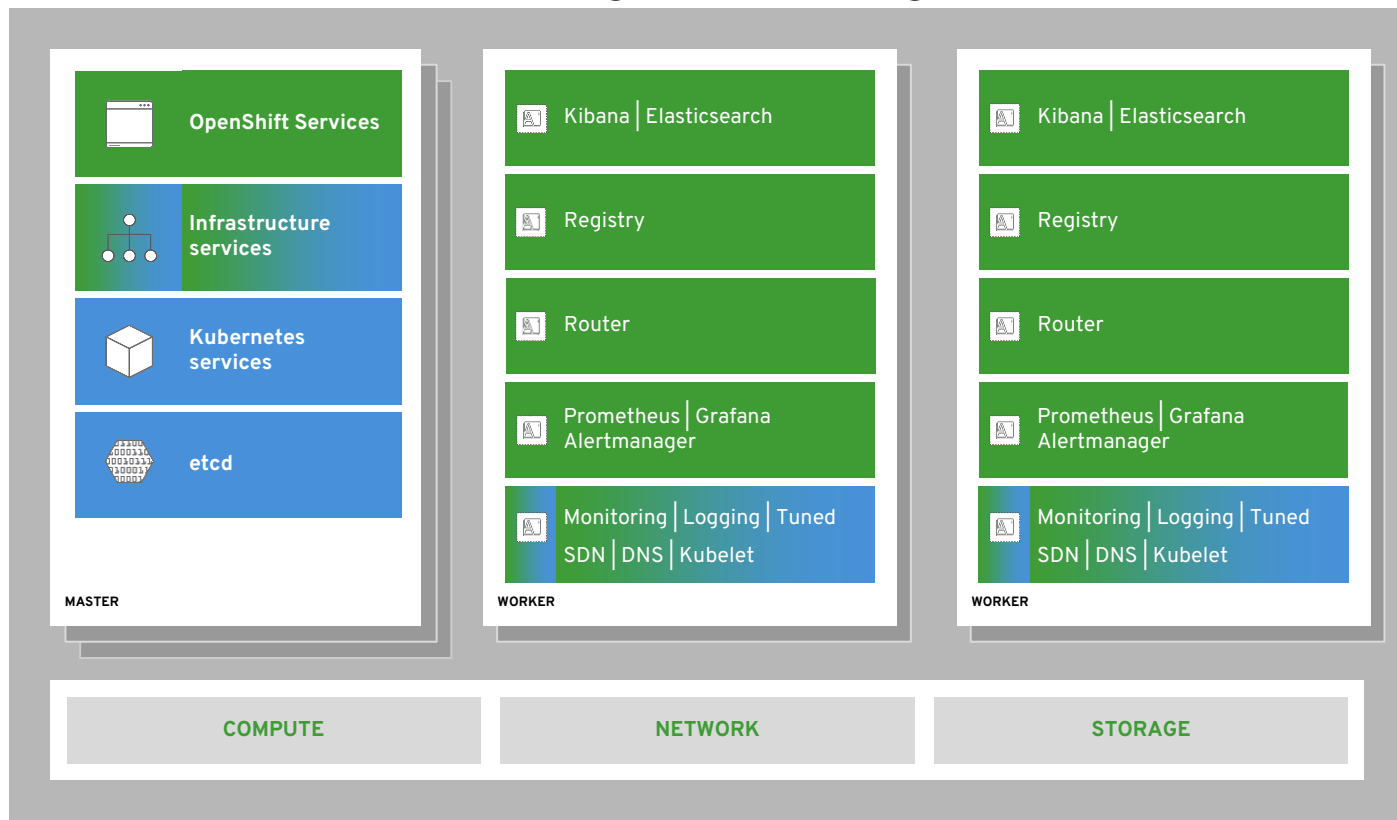
cluster monitoring



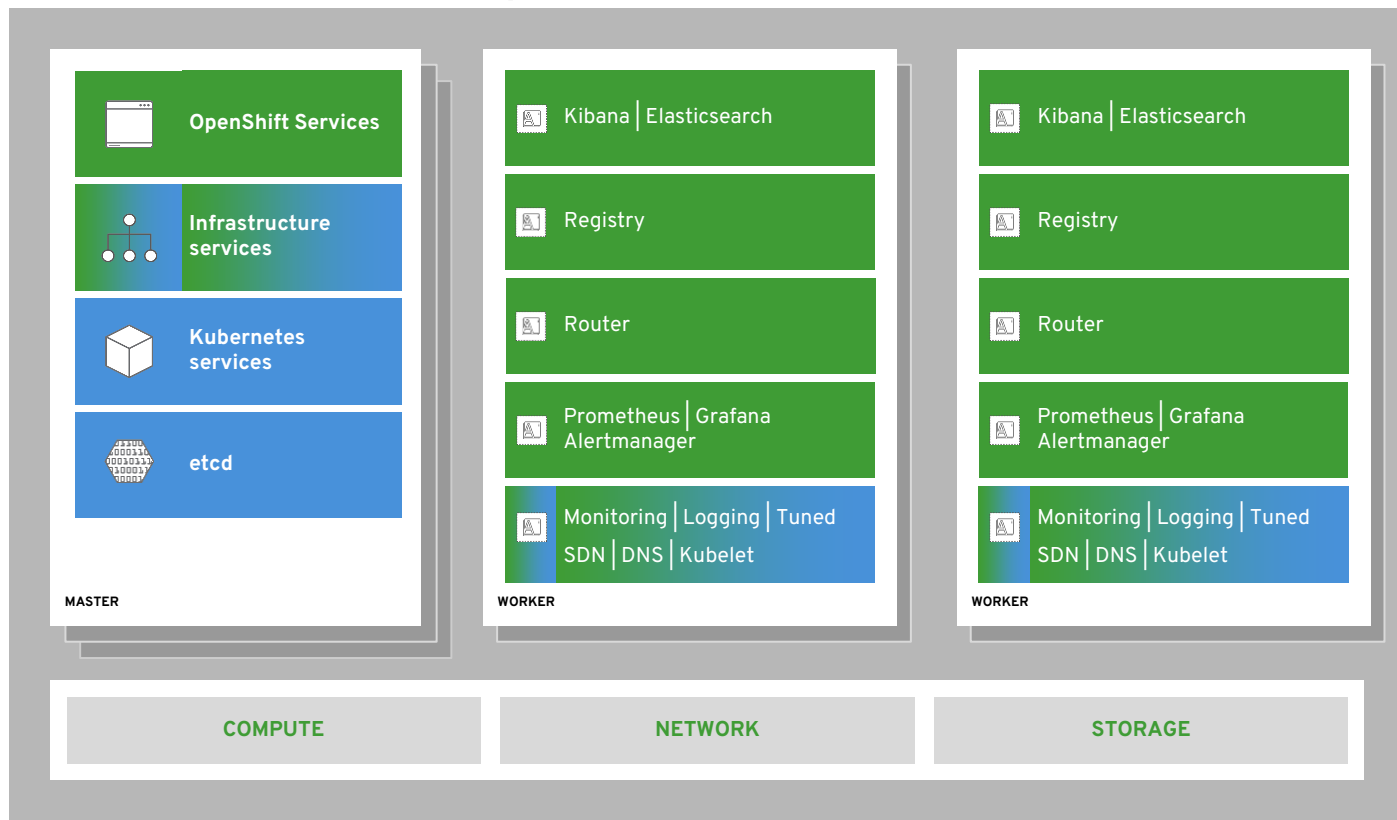
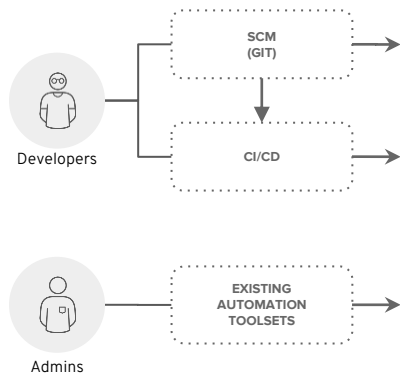
log aggregation



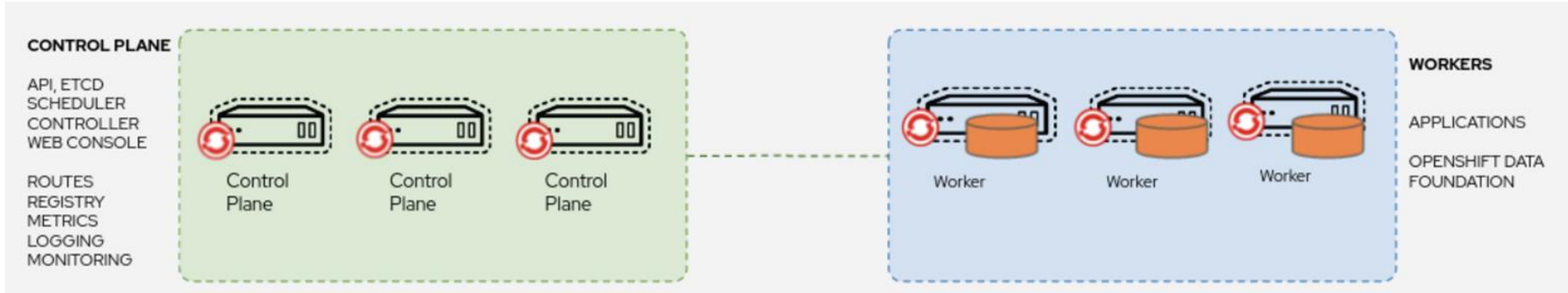
integrated routing



dev and ops via web, cli, API, and IDE

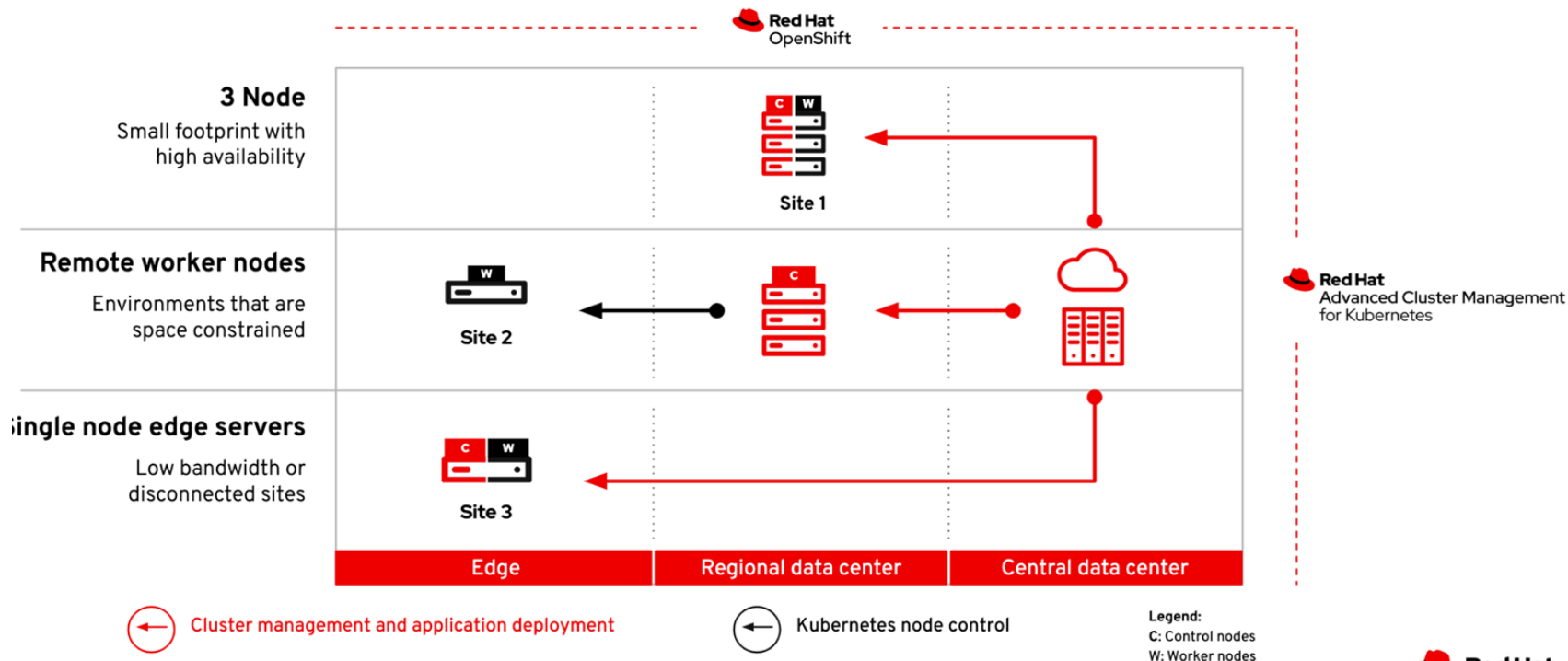


OpenShift Default Deployment Option



Edge Computing with Red Hat OpenShift

Edge computing allows enterprises to mix and match architectures based on the needs of varying edge tiers. Whatever the use case, edge computing tiers can vary in physical size, power and cooling capabilities, and network connectivity. Multiple topology options provide organizations with options to meet their use case needs.





OpenShift lifecycle, installation & upgrades

Red Hat Enterprise Linux CoreOS

The OpenShift
operating system and
its runtime
components

Red Hat Enterprise Linux

RED HAT® ENTERPRISE LINUX®

General Purpose OS

BENEFITS

- 10+ year enterprise life cycle
- Industry standard security
- High performance on any infrastructure
- Customizable and compatible with wide ecosystem of partner solutions

WHEN TO USE

When customization and integration with additional solutions is required

RED HAT® ENTERPRISE LINUX CoreOS

Immutable container host

- Self-managing, over-the-air updates
- Immutable and tightly integrated with OpenShift
- Host isolation is enforced via Containers
- Optimized performance on popular infrastructure

When cloud-native, hands-free operations are a top priority

Immutable Operating System

Red Hat Enterprise Linux CoreOS is versioned with OpenShift

CoreOS is tested and shipped in conjunction with the platform.

Red Hat runs thousands of tests against these configurations.

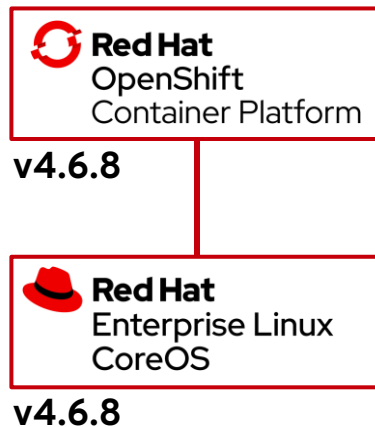
Red Hat Enterprise Linux CoreOS is managed by the cluster

The Operating system is operated as part of the cluster, with the config for components managed by Machine Config Operator:

- CRI-O config
- Kubelet config
- Authorized registries
- SSH config

RHEL CoreOS admins are responsible for:

Nothing. 😊 🙌



Runtime, Build, Synchronize

OCI tooling to create, run, and manage, Linux Containers with a cluster-friendly life cycle



cri-o

A lightweight OCI-compliant runtime

- Minimal and secure architecture
- Optimized for Kubernetes
- Run any OCI-compliant container image (including docker)



podman

A docker-compatible CLI for containers

- Remote management API via Varlink
- Image/container tagging
- Advanced namespace isolation



skopeo

Inspect, push/pull, and sign OCI images

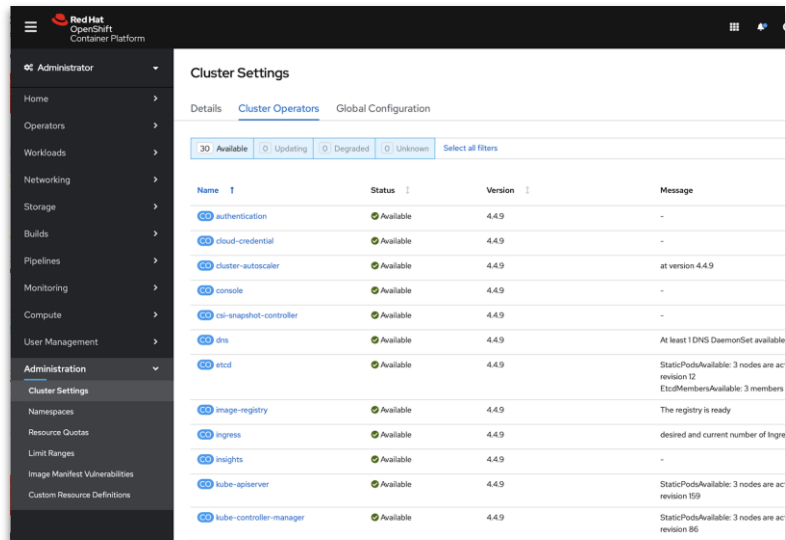
- Inspect image manifests
- Transfer images between registries

OpenShift 4 Lifecycle

Supported paths for
upgrades and
migrations

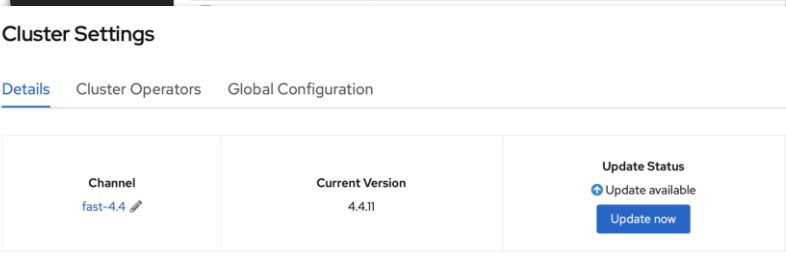
Each OpenShift release is a collection of Operators

- 100% automated, in-place upgrade process
- 30 Operators run every major part of the platform:
 - Console, Monitoring, Authentication, Machine management, Kubernetes Control Plane, etcd, DNS, and more.
- Operators constantly strive to meet the desired state, merging admin config and Red Hat recommendations
- CI testing is constantly running install, upgrade and stress tests against groups of Operators



The screenshot shows the 'Cluster Settings' page in the OpenShift console. The left sidebar lists various administration options, with 'Cluster Settings' selected. The main panel shows a table of operators and their status.

Name	Status	Version	Message
authentication	Available	4.4.9	-
cloud-credential	Available	4.4.9	-
cluster-autoscaler	Available	4.4.9	at version 4.4.9
console	Available	4.4.9	-
csi-snapshot-controller	Available	4.4.9	-
dns	Available	4.4.9	At least 1 DNS DaemonSet available
etcd	Available	4.4.9	StaticPods/Available: 3 nodes are ac revision 12 EtcdMembers/Available: 3 members
image-registry	Available	4.4.9	The registry is ready
ingress	Available	4.4.9	desired and current number of Ingre
insights	Available	4.4.9	-
kube-api-server	Available	4.4.9	StaticPods/Available: 3 nodes are ac revision 159
kube-controller-manager	Available	4.4.9	StaticPods/Available: 3 nodes are ac revision 86



The screenshot shows the 'Cluster Settings' page in the OpenShift console, specifically the 'Details' tab. It displays the current channel and version of the OpenShift platform.

Channel	Current Version	Update Status
fast-4.4	4.4.11	Update available Update now

OpenShift Upgrades and Migrations

Happy path = upgrade through each version

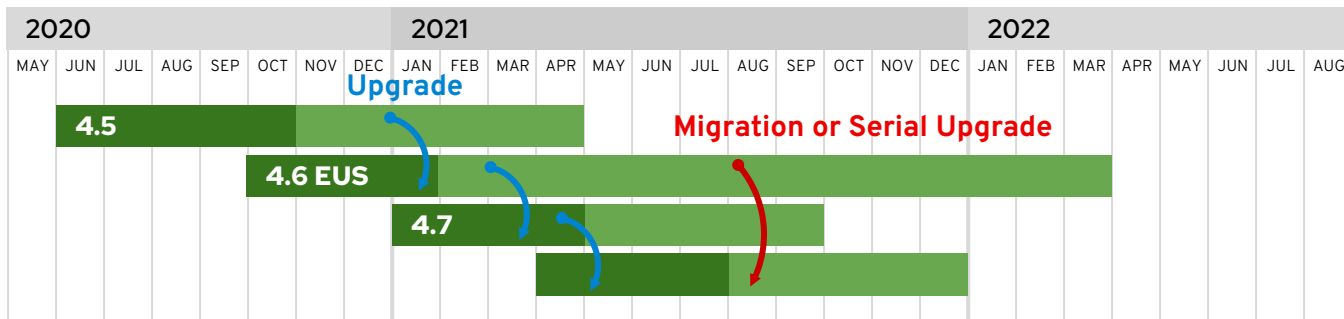
- On a regular cadence, upgrade to the next supported version.

Optional path = migration tooling

- To skip versions or catch up, use the application migration tooling to move to a new cluster.

What is Extended Update Support (EUS) ?

- Extended timeframe for critical security and bug fixes
- Work within a customer's release management philosophies
- Goal to provide a serial pathway to update from EUS to EUS
 - Augmented by Migration Tool and/or Advanced Cluster Management (ACM) based on use-case



N release
Full support, RFEs, bugfixes, security

N-2 release
OTA pathway to N release, critical bugs and security

OpenShift Monitoring

An integrated cluster
monitoring and
alerting stack

OpenShift Cluster Monitoring



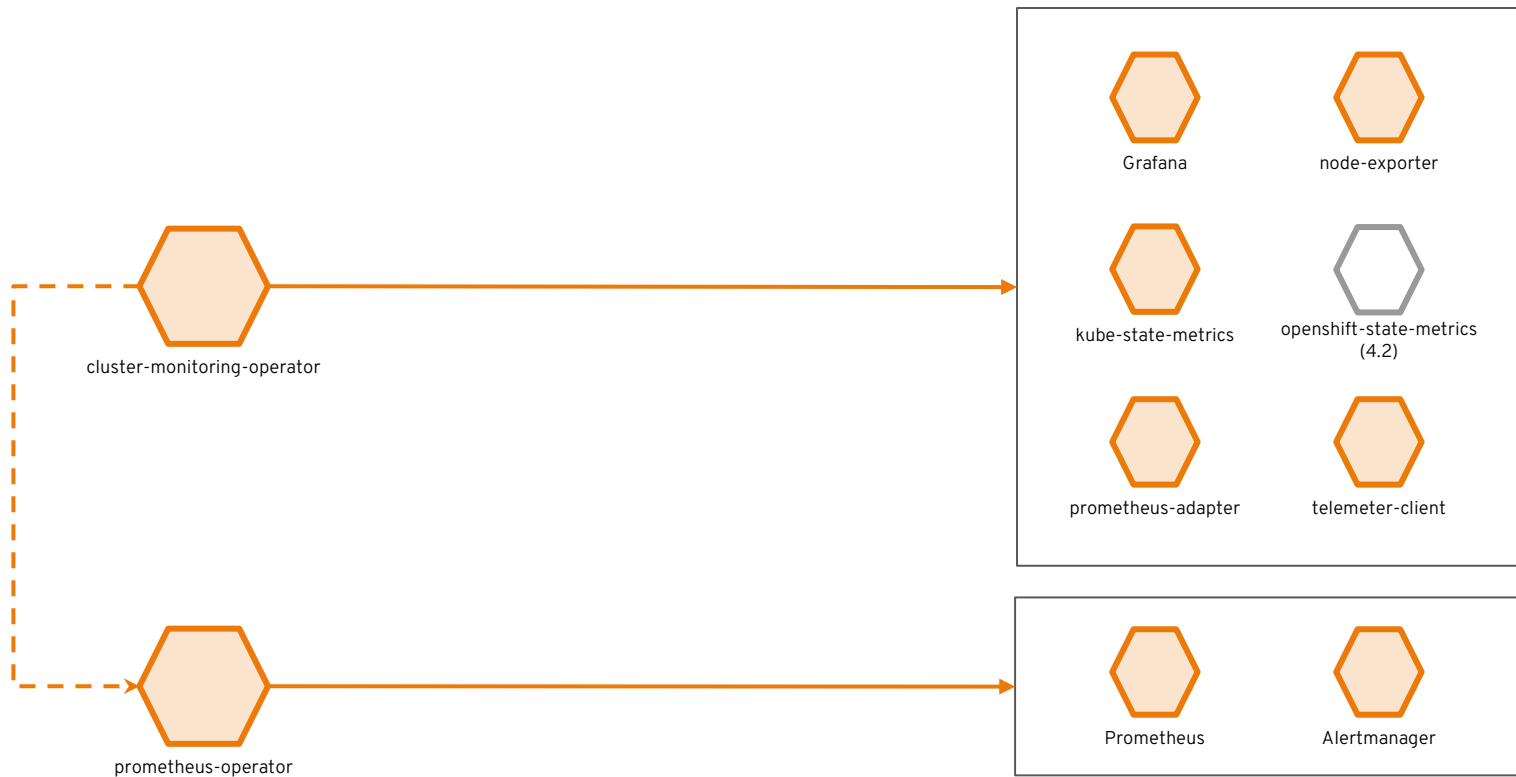
Metrics collection and storage via Prometheus, an open-source monitoring system time series database.

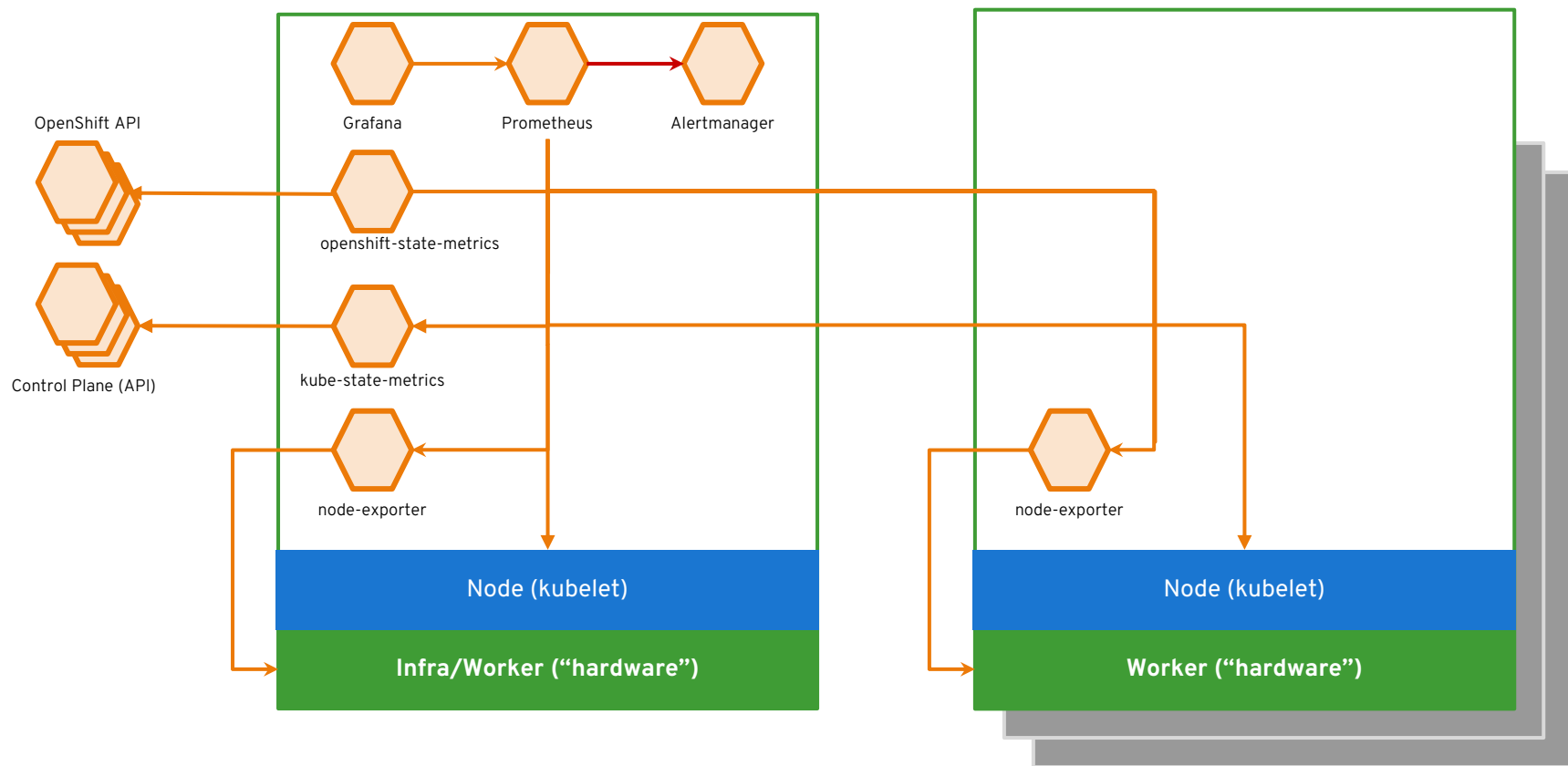


Alerting/notification via Prometheus' Alertmanager, an open-source tool that handles alerts sent by Prometheus.



Metrics visualization via Grafana, the leading metrics visualization technology.





OpenShift Logging

An integrated solution
for exploring and
corroborating
application logs

Observability via log exploration and corroboration with EFK

Components

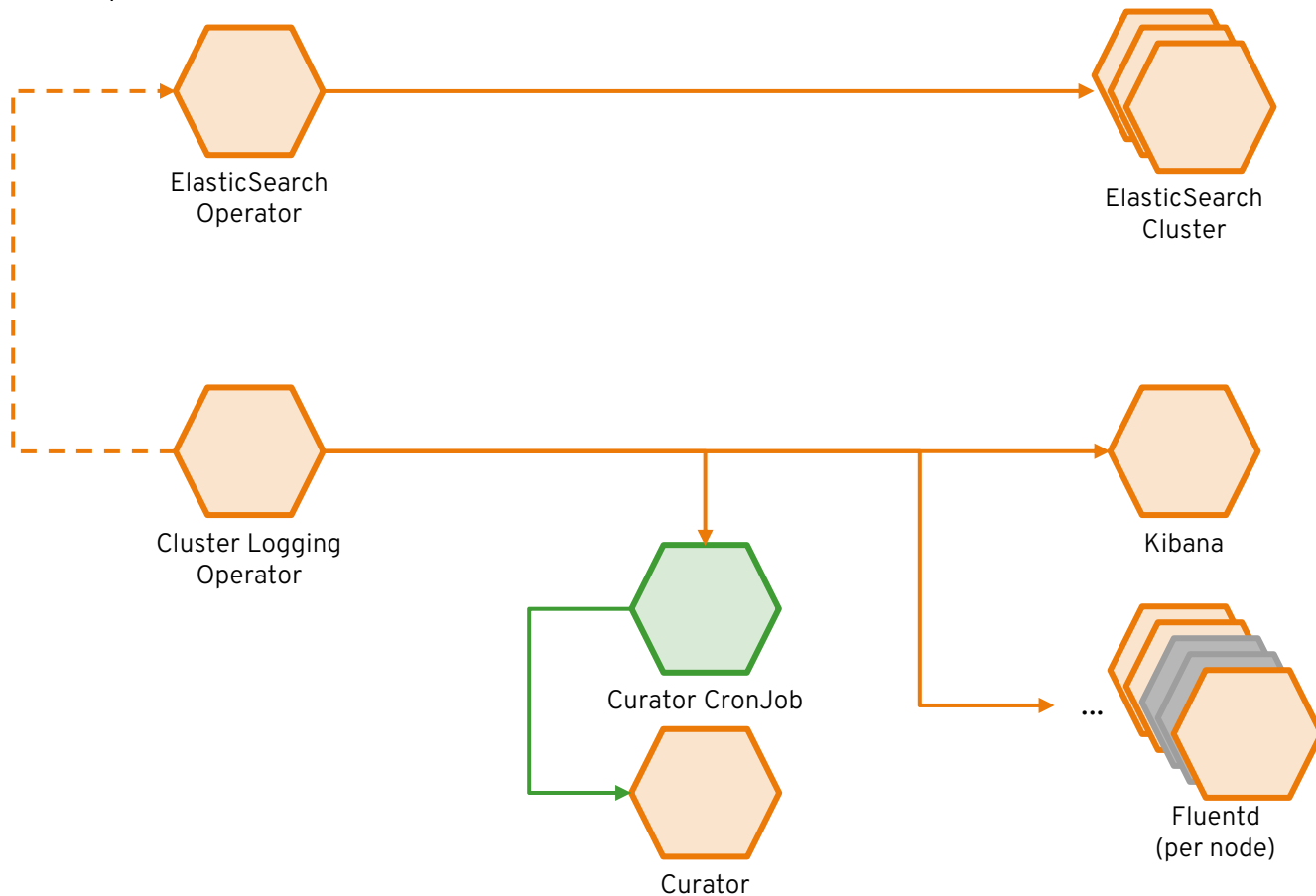
- **Elasticsearch:** a search and analytics engine to store logs
- **Fluentd:** gathers logs and sends to Elasticsearch.
- **Kibana:** A web UI for Elasticsearch.

Access control

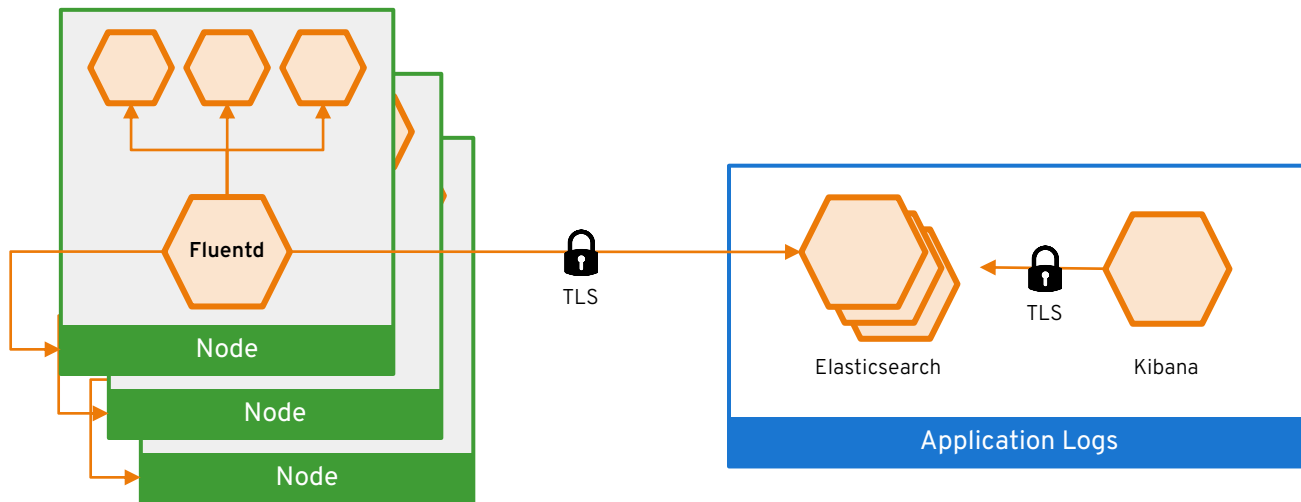
- Cluster administrators can view all logs
- Users can only view logs for their projects

Ability to forward logs elsewhere

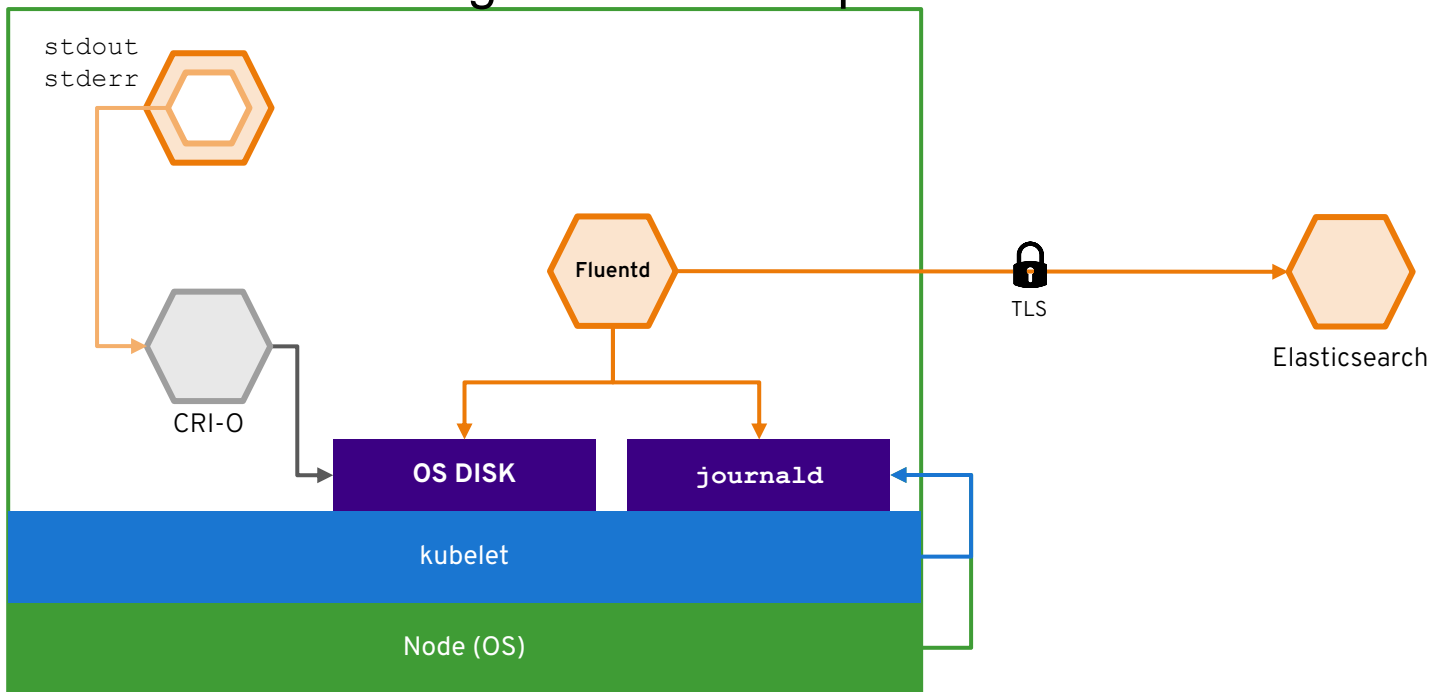
- External elasticsearch, Splunk, etc



Log data flow in OpenShift



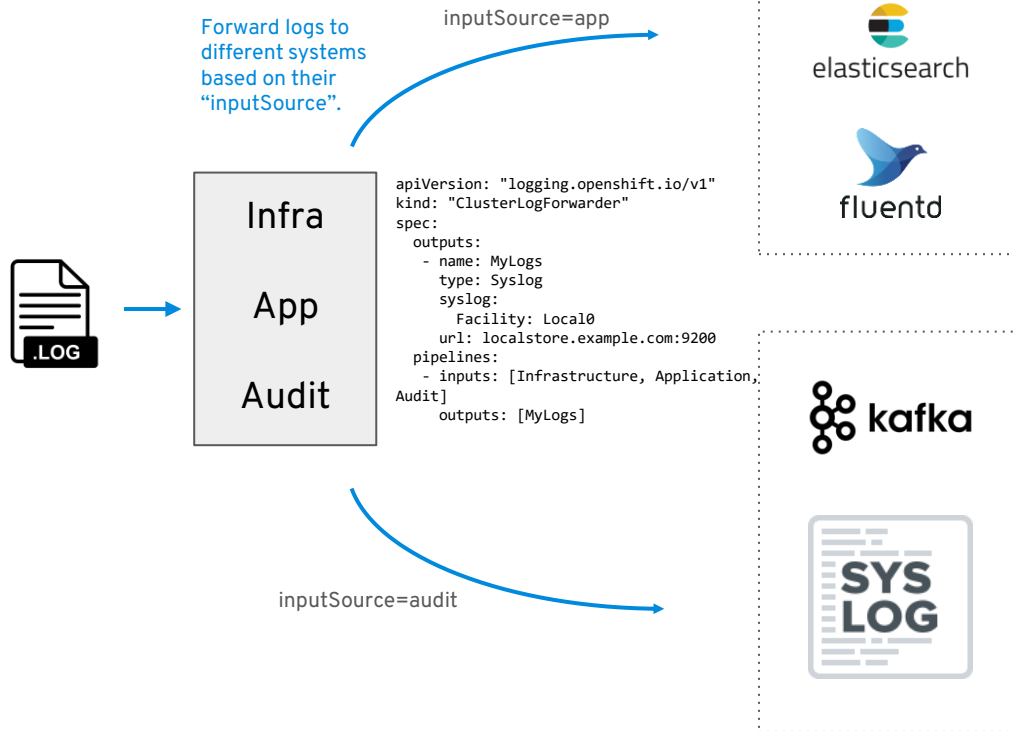
Log data flow in OpenShift



New log forwarding API (since 4.6)

Abstract Fluentd configuration by introducing new log forwarding API to improve support and experience for customers.

- Introducing a new, cluster-wide *ClusterLogForwarder* CRD (API) that replaces needs to configure log forwarding via Fluentd ConfigMap.
- The API helps to reduce probability to misconfigure Fluentd and helps bringing in more stability into the Logging stack.
- Features include: Audit log collection and forwarding, Kafka support, namespace- and source-based routing, tagging, as well as improvements to the existing log forwarding features (e.g. syslog RFC5424 support).



Secure Log Forwarding to 3rd party

```
apiVersion: "logging.openshift.io/v1"
kind: "ClusterLogForwarder"
spec:
  outputs:
    - name: MyLogs
      type: Syslog
      syslog:
        Facility: Local0
        url: localstore.example.com:9200
  pipelines:
    - inputs: [Infrastructure, Application, Audit]
      outputs: [MyLogs]
```

"ClusterLogForwarder"
Custom Resource

Cluster Logging
Operator

watches

create
s

elasticsearch

fluentd

kafka




SYS
LOG

External Logging system

Node

OpenShift Subscription Model

Red Hat OpenShift Subscription Offerings

SELF-MANAGED	INFRASTRUCTURE	BILLED BY	MANAGED BY ⓘ	SUPPORTED BY ⓘ
 Red Hat OpenShift Platform Plus Red Hat OpenShift Platform Plus	Any Private cloud Public cloud Bare metal Virtual machines Edge	1. Red Hat for OpenShift 2. Any cloud or compute resources used from cloud provider(s)	Customer	Red Hat for OpenShift support Another party for infrastructure support
 Red Hat OpenShift Container Platform Red Hat OpenShift Container Platform	Any Private cloud Public cloud Bare metal Virtual machines Edge	1. Red Hat for OpenShift 2. Any cloud or compute resources used from cloud provider(s)	Customer	Red Hat for OpenShift support Another party for infrastructure support
 Red Hat OpenShift Kubernetes Engine Red Hat OpenShift Kubernetes Engine	Any Private cloud Public cloud Bare metal Virtual machines Edge	1. Red Hat for OpenShift 2. Any cloud or compute resources used from cloud provider(s)	Customer	Red Hat for OpenShift support Another party for infrastructure support

Red Hat OpenShift Self-Managed Offerings



Red Hat OpenShift Kubernetes Engine

Essential enterprise Kubernetes infrastructure

Includes:

- Enterprise Kubernetes runtime
- RHEL CoreOS immutable container OS
- Administrator console
- OpenShift Virtualization



Red Hat OpenShift Container Platform

Complete application development platform

Adds:

- Developer Console
- Log Mgt & Metering
- Serverless (Knative)
- Service Mesh (Istio)
- Pipelines & GitOps (Tekton, ArgoCD)
- Insights for OpenShift (Cost, Subscription, Advisor)

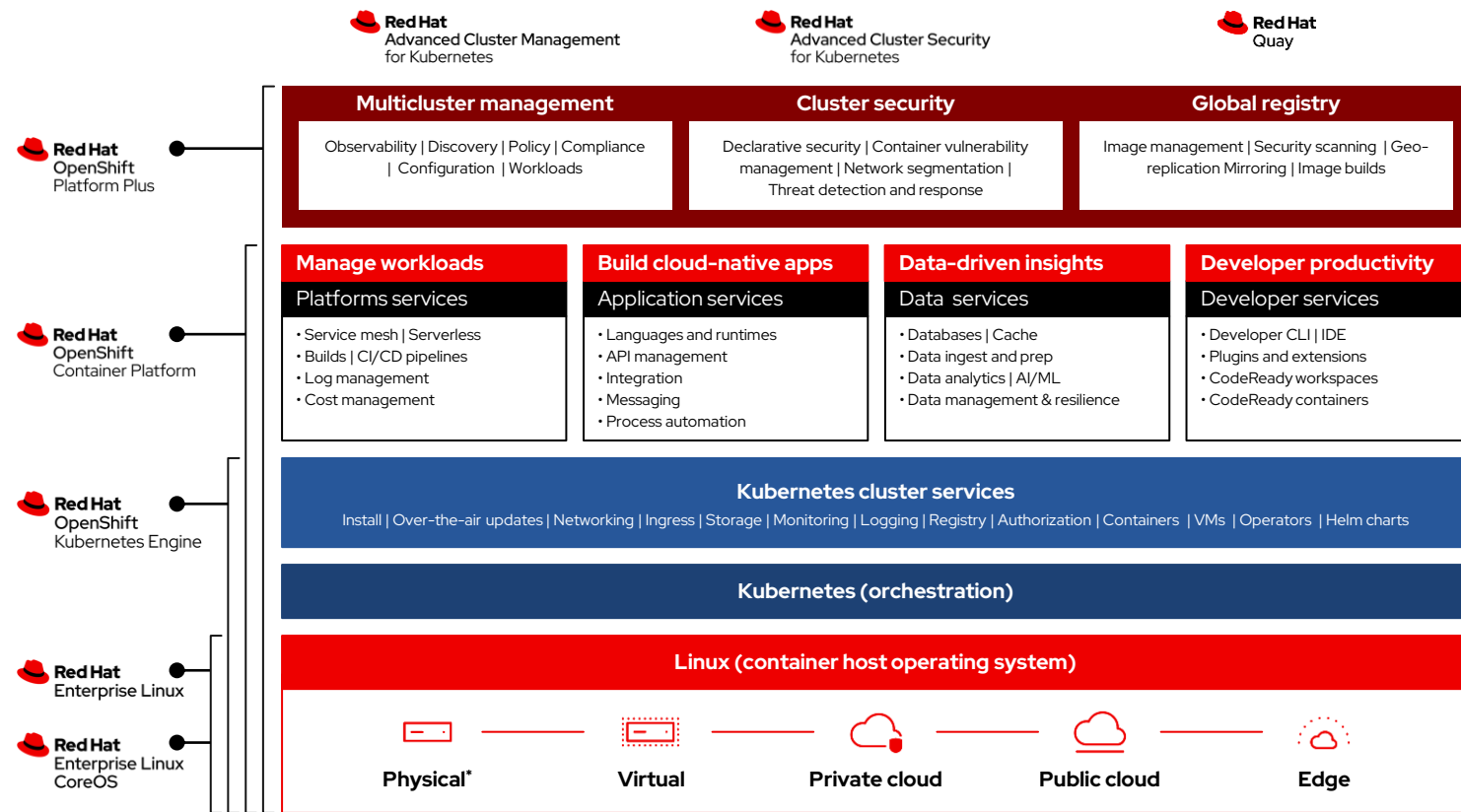


Red Hat OpenShift Platform Plus

Manageability and consistency across hybrid and multicloud with advanced security for DevSecOps

Adds:

- Multicloud management
- Advanced observability and policy compliance
- Declarative security
- Threat detection and response
- Scalable global container registry



Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.



linkedin.com/company/red-hat



youtube.com/user/RedHatVideos



facebook.com/redhatinc



twitter.com/RedHat