Red Hat Partner Bootcamp

OpenShift Topics

Alfred Bach

Principal Solution Architect

Red Hat EMEA

Red Hat

Agenda

- Innovation without limitation
- OpenShift Architecture
- OpenShift Container Platform (OCP) Install
- OpenShift Plus

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- Innovation without limitation
- OpenShift Architecture
- OpenShift Container Platform (OCP) Install
- **OpenShift Plus**

Red Hat OpenShift

OpenShift Plus

As part of Partner Boot Camp

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Principal Solution Architect

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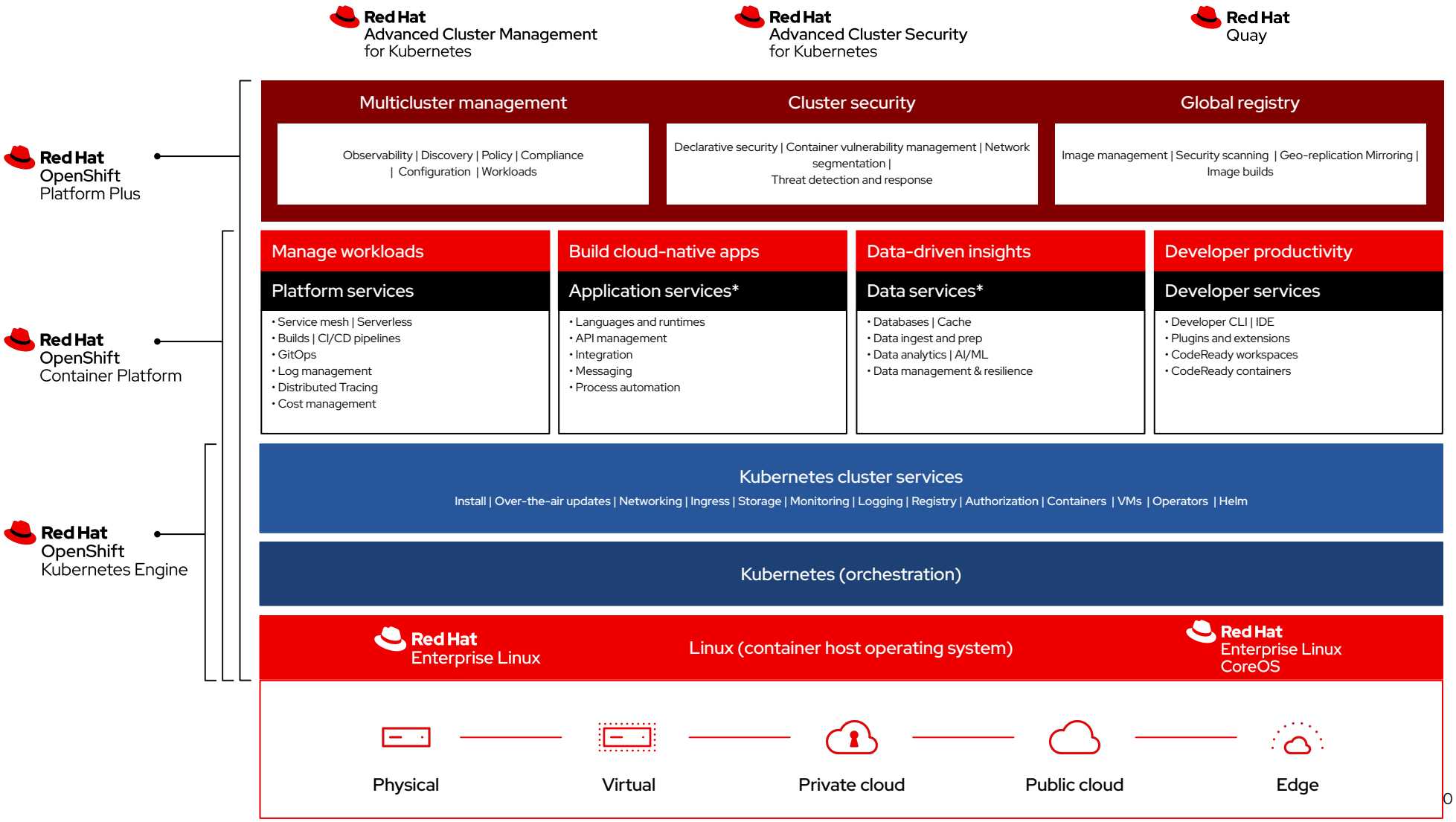
Red Hat OpenShift



HYBRID CLOUD EXPERIENCE

Applications in hybrid clouds and clusters

CORE, PLATFORM & DEVELOPER TOOLS	TELCO & EDGE	MANAGED CLOUD SERVICES
		
Self-managed clusters and applications Foundations for Managed Services and Telco and Edge	5G CORE and 5G RAN Near edge and Far edge From and to the edge	OpenShift as a (SRE) Managed Service Managed (SRE) Application, Data and Management Services

Unified Experience

Security Everywhere

Platform Consistency

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Red Hat Advanced Cluster Management for Kubernetes

Why Red Hat Advanced Cluster Management is important

Why you should care

- App modernization is a top industry priority.
- Kubernetes is platform modernization.
- Enterprises are rapidly adopting Kubernetes.
- There is intense competition for Kubernetes.
- Not all Kubernetes solutions are equal.
- Kubernetes management is complicated.

Key solutions

Move quickly and win the platform

Use the best, most complete solution - OpenShift

Differentiate and win Red Hat OpenShift Container Platform

Recognize VMware as the biggest threat

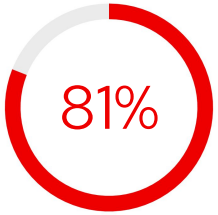
But Hybrid Multi-Cloud management is really hard

As organizations deploy more across multiple clouds, new challenges arise.

- **Difficult and error prone** to manage at scale
- **Inconsistent security controls** across environments
- **Overwhelming to verify** components, configurations, policies, and compliance

IDC Survey of 200 US-based $1B companies actively using two or more "infrastructure clouds" for production applications

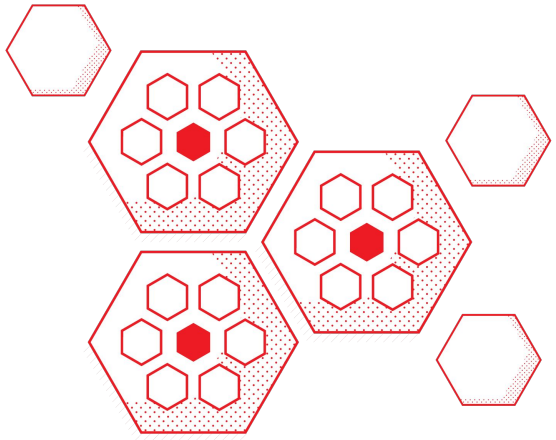
Using multiple infrastructure clouds*



Using multiple public clouds and one or more private/dedicated clouds*

Source:
DC Multicloud Management Survey, 2019: Special Study, Doc # US45020919, April 2019
*IDC Survey of 200 US-based $1B companies actively using two or more "infrastructure clouds" for production applications

Kubernetes adoption leads to multicluster



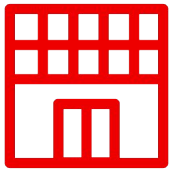
"As Kubernetes gains adoption across the industry, scenarios are arising in which I&O teams are finding they must deploy and manage multiple clusters, either in a single region on-premises or in the cloud, or across multiple regions....for a number of reasons, including multi-tenancy, disaster recovery, and with hybrid, multicloud, or edge deployments."

Source:
Assessing Patterns for Deploying Distributed Kubernetes Clusters doc # G00465217, by Tony Iams

Where is the growth in cluster deployments?

Small Scale Dev teams

- Managing and syncing across Dev/QE/Pre-Prod/Prod clusters can be difficult



Medium Scale Organizations

- Retail with small clusters across 100s of locations
- Organizations with plan for growth 10-15 clusters moving to 100s

Large Scale

- Global organizations with 100s of clusters, hosting thousand of applications
- Large Retail with 1000s of stores

Edge Scale Telco

- 100s of zones, 1000s of clusters and nodes across complex topologies

Reasons for deploying clusters

Application availability

Reduced latency

Address industry standards

Geopolitical data residency guidelines

Disaster recovery

Edge deployments

CapEx cost reduction

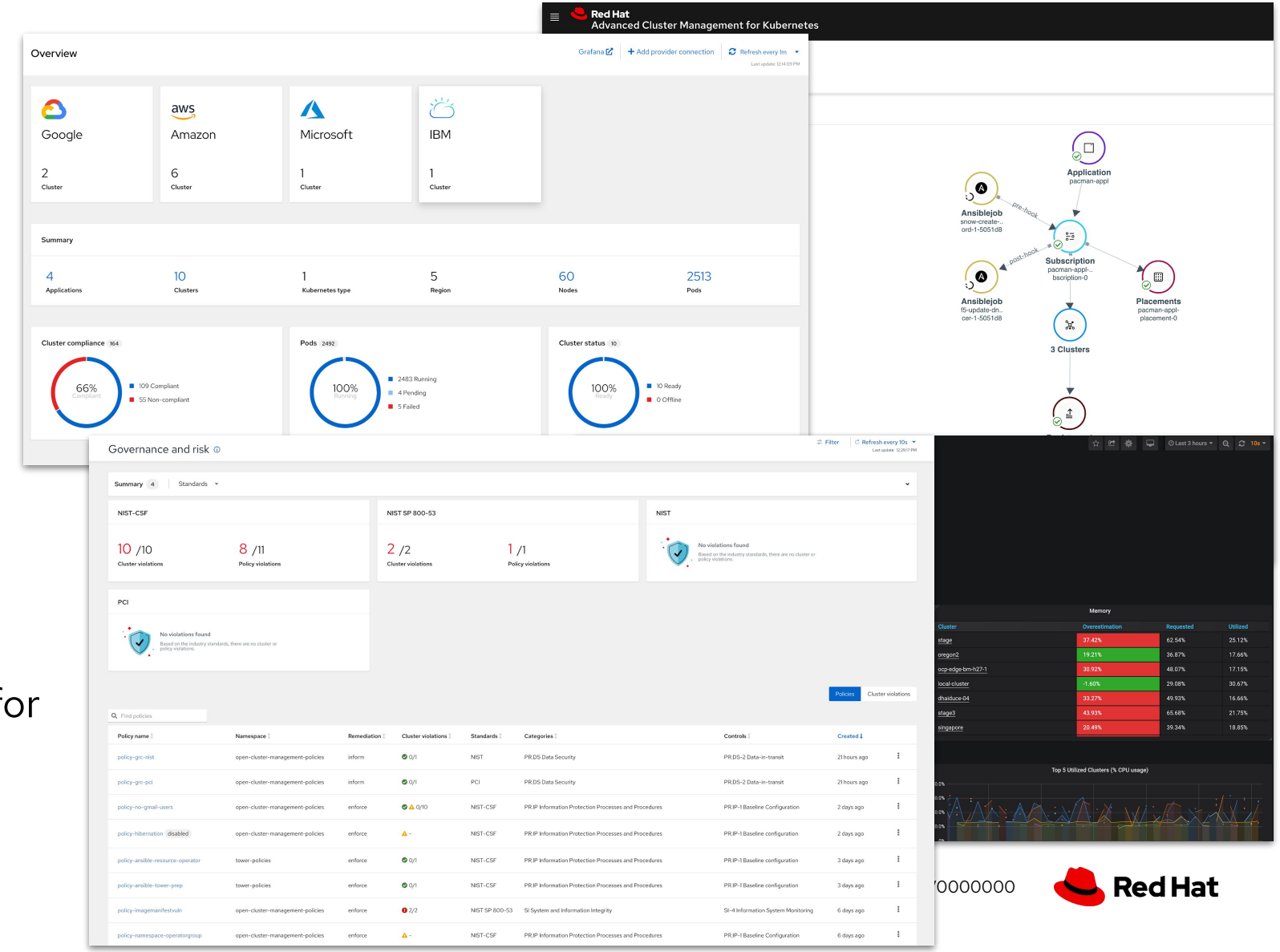
Avoid vendor lock-in

Multicluster management challenges

How do I normalize and centralize key functions across environments?

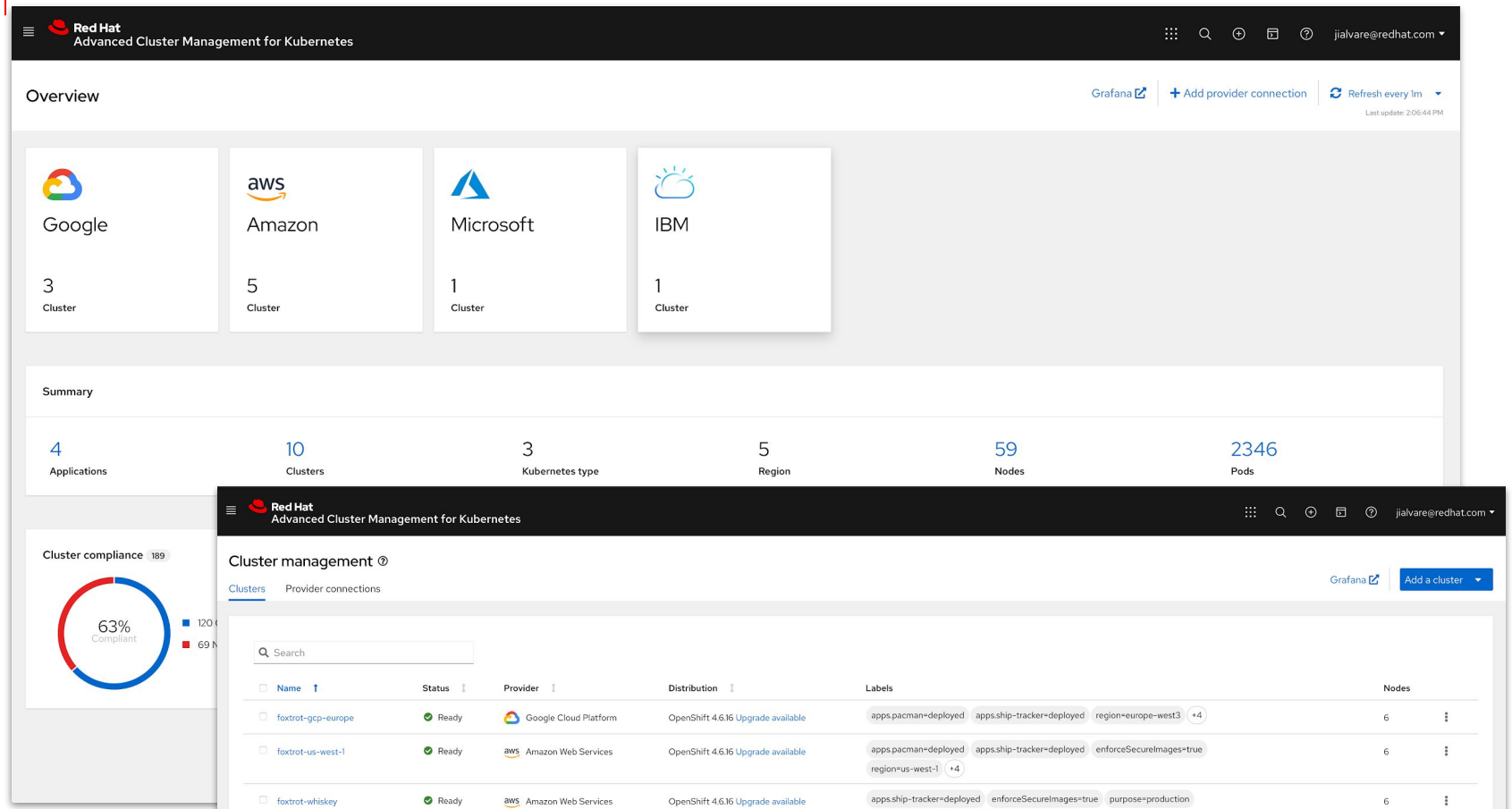
Robust. Proven. Award winning.

- Multicluster lifecycle management
- Policy driven governance, risk, and compliance
- Advanced application lifecycle management
- Multicluster observability for health and optimization



Unified Multi-Cluster Management

Single Pane for all your Kubernetes Clusters



- **Centrally** create, update and delete Kubernetes clusters **across multiple** private and public clouds
- Search, find and modify **any** kubernetes resource across the **entire** domain.
- **Quickly** troubleshoot and resolve issues across your **federated** domain

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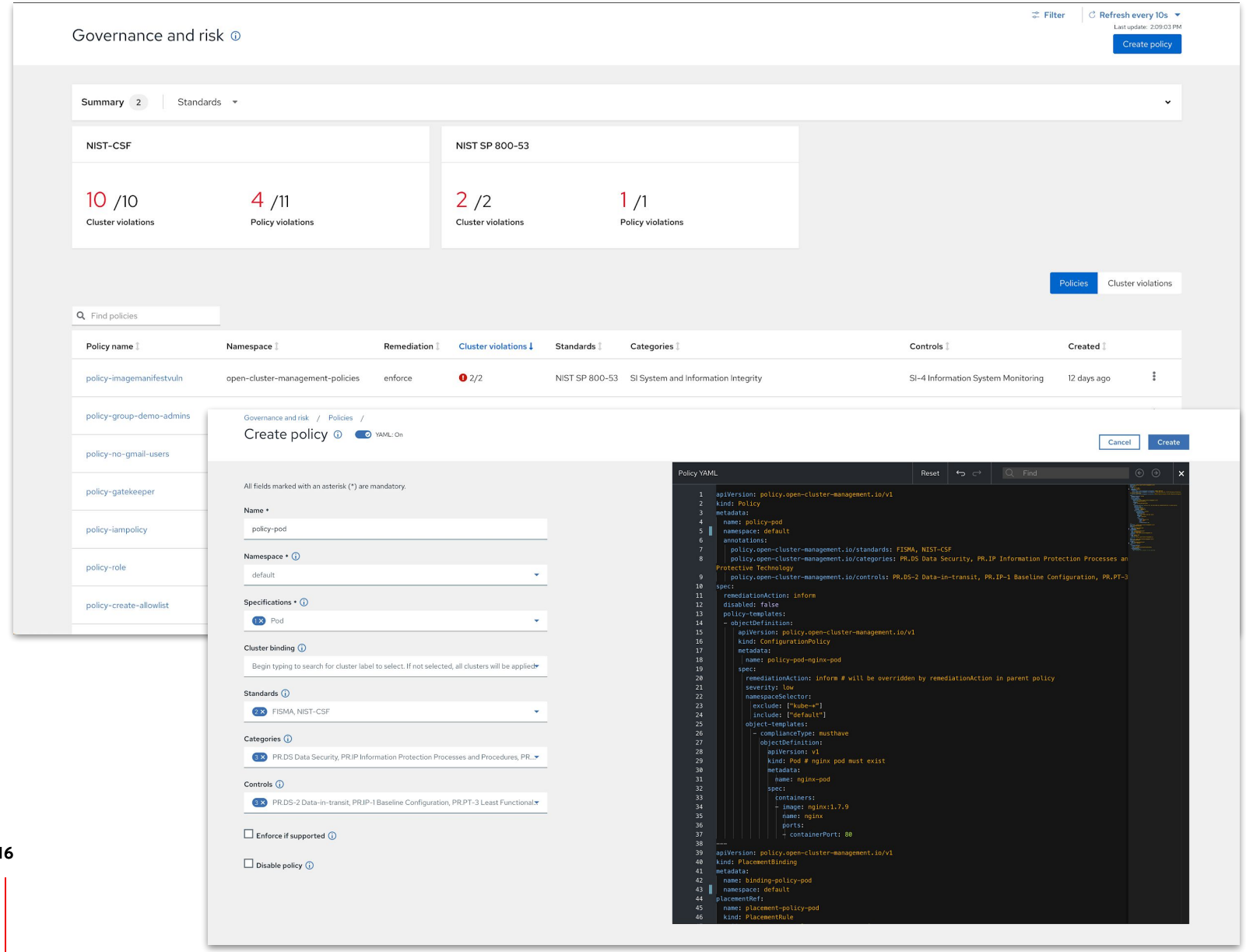
Policy based Governance, Risk and Compliance

Don’t wait for your security team to tap you on the shoulder



- **Centrally** set & enforce policies for security, applications, & infrastructure
- Quickly **visualize** detailed **auditing** on configuration of apps and clusters
- Built-in compliance policies and audit checks
- **Immediate** visibility into your compliance posture based on **your** defined standards

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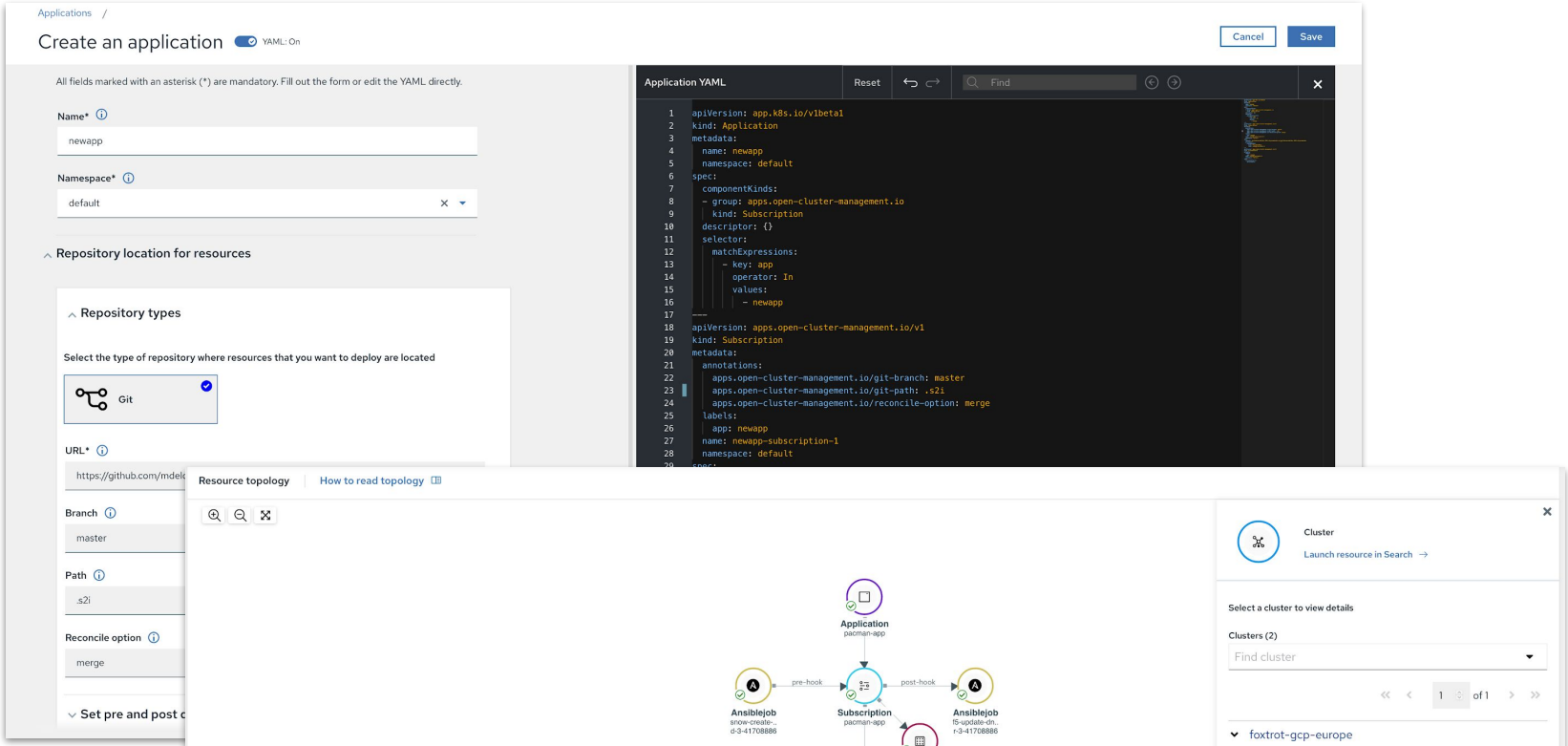
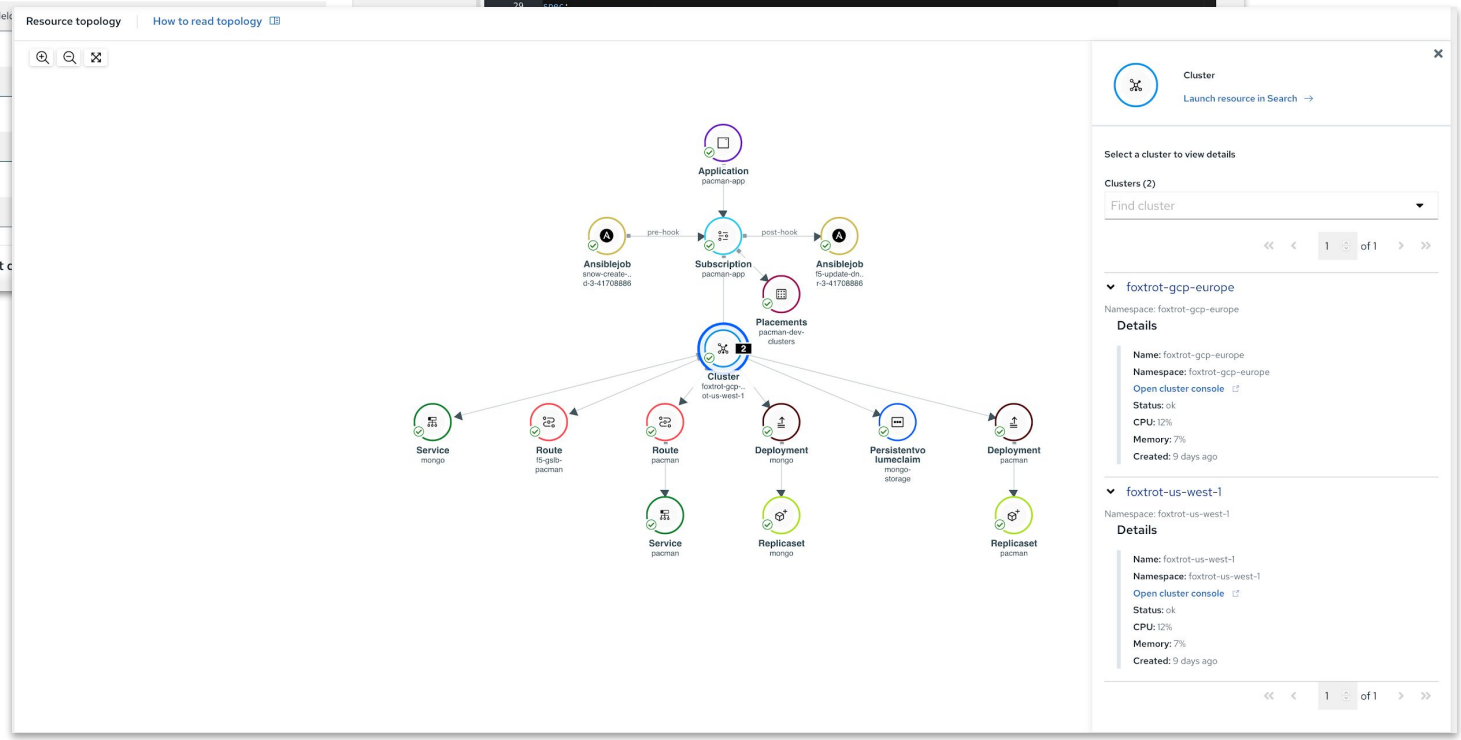
Advanced Application Lifecycle Management

Simplify your Application Lifecycle





- **Easily** deploy an Application using the **Application Builder**
- Deploy Applications from **Multiple** Sources (GIT / HELM / Object Storage)
- Quickly **visualize** application relationships **across** clusters and those that **span** clusters

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Benefits

Red Hat OpenShift and Red Hat Advanced Cluster Management for Kubernetes

Accelerate development to production

Self-service provisioning allows app dev teams to request clusters directly from a catalog removing central IT as a bottleneck.

Increase application availability

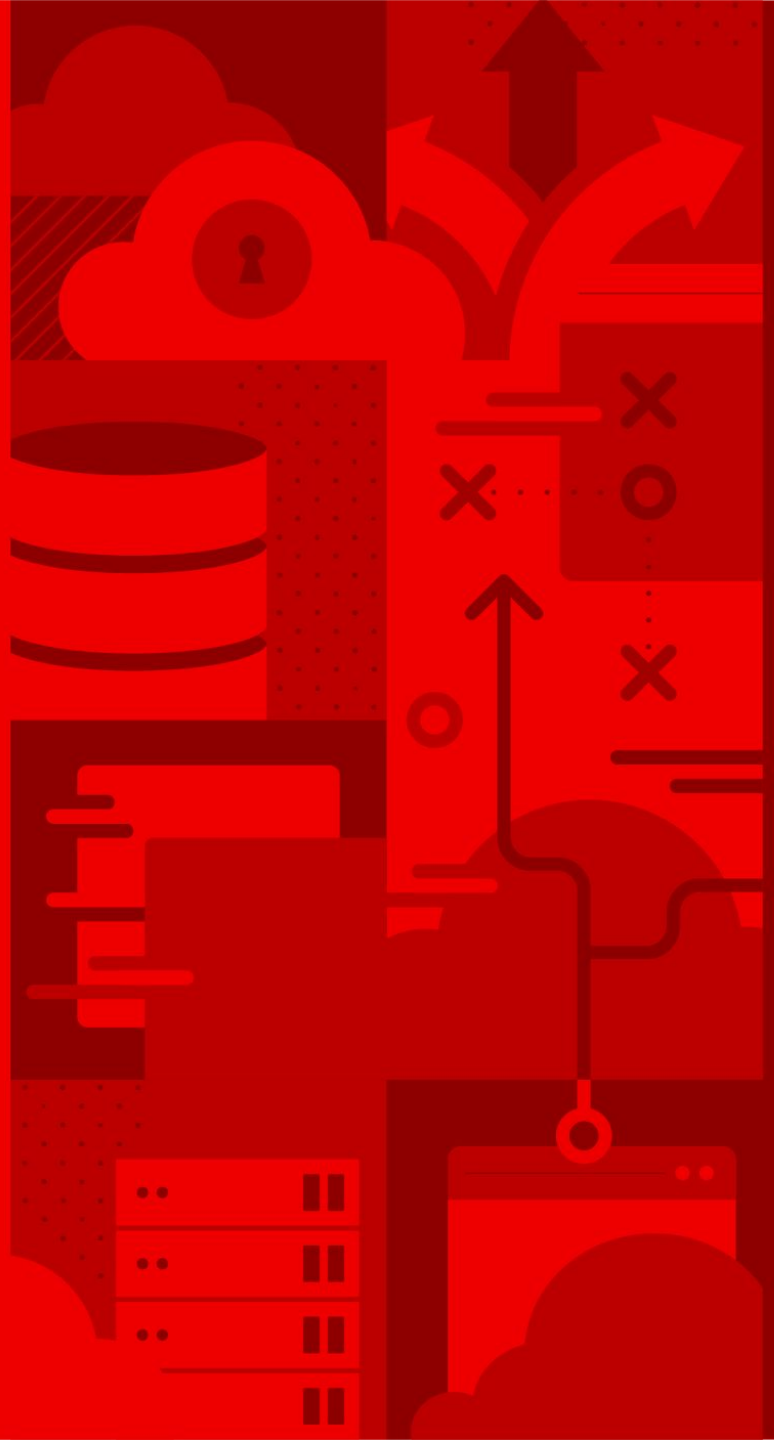
Placement rules can allow quick deployment of clusters across distributed locations for availability, capacity, and security reasons.

Reduce costs

Centralized management of clusters reduces operational cost, makes the environment consistent, and removes the need to manually manage individual clusters.

Ease compliance

Policies can be written by the security team and enforced at each cluster, allowing environments to conform to your policy.

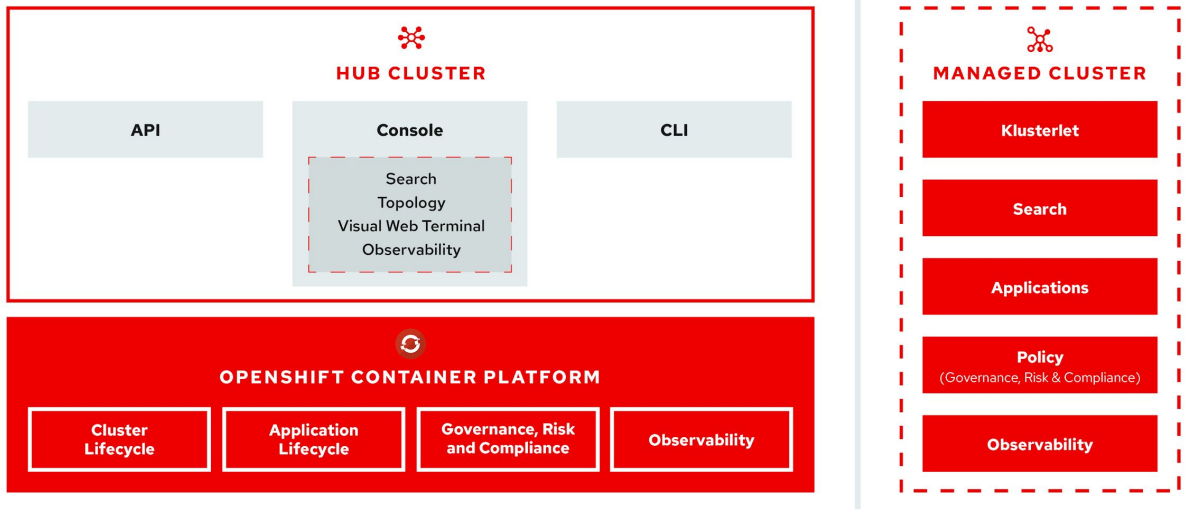


Architecture

Red Hat Advanced Cluster Management For Kubernetes

Architecture overview

IT Operations



Hub architecture and components

Red Hat Advanced Cluster Management uses the **multicluster-hub** operator and runs in the **open-cluster-management** namespace

Managed cluster architecture and components

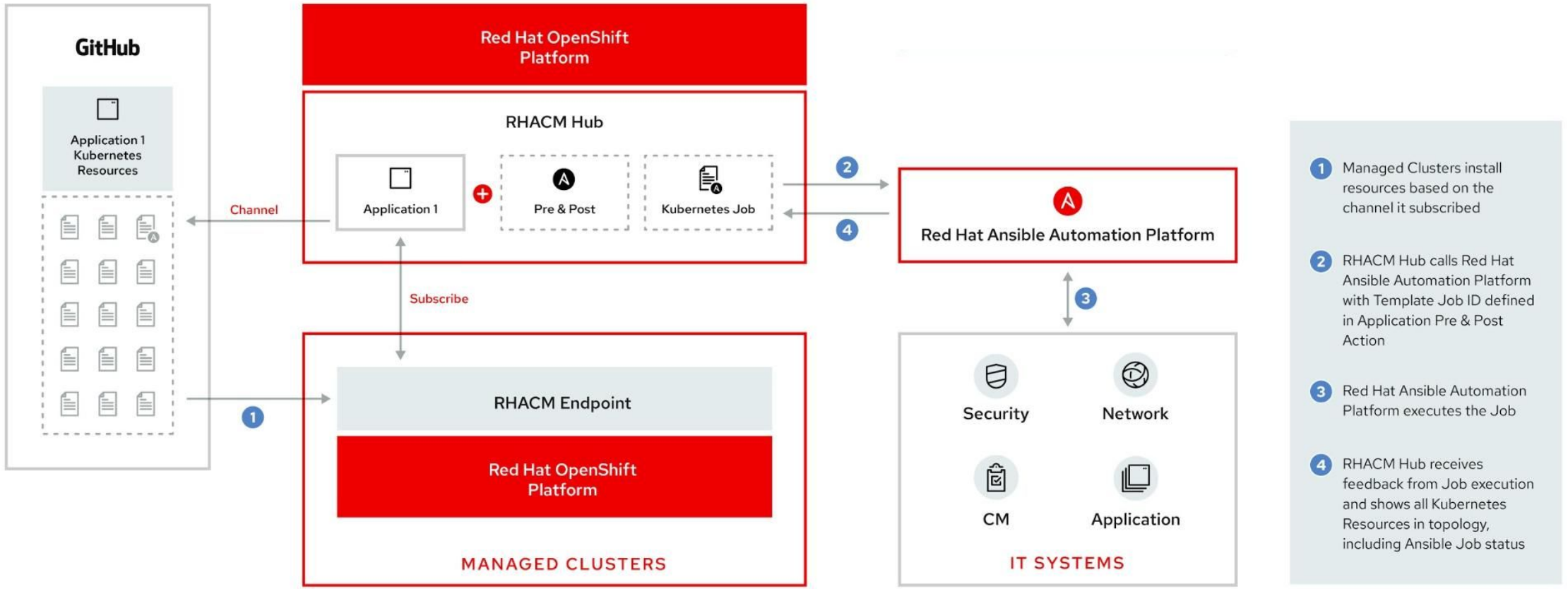
Red Hat Advanced Cluster Management managed clusters use the **multicluster-endpoint** operator which runs in the **open-cluster-management** namespace

Tech preview

Architecture Overview

for Application Lifecycle

Red Hat Advanced Cluster Management for Kubernetes



1. Managed Clusters install resources based on the channel it subscribed
2. RHACM Hub calls Red Hat Ansible Automation Platform with Template Job ID defined in Application Pre & Post Action
3. Red Hat Ansible Automation Platform executes the Job
4. RHACM Hub receives feedback from Job execution and shows all Kubernetes Resources in topology, including Ansible Job status

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Red Hat
Advanced Cluster Security
for Kubernetes

StackRox | Red Hat ACS

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Kubernetes is the standard for application innovation...

- Microservices architecture
- Declarative definition
- Immutable infrastructure

...and Kubernetes-native security is increasingly critical

- Secure supply chain
- Secure infrastructure
- Secure workloads

DevOps → DevSecOps ← Security

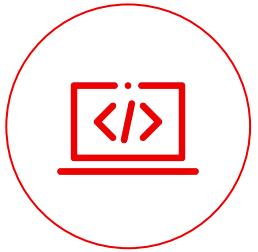
Benefits of a Kubernetes-native approach to security

Lower operational cost

DevOps and Security teams can use a common language and source of truth

Reduce operational risk

Ensure alignment between security and infrastructure to reduce application downtime



Increase developer productivity

Leverage Kubernetes to seamlessly provide guardrails supporting developer velocity

Red Hat Advanced Cluster Security for Kubernetes

A cloud workload protection platform and cloud security posture management to enable you to “shift left”

Shift left	**Cloud security posture management (CSPM)**	**Cloud workload protection (CWPP)**
Secure supply chain	Secure infrastructure	Secure workloads
Extend scanning and compliance into development (DevSecOps)	Leverage built-in Kubernetes CSPM to identify and remediate risky configurations	Maintain and enforce a “zero-trust execution” approach to workload protection

Red Hat OpenShift provides a secure foundation

Detect

- Trusted content
- Container registry
- Build management
- CI/CD pipeline

Protect

- Kubernetes platform lifecycle
- Identity and access management
- Platform data
- Deployment policies

Respond

- Container isolation
- Network isolation
- Application access and data
- Observability

Build — **Deploy** — **Run**

DevSecOps

RHACS delivers security depth to entire application lifecycle

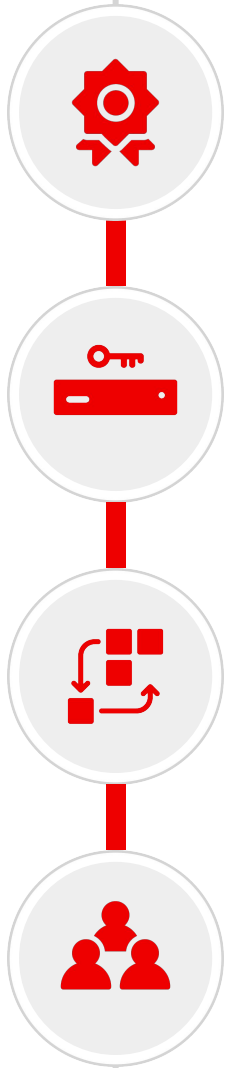
Detect	Protect	Respond
Trusted content	Kubernetes platform lifecycle	Container isolation
Container registry	Identity and access management	Network isolation
Build management	Platform data	Application access and data
CI/CD pipeline	Deployment policies	Observability
Vulnerability analysis	Image assurance and policy admission controller	Runtime behavioral analysis
App config analysis	Compliance assessments	Auto-suggest network policies
APIs for CI/CD integrations	Risk profiling	Threat detection / incident response

Build — **Deploy** — **Run**

DevSecOps

RED HAT QUAY

Red Hat Quay



Industry-leading, **trusted, and open source registry platform** operating at scale since 2014

Built to **efficiently manage content** under governance and security **controls** globally

Runs **everywhere**, easy to **integrate** and **automate** but works best with **OpenShift**

Developed in **collaboration** with a broad open source, customer, and ecosystem **community**

Red Hat Quay Key Features

SCALABILITY

Massive Scale Testing Quay.io
Real Time Garbage Collection
Automated Squashing

BUILD AUTOMATION

Seamless Git Integration
Build Workers
Webhooks

INTEGRATION

Extensible API
Webhooks, OAuth
Robot Accounts

REGISTRY

High Availability
Full Standards / Spec Support
Long-Term Protocol Support
Application Registry
Enterprise Grade Support
Regular Updates

SECURITY

Vulnerability Scanning
Logging & Auditing
Notifications & Alerting

CONTENT DISTRIBUTION

Geo-Replication
Repository Mirroring
Air-Gapped Environments

ACCESS CONTROL

Authentication Providers
Fine-Grained RBAC
Organizations & Teams

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Data Services

Red Hat OpenShift Data Foundation 4.x

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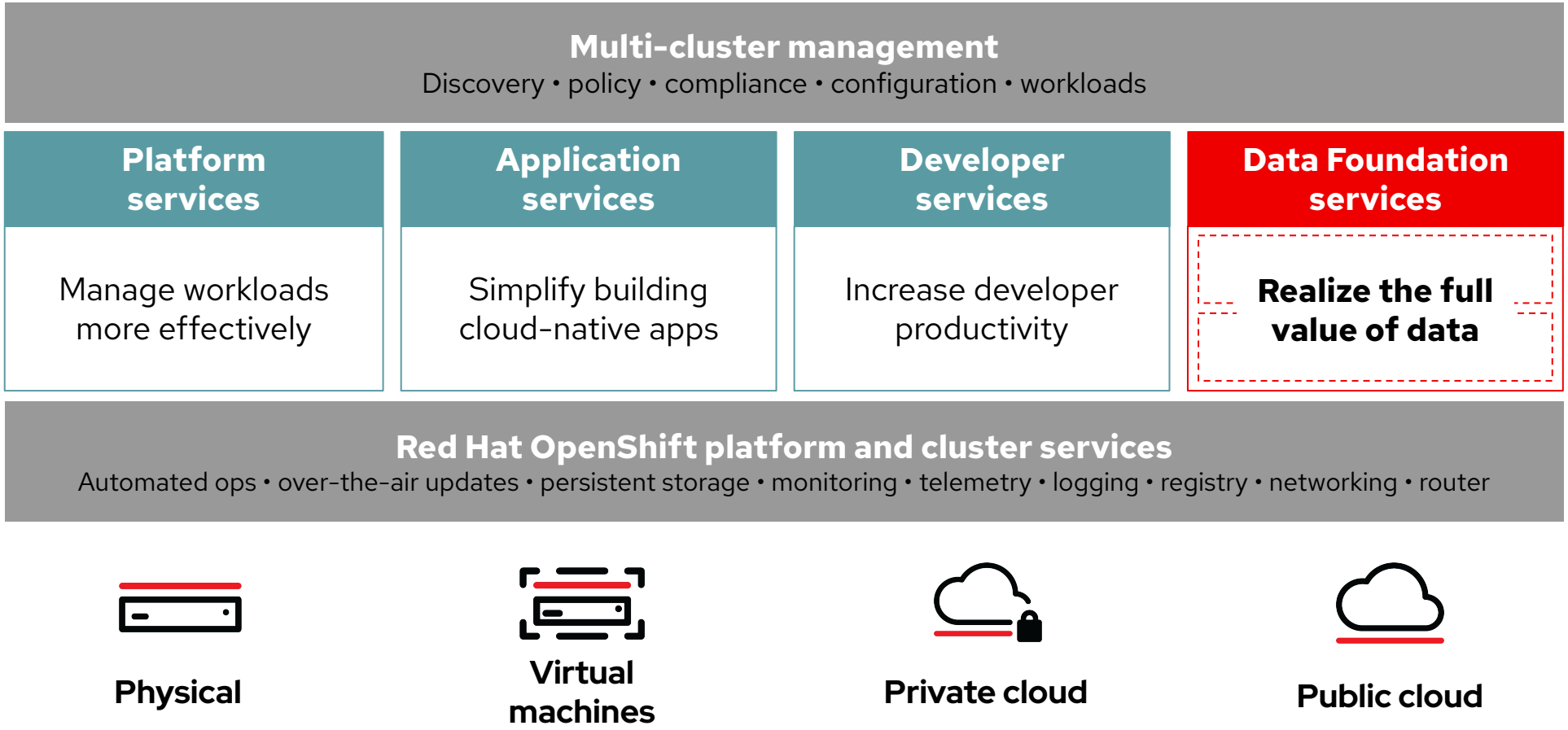
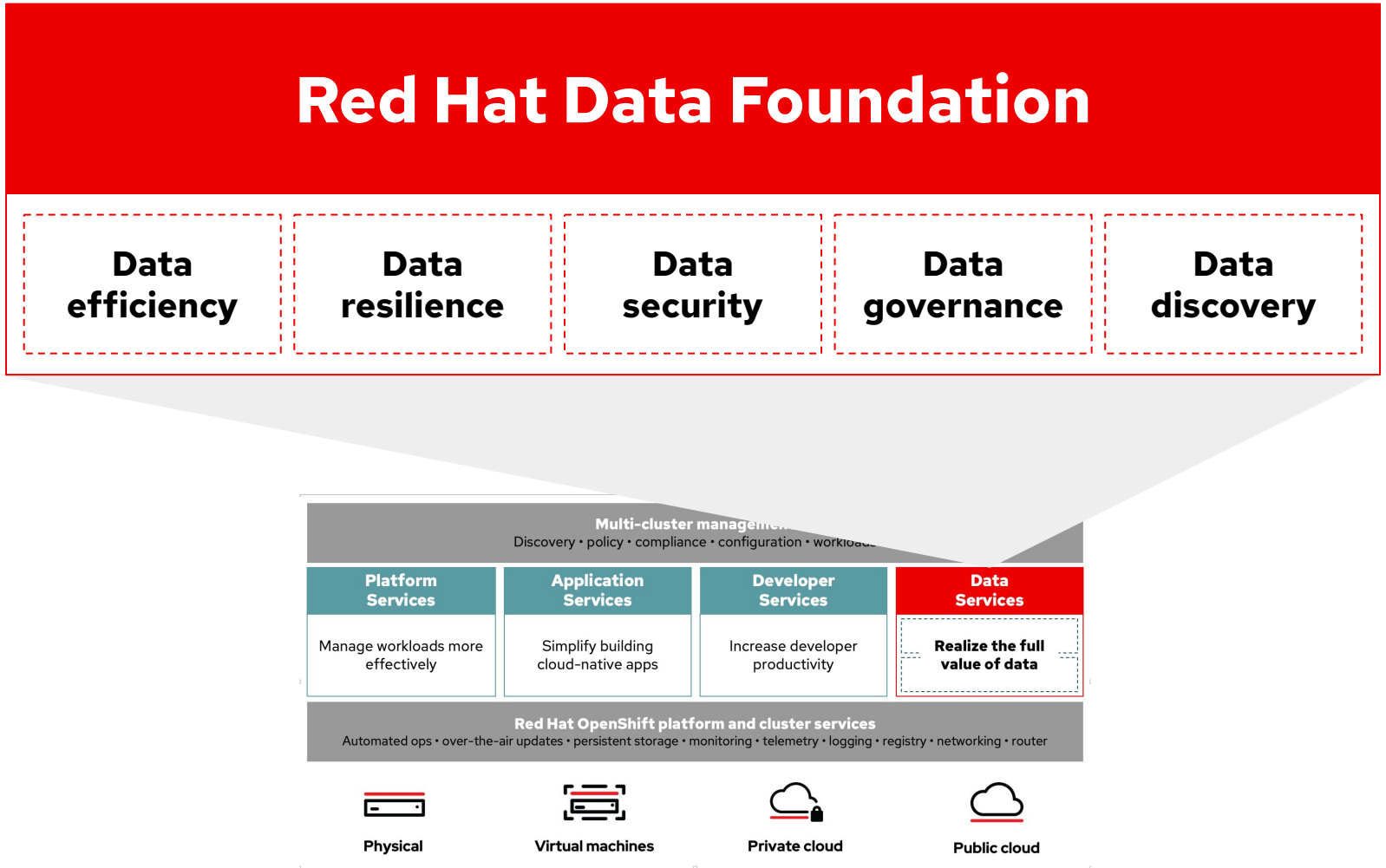
How Red Hat Data Foundation services fit



The Red Hat Data Foundation opportunity



Red Hat Data Foundation in a nutshell

Data efficiency

- Erasure coding
- Compression
- Performance

Data resilience

- Snapshots
- Clones
- Backup
- Recovery
- Business continuity
- Disaster recovery

Data security

- At rest encryption
- In flight encryption
- Key management

Data governance

- WORM
- Auditing
- Compliance
- SEC & FINRA
- GDPR

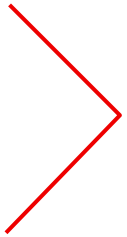
Data discovery

- Cataloging
- Tagging
- Search

Data Foundation: a change of mindset

Traditional, static approach

- Focus on improving efficiency
- Infrastructure-up view
- Poor performance at scale
- Disconnected
- Manual, monolithic and rigid



Dynamic, data foundation approach

- Focus on innovation
- Application-oriented view
- Highly scalable
- Always-on
- Automated, on-demand, and flexible

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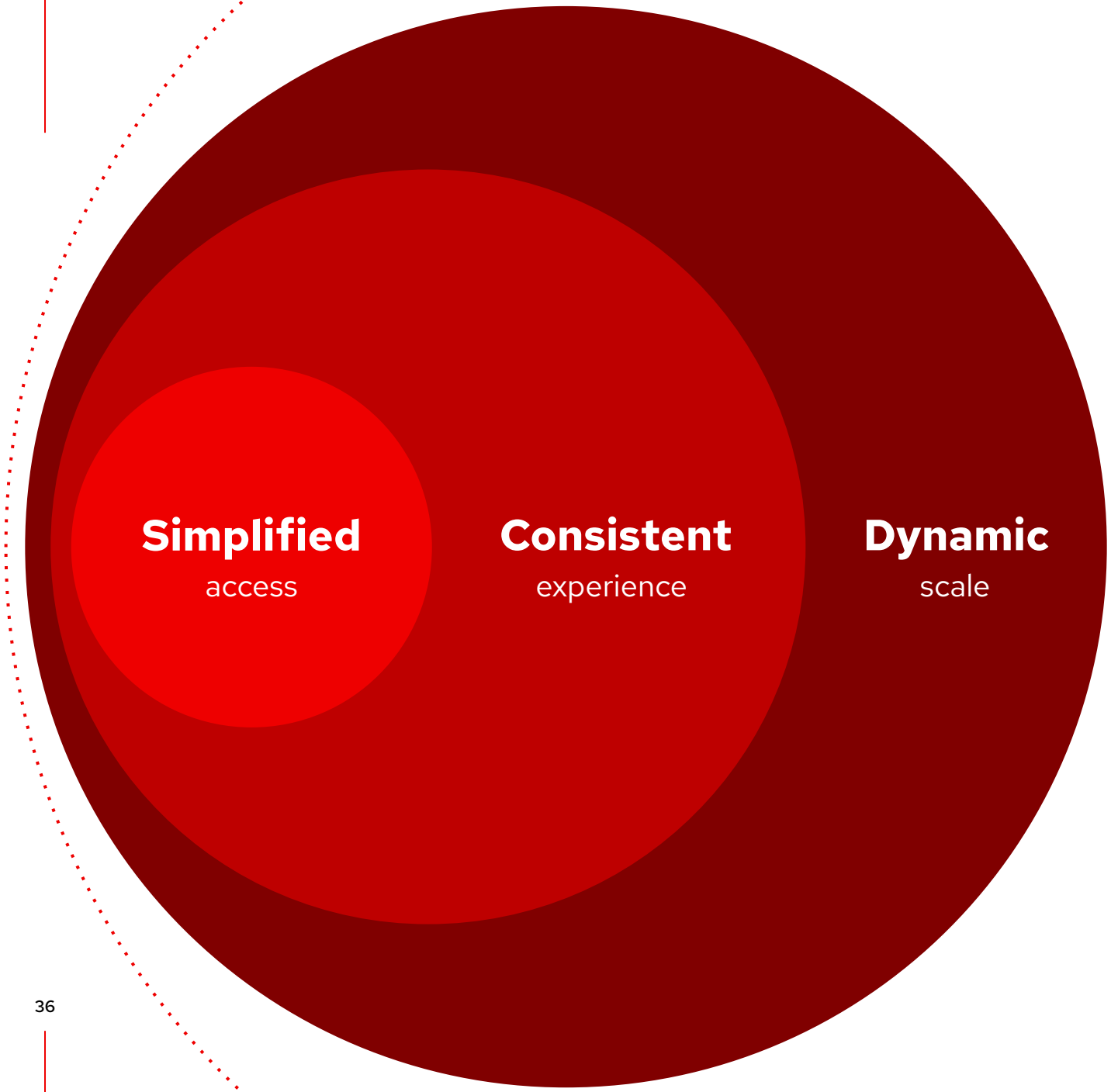


Red Hat Data Services mission:

To make data accessible to applications across the hybrid cloud, unlocking its power in new and impactful ways

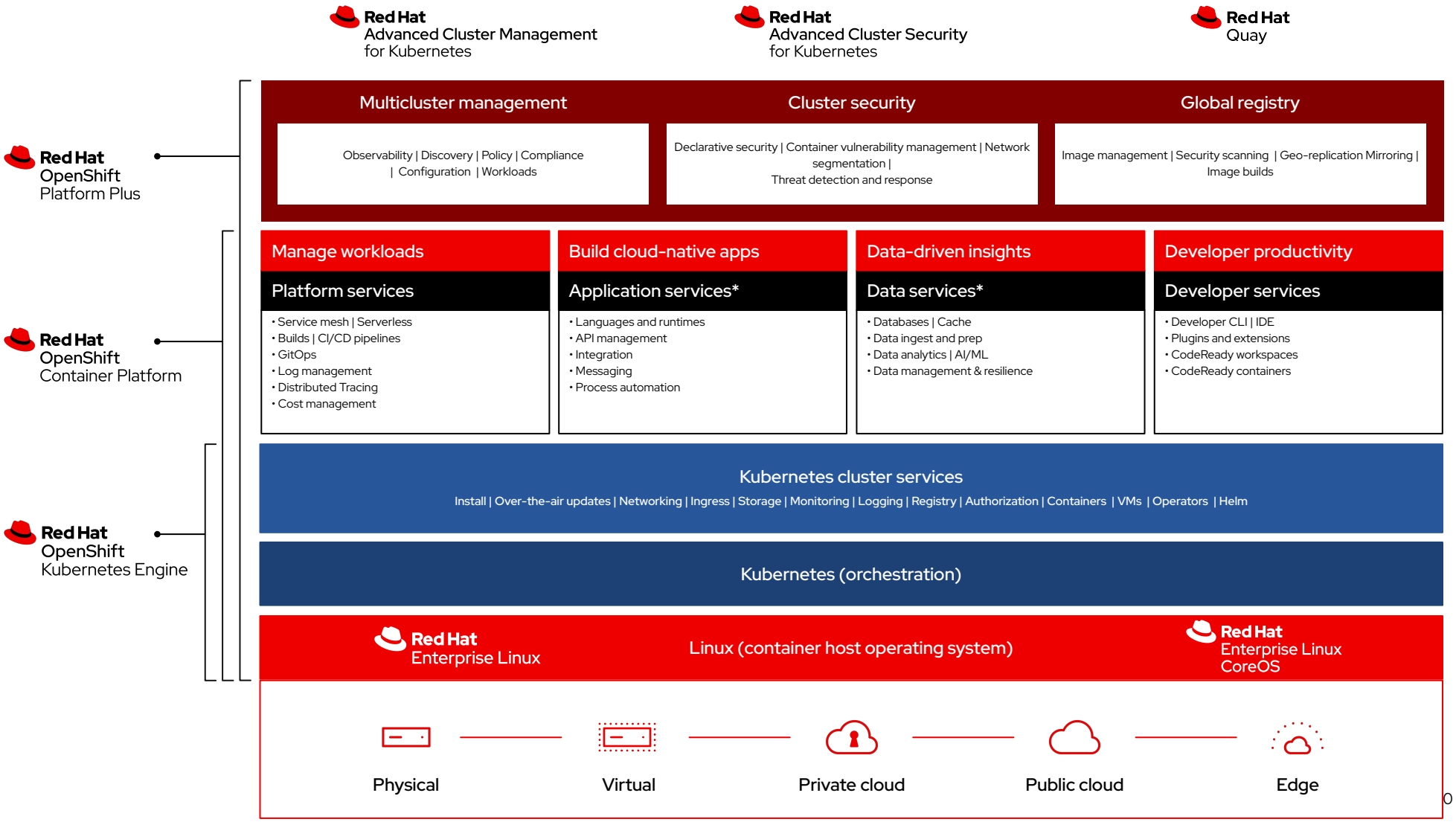
Delivering on the Red Hat OpenShift promise:

Innovation without limitation

Data is the most significant asset in today's businesses—give it data foundation

- Data foundation focuses on infrastructure and application needs so they can run and interact with ease and efficiency
- Provides a foundational data layer for applications to function and interact with data in a simplified, consistent and scalable manner
- Red Hat Ceph Storage is a foundational component to drive data services

Red Hat OpenShift



Thank you

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