



# Red Hat OpenShift

Build and scale applications with confidence.





## Agenda

- Trivia
- Intro
- Openshift
- Ansible

April 24, 2025

# Anybody heard of Red Hat?

What year was Red Hat founded? 1993

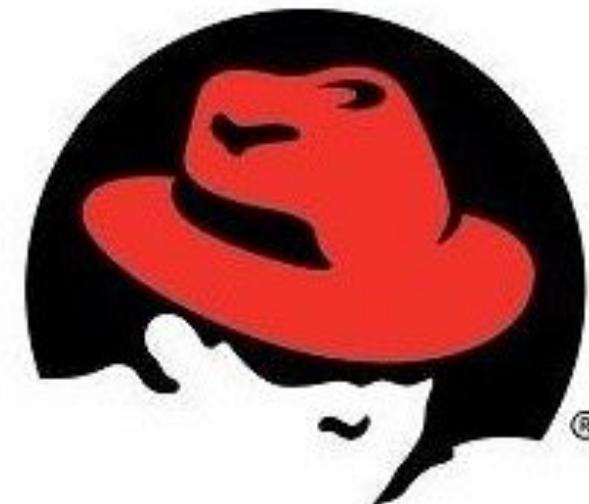
Who is the founder of Red Hat? Marc Ewing

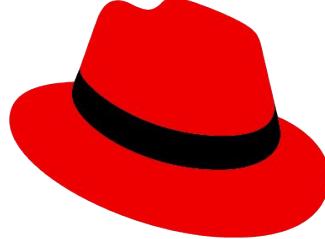
What college did the founder of Red Hat attend? Carnegie Mellon University

What item did the founder wear that inspired the company name? A red Cornell University lacrosse hat

What kind of software does Red Hat primarily provide? Open source software

What is the name of the character featured in Red Hat's previous logo? Shadowman





**Doug Allen**  
Director, MidCentral Area Sales



**Jim Tyrrell**  
Senior Director, South Central Region Sales



**Ryan Heise**  
Account Executive



**Matt Hargrave**  
Solution Architect

## Red Hat Specialist and Architecture Team



**Travis Tutor**  
Sales Specialist Cloud Platform



**Hayden Orr**  
Sales Specialist Automation



**Gregory McHale**  
Consulting TSM



**Brian Marks**  
Training/Learning



**Geoff Allen**  
Associate Principal Solutions Architect



**Adam Mack**  
Senior Solutions Architect



**Ryan Harrison**  
Technical Account Manager

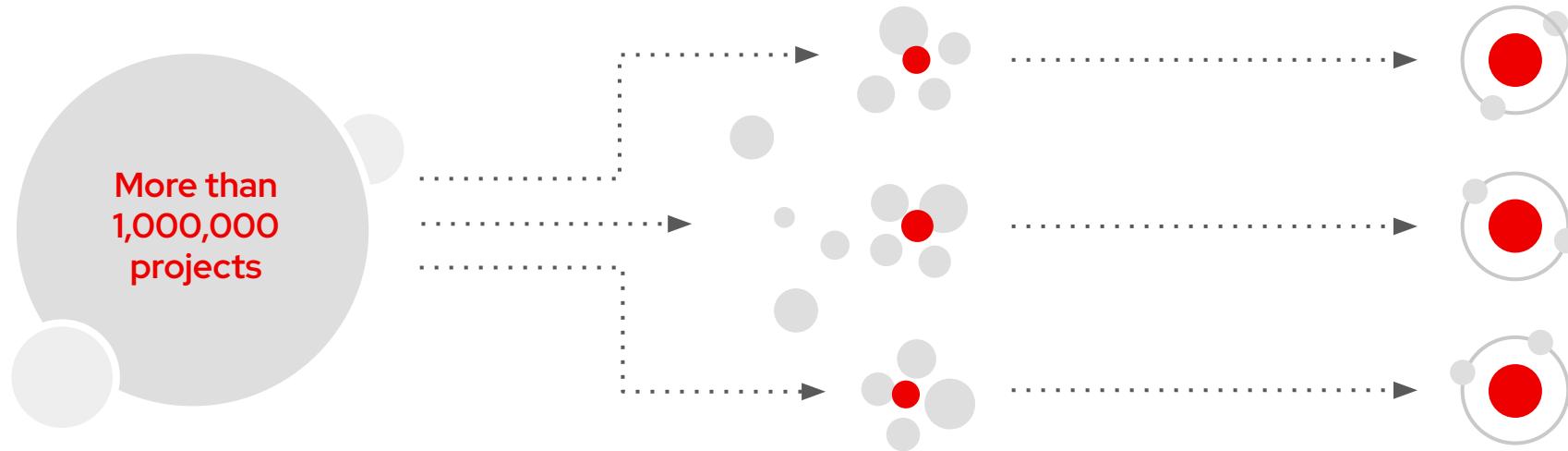


**Demi Larkin**  
Business Value Manager



**Kate Alphin**  
Market Development Rep

# How do community projects become enterprise products?



## Participate

We participate in and create community-powered upstream projects.

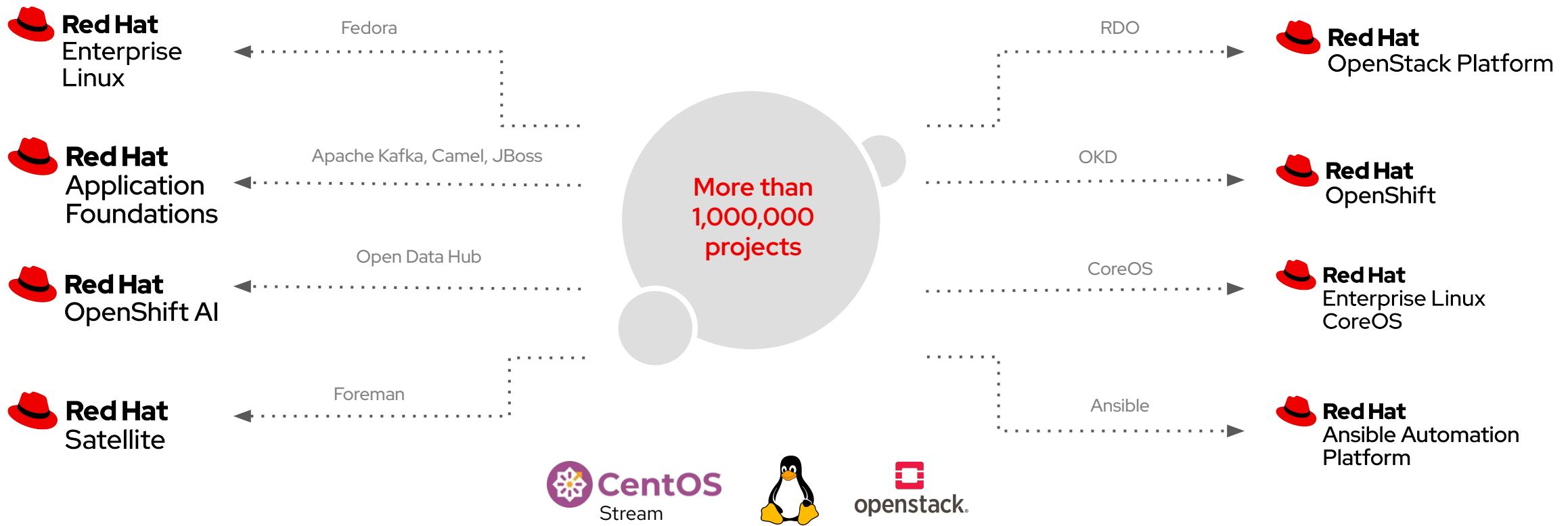
## Integrate

We integrate upstream projects, fostering open community platforms.

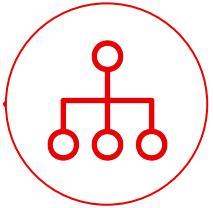
## Stabilize

We commercialize these platforms together with a rich ecosystem of services and certifications.

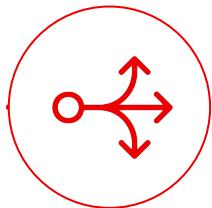
# From communities to enterprise



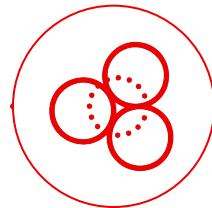
# By Mid-Morning...



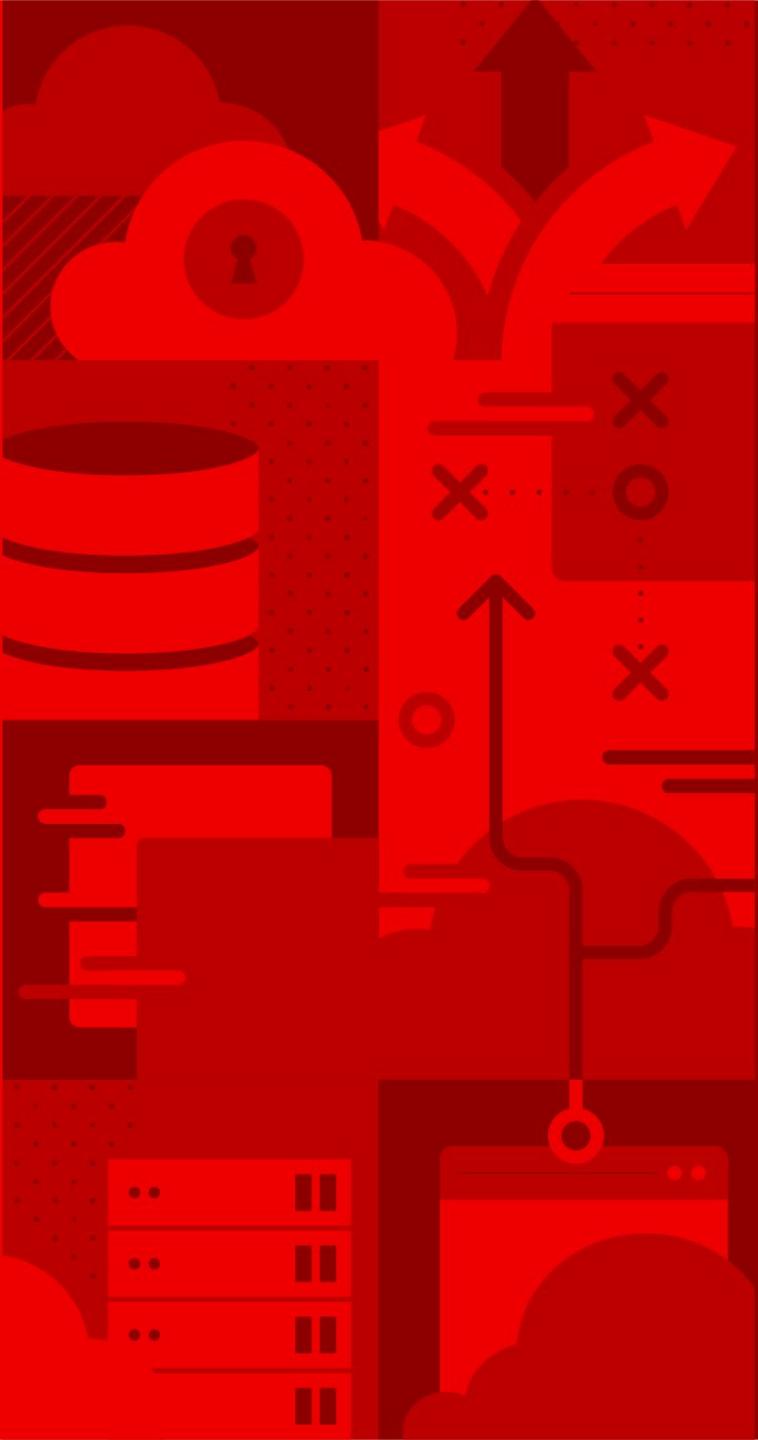
Better Understand the Relationship of Containers - Kubernetes - OpenShift



Operational and Developer Benefits of OpenShift Platform



Virtualization - AI - Developer Productivity Tools



# Red Hat OpenShift and Kubernetes Core Concepts

# Continental Breakfast..



# What Are Containers?

INFRASTRUCTURE

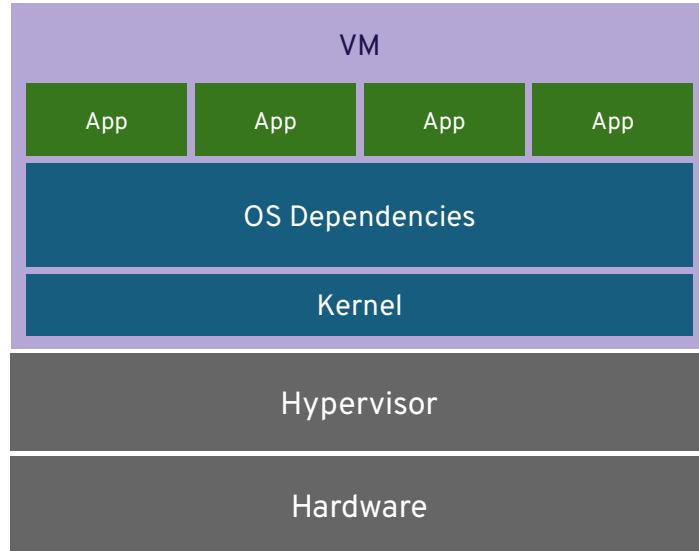
APPLICATIONS



- Isolated processes on a shared kernel
- Simpler, lighter, and denser than VMs
- Portable across different environments
- Package apps with all dependencies
- Deploy to any environment in seconds
- Easily accessed and shared

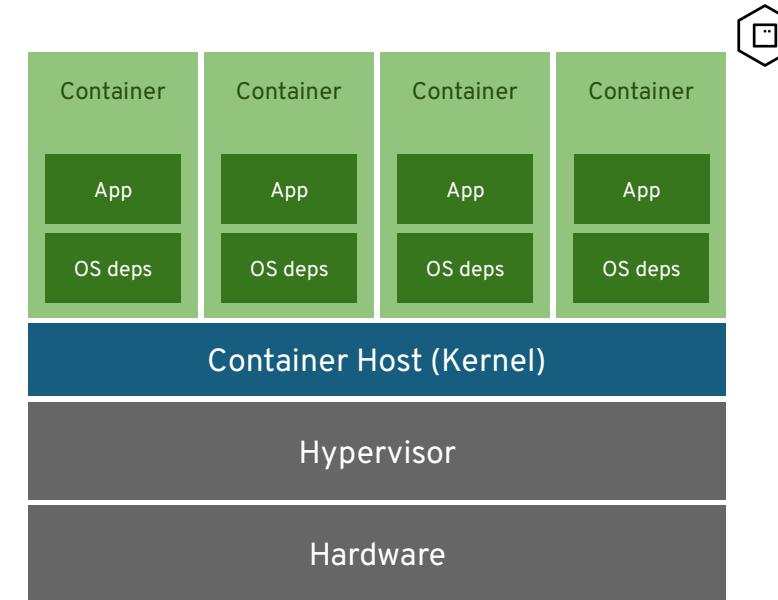
# Virtual Machines and Containers

VIRTUAL MACHINES



VM isolates the hardware

CONTAINERS



Container isolates the process

# Benefits of Containers

## DEVELOPERS

- CLOUD-NATIVE APPS
- SIMPLIFY PACKAGING
- SIMPLIFY TESTING
- FREEDOM

## IT OPERATIONS

- CONSISTENT APP DEPLOYS
- AUTOMATED APP DEPLOYS & LC
- IMPROVED APP PERFORMANCE
- MULTI-CLOUD CONSISTENCY

## BUSINESS LEADERS

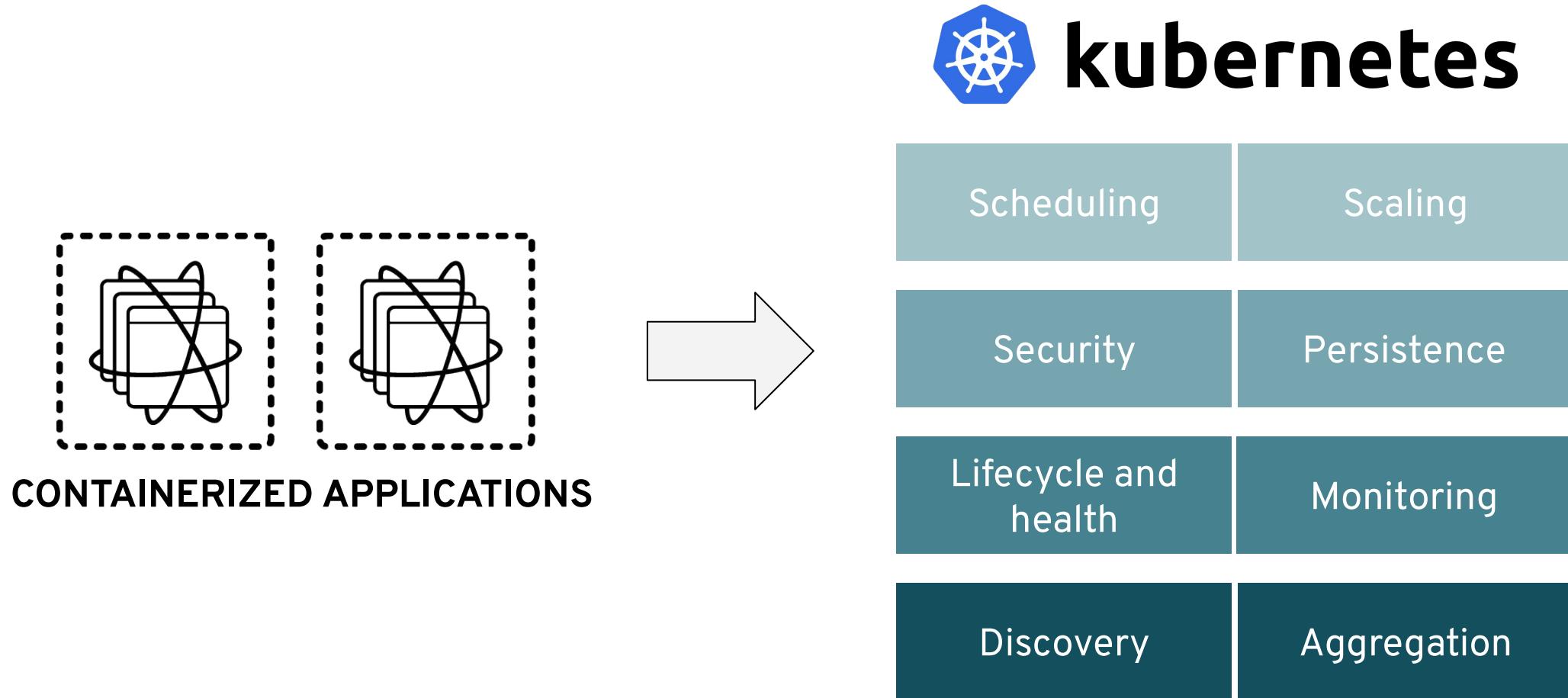
- ENABLE DEVOPS CULTURE
- ENABLE HYBRID CLOUD
- REDUCE VM LICENSING COSTS
- ACCELERATE APP-DEV CYCLES

# What is Kubernetes?

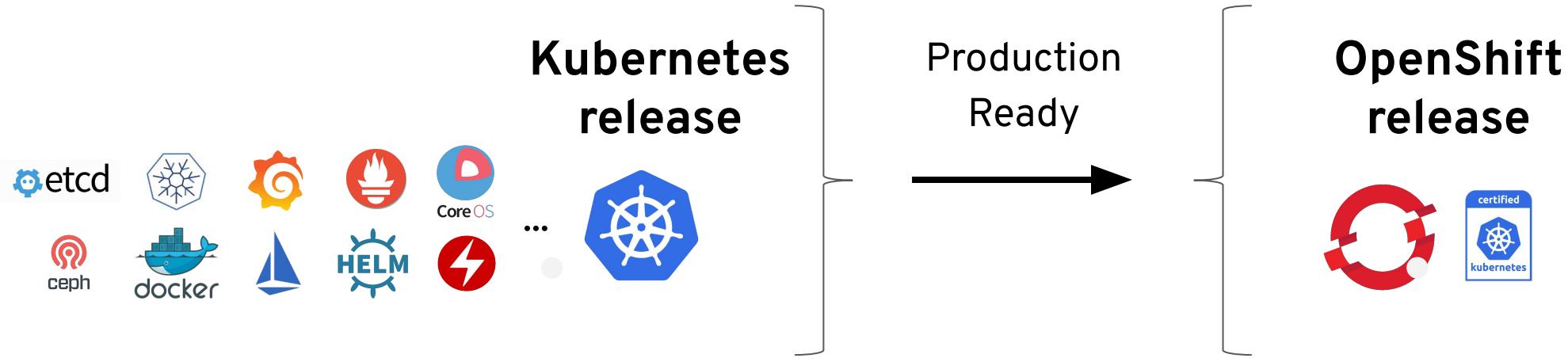
An open source **orchestration** system  
for managing **containerized** workloads  
across a **cluster of nodes.**



# Why Do I Need Kubernetes

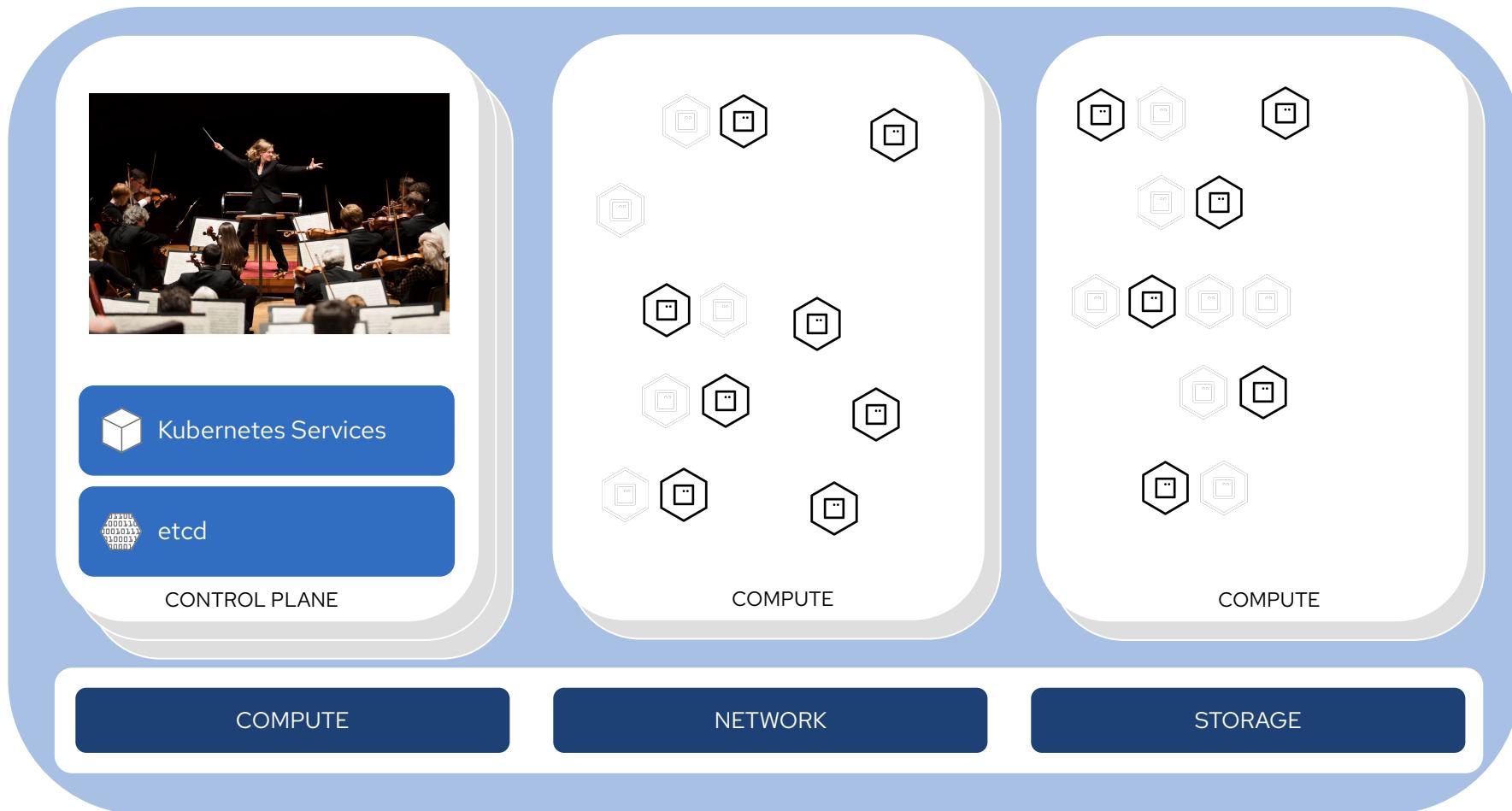


# OpenShift is trusted enterprise Kubernetes

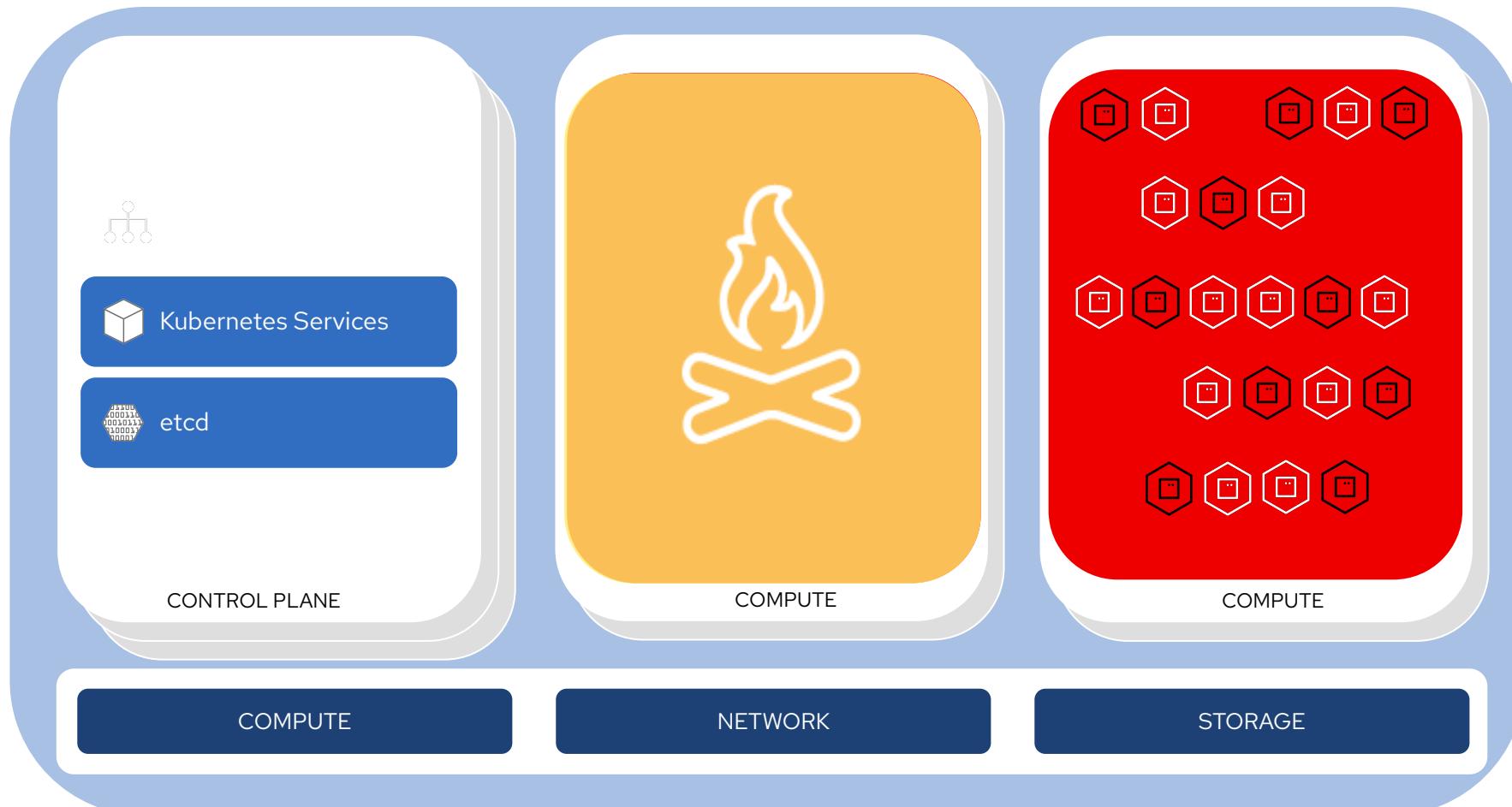


- Hundreds of defect and performance fixes
- 200+ validated integrations
- Certified container ecosystem
- Red Hat is a leading Kubernetes contributor since day 1

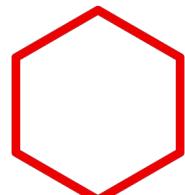
# Typical Kubernetes Cluster



# Scheduling Workloads



# A container is the smallest compute unit



CONTAINER

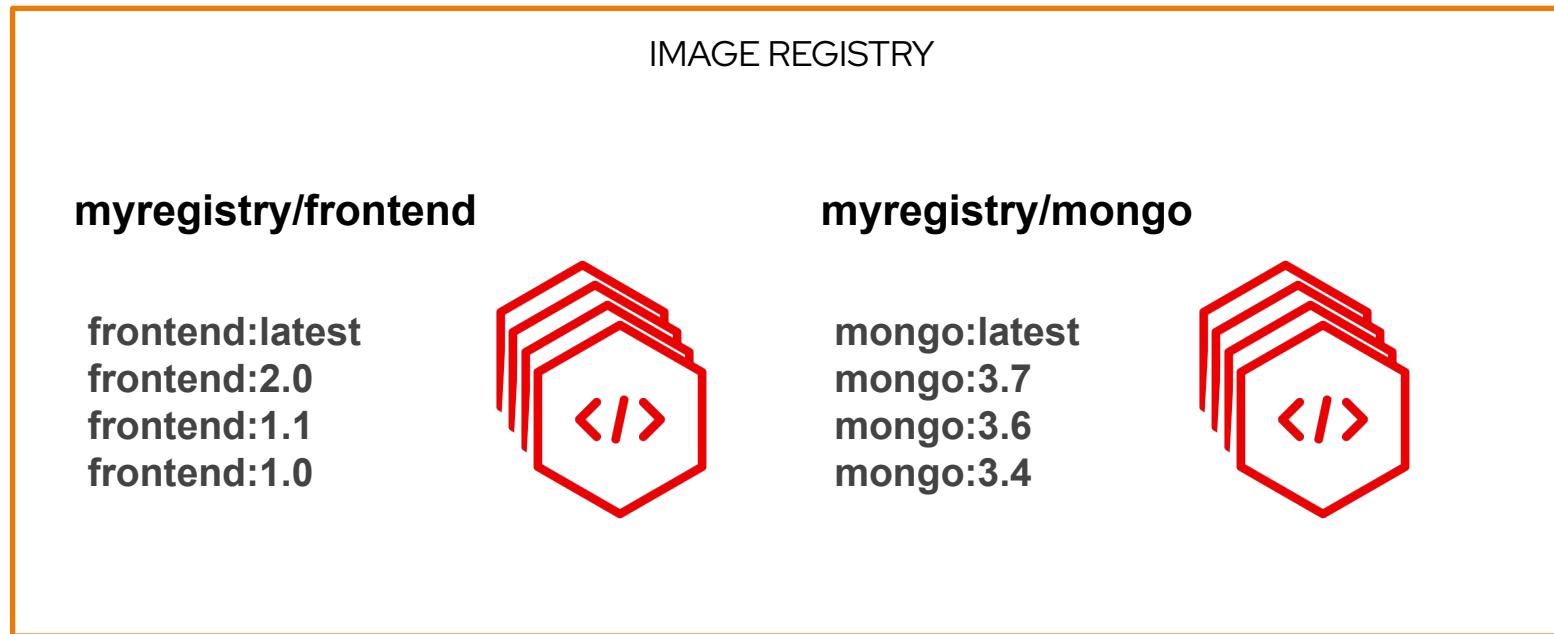
# Containers are created from container images



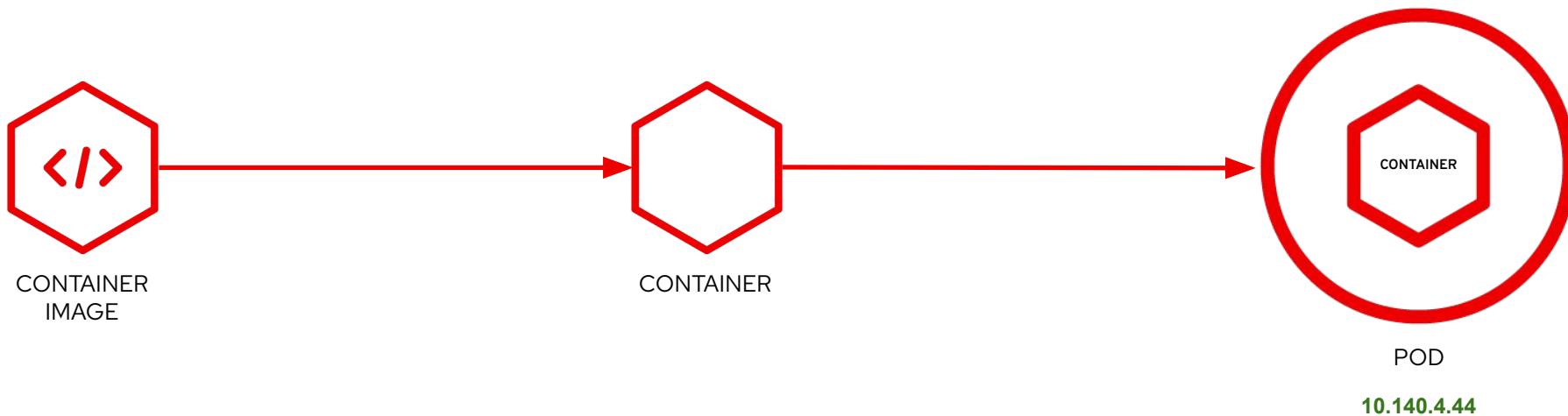
# Container images are stored in an image registry



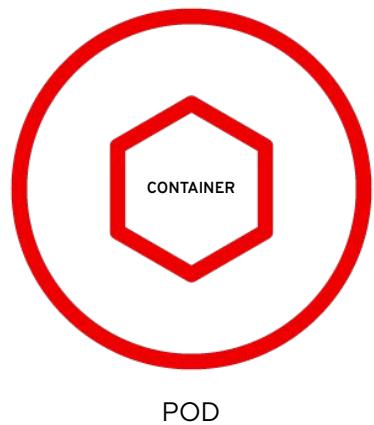
An image repository contains all versions of an image in the image registry



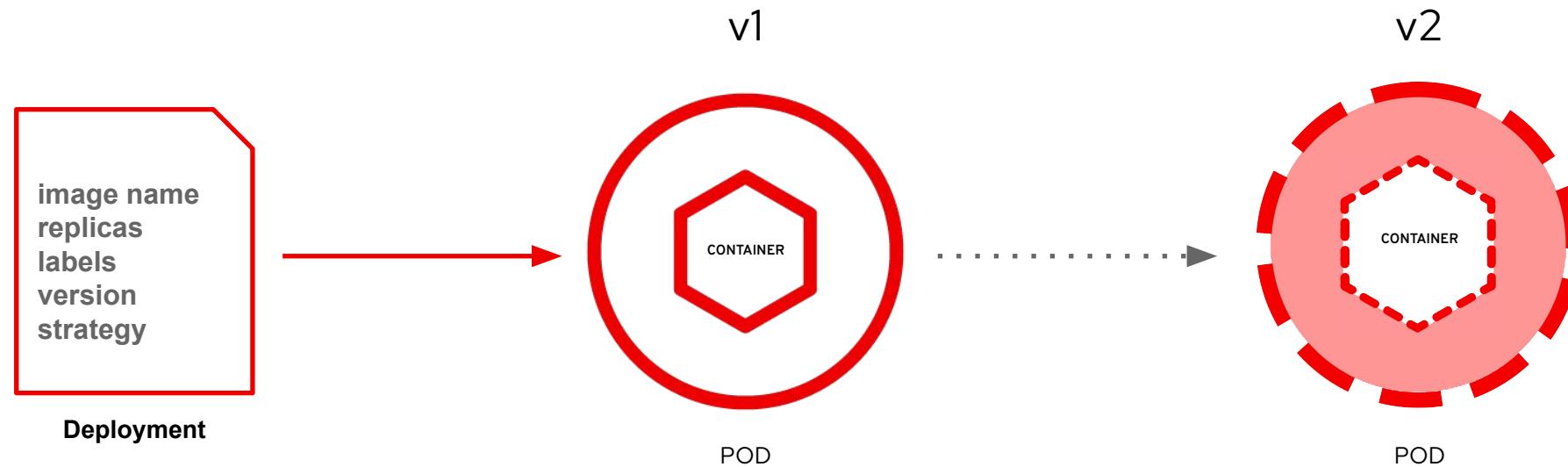
# Everything runs in pods



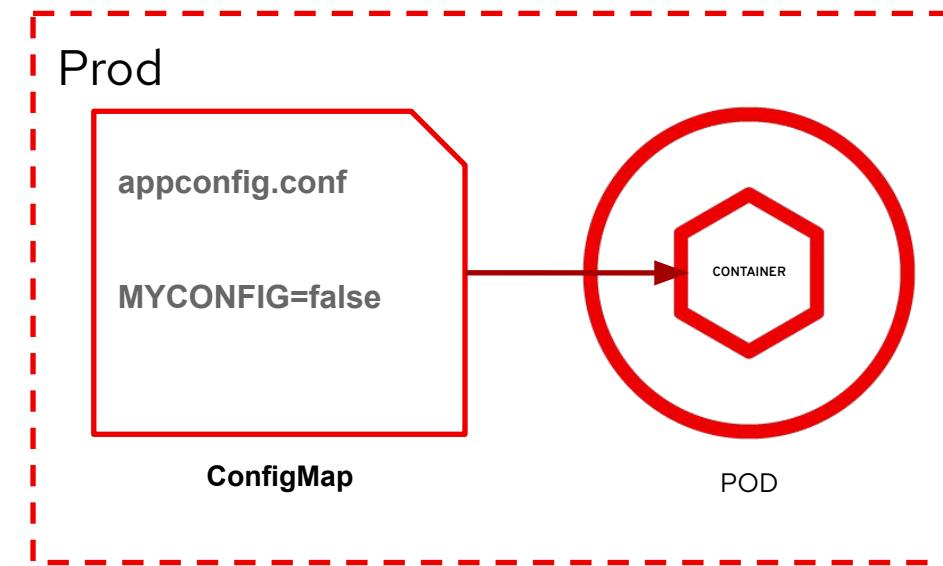
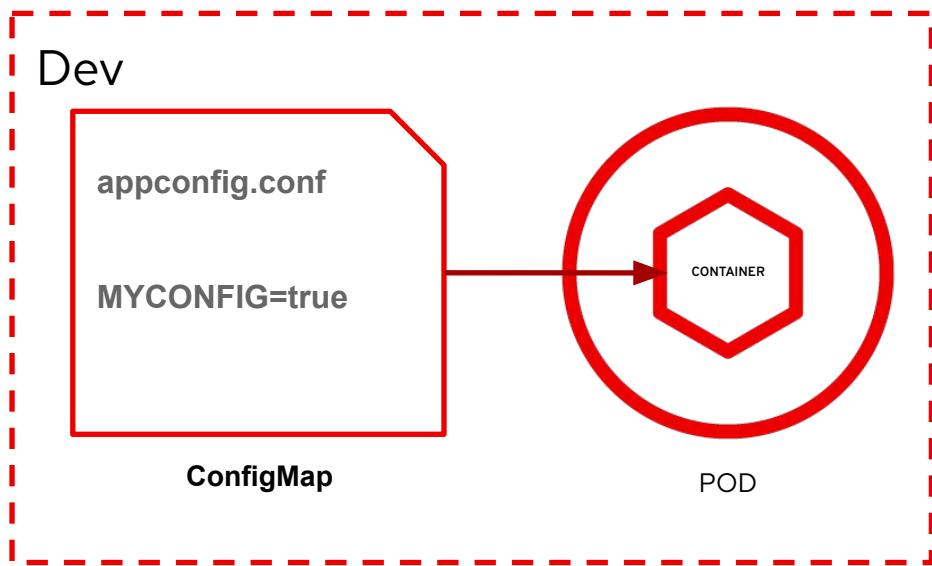
Containers are wrapped in pods which are units of deployment and management



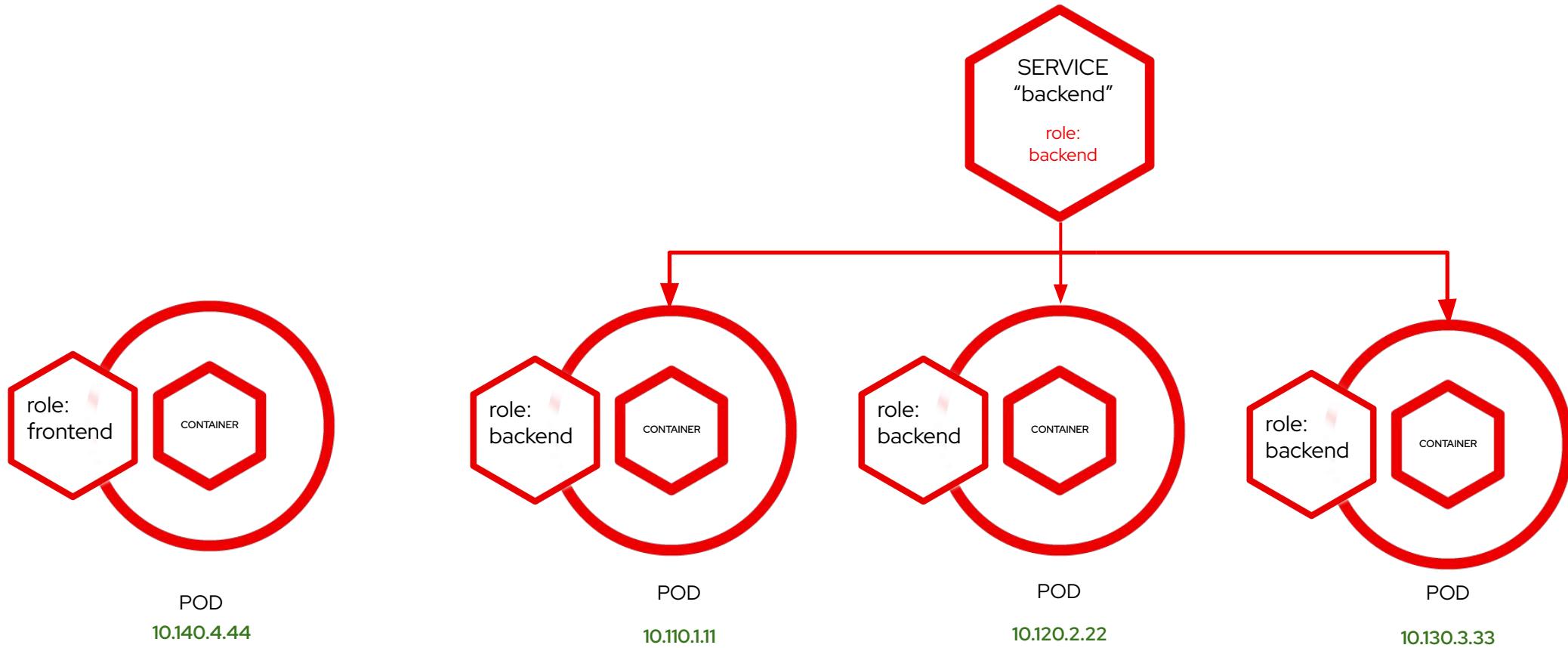
# Deployments define how to roll out new versions of Pods



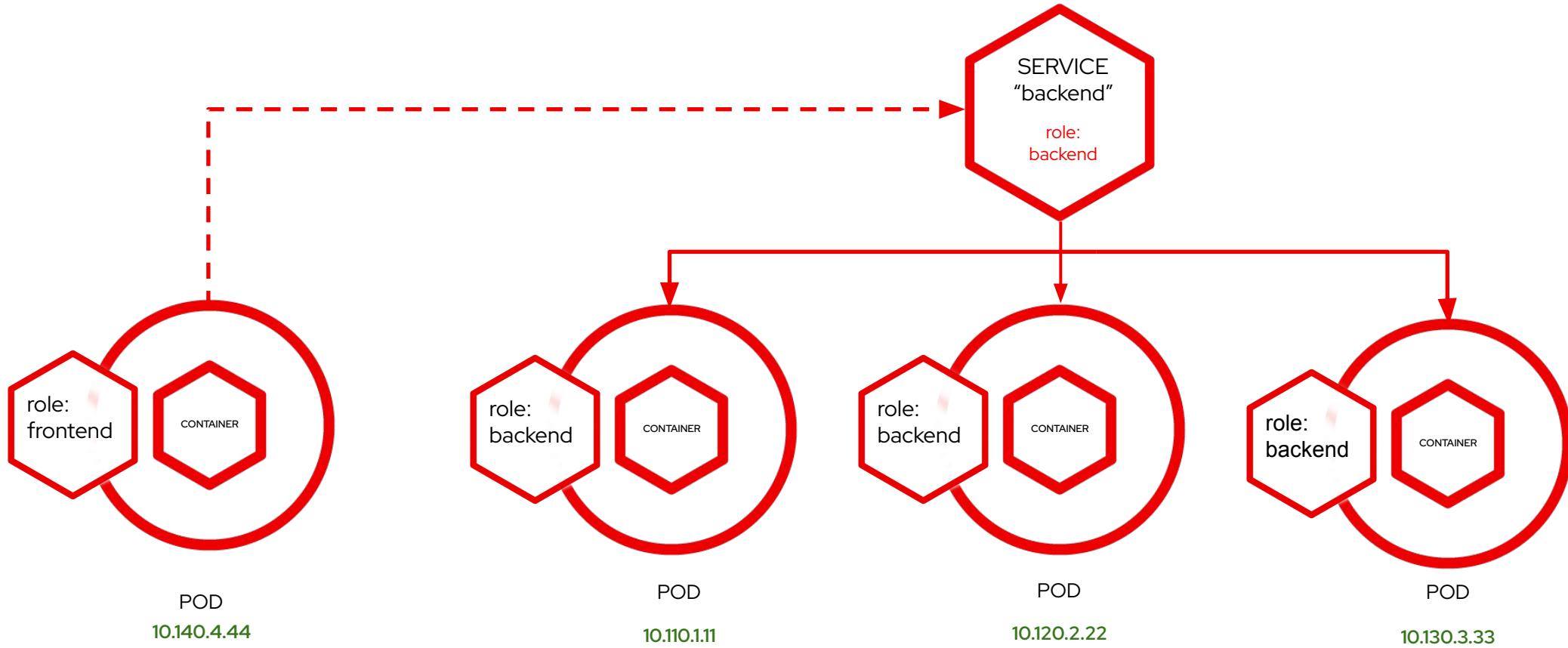
# Configmaps allow you to decouple configuration artifacts from image content



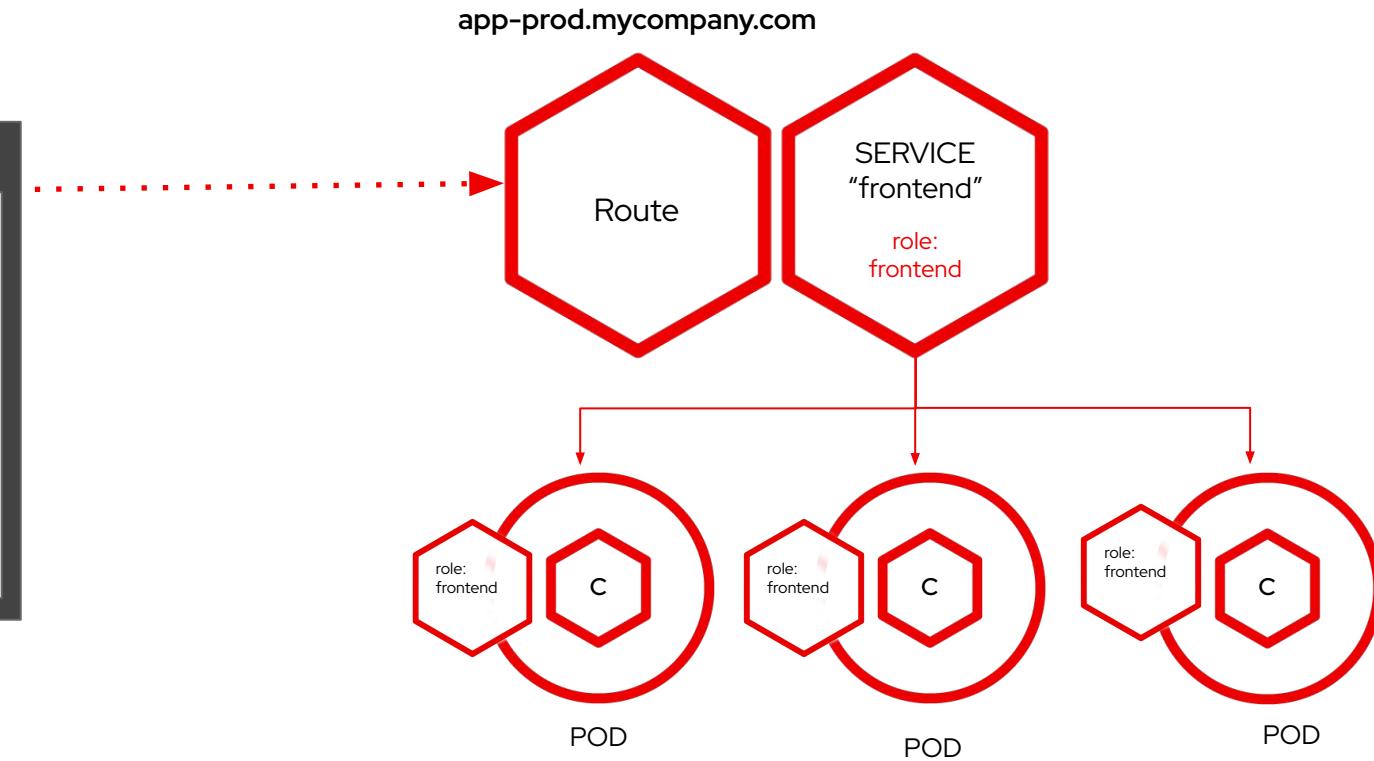
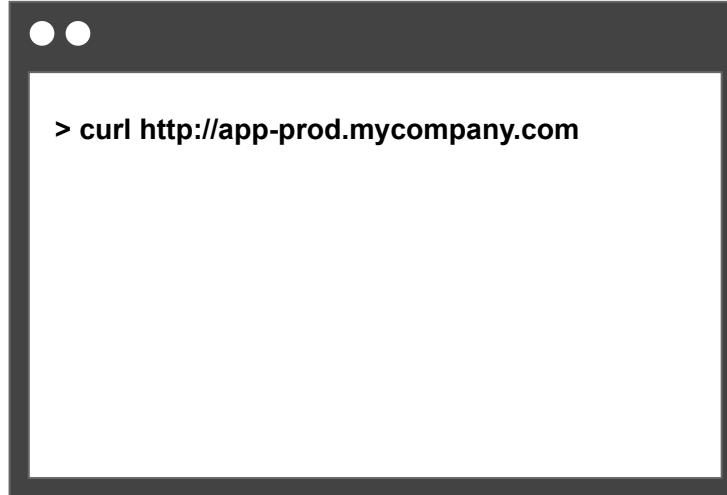
# Services provide internal load-balancing and service discovery across pods



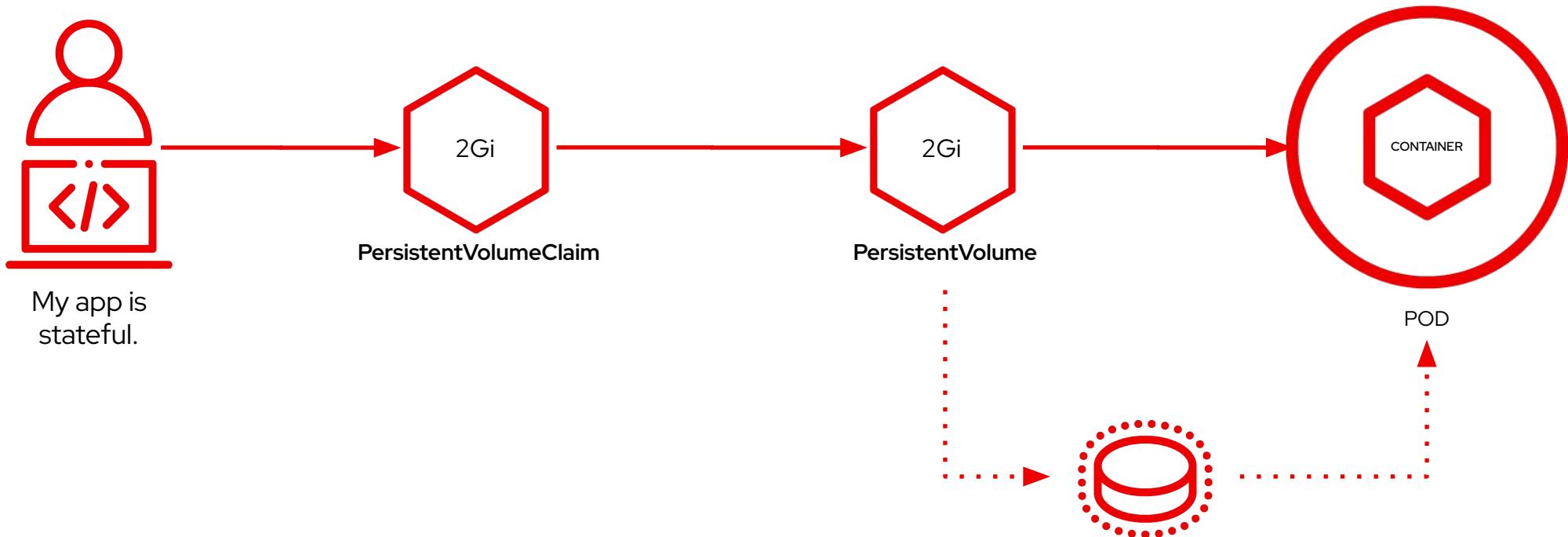
## Apps can talk to each other via services



# Routes make services accessible to clients outside the environment via real-world urls



# Persistent Volume and Claims





# OpenShift Multi-Cloud Container Platform

# Kubernetes

Kubernetes  
1.29



Red Hat OpenShift  
4.16



Kubernetes  
1.30



Red Hat  
OpenShift 4.17



Kubernetes  
1.31



Red Hat  
OpenShift 4.18



# Support Lifecycle

## Life Cycle Dates

Version	General availability	Full support ends	Maintenance support ends	Extended Update Support Add-On - Term 1 ends	Extended Update Support Add-On - Term 2 ends	Extended life phase ends
<b>Full Support</b>						
4.18	February 25, 2025	GA of 4.19 + 3 Months	August 25, 2026	February 25, 2027	February 25, 2028	N/A
4.17	October 1, 2024	May 25, 2025	April 1, 2026	N/A	N/A	N/A
<b>Maintenance Support</b>						
4.16	June 27, 2024	January 1, 2025	December 27, 2025	June 27, 2026	June 27, 2027	N/A
4.15	February 27, 2024	September 27, 2024	August 27, 2025	N/A	N/A	N/A
4.14	October 31, 2023	May 27, 2024	May 1, 2025	October 31, 2025	October 31, 2026	N/A
<b>Extended Support</b>						
4.12	January 17, 2023	August 17, 2023	July 17, 2024	January 17, 2025 <sup>13</sup>	January 17, 2026	N/A

Estimated release cadence: 4 months

All future dates mentioned are close approximations, non definitive, and subject to change.

For a historical reference of life cycle dates/phases please see the [Red Hat Product Life Cycles](#) for OpenShift

## Value of Red Hat OpenShift

Monitoring, Logging,  
Registry, Router, Telemetry

Cluster Services

Service Mesh, Serverless,  
Middleware/Runtimes, ISVs

Application Services

Dev Tools, CI/CD,  
Automated Builds, IDE

Developer Services

Automated Operations

Kubernetes

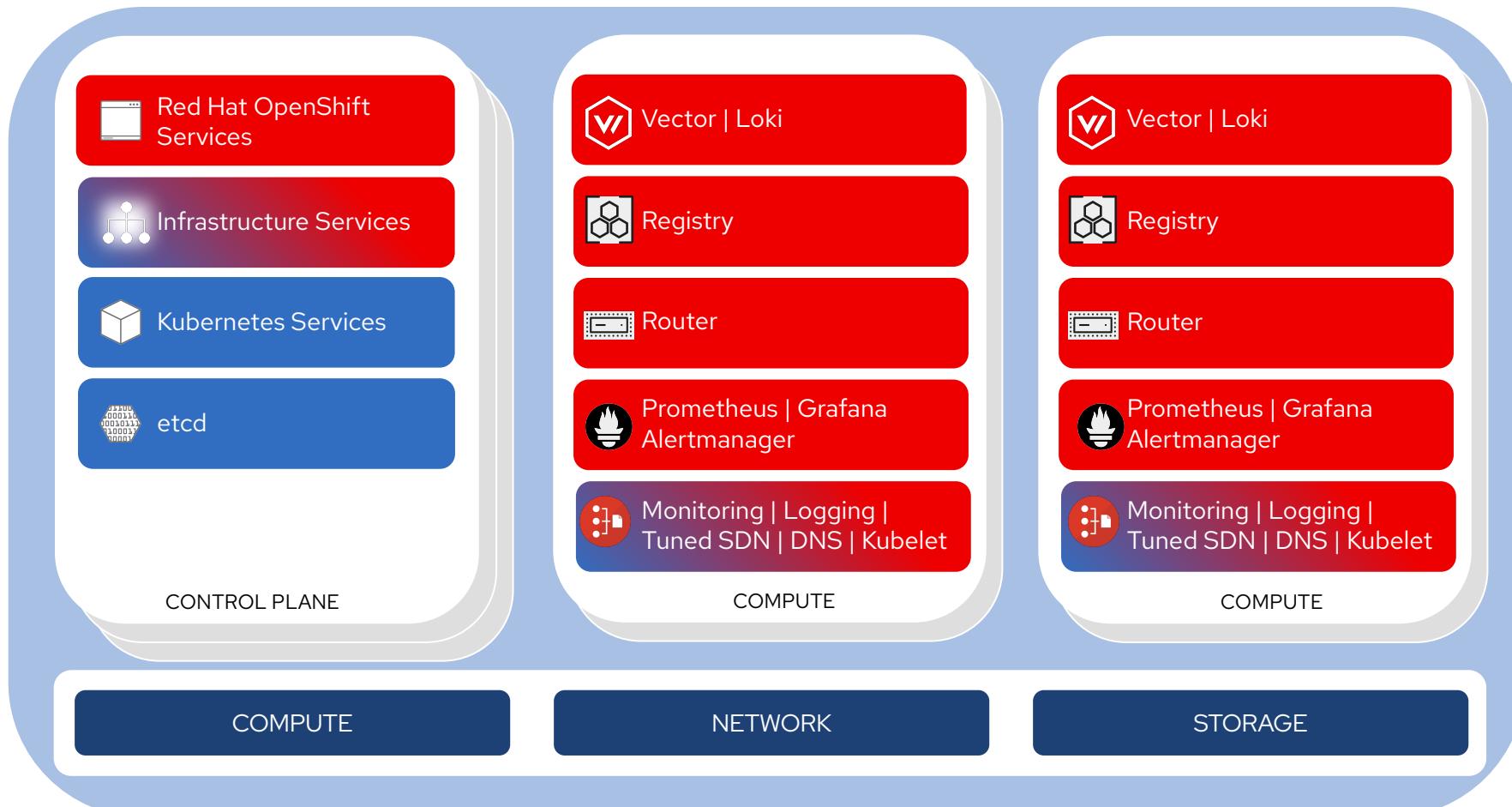
Red Hat Enterprise Linux | RHEL CoreOS

Best IT Ops Experience

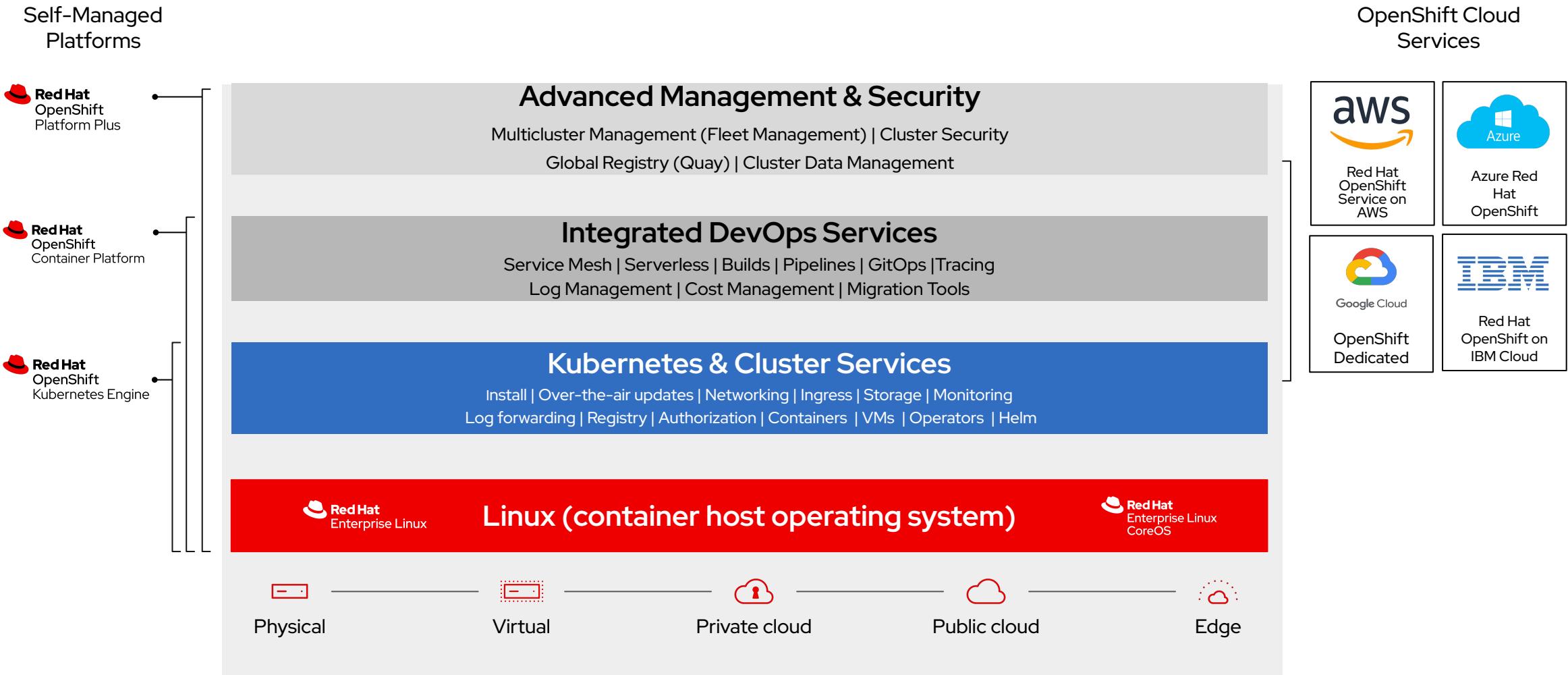
CaaS  $\longleftrightarrow$  PaaS  $\longleftrightarrow$  FaaS

Best Developer Experience

# Red Hat OpenShift High Level Architecture

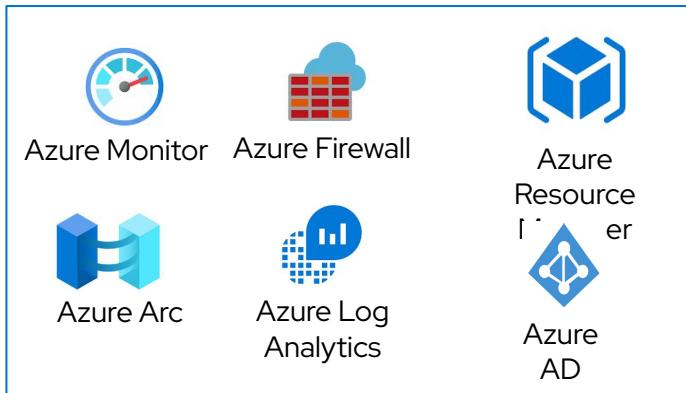


# Red Hat open hybrid cloud platform

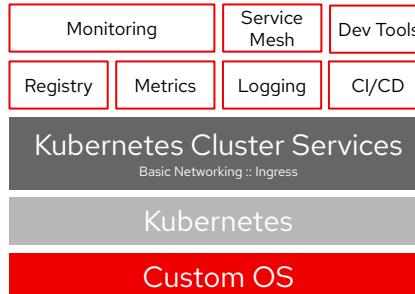


# Build and run a platform **VS** using OpenShift cloud services

Use your tool of choice with integrated Cloud components.



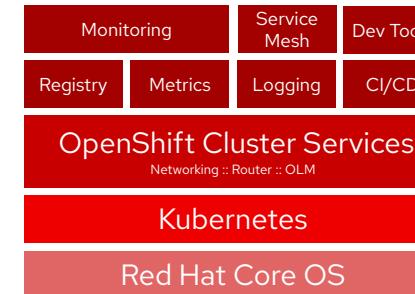
The Parts



Kubernetes and available services



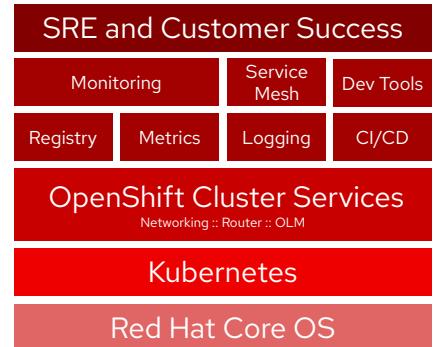
The Assembled Car



- Application Platform -  
Self-managed Red Hat OpenShift



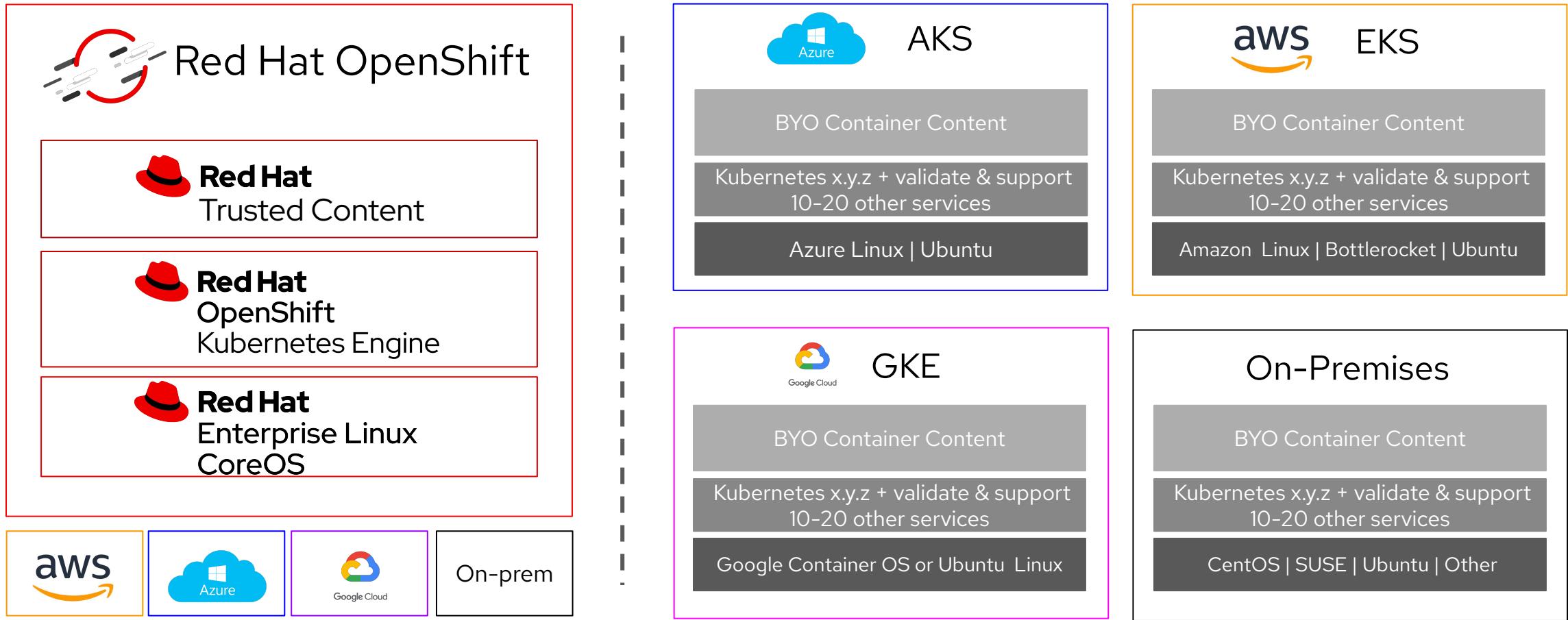
The Car & Pit Crew



- Turnkey Application Platform -  
Red Hat OpenShift cloud services

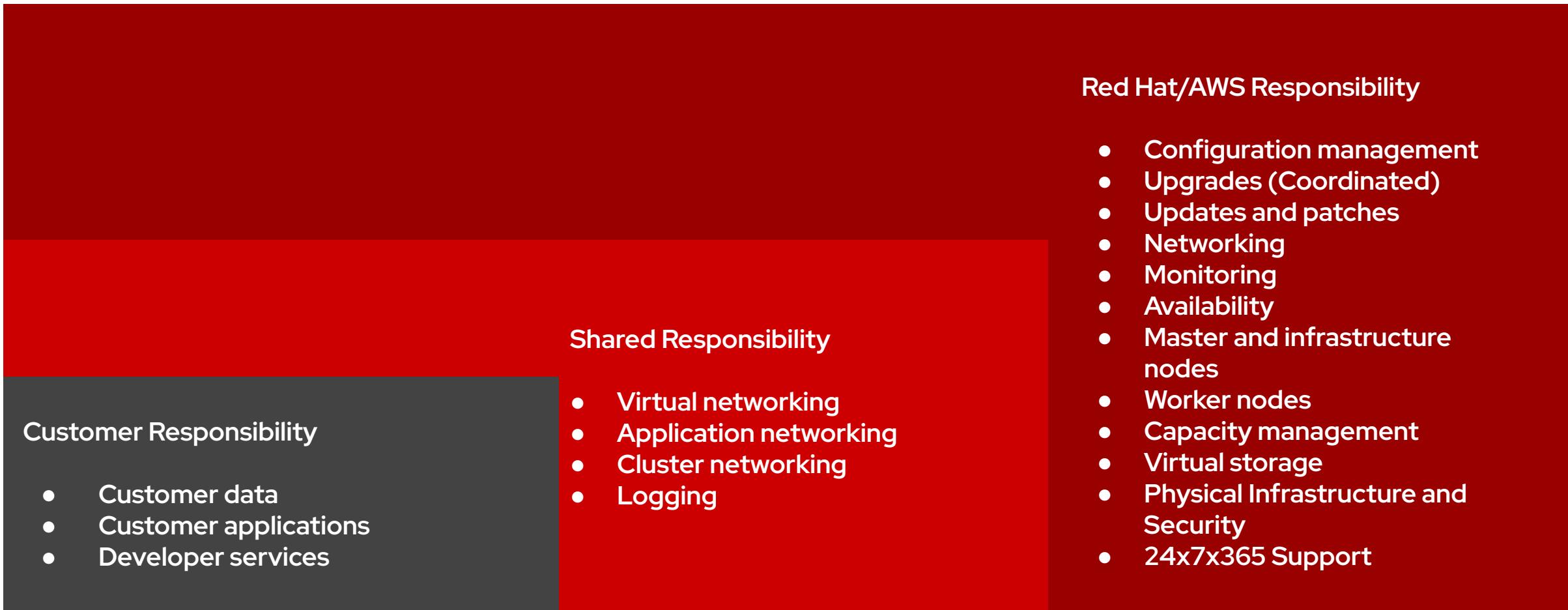
# OpenShift Trust & Consistency Across the Hybrid Cloud

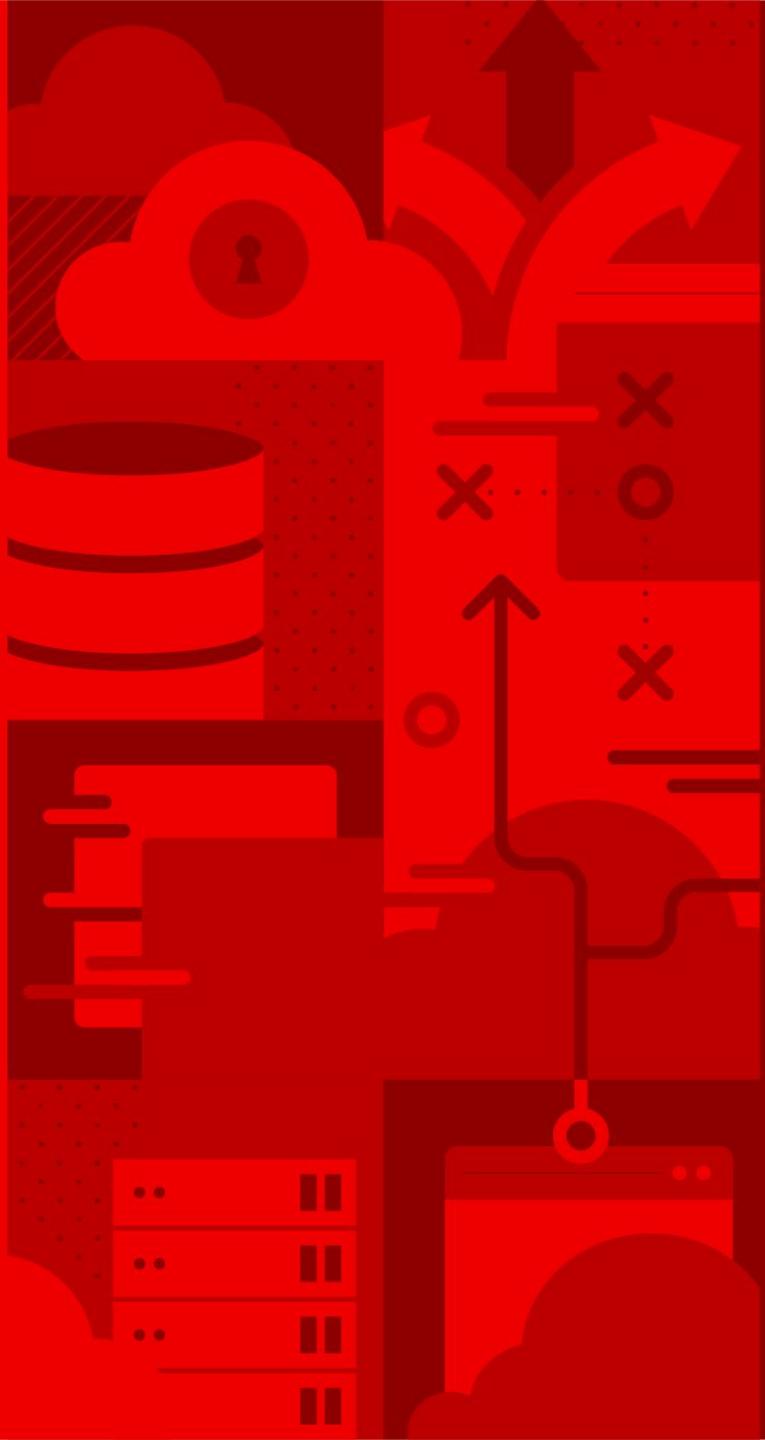
Versus managing different stacks across each environment



# Red Hat OpenShift on AWS

## Simplified Responsibility Model





# Under the Hood...

# Red Hat Enterprise Linux CoreOS

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The Red Hat OpenShift operating system and its runtime components



# Red Hat Enterprise Linux

## RED HAT® ENTERPRISE LINUX®

### General Purpose OS



## RED HAT® ENTERPRISE LINUX CoreOS

### Immutable container host



#### Benefits:

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

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

#### When To Use:

When customization and integration with additional solutions is required

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

# Immutable Operating System

## **Red Hat Enterprise Linux CoreOS is versioned with Red Hat OpenShift**

CoreOS is tested and shipped in conjunction with the platform. Red Hat runs thousands of tests against these configurations.

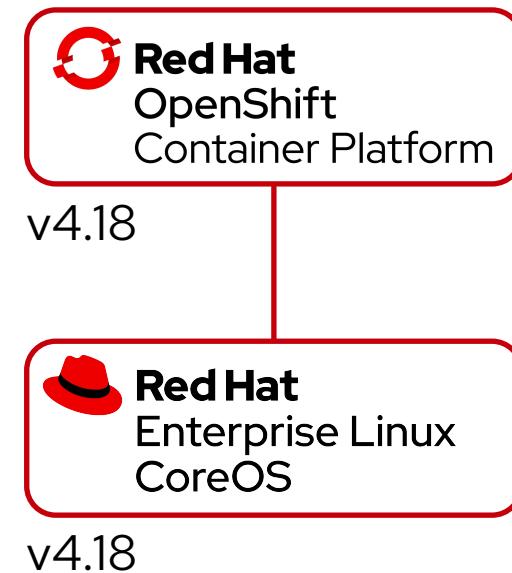
## **Red Hat Enterprise Linux CoreOS is managed by the cluster**

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

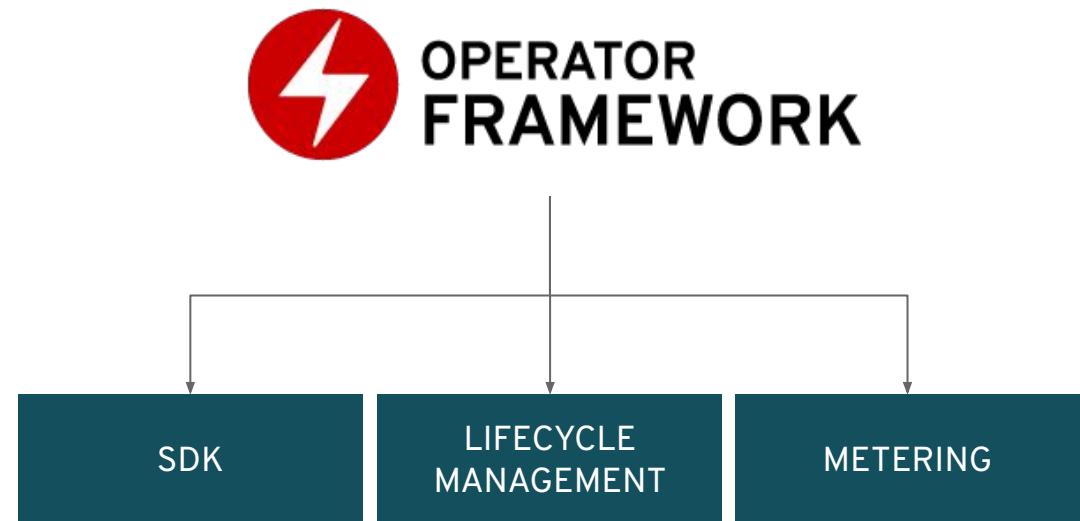
## **RHEL CoreOS admins are responsible for:**

Nothing. 😊 🙌

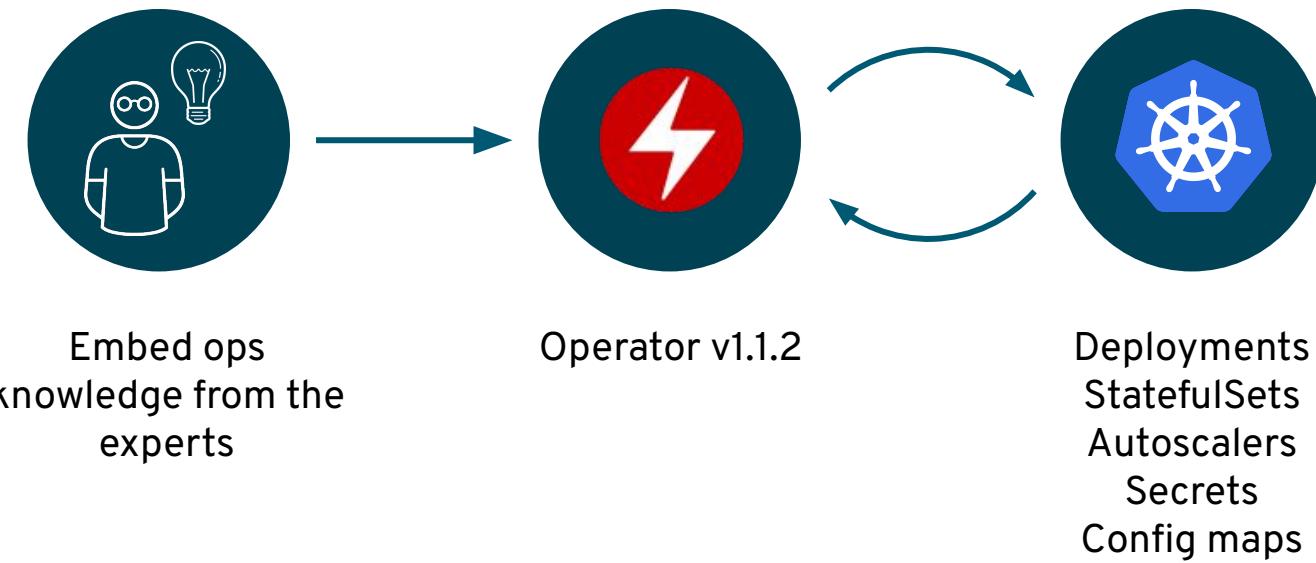


# Kubernetes Operator Framework

Operators codify operational knowledge and workflows to automate lifecycle management of containerized applications with Kubernetes



## HOW DOES AN OPERATOR OFFER MANAGED SERVICES?



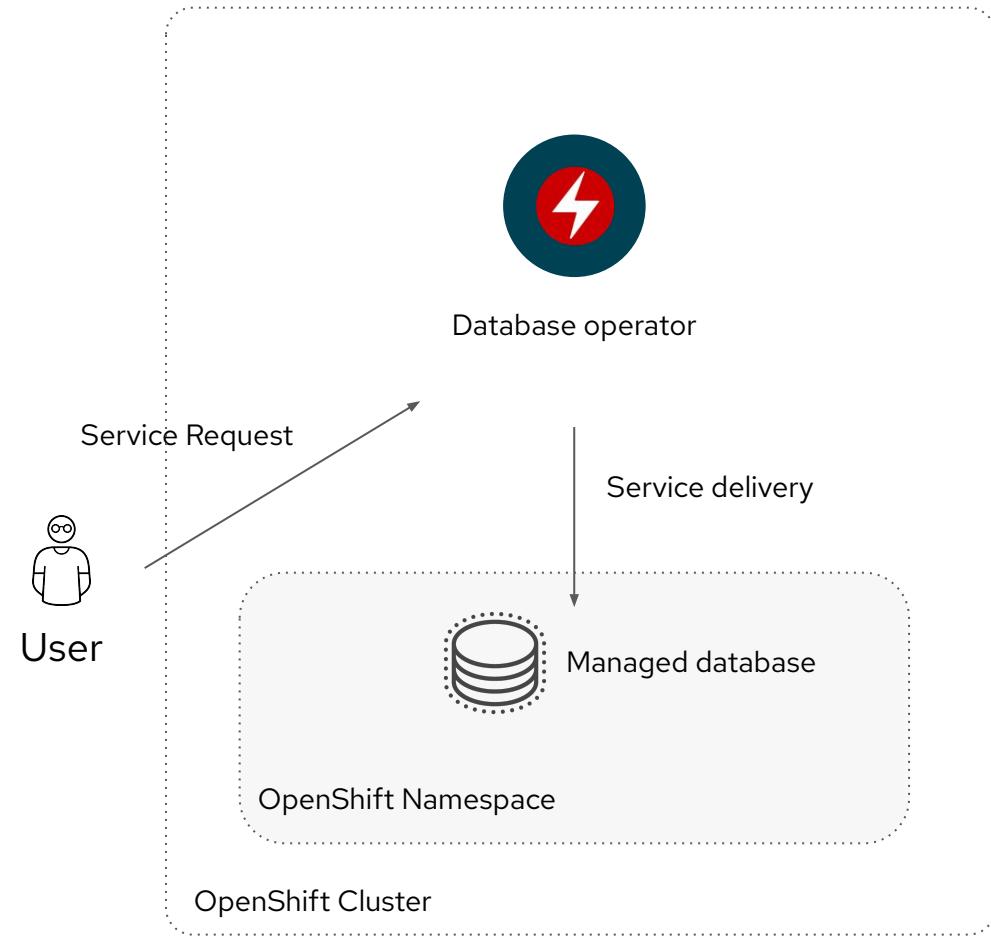
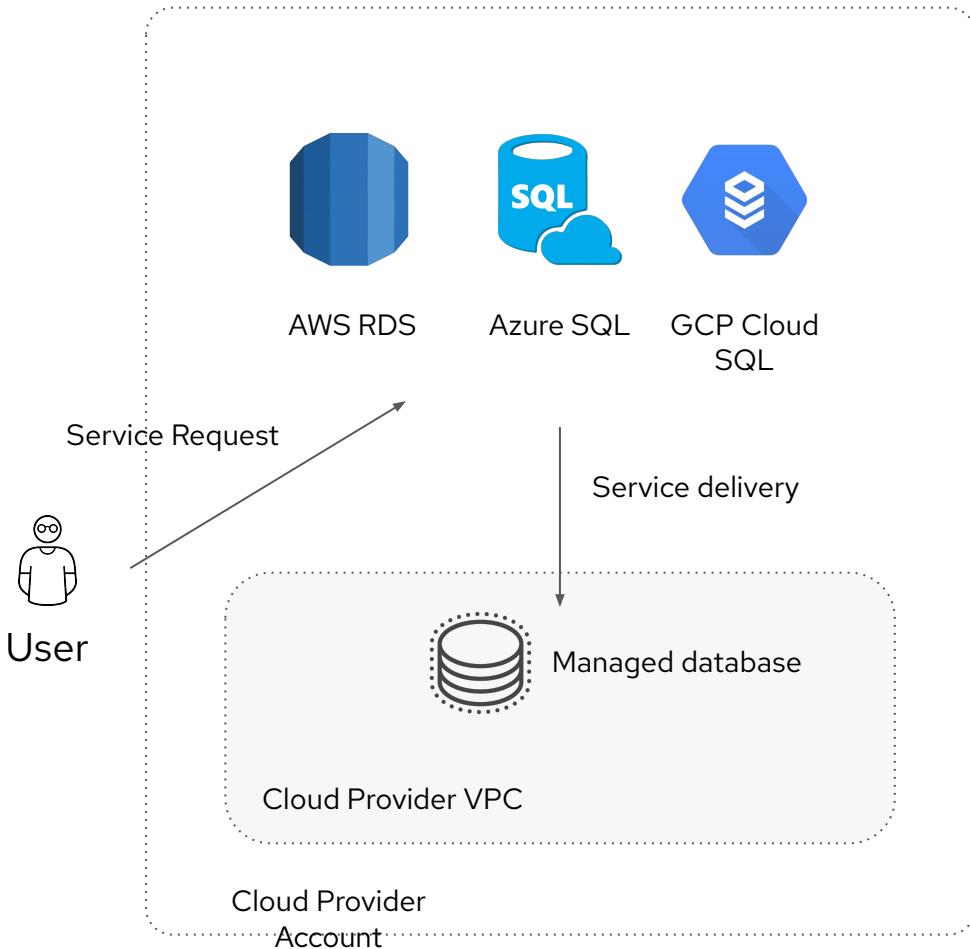
# Each Red Hat OpenShift release is a collection of Operators

- 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

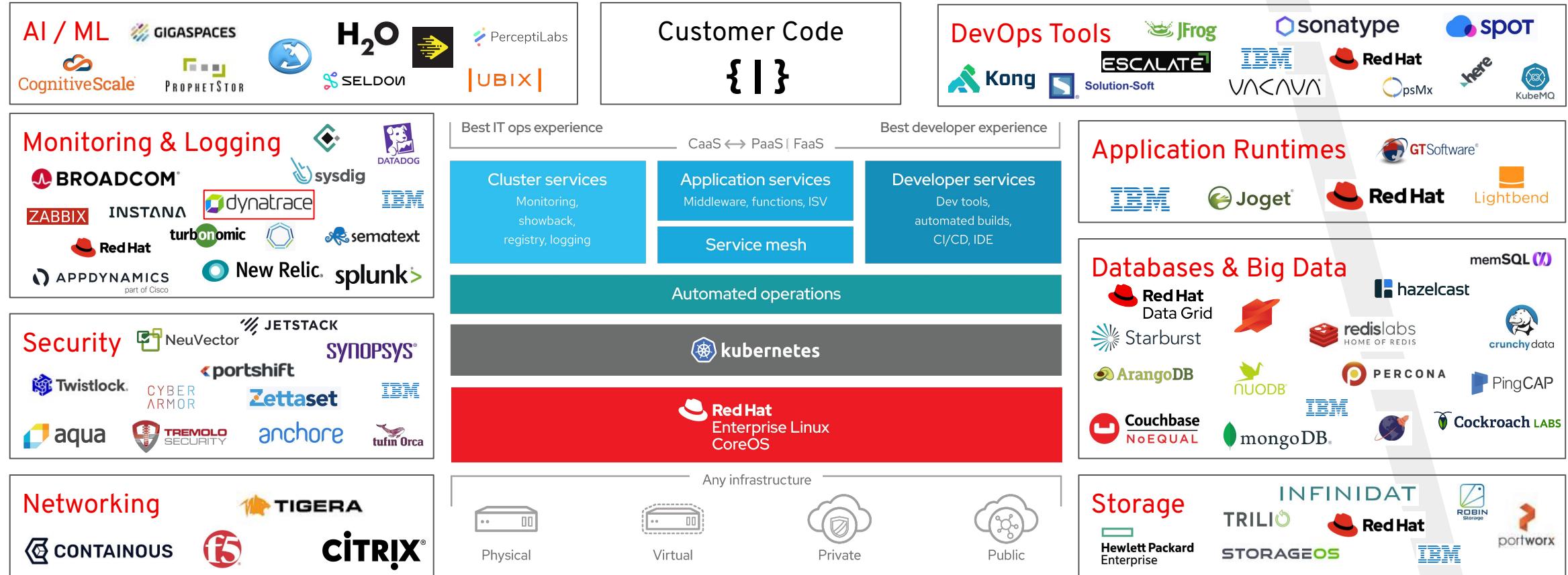
The screenshot shows the Red Hat OpenShift web interface. On the left, a dark sidebar menu includes options like Home, Operators, Workloads, Networking, Storage, Builds, Pipelines, Monitoring, Compute, User Management, Administration, Namespaces, Resource Quotas, Limit Ranges, Image Manifest Vulnerabilities, and Custom Resource Definitions. The 'Administration' section is currently selected. The main content area has a title 'Cluster Settings' with tabs for 'Details', 'Cluster Operators', and 'Global Configuration'. Under 'Cluster Operators', there's a summary bar with counts for Available (30), Updating (0), Degraded (0), and Unknown (0), followed by a 'Select all filters' button. Below is a table listing 15 operators with columns for Name, Status, Version, and Message. Most operators are 'Available' (green) at version 4.4.9. The 'dns' operator has a note: 'At least 1 DNS DaemonSet available'. The 'etcd' operator has notes: 'StaticPodsAvailable: 3 nodes are at revision 12' and 'EtcdMembersAvailable: 3 members'. The 'image-registry' operator has a note: 'The registry is ready'. The 'ingress' operator has a note: 'desired and current number of Ingress'. The 'kube-apiserver' operator has a note: 'StaticPodsAvailable: 3 nodes are at revision 159'. The 'kube-controller-manager' operator has a note: 'StaticPodsAvailable: 3 nodes are at revision 86'. At the bottom, there's another 'Cluster Settings' section with tabs for 'Details', 'Cluster Operators', and 'Global Configuration'. It shows a summary table with columns for Channel (fast-4.4), Current Version (4.4.11), and Update Status. A blue 'Update now' button is visible.

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	StaticPodsAvailable: 3 nodes are at revision 12 EtcdMembersAvailable: 3 members
image-registry	Available	4.4.9	The registry is ready
ingress	Available	4.4.9	desired and current number of Ingress
insights	Available	4.4.9	-
kube-apiserver	Available	4.4.9	StaticPodsAvailable: 3 nodes are at revision 159
kube-controller-manager	Available	4.4.9	StaticPodsAvailable: 3 nodes are at revision 86

# Operators are like cloud services, but on your cluster!

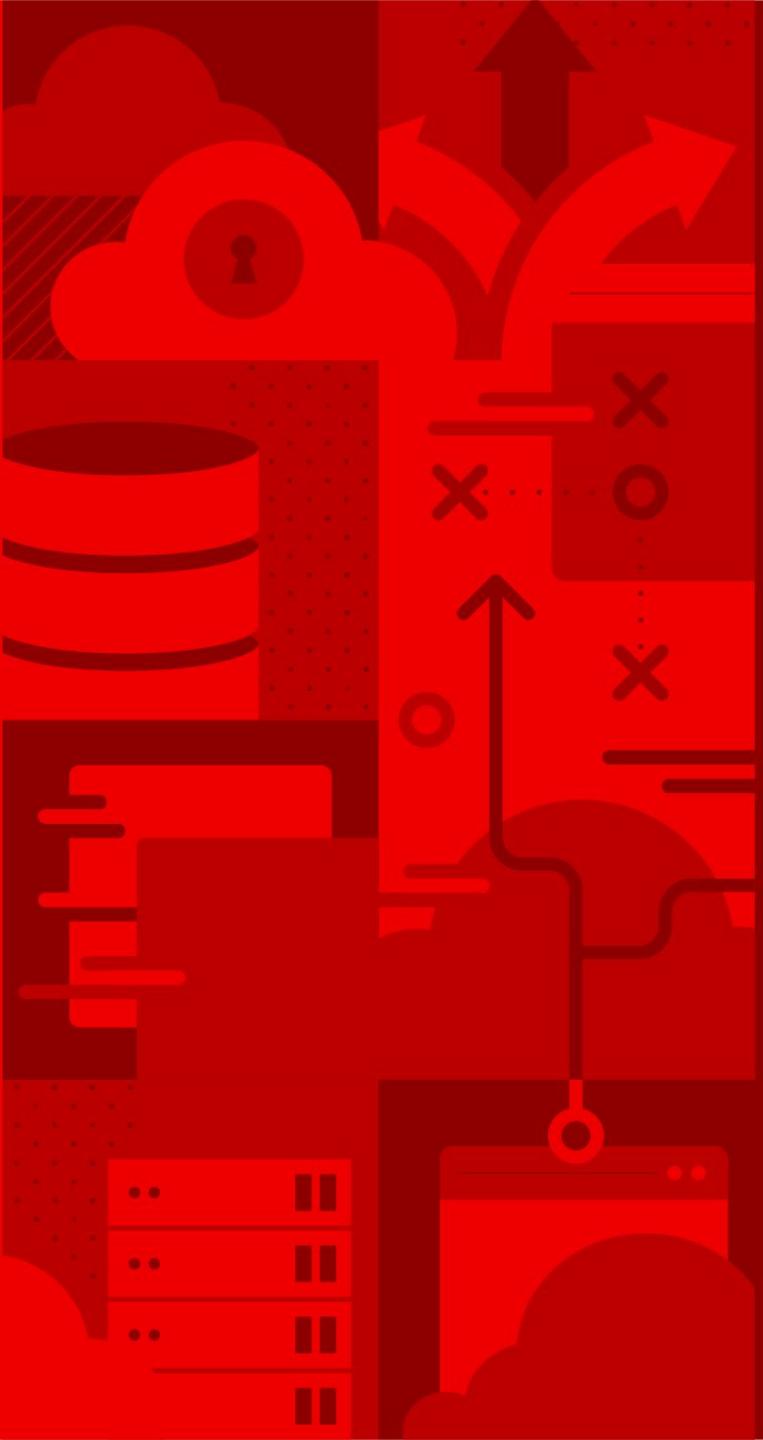


# Hundred of Certified Operators



OperatorHub.io launched by Red Hat, AWS, Microsoft and Google

# Installation & Upgrades



# Installation Paradigms

## Red Hat OpenShift

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 Red Hat OpenShift

Azure Red Hat OpenShift (ARO) & Red Hat OpenShift for Azure (ROSA)

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

Red Hat OpenShift Dedicated (OSD)

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

# OpenShift Installation Options for Bare Metal



## Agent Based Installer

*Automatable  
Local, Disconnected*

- Create ISOs, insert in machines and go
- Connectivity not required
- Automatable via CLI and config files
- User must configure how to insert ISO into machines

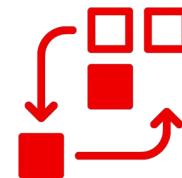


## Assisted Installer

[console.redhat.com](http://console.redhat.com)

*Interactive  
GUI*

- Web GUI with guided experience
- Integrated into [console.redhat.com](http://console.redhat.com) experience
- Download ISOs for machines
- Unique API usable for automation
- User must configure how to insert ISO into machines



## Installer Provisioned Infrastructure

*More Automated  
More Opinionated*

- After prereqs are set up, one command and go!
- Manages full lifecycle of machines including power-on and insertion of CoreOS media
- Requires dedicated provisioning machine during install
- Enables self-service expansion of cluster



## User Provisioned Infrastructure

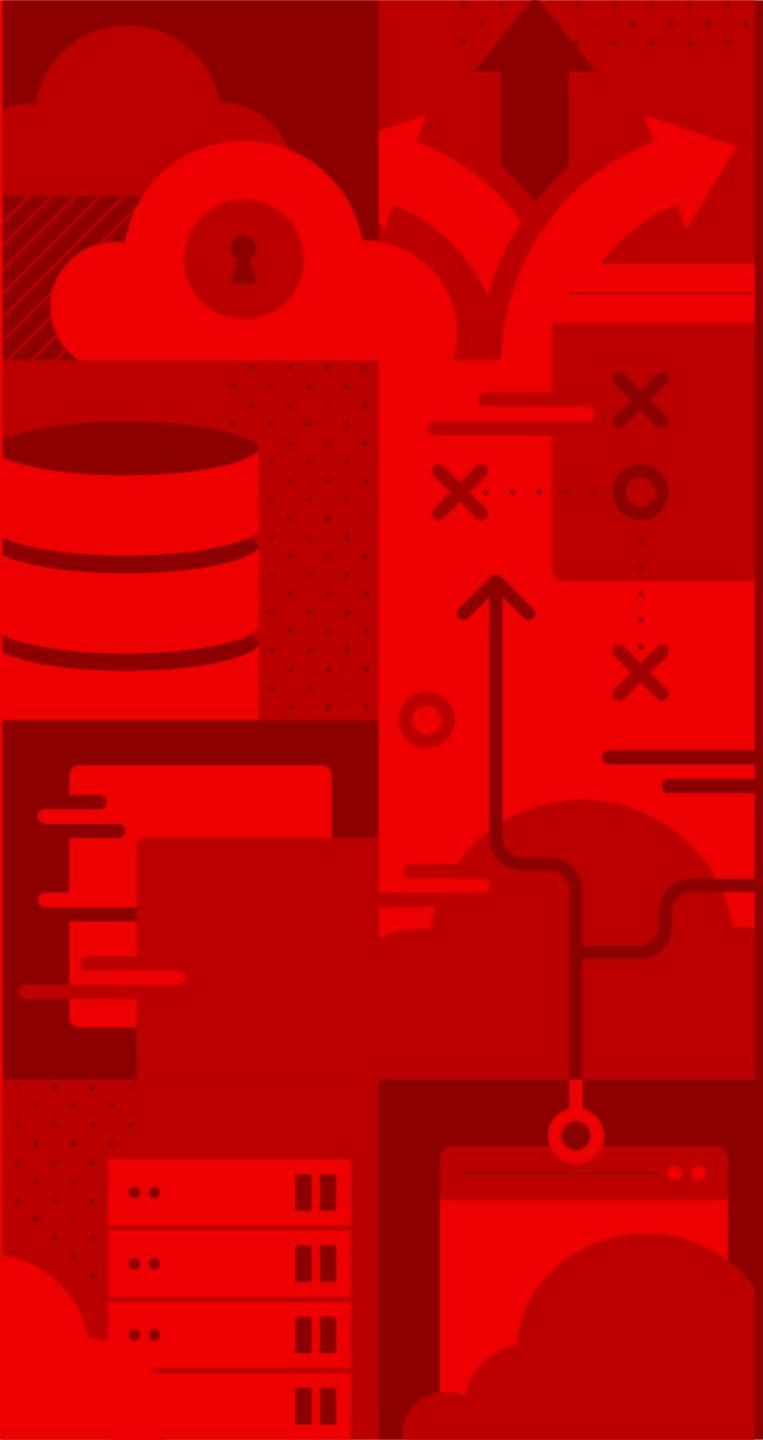
*Full control  
Full complexity*

- User must host required files and services
- User must prepare CoreOS images as needed
- User must host or embed configuration files
- Unlocks more customizability

# Automated Install & Over the Air Updates

- OpenShift retrieves the list of available updates
- Admin selects the target version
- OpenShift is updated over the air
- Auto-update support

# Security





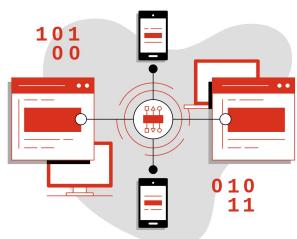
## CONTROL

### Application Security



## DEFEND

### Infrastructure

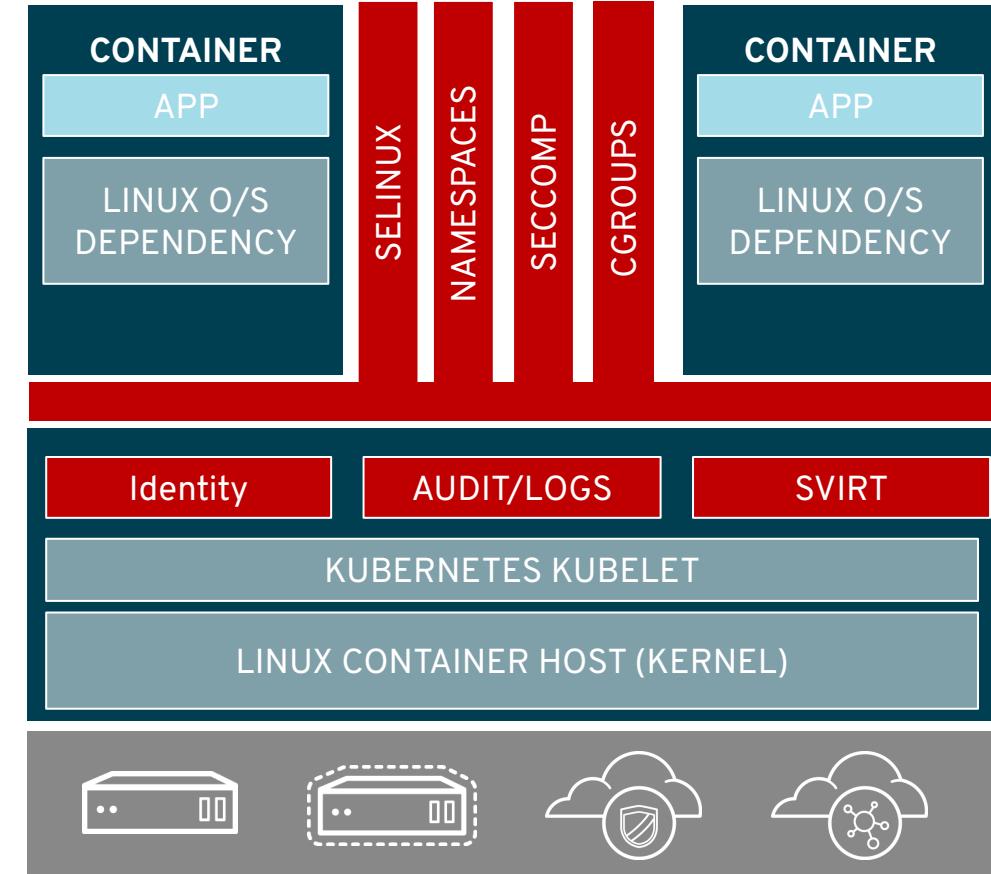


## EXTEND

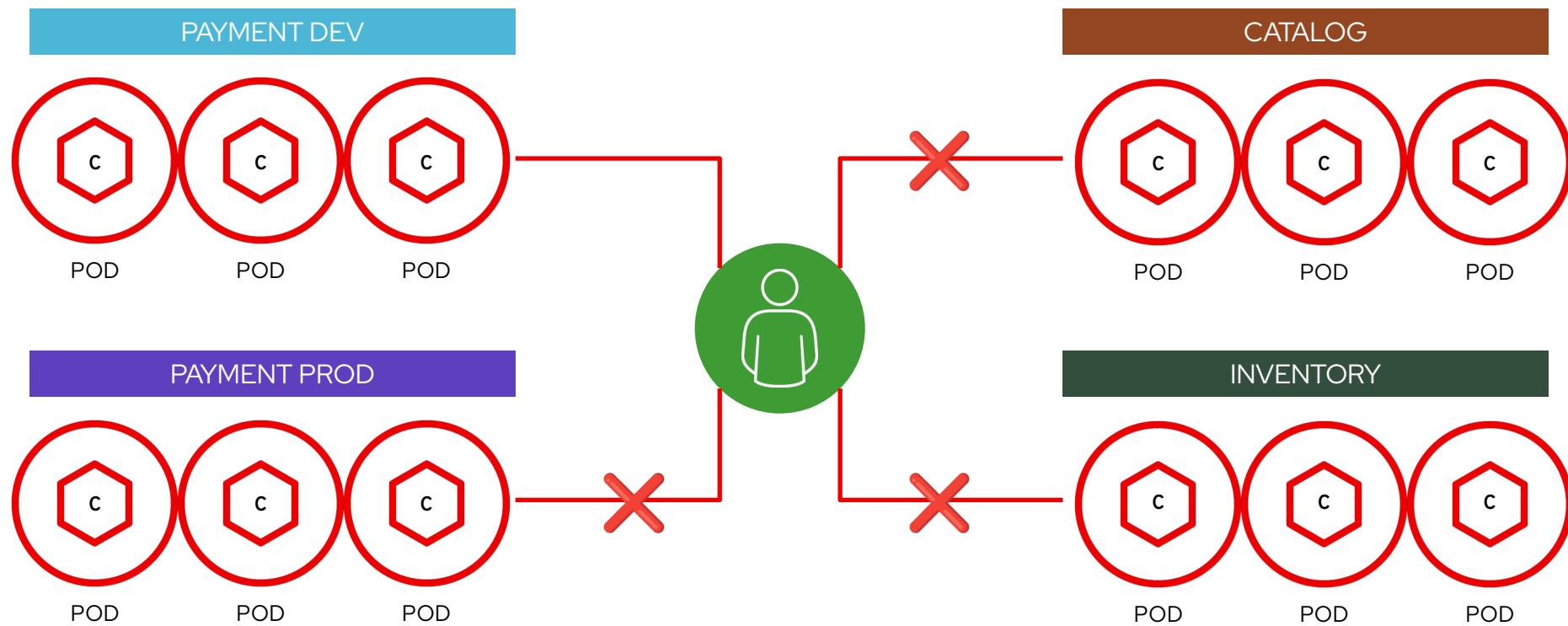
Container Content	CI/CD Pipeline
Container Registry	Deployment Policies
Container Platform	Container Host Multi-tenancy
Network Isolation	Storage
Audit & Logging	API Management
Security Ecosystem	

# Container security starts with Linux security

- ▶ OpenShift enhances container security using Linux kernel mechanisms like Seccomp, AppArmor, and SELinux, which limit system calls and resource access.
- ▶ Protects not only the host, but containers from each other
- ▶ The container runtime used in OpenShift is CRI-O
- ▶ OpenShift provides SCC facility to manage easily the linux features (Selinux, SecComp, Namespaces, et Capabilities).



Projects isolate apps across environments, teams,  
groups and departments



# Openshift Quotas

Defining a cluster control strategy

## *ResourceQuota*

**provides constraints that limit aggregate resource consumption per project.**

## *LimitRange*

**restricts resource consumption in a project.**

In the project you can set specific resource limits for a pod, container, image, image stream, or persistent volume claim (PVC).

# Fine-Grained RBAC

- Project scope & cluster scope available
- Operator- and user-level roles are defined by default
- Custom roles are supported

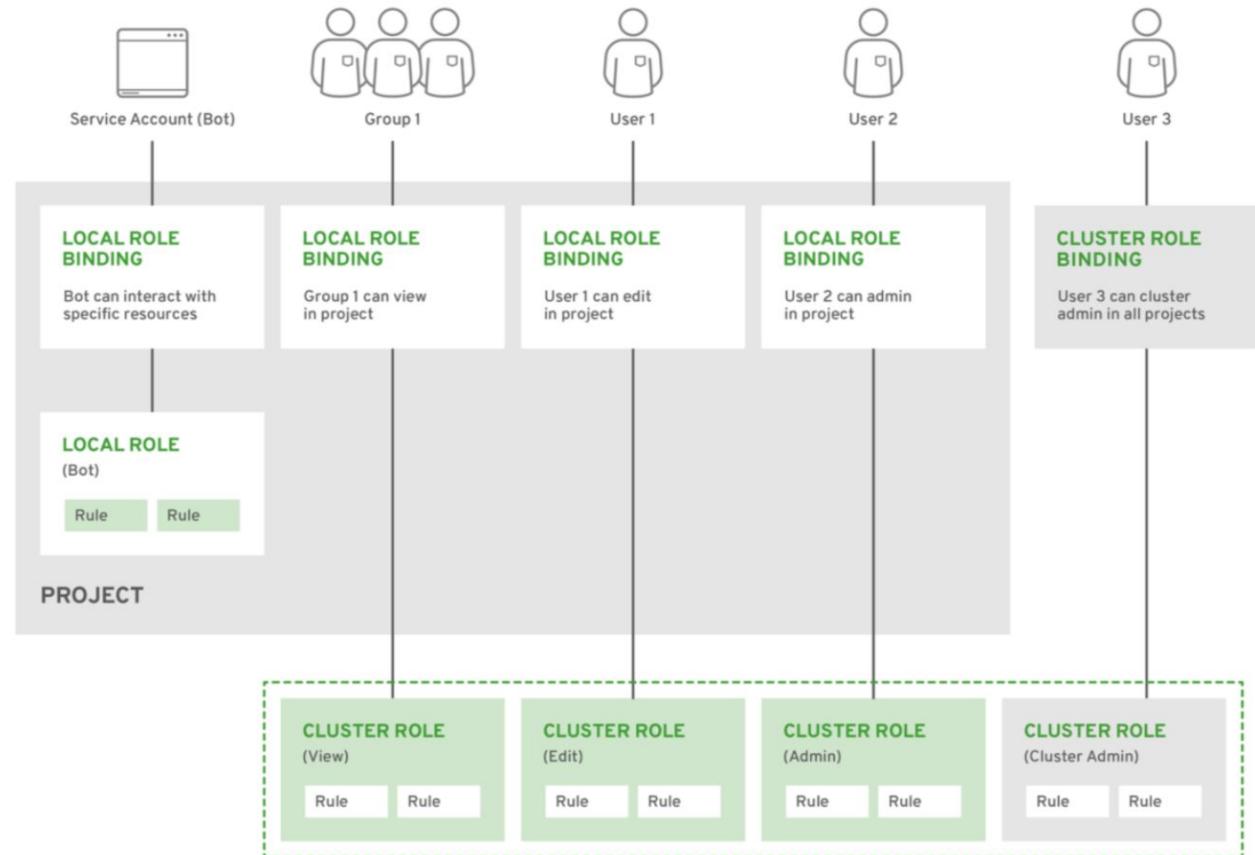
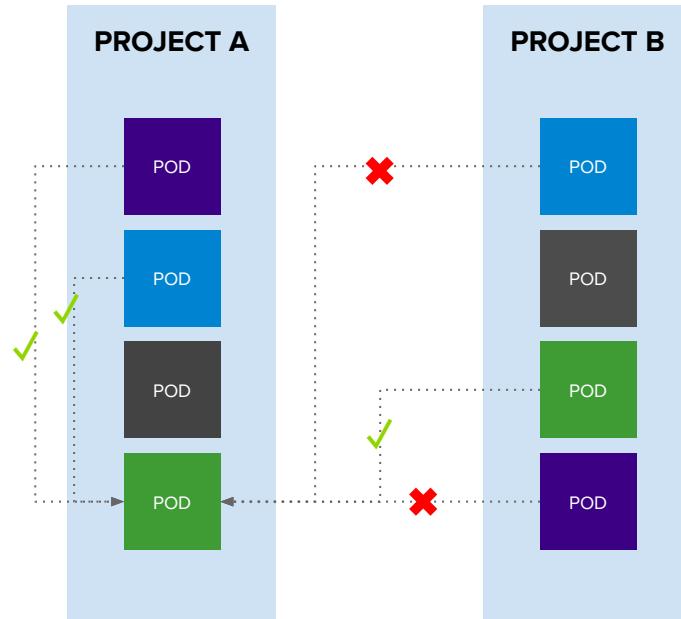


Figure 12 - Authorization Relationships

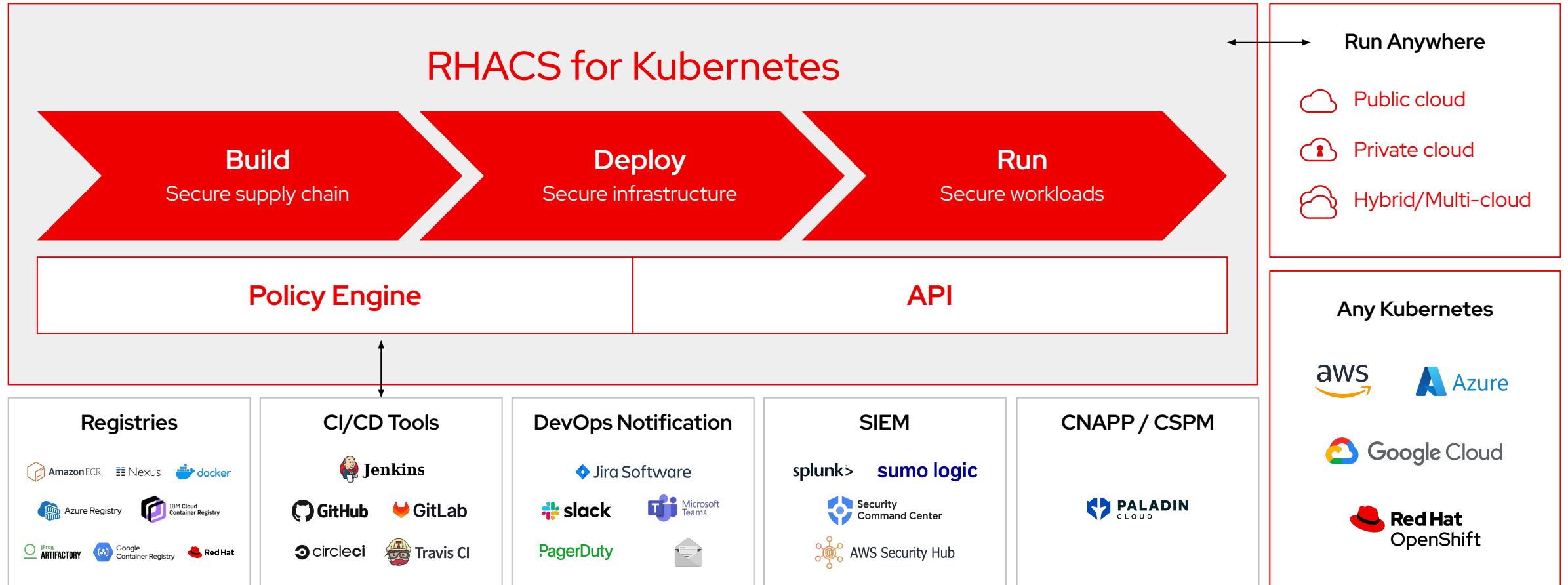
# Network Policies



```
apiVersion: v1
kind: NetworkPolicy
metadata:
  name: allow-green-pod
spec:
  podSelector:
    matchLabels:
      name: green-pods
  ingress:
    podSelector:
      matchLabels:
        name: green-pods
```

```
kind: NetworkPolicy
apiVersion:
networking.k8s.io/v1
metadata:
  name:
allow-same-namespace
spec:
  podSelector:
  ingress:
  - from:
    - podSelector: {}
```

# Red Hat Advanced Cluster Security for Kubernetes



# Red Hat Advanced Cluster Security: Use Cases

Security across the entire application lifecycle



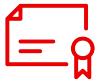
## Vulnerability Management

Protect yourself against known vulnerabilities in images and running containers



## Risk Profiling

Gain context to prioritize security issues throughout OpenShift and Kubernetes clusters



## Compliance

Meet contractual and regulatory requirements and easily audit against them



## Network Segmentation

Apply and manage network isolation, generate network policies in build or run time



## Security Policy Guardrails

Ensure your deployments are configured according to security best practices

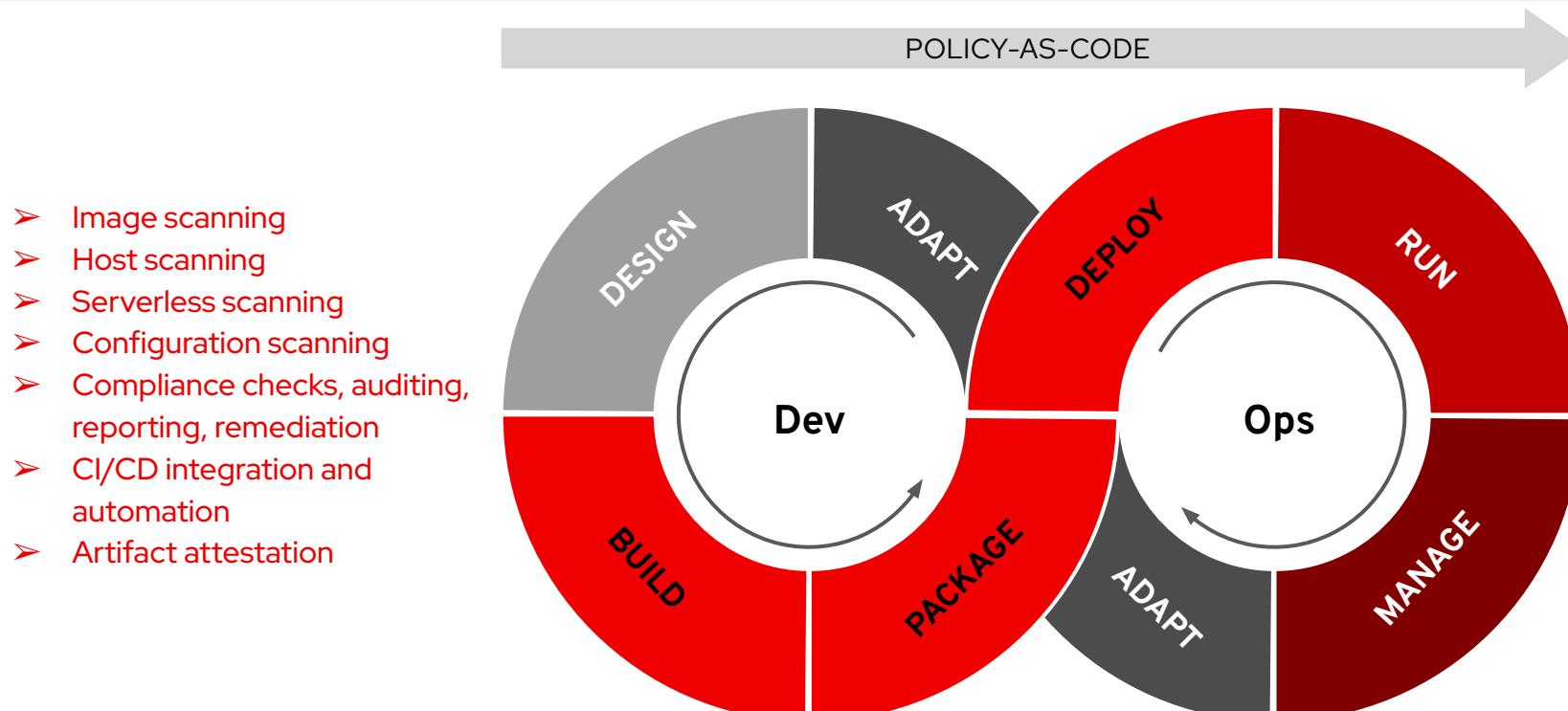


## Threat Detection and Response

Carry out incident response to address active threats in your environment

# Red Hat Advanced Cluster Security

Security across the entire application lifecycle



- Image scanning
- Host scanning
- Serverless scanning
- Configuration scanning
- Compliance checks, auditing, reporting, remediation
- CI/CD integration and automation
- Artifact attestation

- Runtime threat detection
  - ✓ Process allowlisting
  - ✓ Anomaly detection
  - ✓ Policy-based detection
- Runtime vulnerability management
- Incident response
- Integrations
  - ✓ SIEM
  - ✓ Registries, CI/CD, runtimes, notification tools
- Feedback loop

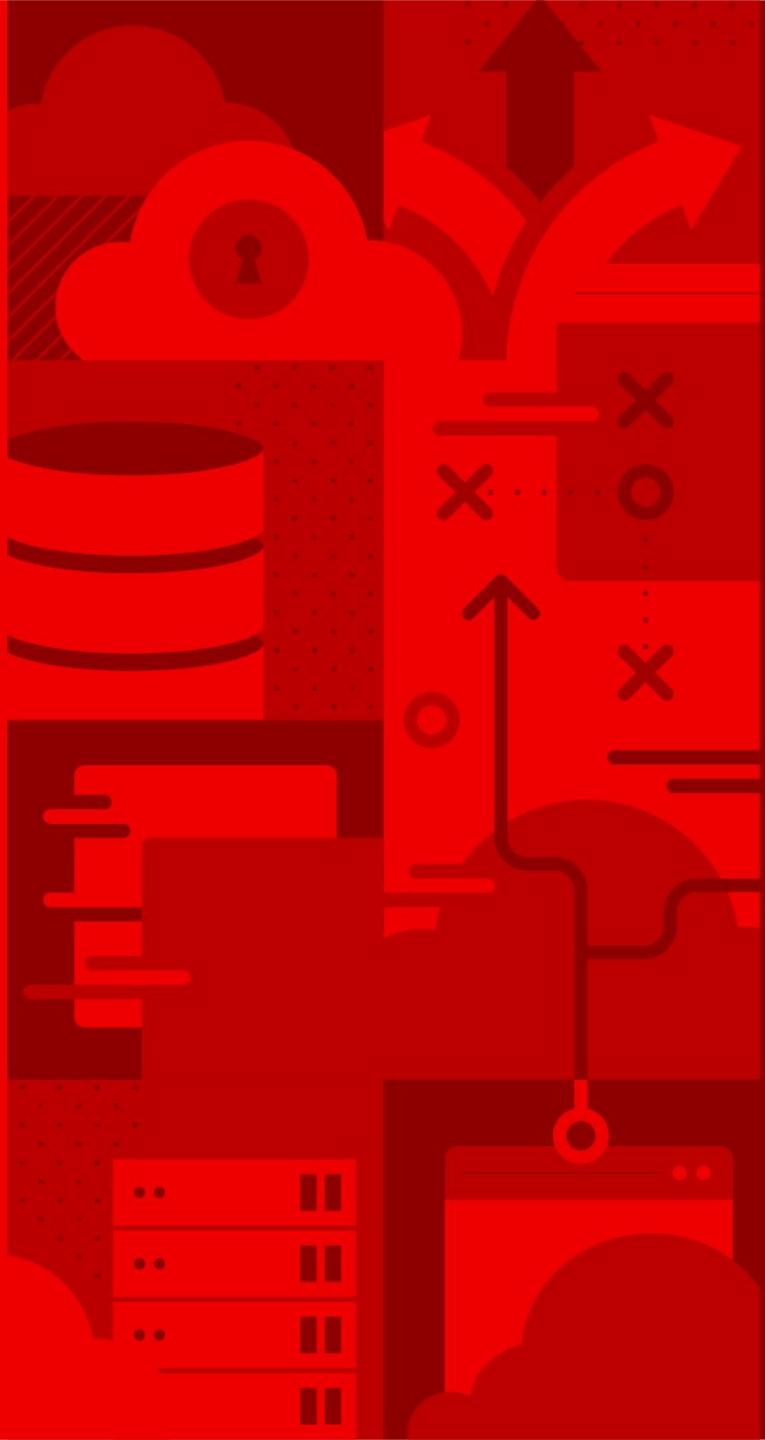
VISIBILITY (images, deployments, network flows, processes, secrets use)

CONTAINERS AND K8S (on-premises, cloud/hybrid, edge)

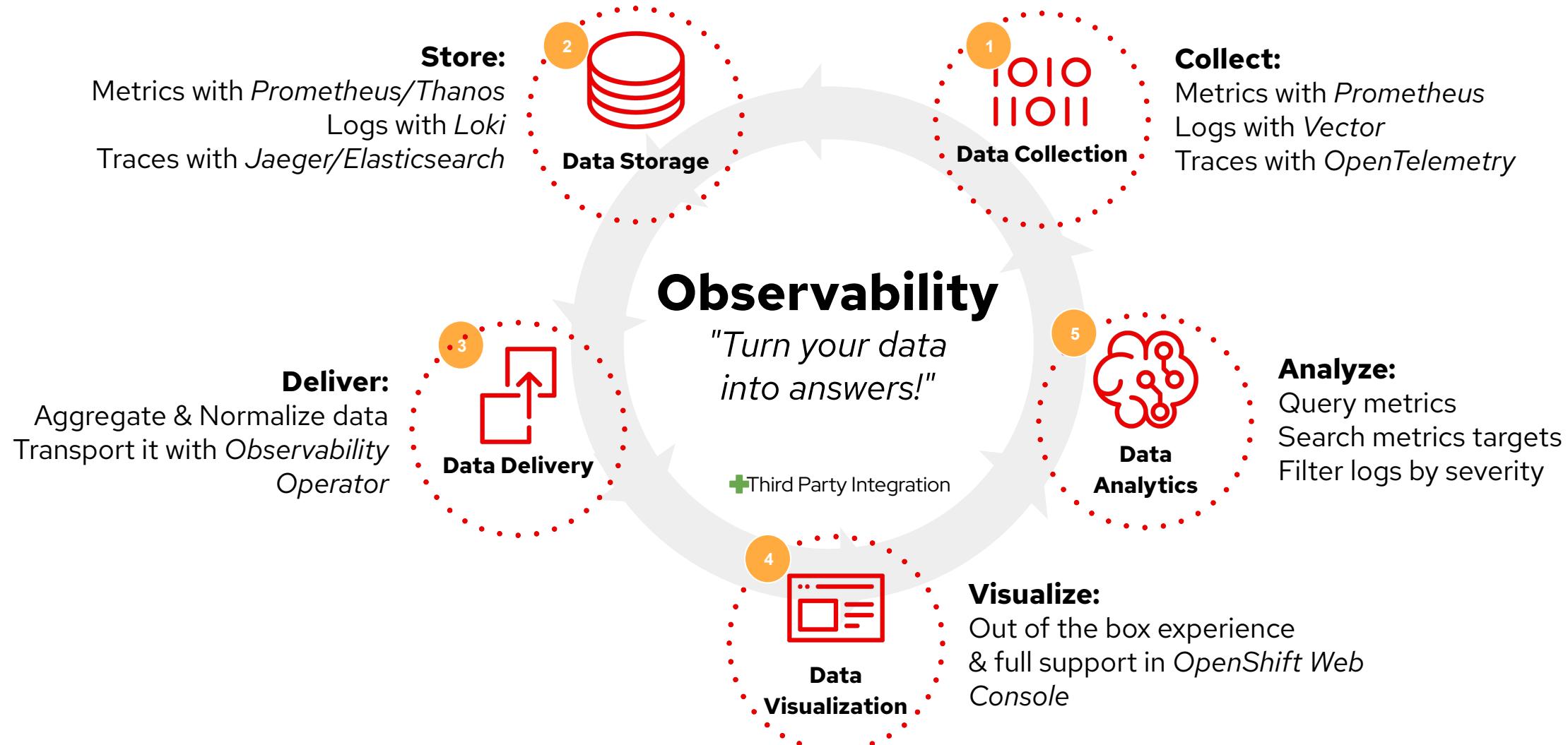
# Security partners

Enhance and extend Red Hat functionality to better secure the entire DevOps life cycle

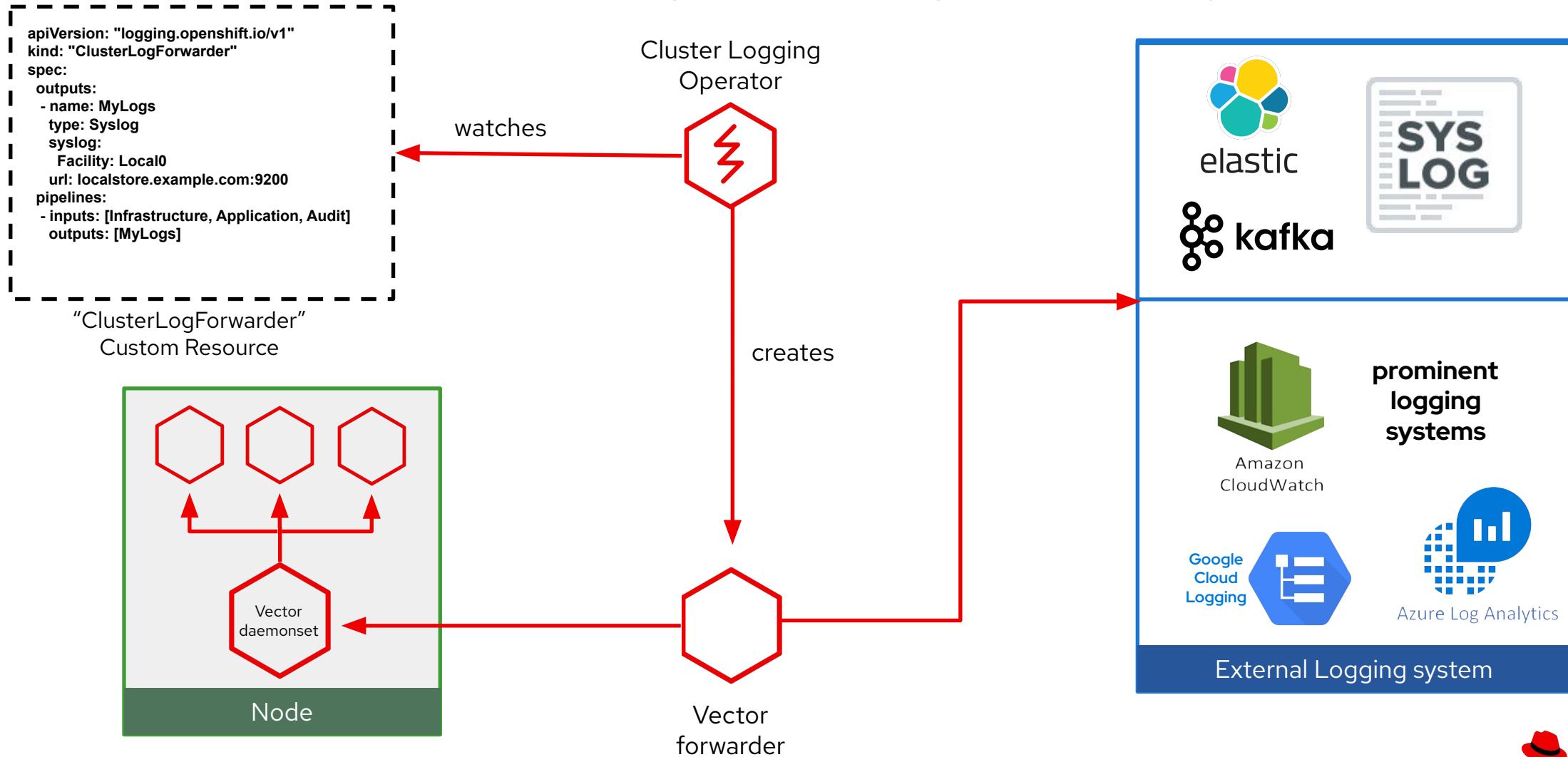
Application analysis	Identity & access management		
SAST, SCA, IAST, DAST, Image risk	SAST, SCA, IAST, DAST, Image risk		
Compliance	Network controls		
Regulatory compliance, PCI-DSS, GDPR	CNI plugins, policies, traffic controls, service mesh		
Data controls	Runtime analysis & protection		
Data protection and encryption	RASP, production analysis		
Audit and monitoring	Remediation		
Logging, visibility, forensics	SOAR, automatic resolution		
 CYBERARK®	 sysdig	 aqua	 SYNOPSYS®
 TIGERA	 paloalto NETWORKS	 NeuVector	
 StackRox	 IBM	 snyk	 TREND MICRO™
 anchore	 portshift	 tufin	 Lacework™
 Red Hat	platform security		
Secure host, container platform, namespace isolation, k8s and container hardening			

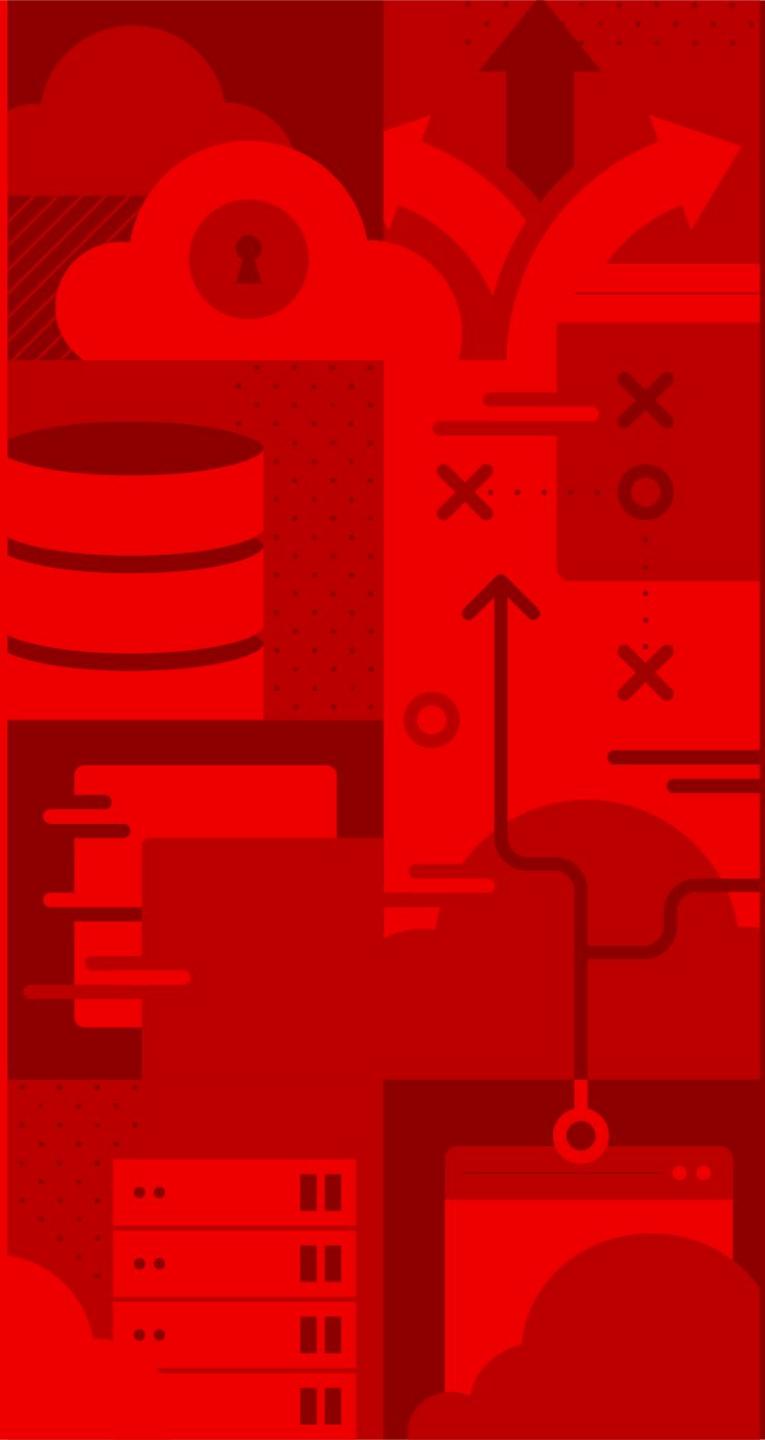


# Observability



# Secure Log Forwarding to 3rd party

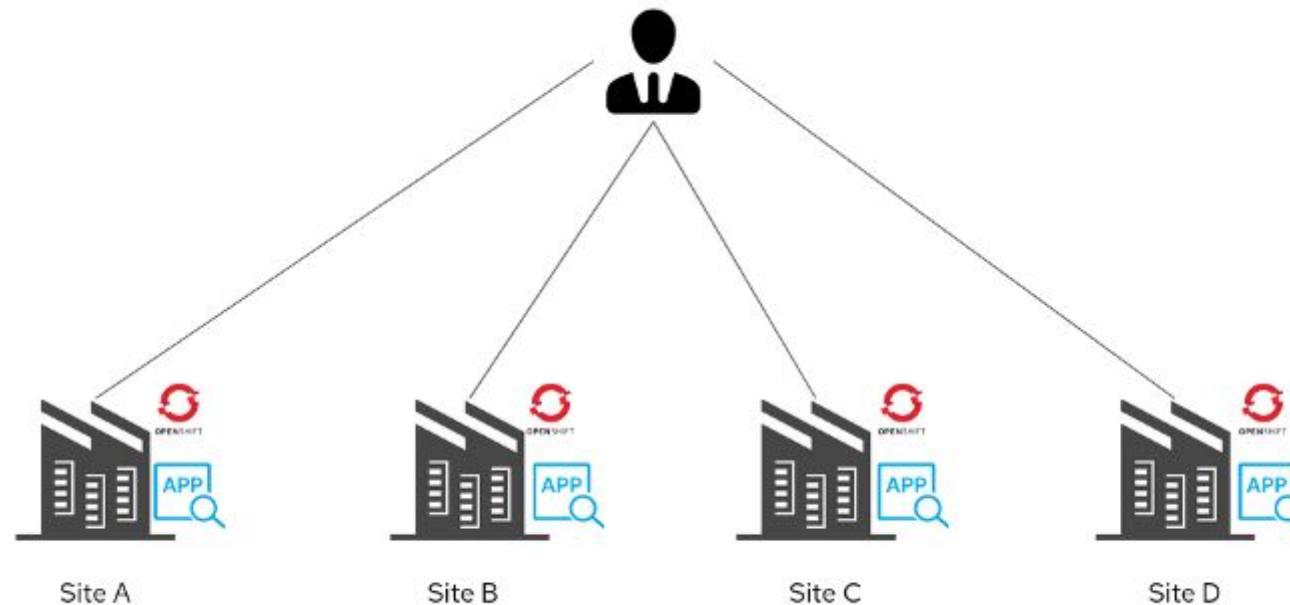




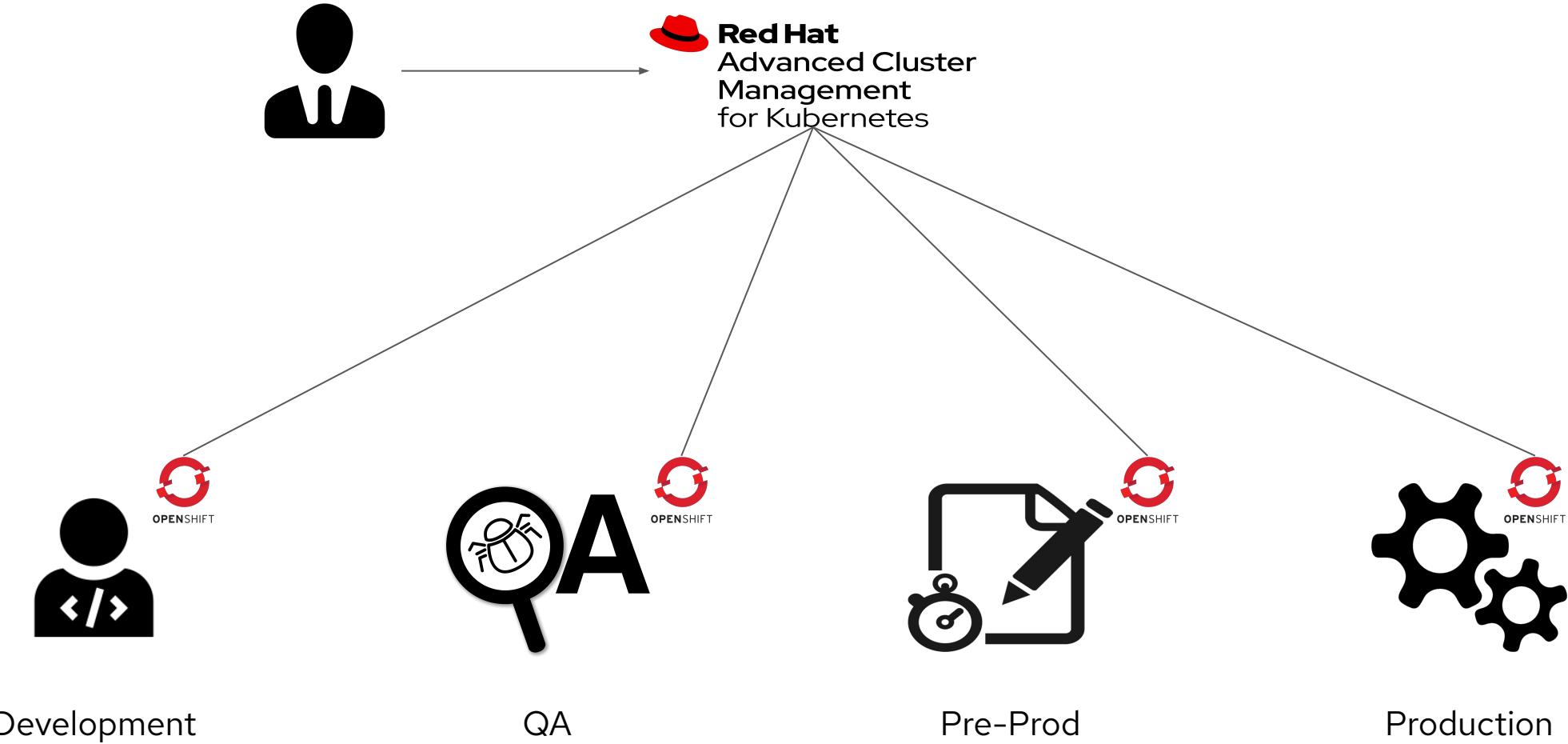
# Advanced Cluster Management

# What is Red Hat Advanced Cluster Management

Red Hat Advanced Cluster Management for Kubernetes is a platform which is designed to help developers, administrators, and security teams to manage cloud-native applications that run on multiple OpenShift clusters.



# Different clusters for each stage of Application Lifecycle

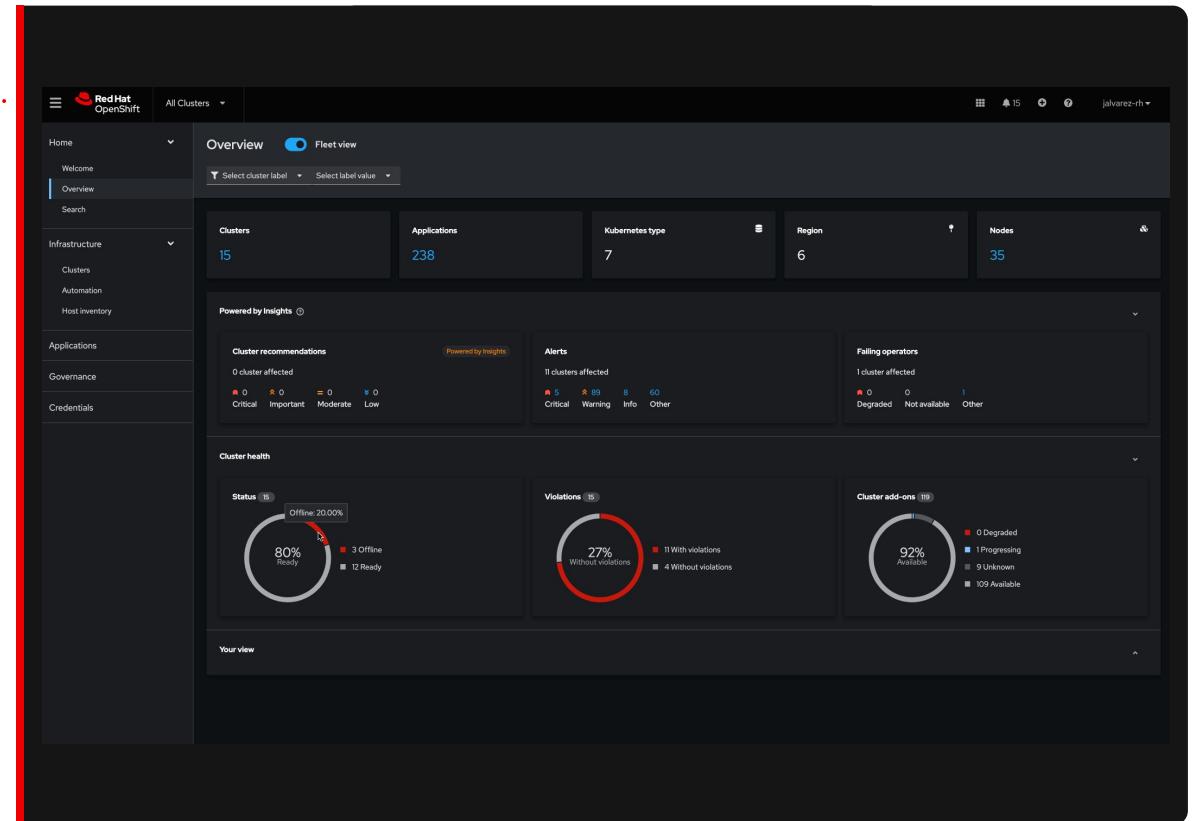


# Fleet health monitoring

Proactively monitoring cluster health and performance

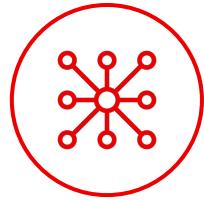


- ▶ Sort, filter, and scan individual clusters and user workloads in addition to aggregated multiclusters with Grafana.
- ▶ Use the open source Thanos project for scalable metrics collection with long-term data retention.
- ▶ Get health metrics for OpenShift clusters and non-OpenShift clusters—such as EKS, GKE, AKS, and IKS—in the many out-of-the-box Grafana dashboards.

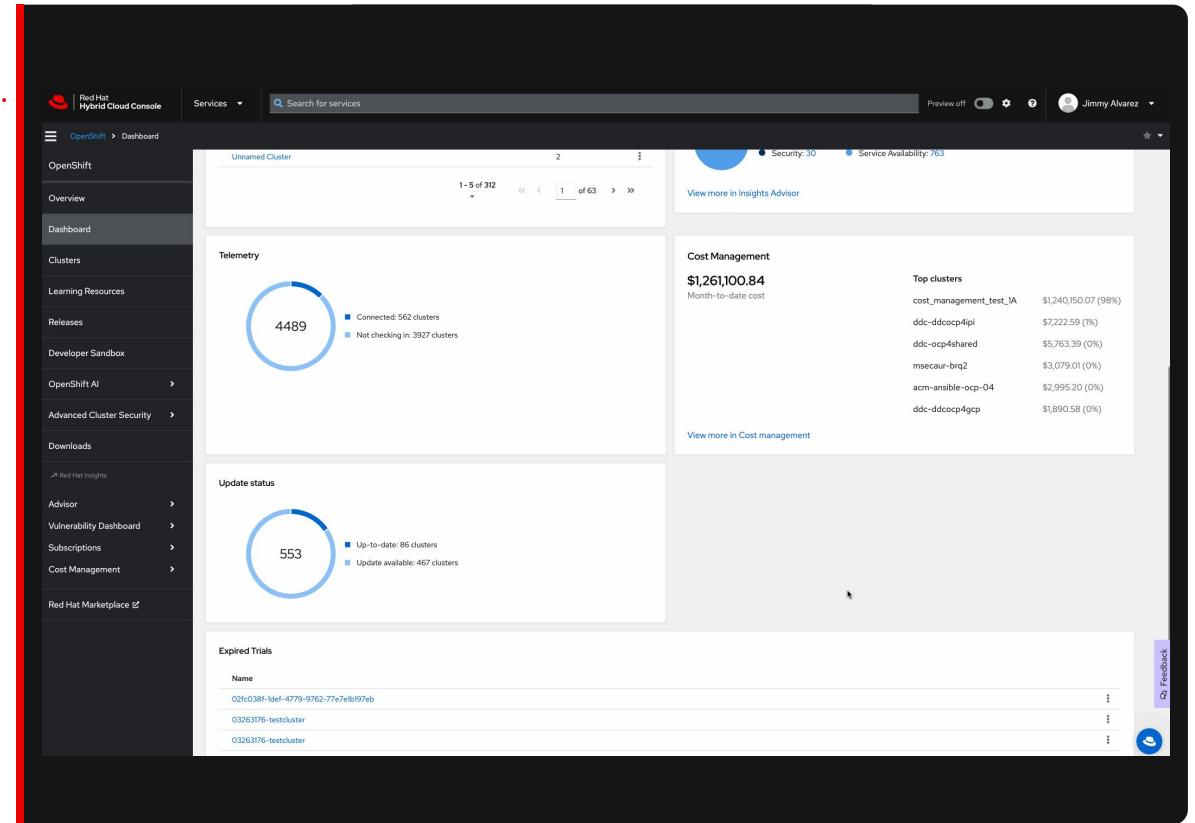


# Analytics through Red Hat Insights for Red Hat OpenShift

## Boost operational efficiency and reliability



- ▶ Identifies availability, performance, stability, and security risk analysis
- ▶ Analyzes remote health data (Insights + Telemetry) data to provide recommendations
- ▶ Recommendations cover the infrastructure and service layers of OpenShift
- ▶ Provides predictive findings and prescriptive information on how to resolve
- ▶ Integrates with notifications, OpenShift web console and Advanced Cluster Manager

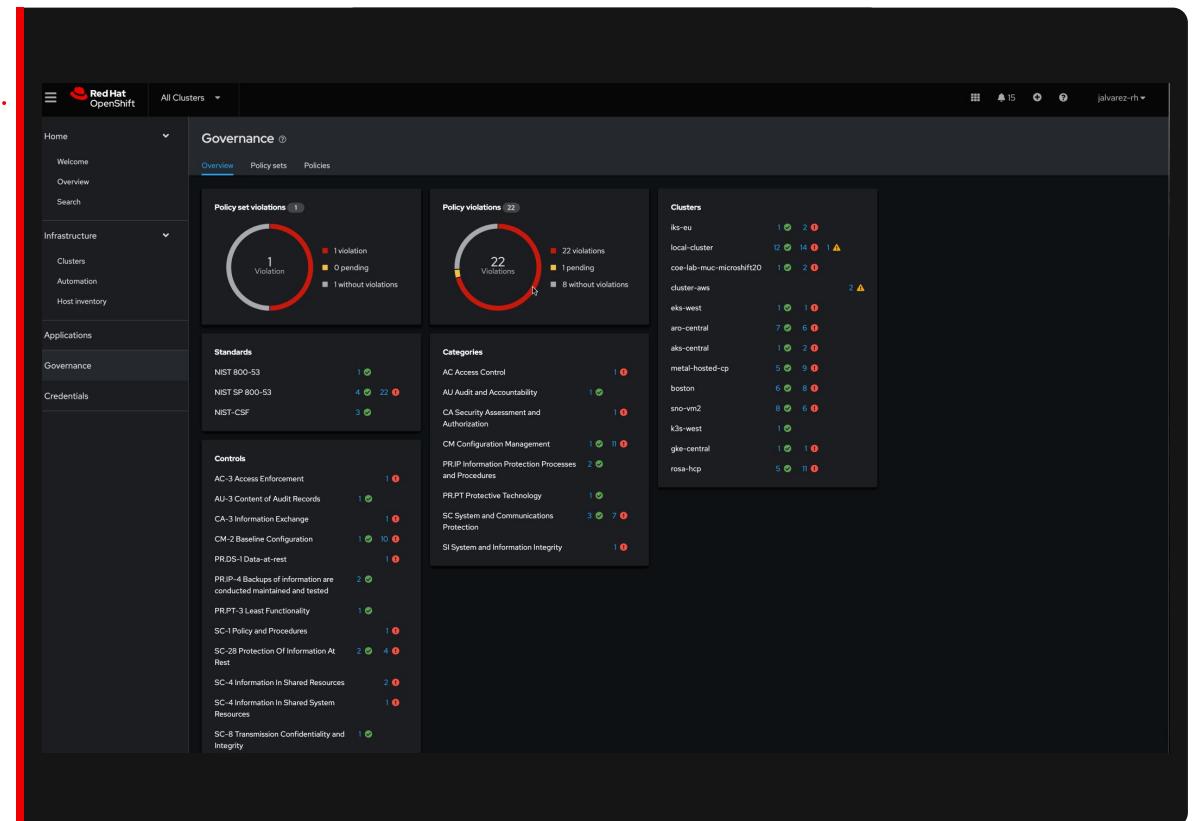


# Governance dashboard

Manage policy violations across workloads



- ▶ Use the governance dashboard to view and manage policy violations in all of your clusters and applications. Get details on violation history.
- ▶ Drill down into violation details by centrally accessing details from managed clusters from the Red Hat Advanced Cluster Management hub.



# Workload placement(s)

Deploy workloads across your fleet or only to specific clusters



- ▶ Rapidly deploy workloads across your fleet, or only to specific clusters, on the basis of placement rule definitions and time windows to control when and where your applications are being deployed.
- ▶ Based on the powerful [Placement API](#) from Open Cluster Management

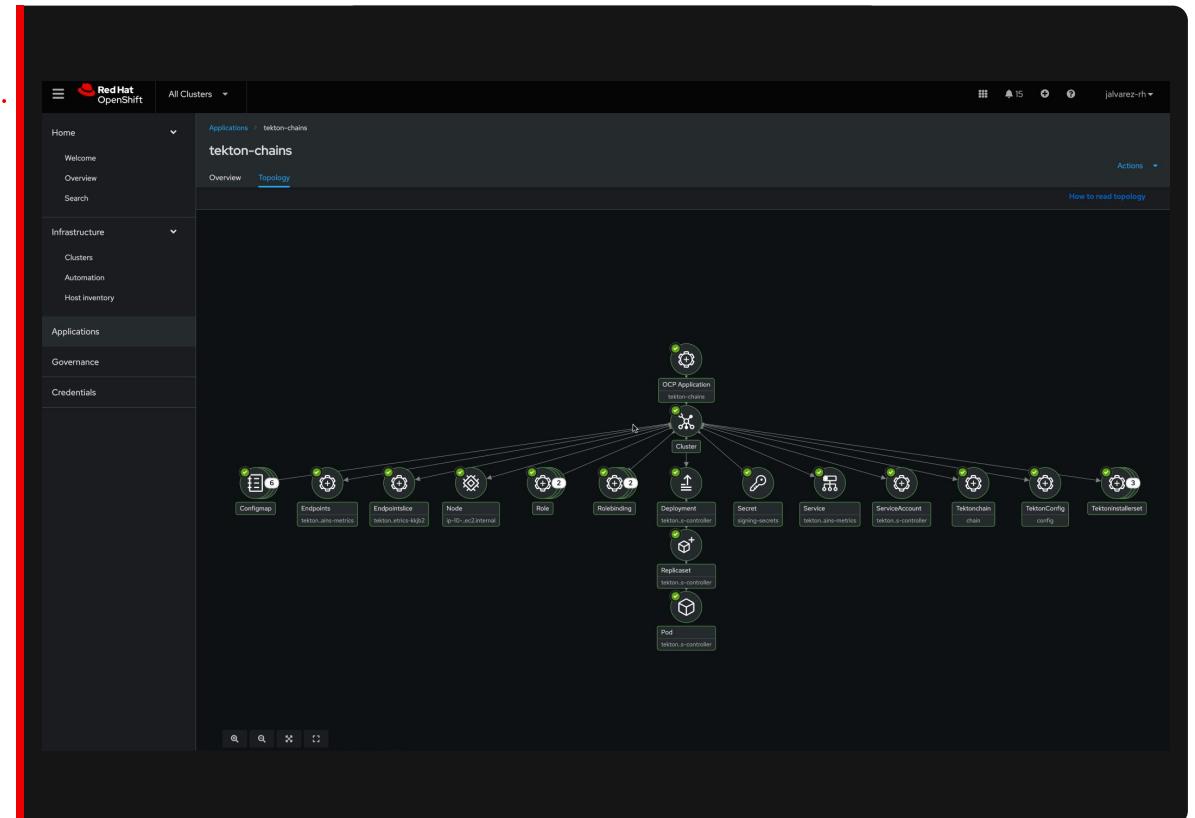
A screenshot of the Red Hat OpenShift web interface. On the left, a sidebar shows 'Applications' selected. The main area is titled 'Create application' with a 'YAML: On' toggle. It includes sections for 'Deploy application resources on clusters with all specified labels' (with a dropdown for 'Cluster sets' containing 'demo'), 'Label' (with dropdowns for 'Select the label' and 'Operator' set to 'equals any of'), 'Value' (with 'Select the values' dropdown), and a button to 'Add another label'. Below this is a section for 'Settings: Specify application behavior' with radio buttons for 'Always active', 'Active within specified interval', and 'Blocked within specified interval' (which is selected). Under 'Time window configuration', there's a 'Days of the week' section with checkboxes for Monday, Tuesday, Wednesday, Thursday, and Friday, with a note to 'Select at least one day to create a time window.'

# Application topology view

Get wider visibility and readily view the health of pods

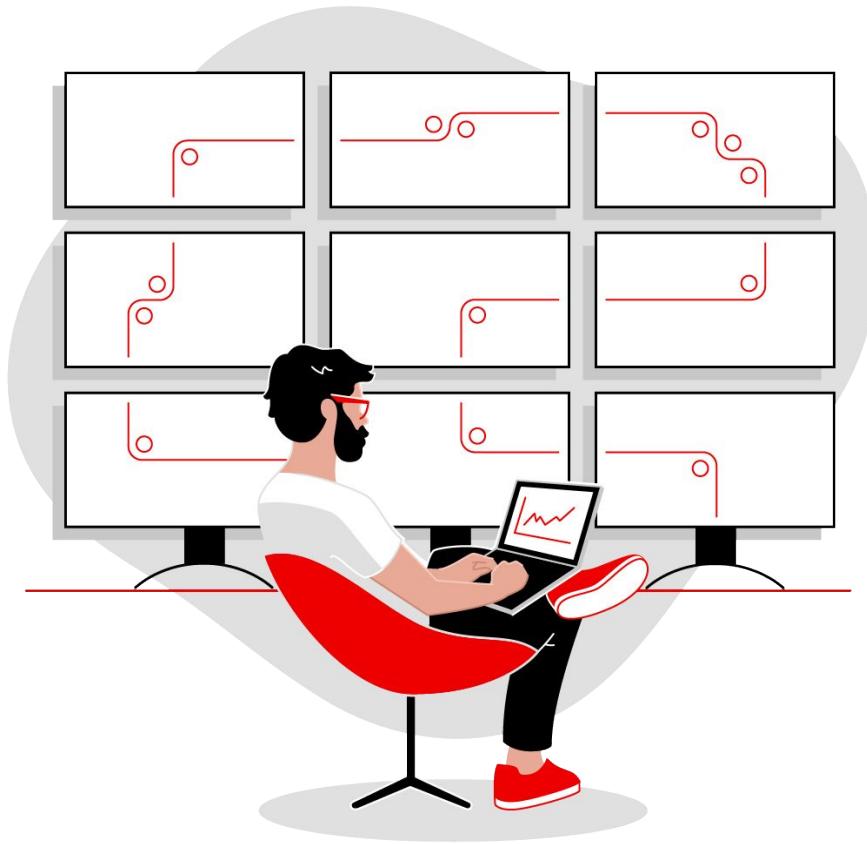


- ▶ Get wider visibility of the application topology and readily view the health of service endpoints and pods with all of the connected dependencies like image versions, associated placement rules, Kubernetes resources, and ConfigMaps, no matter if your application was created within Red Hat Advanced Cluster Management, Red Hat OpenShift, or GitOps tools like ArgoCD and Flux.



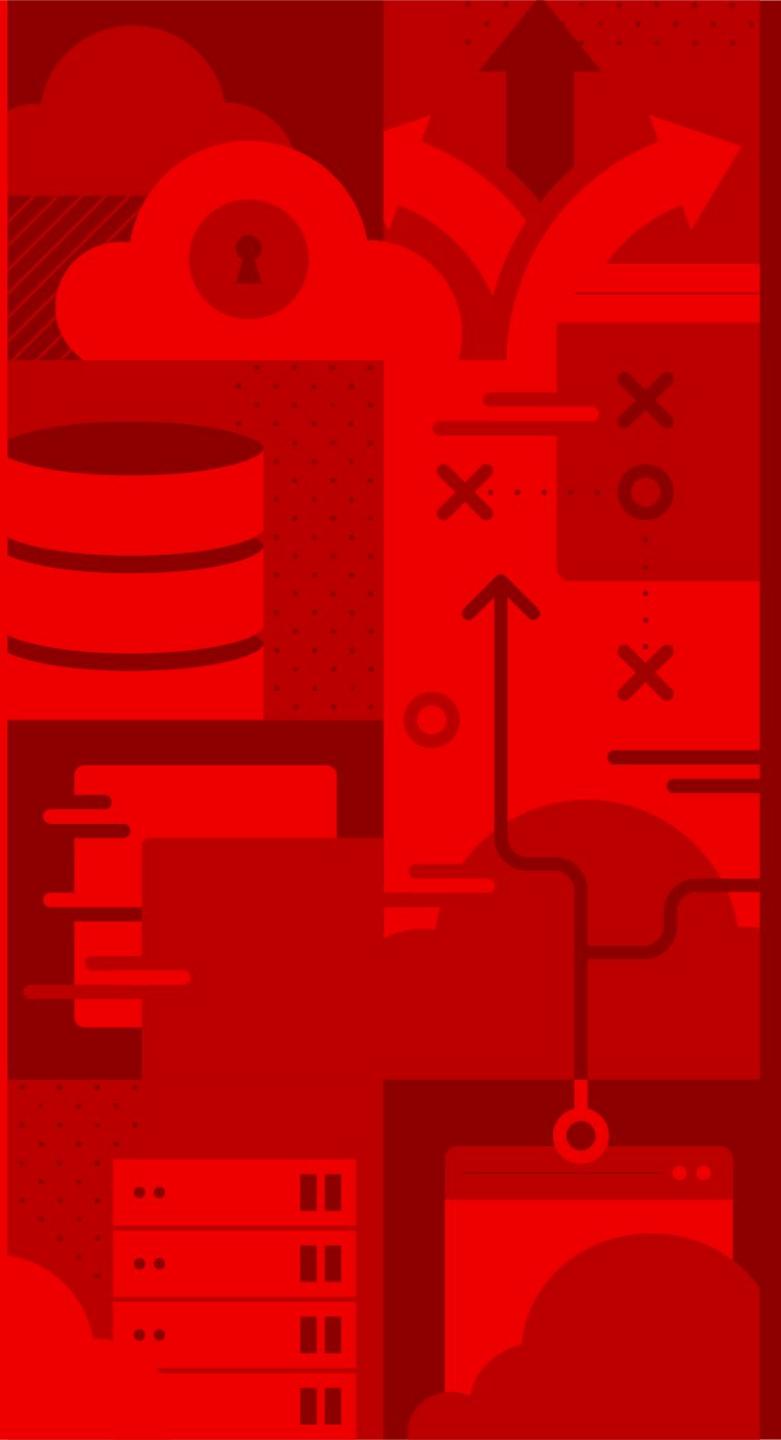
# Red Hat Ansible Automation Platform integration

## Automating lifecycle management



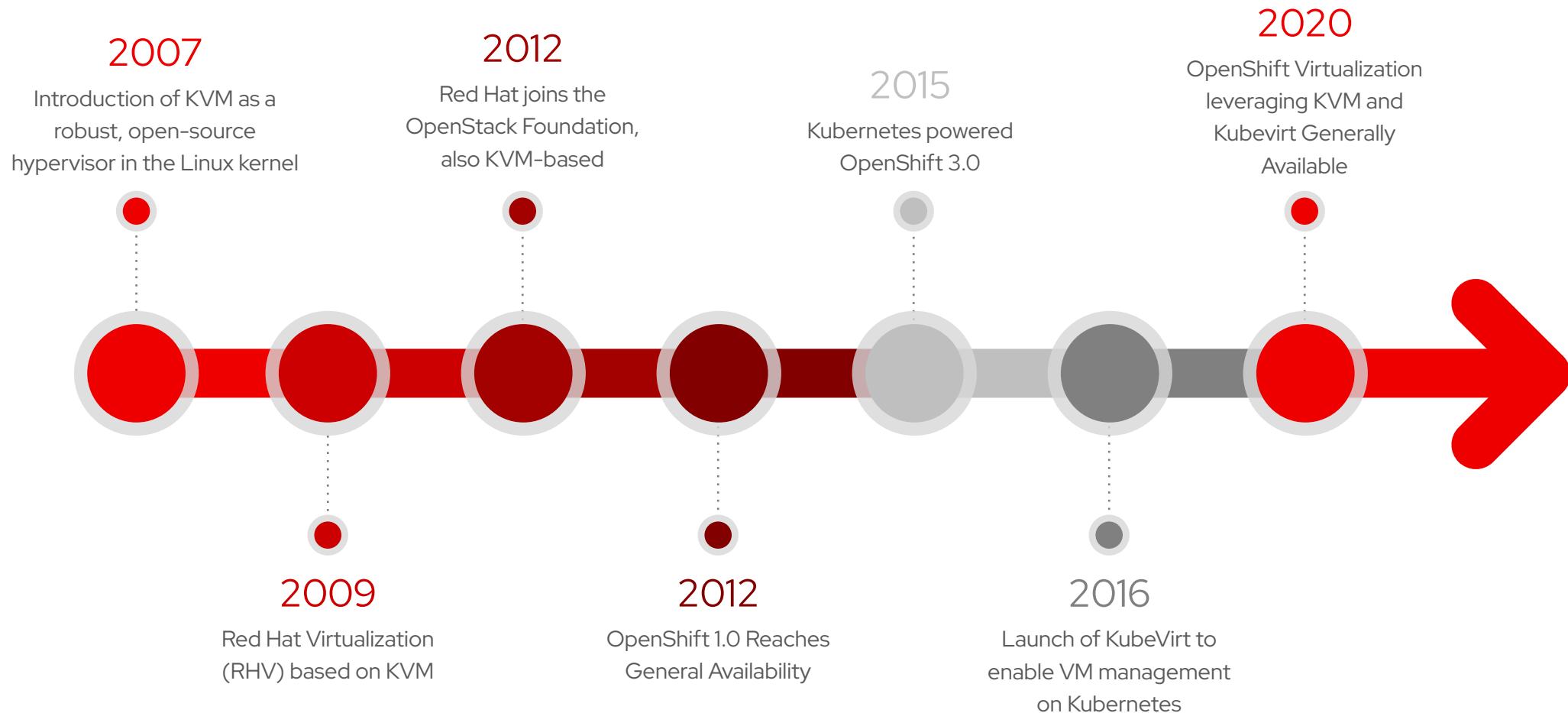
### Create Ansible-native access across your Kubernetes fleet:

- ▶ Ansible integration allows for the delivery of straightforward and security-focused playbooks across your Kubernetes fleet.
- ▶ Uses the multicluster engine for Kubernetes operator, Red Hat Advanced Cluster Management, and the [stolostron.core](#) Ansible Collection.
- ▶ Plug-in Ansible automation jobs
  - When creating or upgrading clusters (pre and post hooks)
  - When policy violations occur



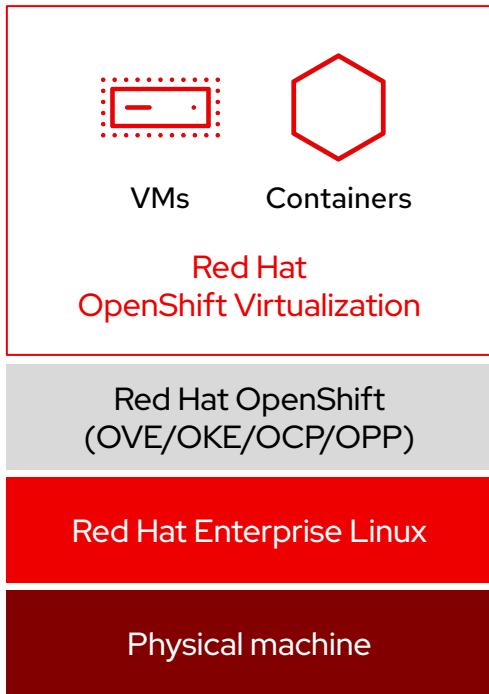
# Virtualization

# Red Hat has a long history with Virtualization



# Red Hat OpenShift Virtualization

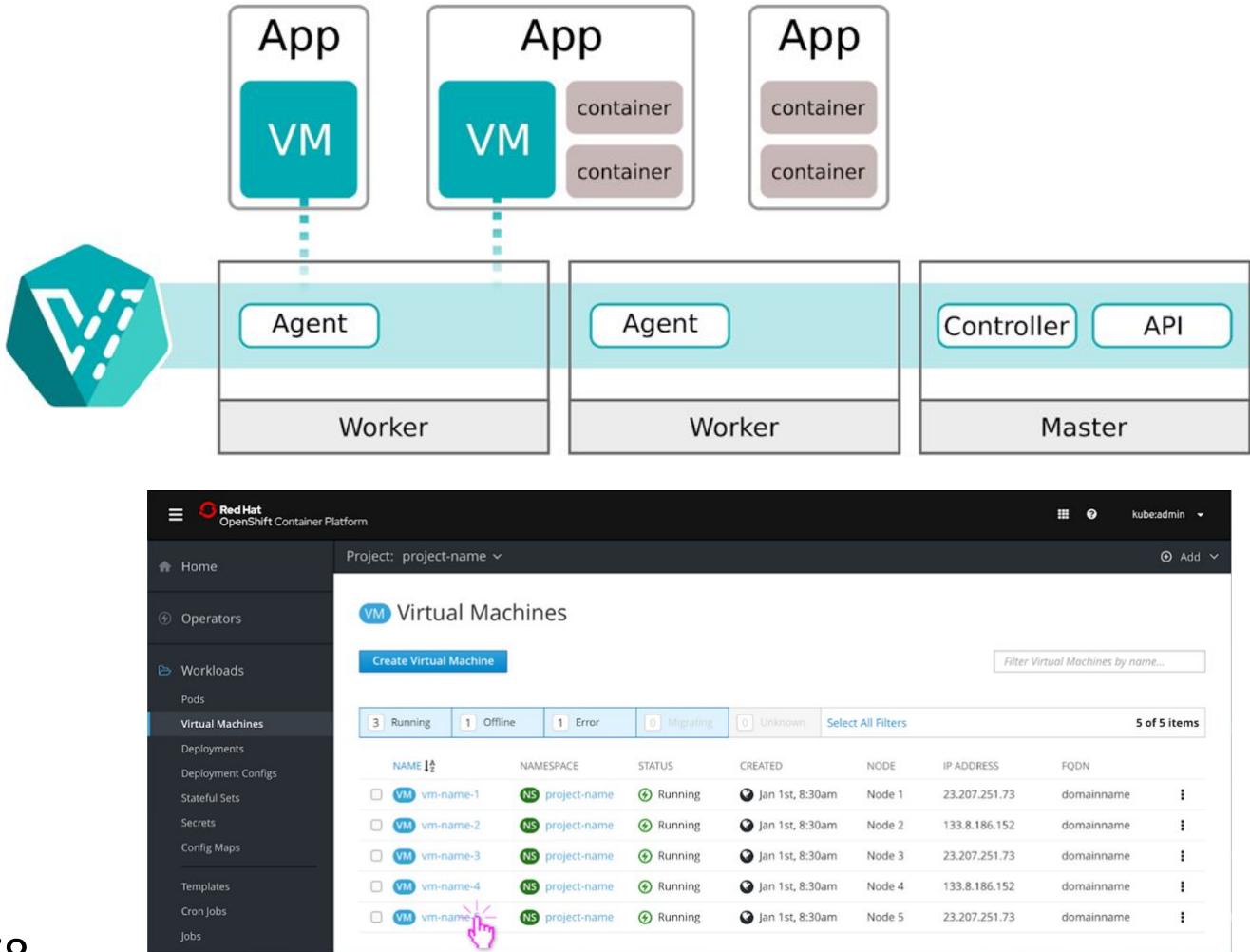
The modern option for general purpose virtualization



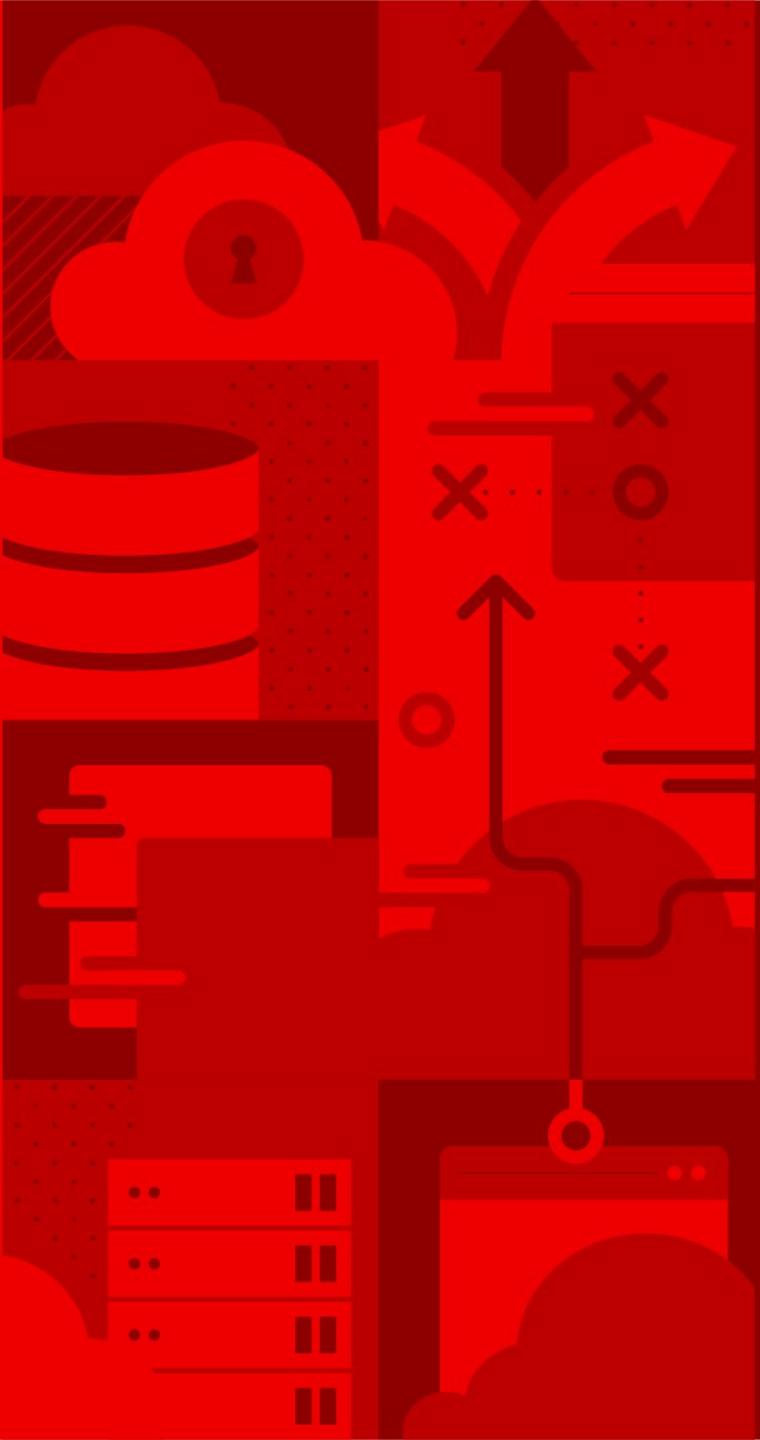
- ▶ **Unified platform**  
for virtual machines and containers\*
- ▶ **Consistent management**  
tools, interfaces, and APIs incl. ACM and AAP integrations
- ▶ **Performance and stability**  
of Linux, KVM, and qemu
- ▶ **Healthy open source community**  
the KubeVirt project is a top 10 CNCF active project, with 200+ contributing companies
- ▶ **Diverse ecosystem**  
of Red Hat & partner operators
- ▶ **Included feature**  
of all OpenShift subscriptions (OVE/OKE/OCP/OPP)
- ▶ **Includes Red Hat Enterprise Linux guest entitlements\***
- ▶ **Supports Microsoft Windows**  
guests through Microsoft SVVP
- ▶ **Inbound guest migration**  
using Ansible Automation Platform + Migration Toolkit for Virtualization, Training and Consulting
- ▶ **Virt admin focused training**  
[DO316](#), [EX316](#)

\*excluding OVE which is virtual machines only and includes no RHEL guest entitlements

# Openshift Virtualization



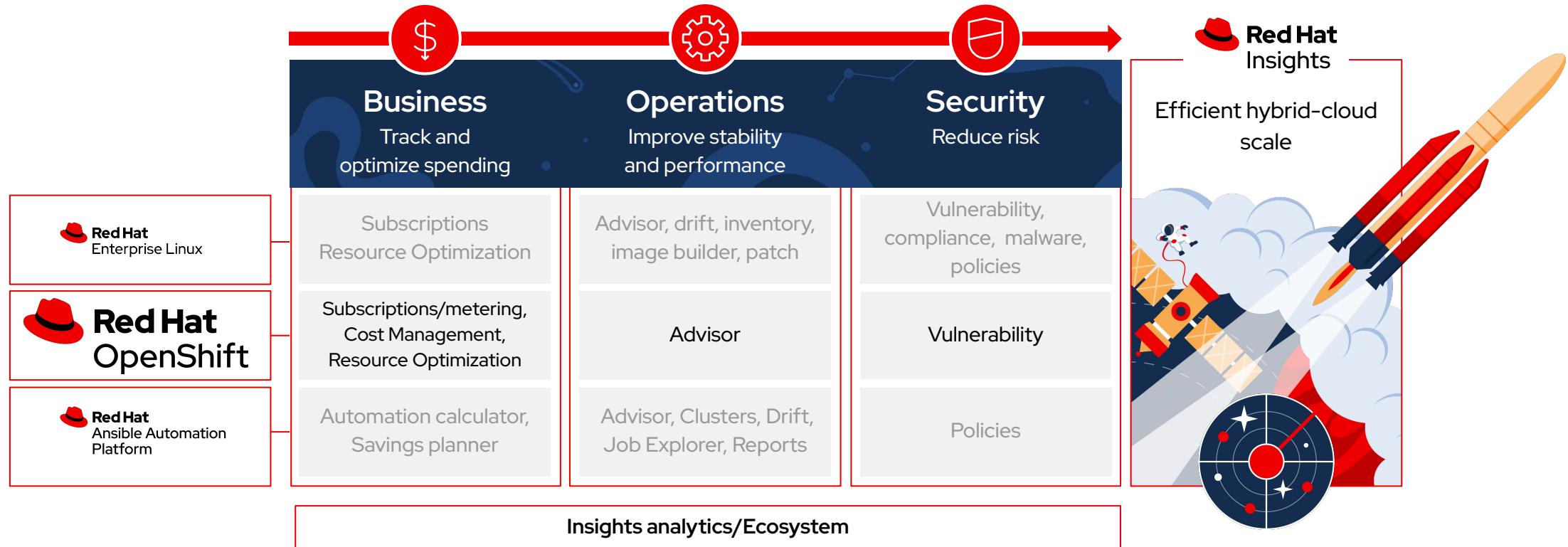
- Kubernetes native virtualization
- Use both containers and virtualization today
- Delivers an efficient process to manage both in one centralized platform



# Red Hat Insights & Cost Management

# Red Hat Insights

A full suite of free services for connected customers



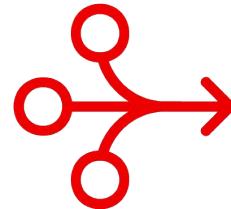
# Red Hat Insights cost management



## Visualize costs

Review cloud and OpenShift costs aggregated across hybrid infrastructure so you can stay on budget

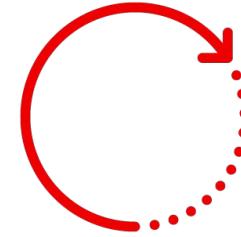
Show Red Hat-related costs in context



## Allocate costs

Understand spending habits and distribute costs into projects, organizations, and regions

Improve communication between IT and line of business (LOB)



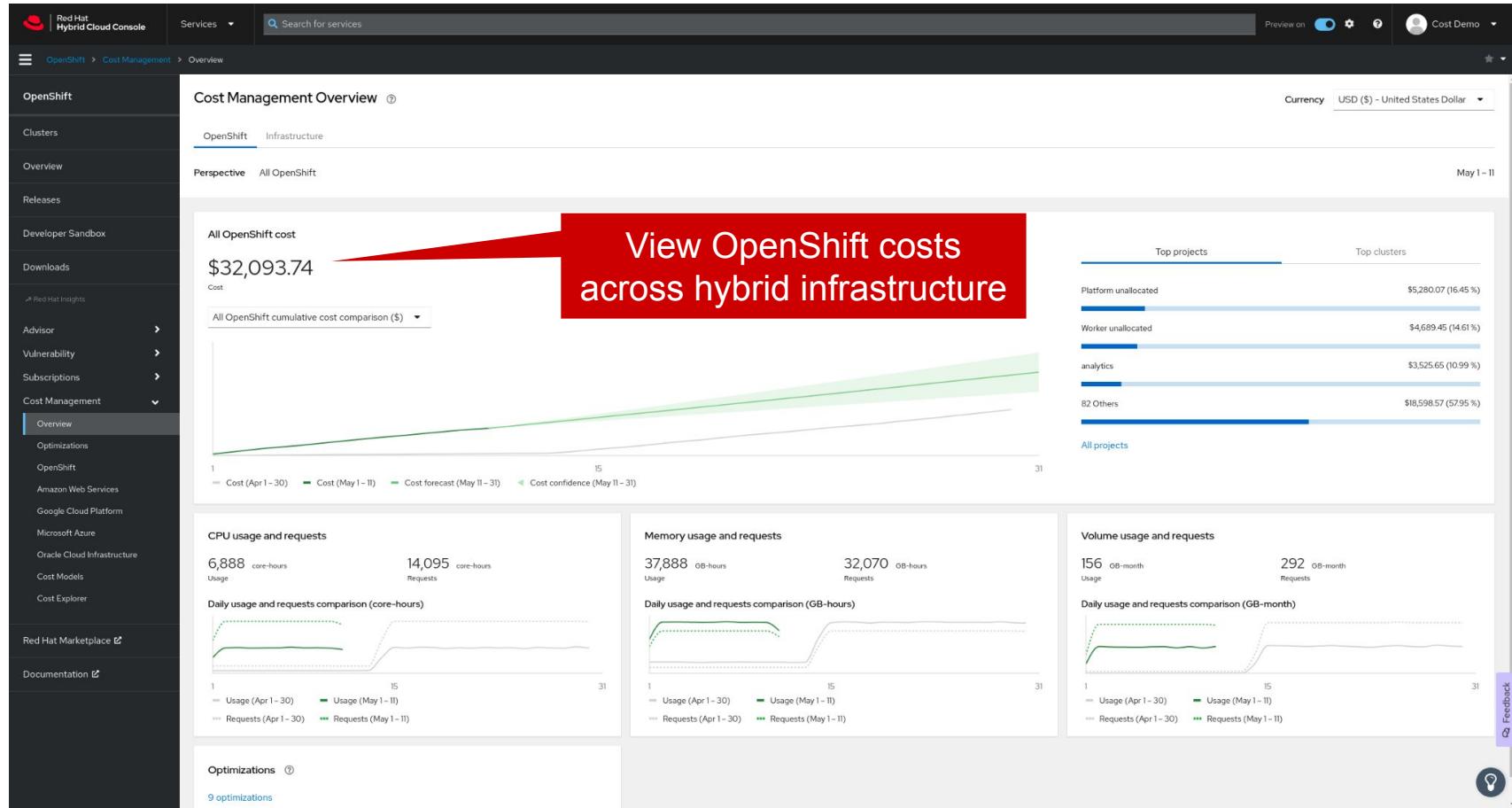
## Communicate and Influence behaviours

Models costs to align operations, developers and business.

Make those responsible accountable so they take action

# Red Hat Insights cost management

Red Hat SaaS offering to provide customers with cost visibility across OCP clusters on-premises and in the cloud



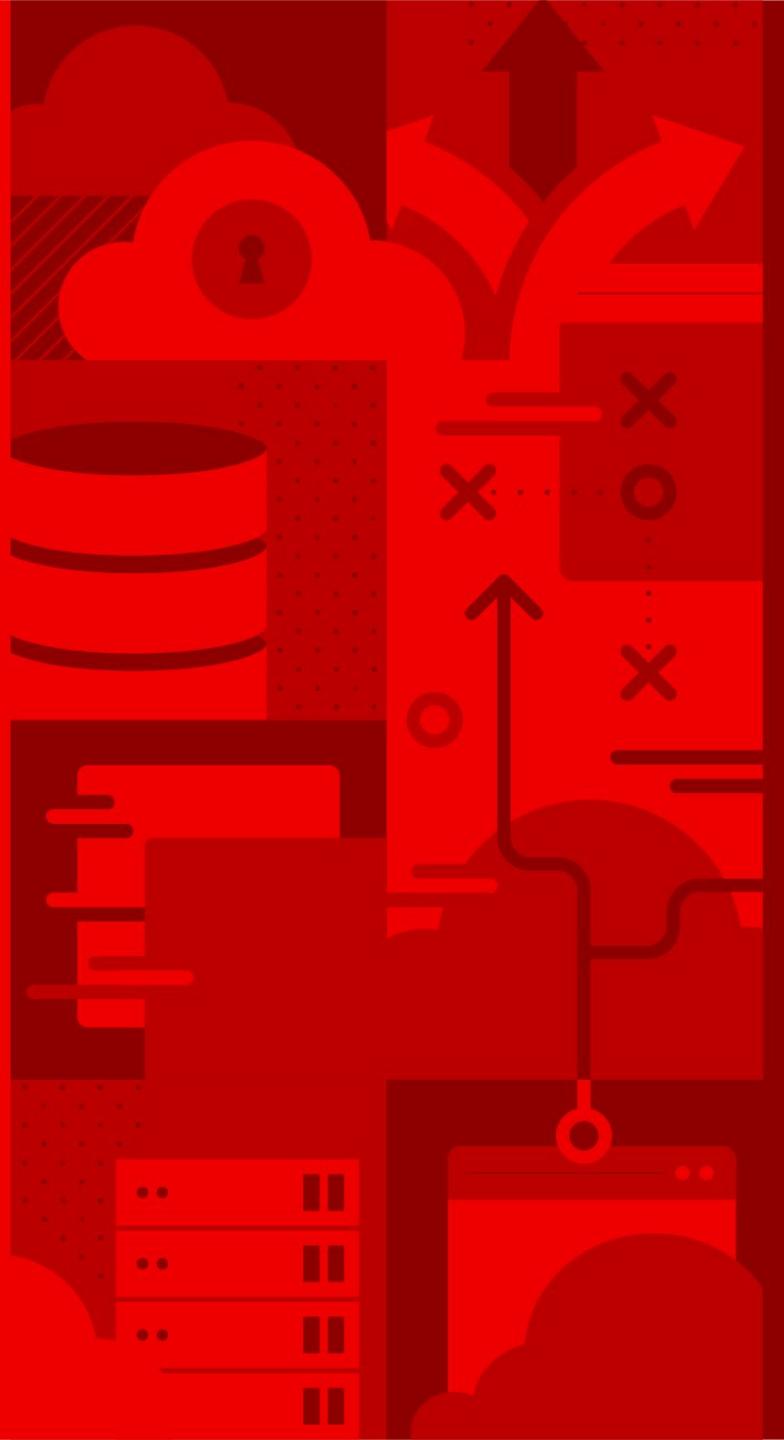
- Visualize costs across hybrid cloud infrastructure
- Track cost trends
- Map charges to projects, labels and organizations. Slice and dice the data with filters
- Use cost models to normalize data from the cluster and clouds
- Generate showback exports and utilize them to build your chargeback reports
- 99% of customers export data to BI or FinOps tools

# Red Hat Insights cost management

## Resource Optimization

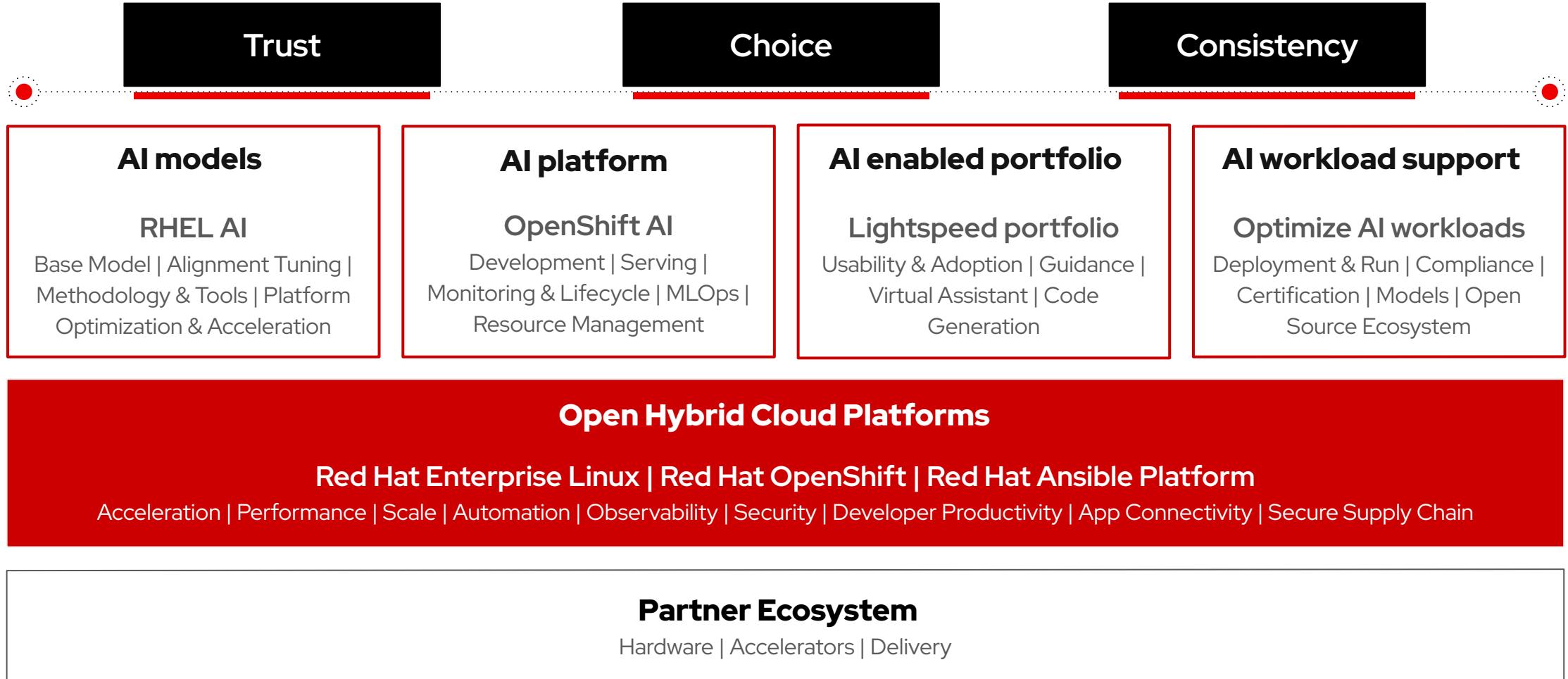
CONFIDENTIAL designator

The screenshot shows the Red Hat Hybrid Cloud Console interface. The left sidebar is titled 'OpenShift' and includes sections for Overview, Dashboard, Clusters, Learning Resources, Releases, Developer Sandbox, Downloads, Red Hat Insights (selected), Advisor, Vulnerability Dashboard, Subscriptions, Cost Management (selected), Overview, Optimizations, and OpenShift. The main content area is titled 'Dog lovers' and shows project details: Last reported 6 hours ago, Cluster name: Cluster1 - Pets, Project name: Pet Services Staging, Workload type: deployment, Workload name: Website123. A dropdown menu shows 'View optimization based on' set to 'Last 7 days'. The 'Cost optimizations' tab is selected, displaying 'Current state' with a spend of €30 (Container cost Jan 1-7) and 'Current configuration' showing resource requests and limits. The 'Recommended state' shows a potential cost of €23 (Container cost Jan 1-7) and a change of -€7. The 'Recommended configuration' shows updated resource requests and limits. Below these are two charts: 'Current CPU utilization' and 'Current Memory utilization', each showing utilization over 7 periods (1-7) with blue bars for CPU usage and red bars for recommended limits.



AI

# Red Hat's AI portfolio strategy



# Red Hat AI platforms



## Red Hat Enterprise Linux AI

**Foundation model platform for developing, testing, and running Granite family LLMs**

- ▶ Provides a simplified approach to get started with generative AI that includes open source models
- ▶ Makes AI accessible to developers and domain experts with little data science expertise
- ▶ Provides the ability to do training & inference on individual production server deployments



## Red Hat OpenShift AI

**Integrated MLOps platform for model lifecycle management at scale anywhere**

- ▶ Provides support for both generative and predictive AI models with a BYOM approach
- ▶ Includes distributed compute, collaborative workflows, model serving and monitoring
- ▶ Offers enterprise MLOps capabilities and the ability to scale across hybrid-clouds
- ▶ Includes Red Hat Enterprise Linux AI, including the Granite family models

# A purpose-built platform for GenAI

Image mode: A container-native approach to build, deploy, and manage RHEL as an immutable & bootable container image, universally.

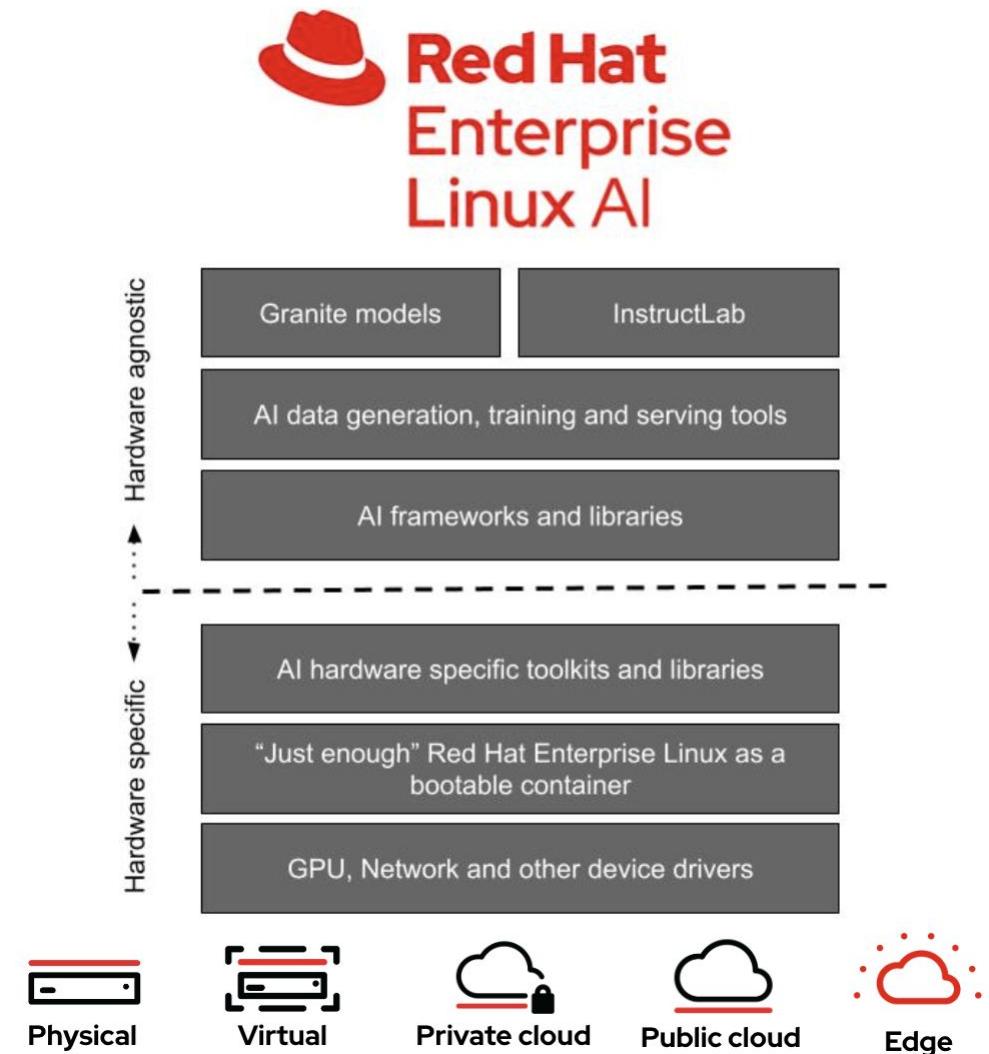
- ▶ Available on world's leading clouds and datacenter/OEMs

Hardware Accelerators + middleware + drivers

- ▶ NVIDIA GPUs/CUDA
- ▶ AMD GPUs/ROCM
- ▶ Intel Gaudi

Leading open source Deep Learning tools:

- ▶ vLLM
- ▶ Deepspeed
- ▶ PyTorch / FSDP



# Red Hat OpenShift AI

## Integrated AI platform

Create and deliver gen AI and predictive models at scale across hybrid cloud environments.

Available as

- Fully managed cloud service
- Traditional software product on-site or in the cloud!



### Model development

Bring your own models or customize Granite models to your use case with your data. Supports integration of multiple AI/ML libraries, frameworks, and runtimes.



### Model serving and monitoring

Deploy models across any OpenShift footprint and centrally monitor their performance.



### Lifecycle management

Expand DevOps practices to MLOps to manage the entire AI/ML lifecycle.

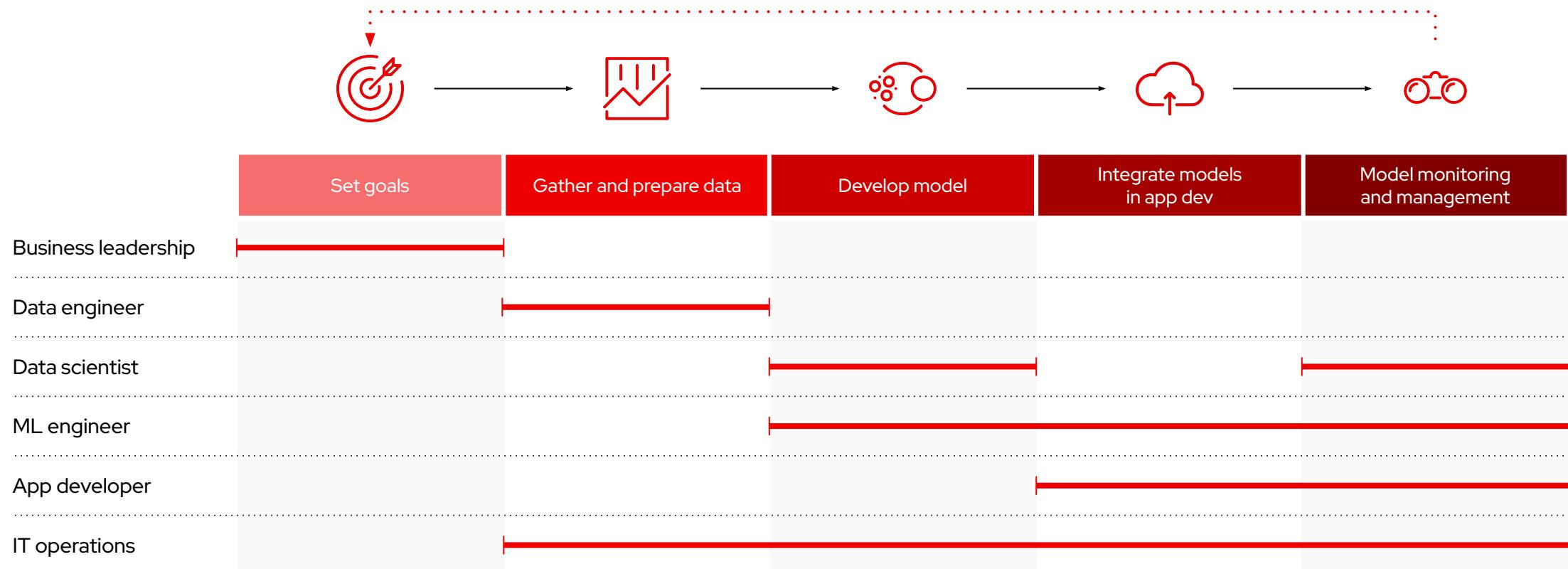


### Resource optimization and management

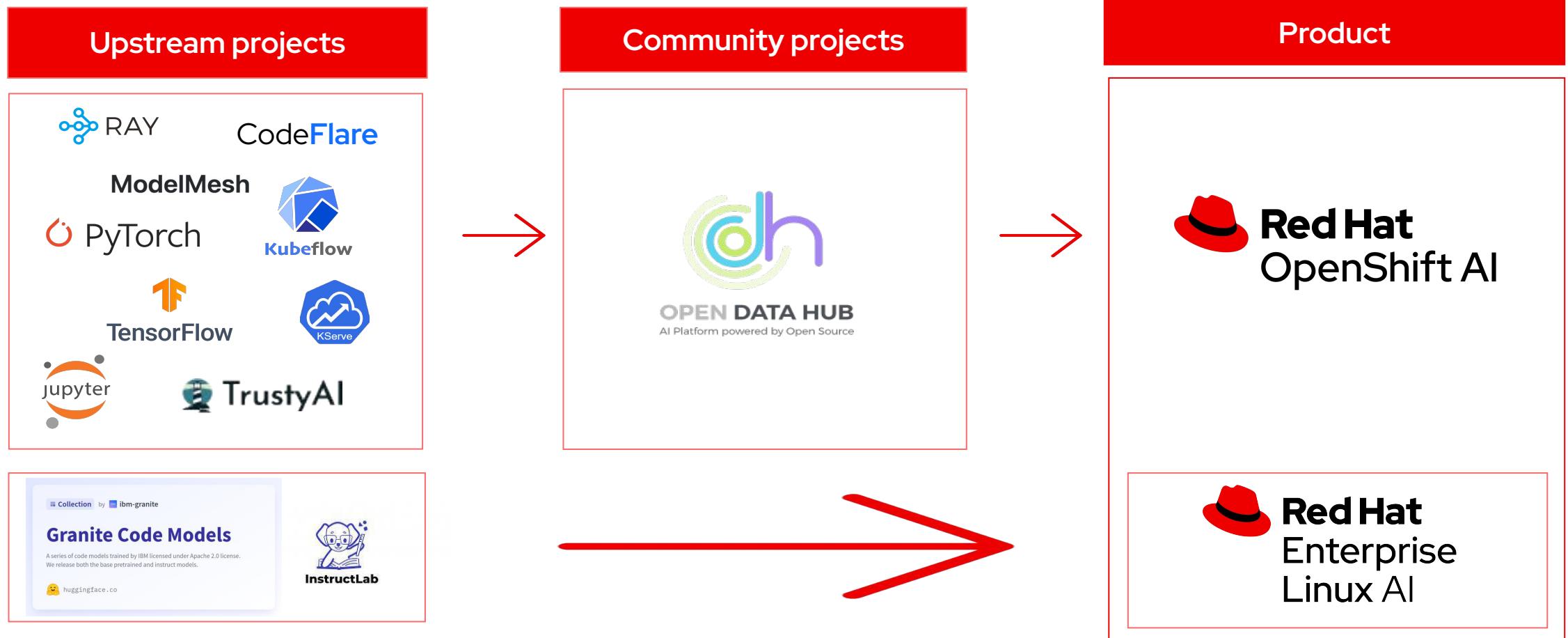
Scale to meet workload demands of gen AI and predictive models. Share resources, projects, and models across environments.

# Operationalizing AI/ML is not trivial

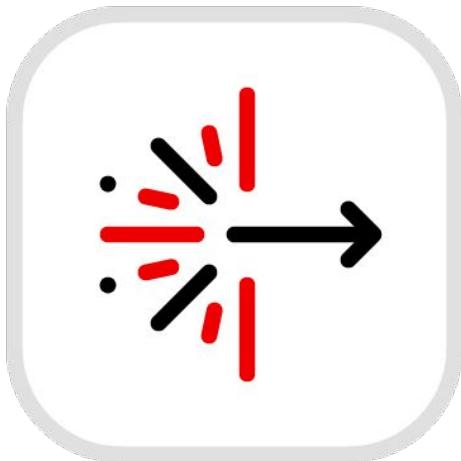
Every member of your team plays a critical role in a complex process



# Red Hat's AI/ML engineering is 100% open source



# OpenShift Lightspeed



## Help where you need it

Integrated directly into the Red Hat OpenShift web console

## Troubleshoot, investigate and learn more

Provides assistance with troubleshooting and investigating cluster resources

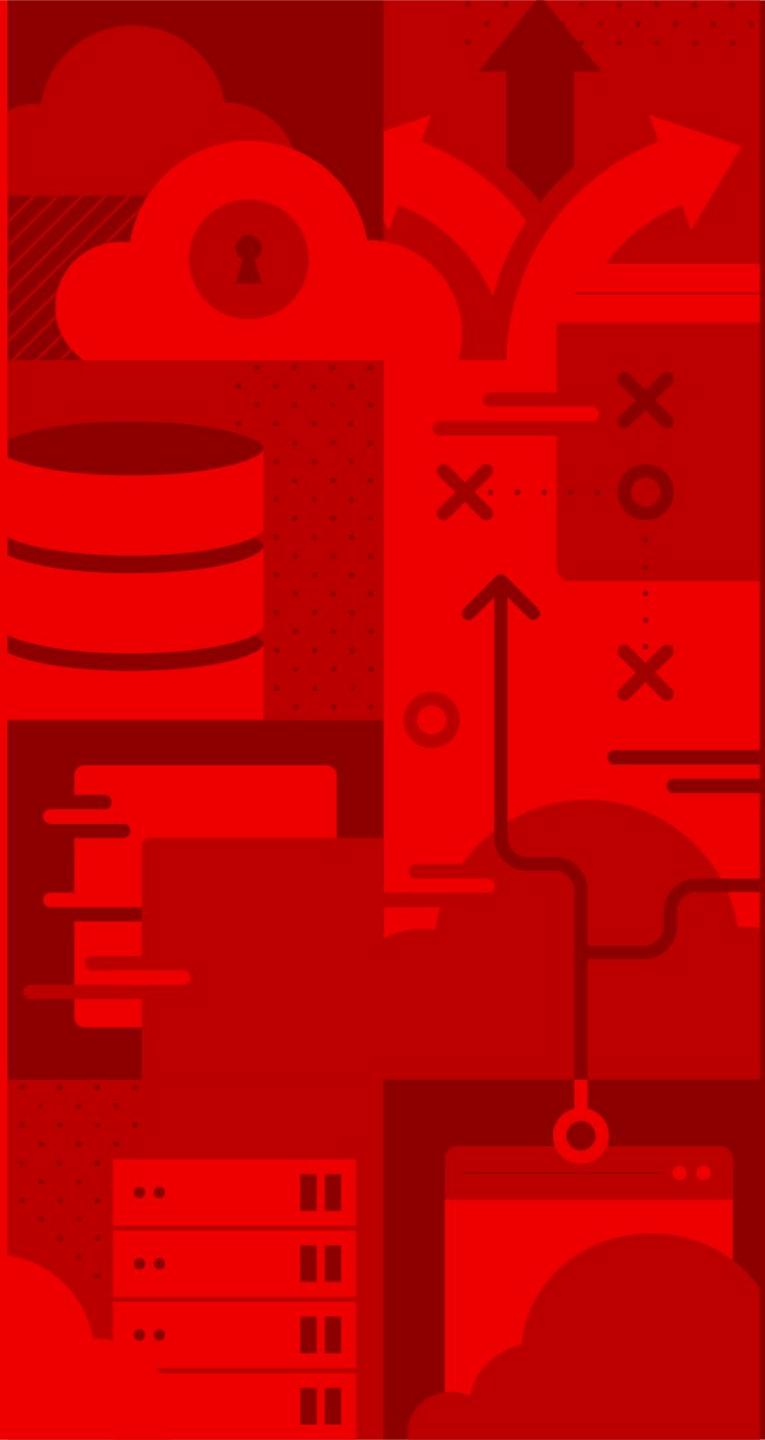
## Generative AI

Powerful, pluggable LLMs combined with the latest OpenShift documentation

# OpenShift Lightspeed

## What is it?

- ▶ A virtual assistant integrated in the OpenShift UI
  - Novice friendly natural language interactive conversation
  - Multiple integration points for ease of use
- ▶ Installation by an OLM operator from Operator Hub
- ▶ OpenShift documentation included for Retrieval Augmented Generation (RAG)
- ▶ We are not training or serving a model
  - Bring your own LLM (Azure AI, OpenAI, WatsonX)
  - RHOAI / RHELAI



# Developer Productivity

# Developer Productivity

Developer Services

**Red Hat Developer Hub**

**Podman Desktop**

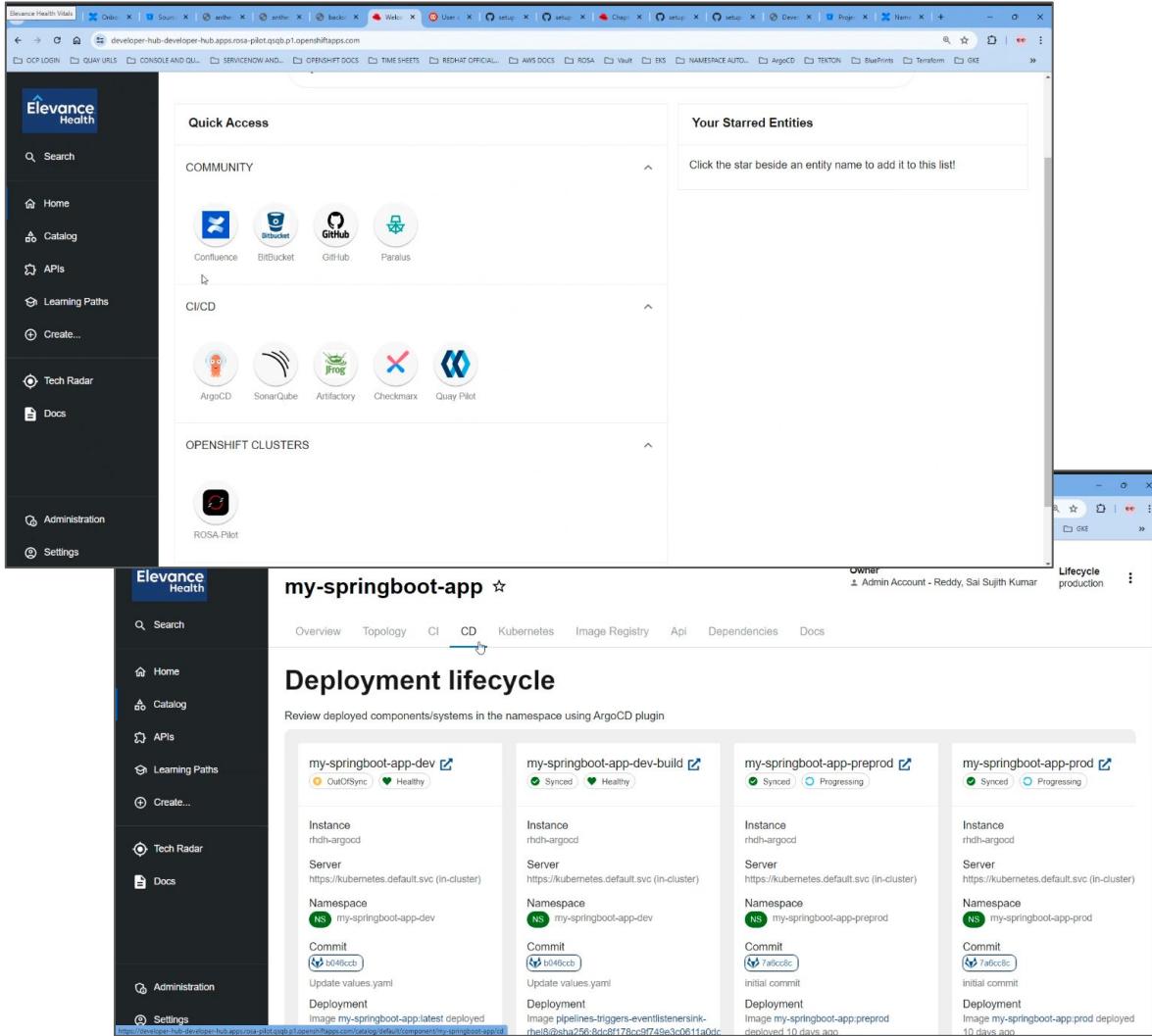
**Eclipse Che**  
OpenShift Dev Spaces

**KONVEYOR**  
Migration Services

**sigstore**  
Trusted Software Supply Chain

- ▶ Enterprise-grade platform for building developer portals
- ▶ Containers and Kubernetes for Application Developers
- ▶ Cloud Developer Environment
- ▶ Assess, Plan and Automation your Modernization Journey

# Red Hat Developer Hub



The screenshot shows the Red Hat Developer Hub interface. On the left is a sidebar with the Elevance Health logo and links to Home, Catalog, APIs, Learning Paths, Create..., Tech Radar, Docs, Administration, and Settings. The main area has a "Quick Access" sidebar with sections for COMMUNITY (Confluence, BitBucket, GitHub, Paralus), CI/CD (ArgoCD, SonarQube, Artifactory, Checkmark, Quay Pilot), and OPENSHIFT CLUSTERS (ROSA-Pilot). Below this is a card for the "my-springboot-app" with a star icon. The card has tabs for Overview, Topology, CI, CD (which is selected), Kubernetes, Image Registry, API, Dependencies, and Docs. The "Deployment lifecycle" section shows four components: my-springboot-app-dev (OutOfSync, healthy), my-springboot-app-dev-build (Synced, healthy), my-springboot-app-preprod (Synced, Progressing), and my-springboot-app-prod (Synced, Progressing). Each component has details like Instance, Server, Namespace, Commit, Update values.yaml, Deployment, and a link to the ArgoCD plugin.



**Centralized Catalog**



**Self-Service**



**Search**



**Plug-ins Ecosystem**



**Software Templates**



**Technical Documentation**





# What is Podman Desktop?

Containers and Kubernetes for application developers



## Fast and light

Daemonless with Podman. Using the fastest technologies for a snappy experience.



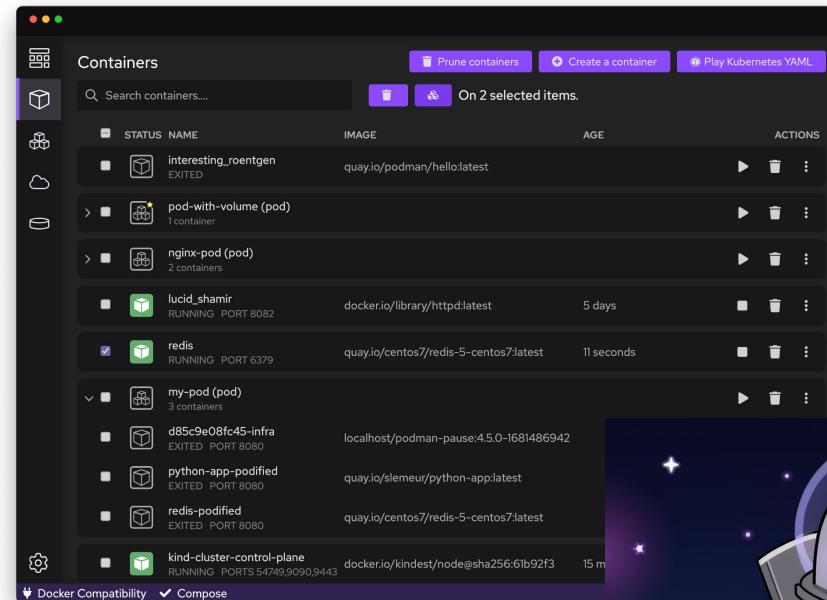
## Open

Podman and Podman Desktop are open source first and won't lock you in. Podman Desktop even supports Docker as an engine! CNCF Sandbox Project



## Secure

Rootless containers allow you to contain privileges without compromising functionality.

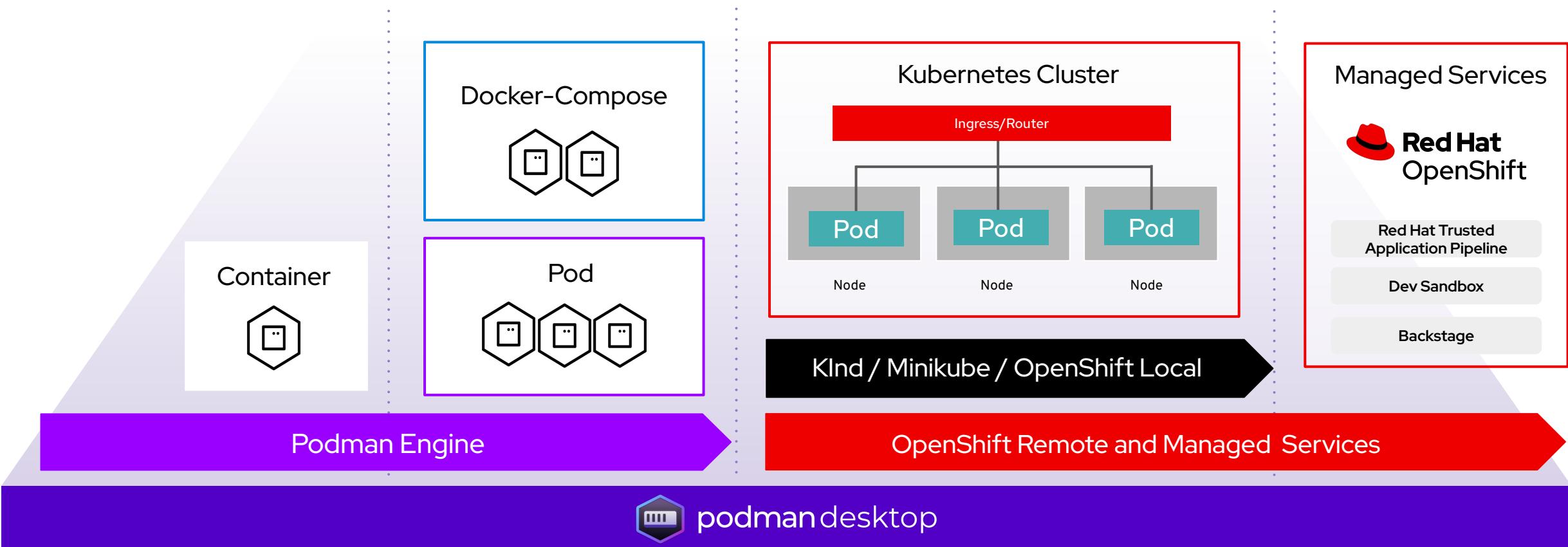


Supported platforms:



# Simplistic onboarding.

From applications to containers, to pods, to Kubernetes.





# Podman Desktop AI Lab

The developer environment for working with Generative AI

## Discover GenAI

- Get inspired by AI use cases
- Learn how to integrate AI in an optimal way
- Experiment with different compatible Models

## Model Catalog

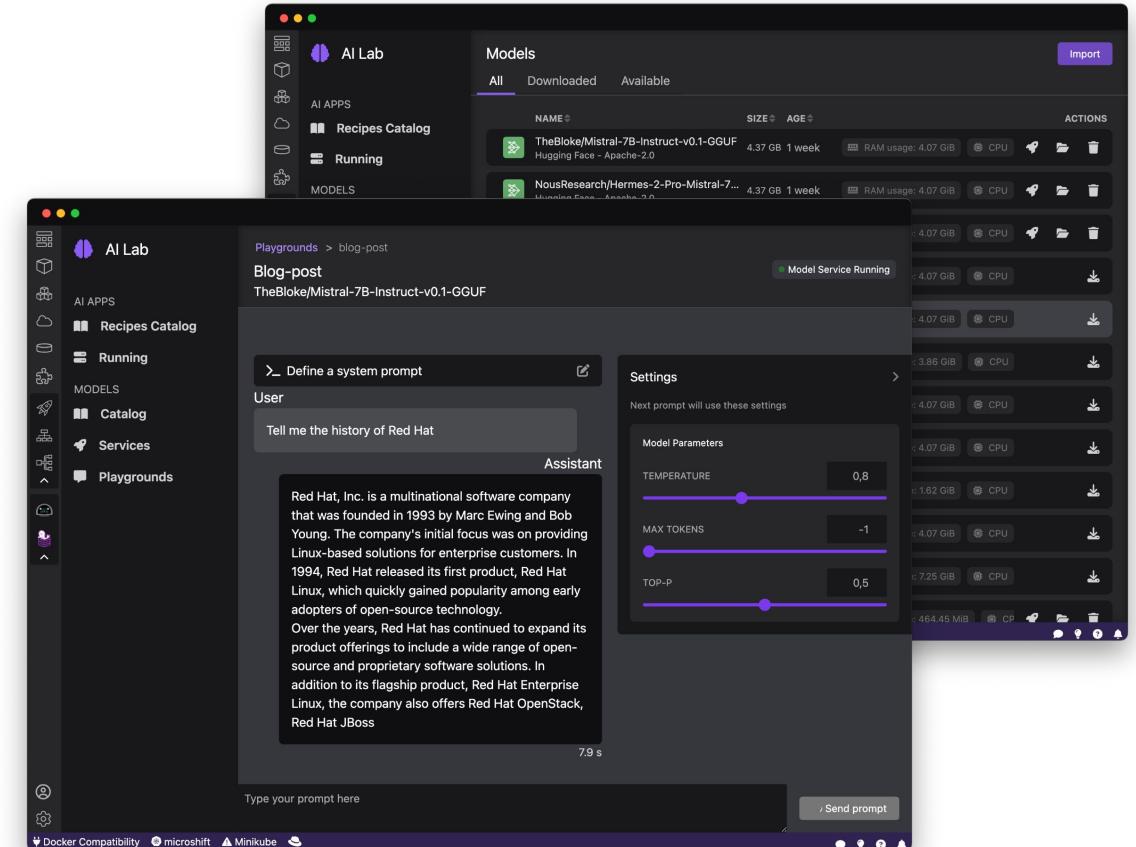
- Leverage a curated list of open source large language models available out of the box
- Import your own models

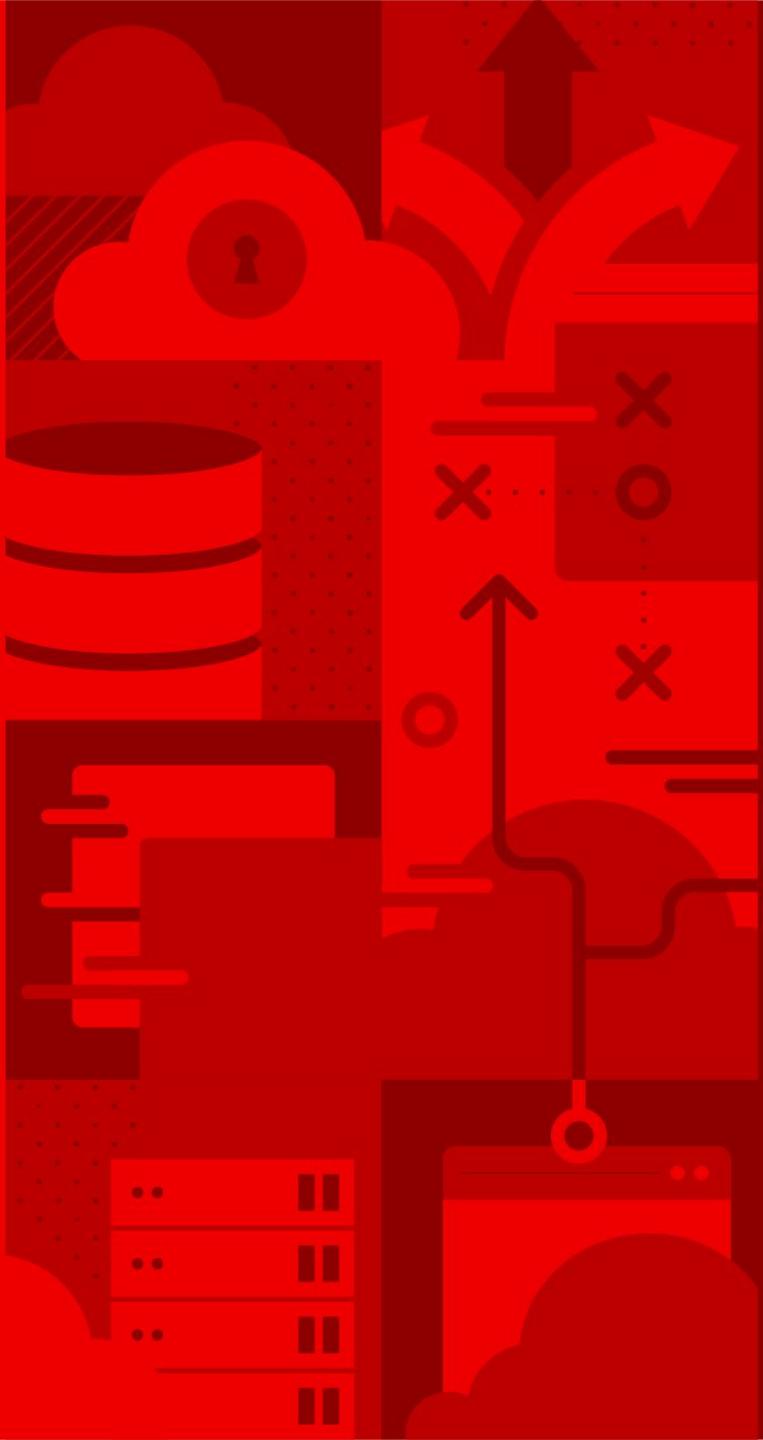
## Run Models Locally

- Run models with an inference server running in UBI image
- Get OpenAI compatible API
- Use code snippets

## Playground Environment

- Experiment with models and prompts
- Configure settings and system prompts
- Test and validate prompt workflows before using in your application





# Why Red Hat?



# The platform for all your workloads

**Trusted**

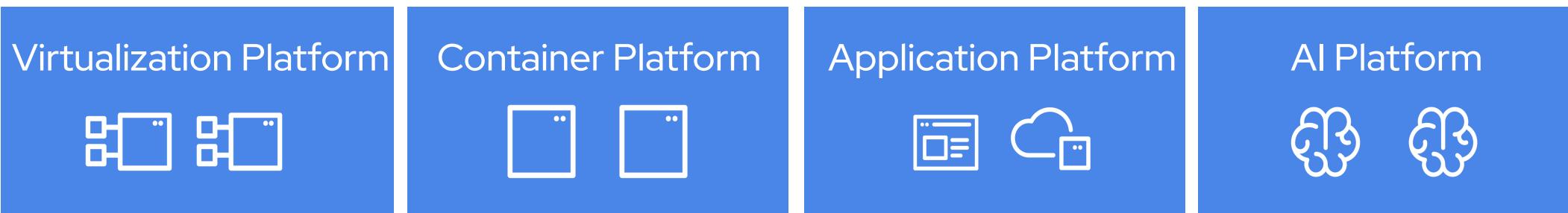
to reduce risk

**Comprehensive**

to improve productivity

**Consistent**

to increase flexibility



Physical



Virtual



Private cloud



Public cloud



Edge

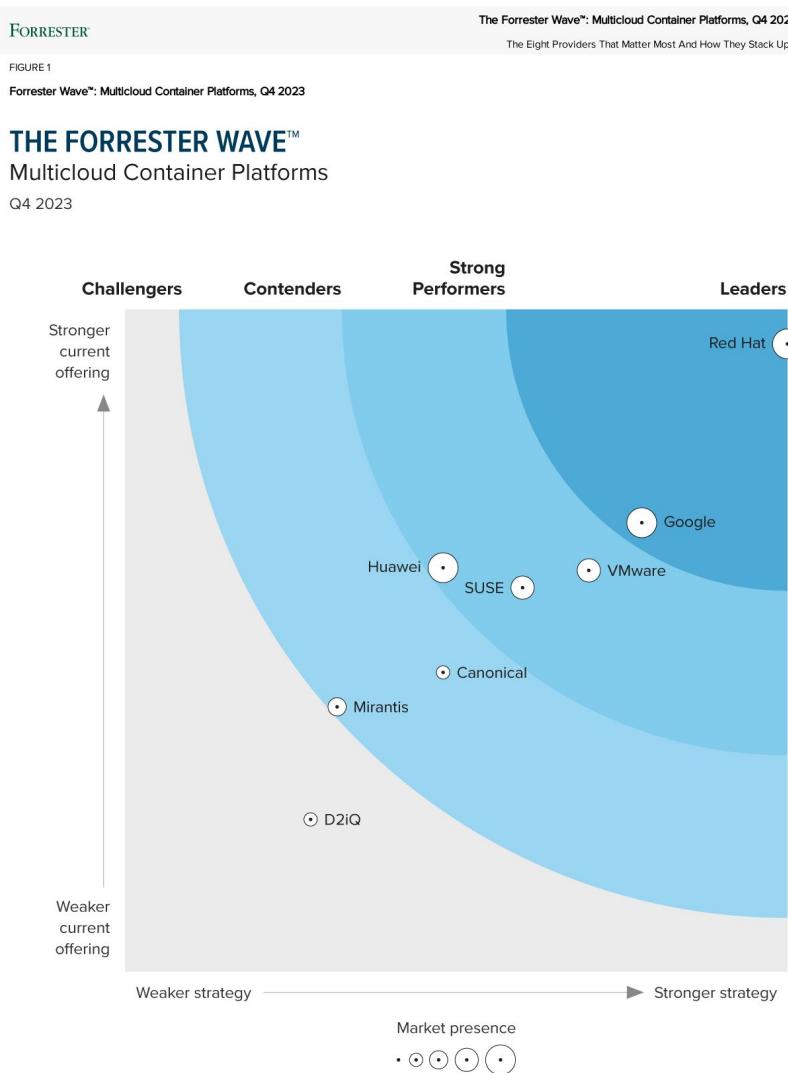
# Red Hat OpenShift for a second year in a row is recognized as a Leader in the 2024 Gartner® Magic Quadrant™ for Container Management with highest completeness of vision.

Figure 1: Magic Quadrant for Container Management



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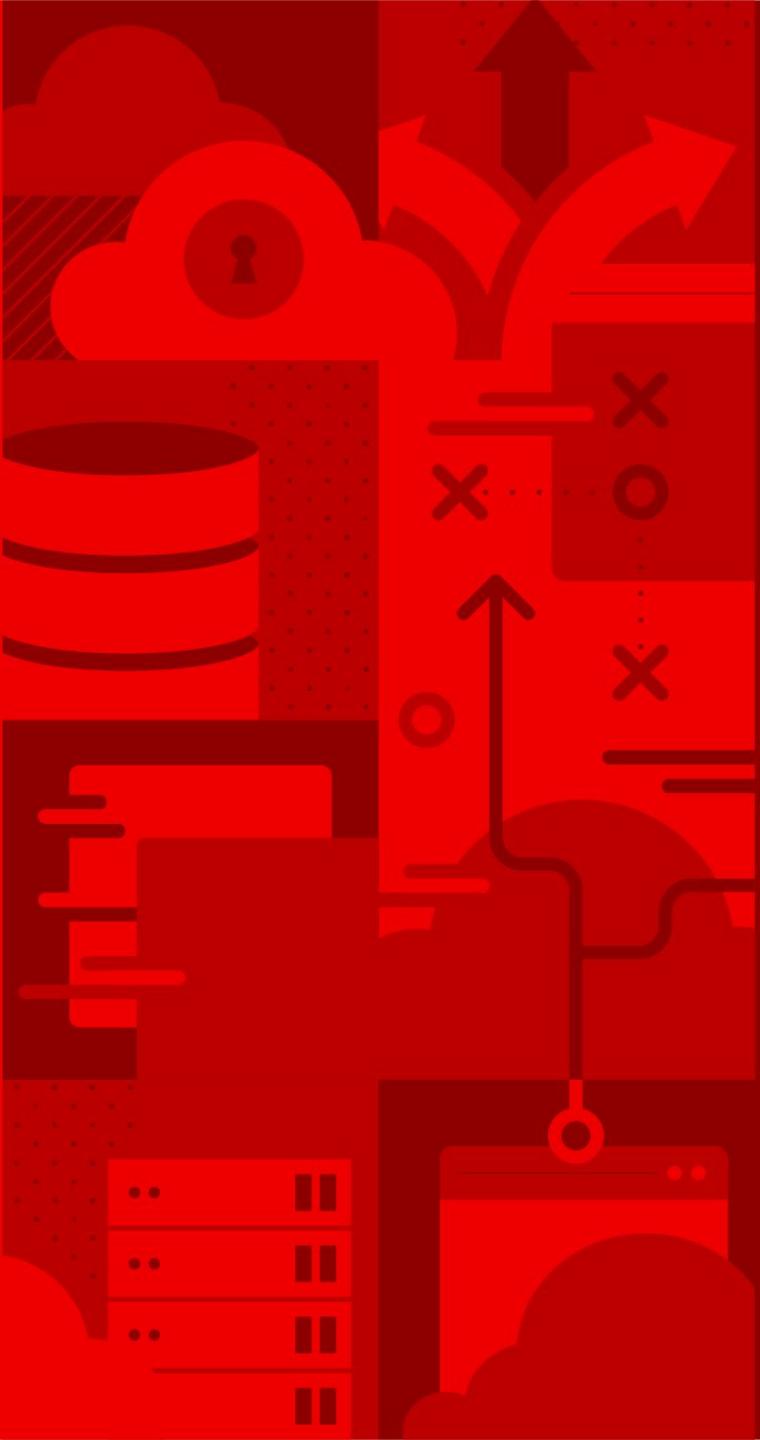
# The Forrester Wave™: Multicloud Container Platforms, Q4 2023



**"Red Hat sets the pace with enterprise IT capabilities and massive market presence.** With OpenShift's systematic innovation and development on multiple fronts, Red Hat has helped transform the MCP market segment."

"The demand for OpenShift prompted AWS and Microsoft Azure to sell OpenShift as a managed service, despite having their own Kubernetes-based container services. Red Hat's differentiated strategic vision is to up the ante on enterprise-grade open source computing."

**The Forrester Wave™: Multicloud Container Platforms, Q4 2023: The Eight Providers That Matter Most and How They Stack Up**  
Oct 2023



# Let's Drive!



# Workshops

## OpenShift - Operations

- Environment Overview
- Installation and Verification
- Application Management Basics
- Application Storage Basics
- MachineSets, Machines, and Nodes
- Infrastructure Nodes and Operators
- OpenShift Logging with Loki
- External (LDAP) Authentication Providers, Users, and Groups
- OpenShift Monitoring with Prometheus
- Project Template, Quota, and Limits
- OpenShift Networking and NetworkPolicy
- Disabling Project Self-Provisioning
- Cluster Resource Quotas
- Taints and Tolerations
- Vulnerability Scanning with ACS
- DevSecOps with ACS
- Multicluster management with ACM

## OpenShift Virtualization

- Virtual Machine Management:
- Migrating Existing Virtual Machines:
- Storage Management:
- Backup and Recovery for Virtual Machines:
- Template and InstanceType Management:
- Working with Virtual Machines and Applications:
- Network Management:

Kubernetes by Example Home +

kubernetesbyexample.com

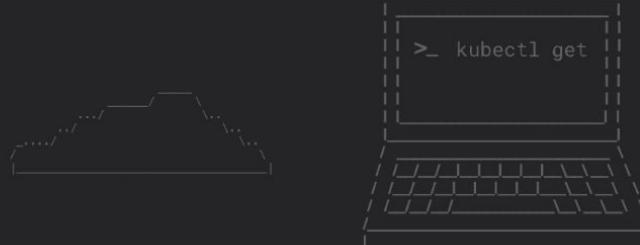
star B 1 C me G Update :

 kubernetes  
by:example Concepts Learning paths Community Resources

## Learn by doing

KBE lessons emphasize an 'absorb by doing' approach so you can practice skills as they are explored and explained to learn Kubernetes By Example.

[Get started with Kubernetes basics](#)



## Learn by watching

KBE Insider, our new streaming show, allows you to watch how Kubernetes experts develop, deploy, manage, and automate containers in cloud-native environments.



Red Hat OpenShift KBE Insider: Clayton Coleman Watch later Share

Brought to you by Red Hat

Watch on YouTube

 kubernetes  
by:example KBE INSIDER SHOW

Build, test, and deploy your applications in real clusters.

Try Kubernetes

# learn.openshift.com

Foundations of  
OpenShift

START COURSE

Building  
Applications On  
OpenShift

START COURSE

Subsystems,  
Components, and  
Internals

START COURSE

OpenShift  
Playgrounds

START COURSE

Service Mesh  
workshop with Istio

START COURSE

Serverless scenarios  
with OpenShift  
Cloud Functions

START COURSE

Interactive Learning Scenarios provide you with a pre-configured OpenShift instance, accessible from your browser without any downloads or configuration.

# Thank you

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