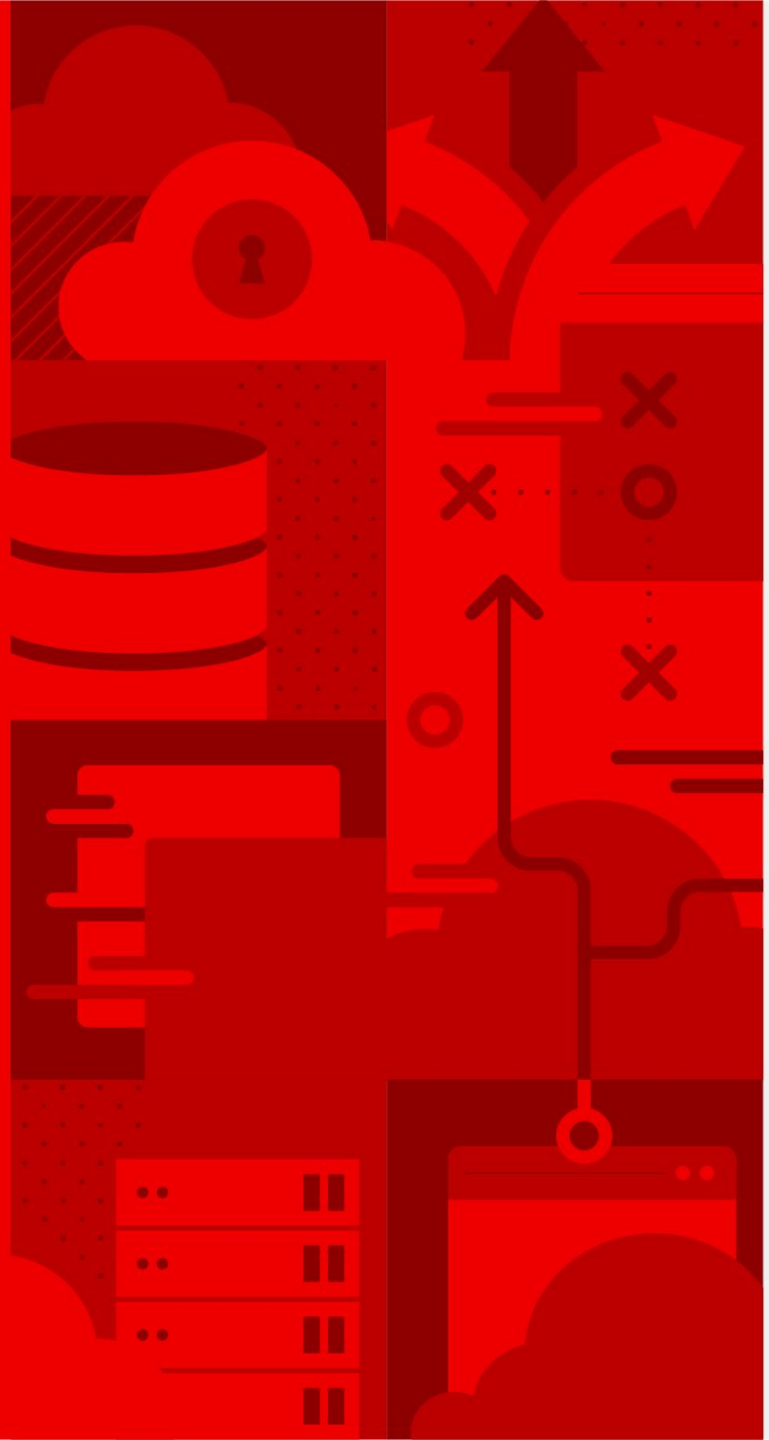

The Kubernetes platform for big ideas

Red Hat
Advanced Cluster Management
for Kubernetes

Red Hat Advanced Cluster Management for Kubernetes

February 11th, 2020

Dieter De Moitié
Senior Solution Architect

Kevin Dubois
Senior Solution Architect
@kevindubois

Red Hat

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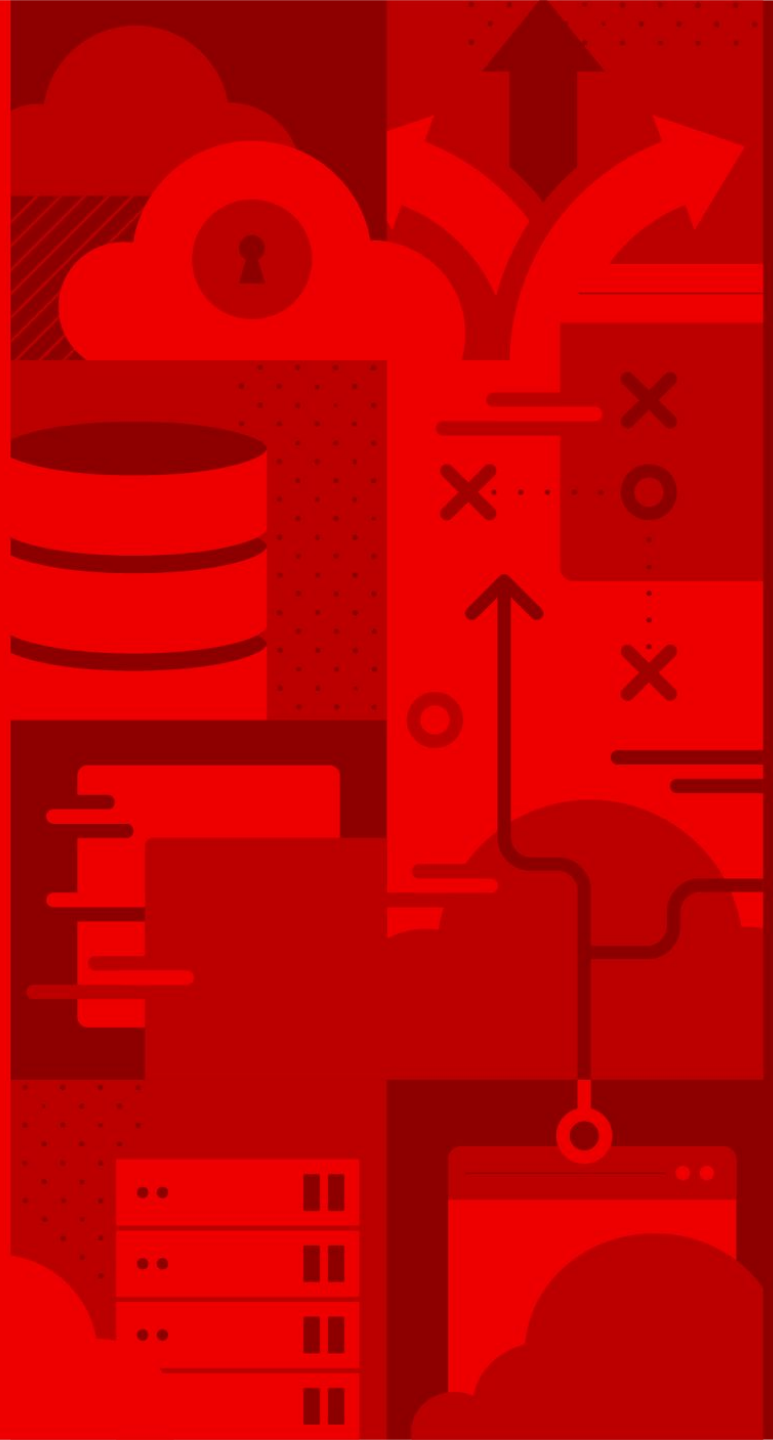
Agenda

- Why Hybrid Multi-Cloud
- Introducing Red Hat Advanced Cluster Management for Kubernetes
- Demo
- Installation
- Wrap up

ACM



Why Hybrid Multi-Cloud?

Red Hat

OpenShift Container Platform

Advanced Cluster Management

Multi-cluster management

Inventory ⁝ Policy ⁝ Compliance ⁝ Configuration ⁝ Workloads

OpenShift Container Platform

Manage workloads	Build cloud-native apps	Data driven insights	Developer productivity
Platform services	**Application services**	**Data services**	**Developer services**
Service Mesh Serverless ⁝ Builds CI/CD Pipelines Log Management ⁝ Cost Management	Languages & Runtimes API Mgmt ⁝ Integration⁝ Messaging ⁝ Process Automation	Databases ⁝ Cache Data Ingestion & Preparation Data Analytics ⁝ AI/ML Data Mgmt & Resilience	Developer CLI ⁝ IDE Plugins & Extensions ⁝ Cloud-native IDE ⁝ Local developer sandbox

OpenShift Kubernetes Engine

Cluster services

Install ⁝ Operators ⁝ Over-the-air updates ⁝ Monitoring ⁝ Logging ⁝ Registry ⁝ Storage ⁝ Networking ⁝ Security | Ingress routing

Kubernetes

Red Hat Enterprise Linux CoreOS

Physical

Virtual

Private cloud

Public cloud

Edge

Red Hat

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

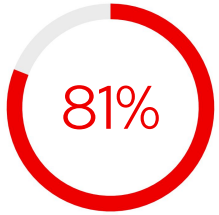
Hybrid Multi-Cloud management is really hard

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*

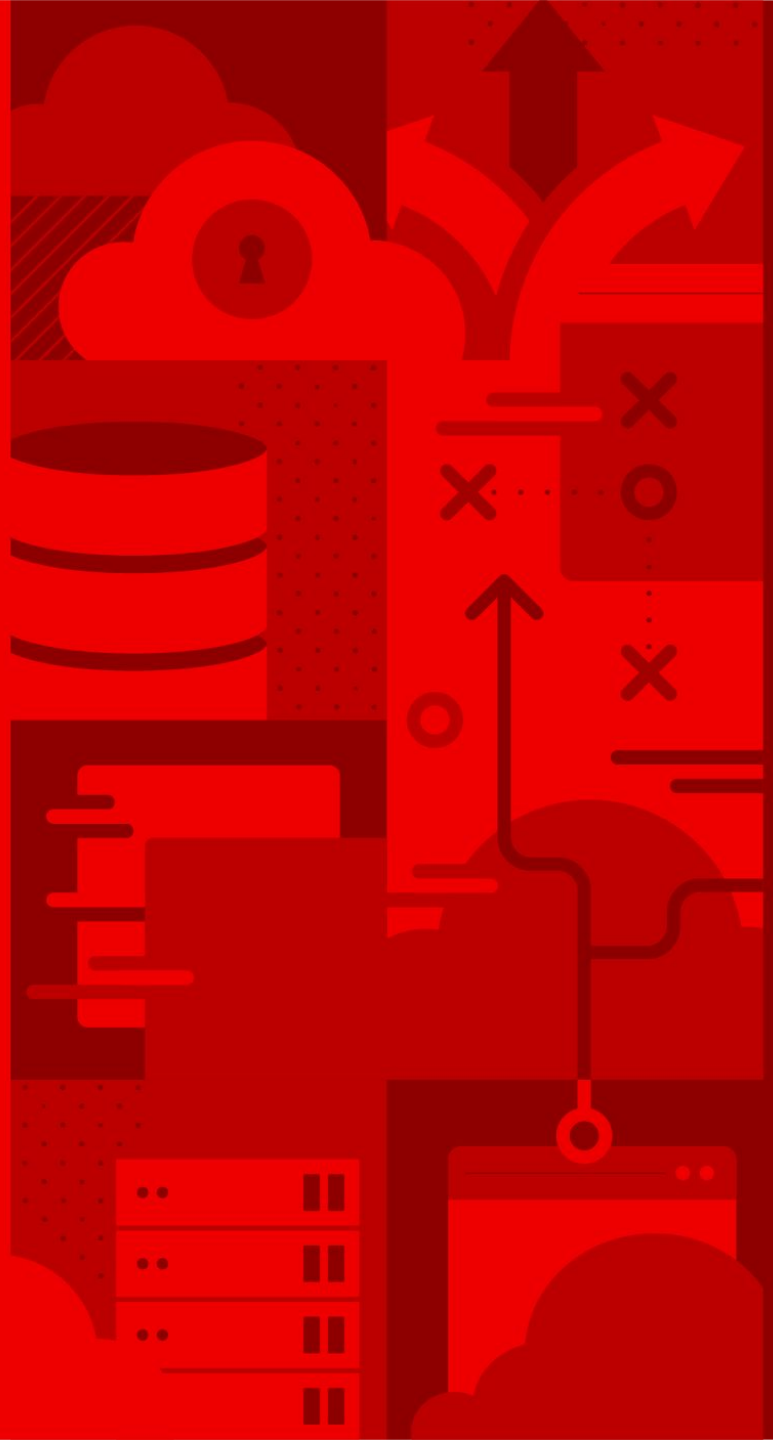


Using multiple public clouds and one or more private/dedicated clouds*

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

Red Hat

ACM



Introducing Red Hat Advanced Cluster Management For Kubernetes

Red Hat

Key personas

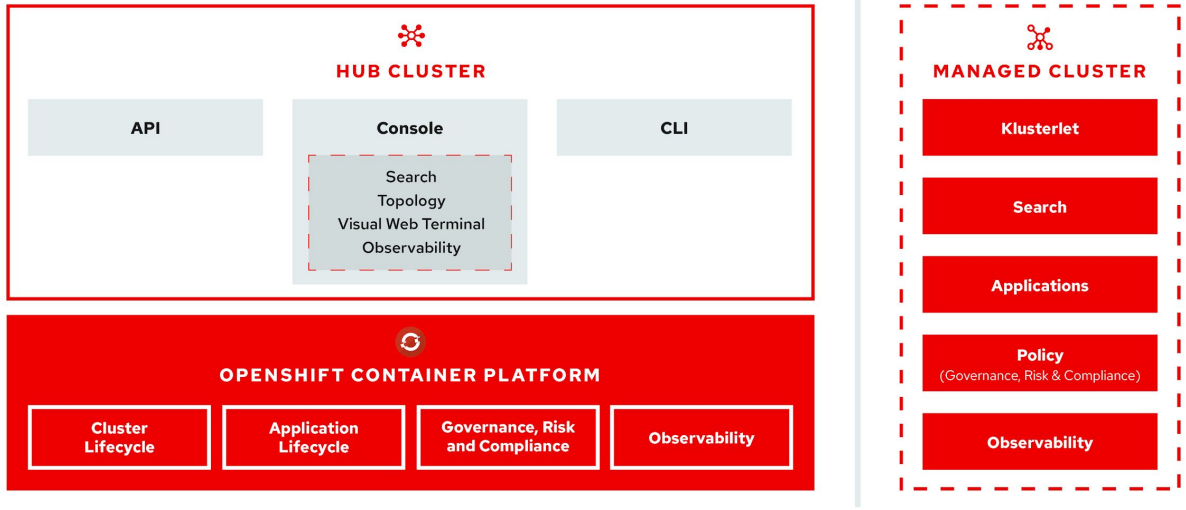
IT Operations

SRE/DevOps

SecOps

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

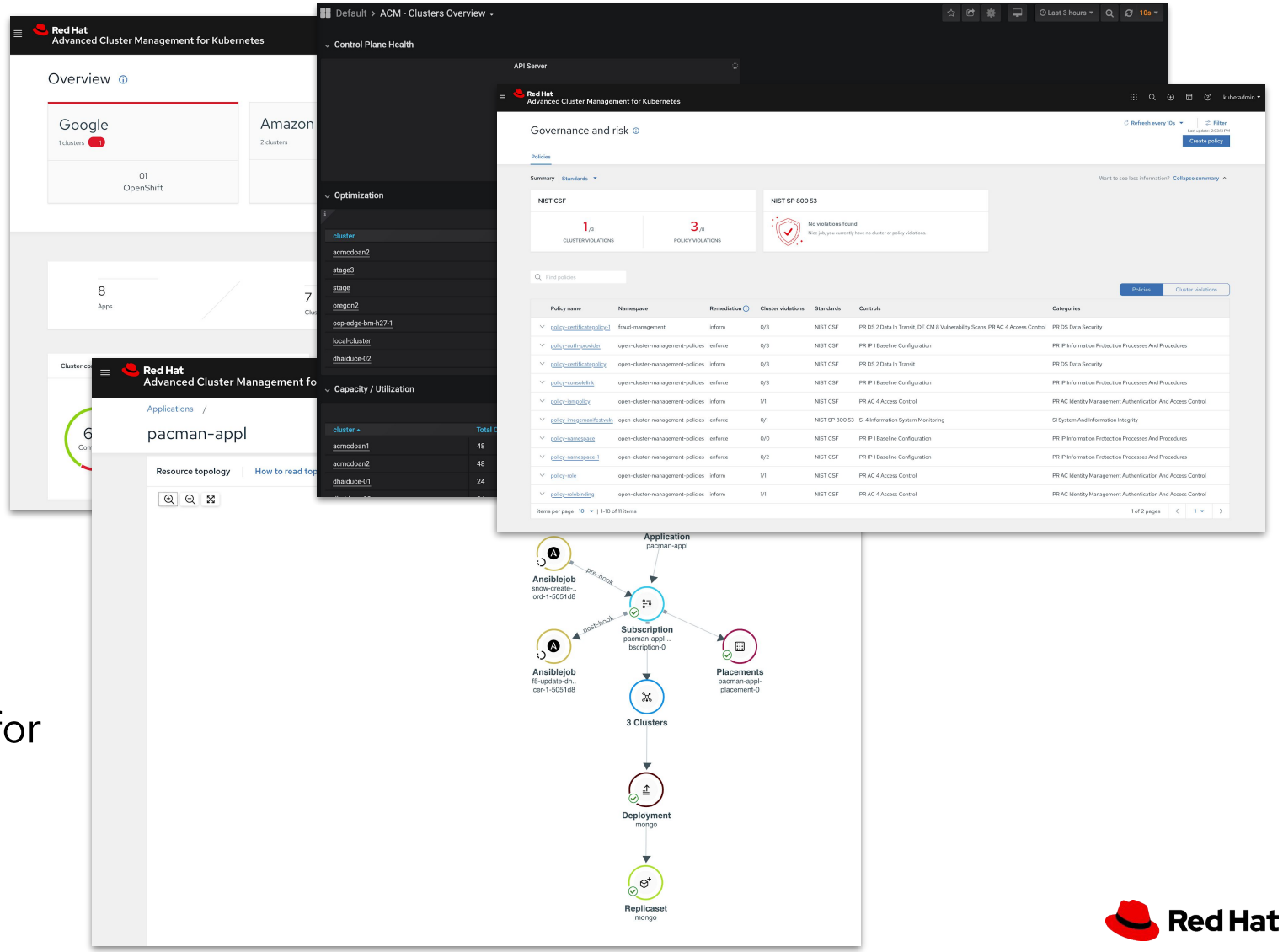
Managed cluster architecture and components

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

Red Hat

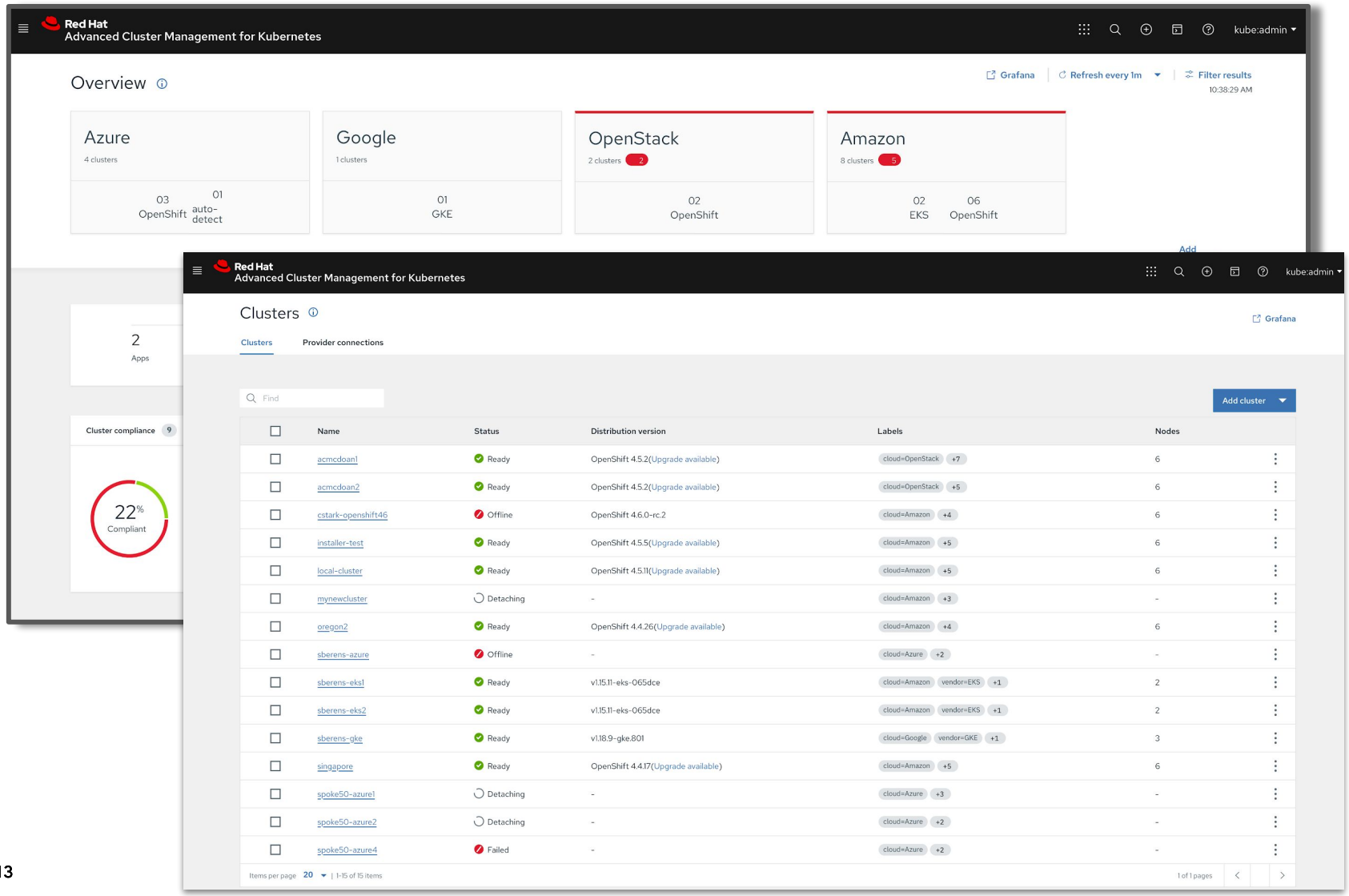
Robust. Proven. Award winning.

- 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

Red Hat

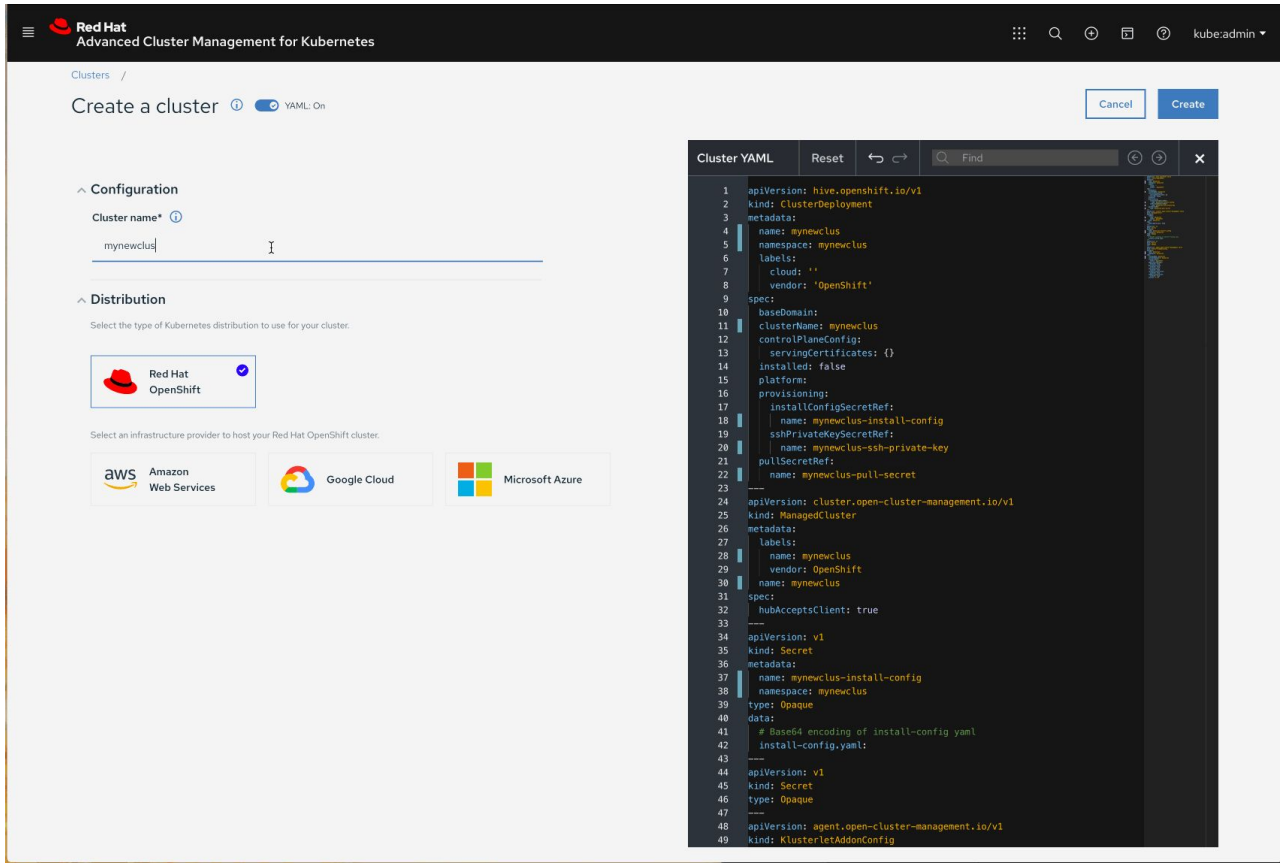
Multi-Cluster Lifecycle Management

Creating & Importing Clusters

IT Operations

DevOps/SRE

- Full Management of OCP Kubernetes
  - Install OCP 4.4-4.6 on public cloud, bare metal or vsphere
  - Import any existing OCP 3.11 to 4.6.x
- Public cloud managed kubernetes: EKS, AKS, GKE, IKS,ROKS.
- Leverage Hive API for OCP cluster deployment
- Wizard or YAML based create cluster flow
- Launch to an OCP Console from ACM
- Access cluster login credentials and download kubeadmin configuration



Red Hat

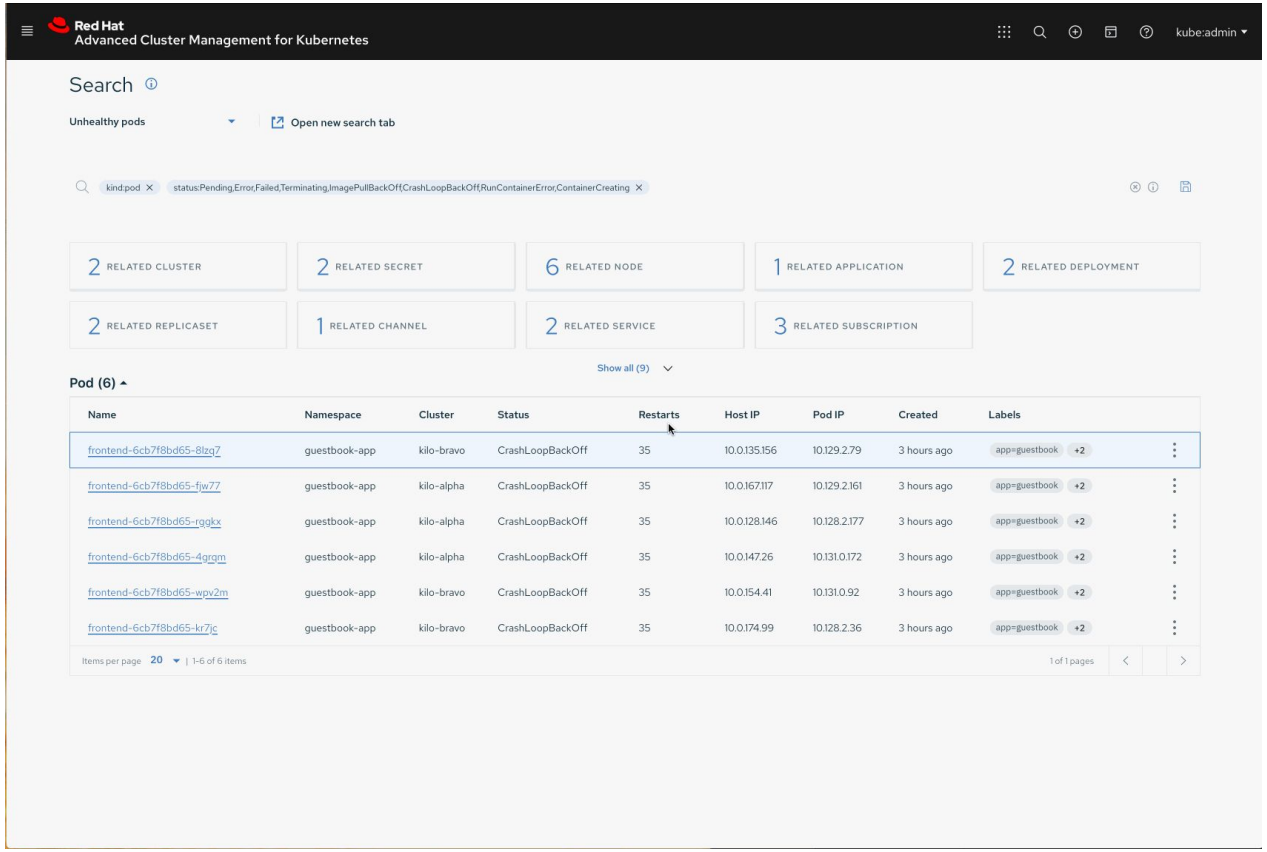
Multi-Cluster Lifecycle Management

Dynamic Search

IT Operations

DevOps/SRE

- Troubleshooting across clusters via relationships
- See all **unhealthy** pods
- See related application models to those pods
- See related Persistent Volumes
- See related secrets
- See related ***any*** kube resource object category



Red Hat

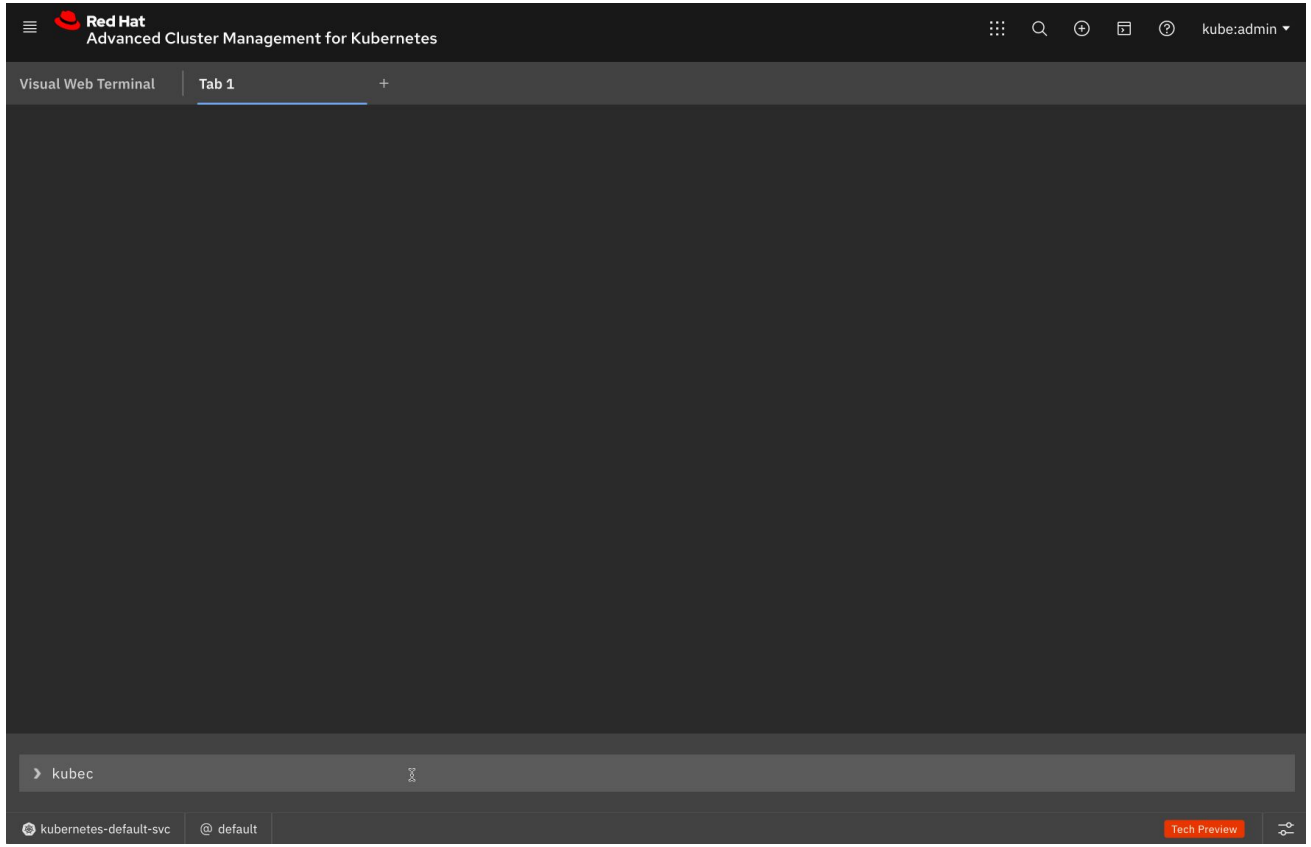
Multi-Cluster Lifecycle Management

Visual Web Terminal

- Interactive terminal combines command input with visual output
- One **Terminal** for **all**
- Works with **helm**, **kubectl**, **oc**, **istioctl**
- Single interface for multi-cluster
- Drive ops directly from dashboards
- Bash commands allow for grep

IT Operations

DevOps/SRE



Red Hat

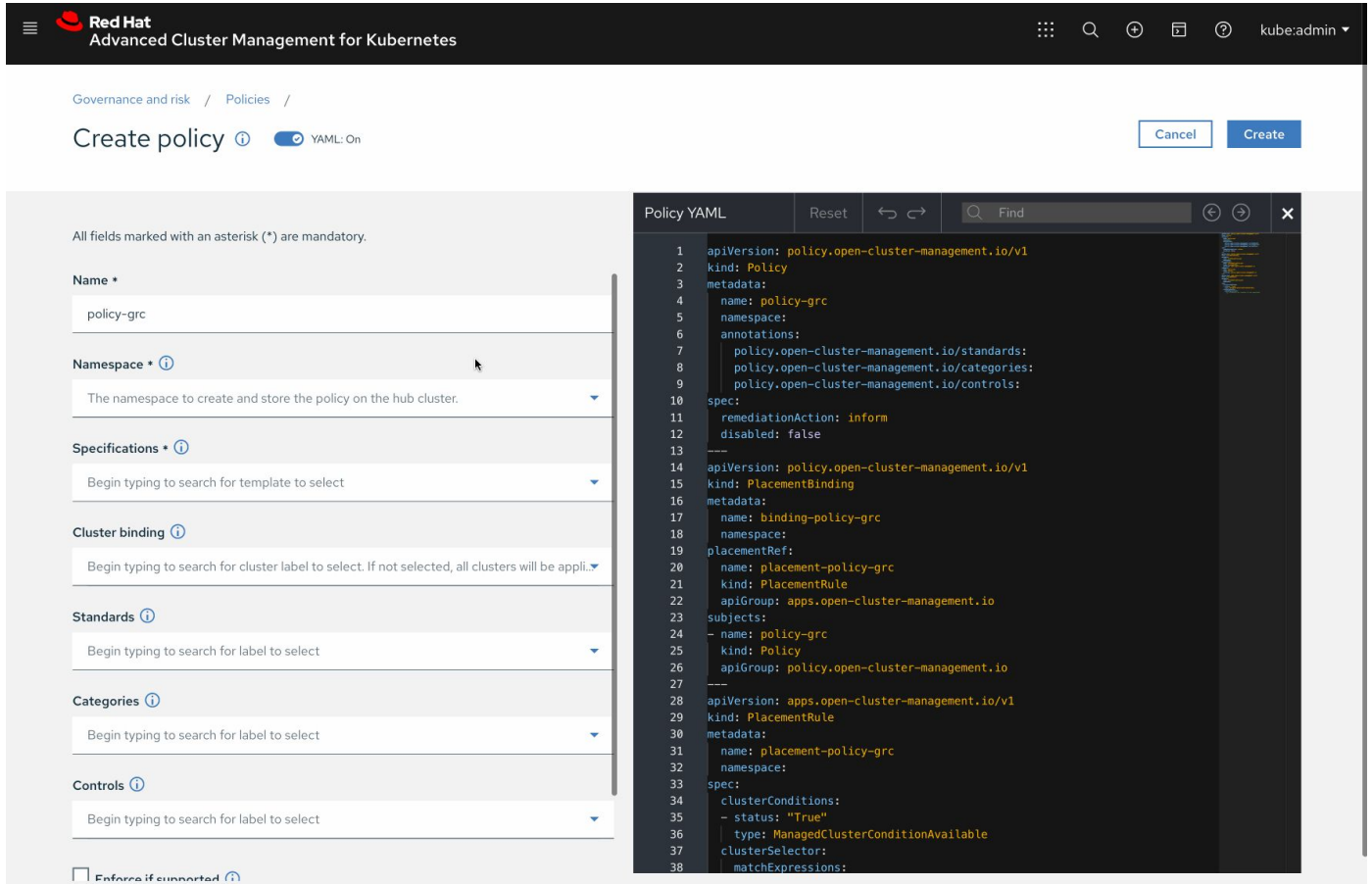
Policy based Governance, Risk and Compliance

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

Security Ops

IT Operations

- Set and enforce policies for security, applications, & infrastructure
- Deep visibility for auditing configuration of apps and clusters
- Unique policy capabilities around compliance
- Categorize violations based on your standards for immediate visibility into your compliance posture



Red Hat

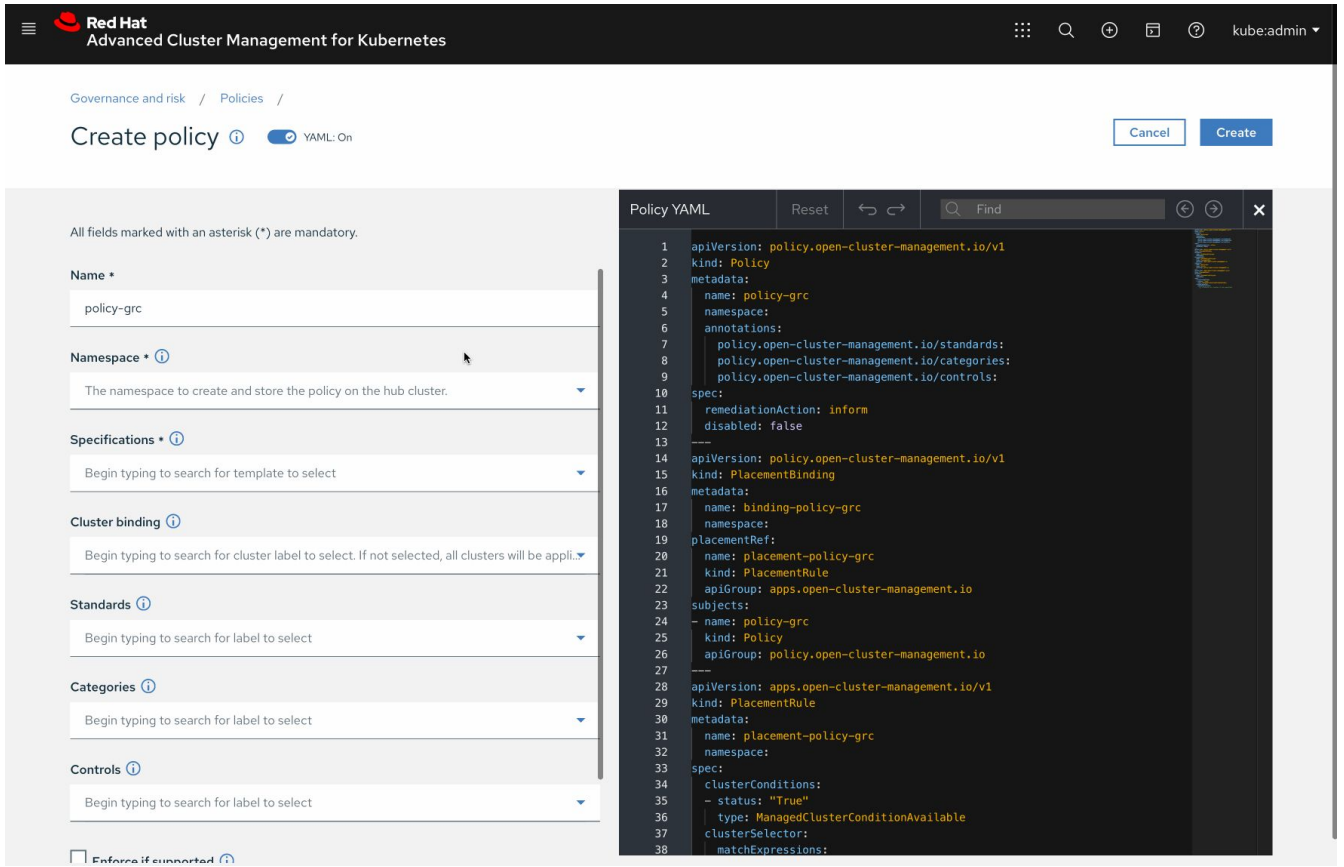
Policy based Governance, Risk and Compliance

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

Security Ops

IT Operations

- Standard Policies out of the box
  - FISMA
  - HIPAA
  - NIST
  - PCI
- Leverage Different Categories to Represent more standards (if Needed)
- Use Labels to enforce policies against clusters
- Use **inform** to view policy violations
- Use **enforce** to view violations and automatically remediate



Red Hat

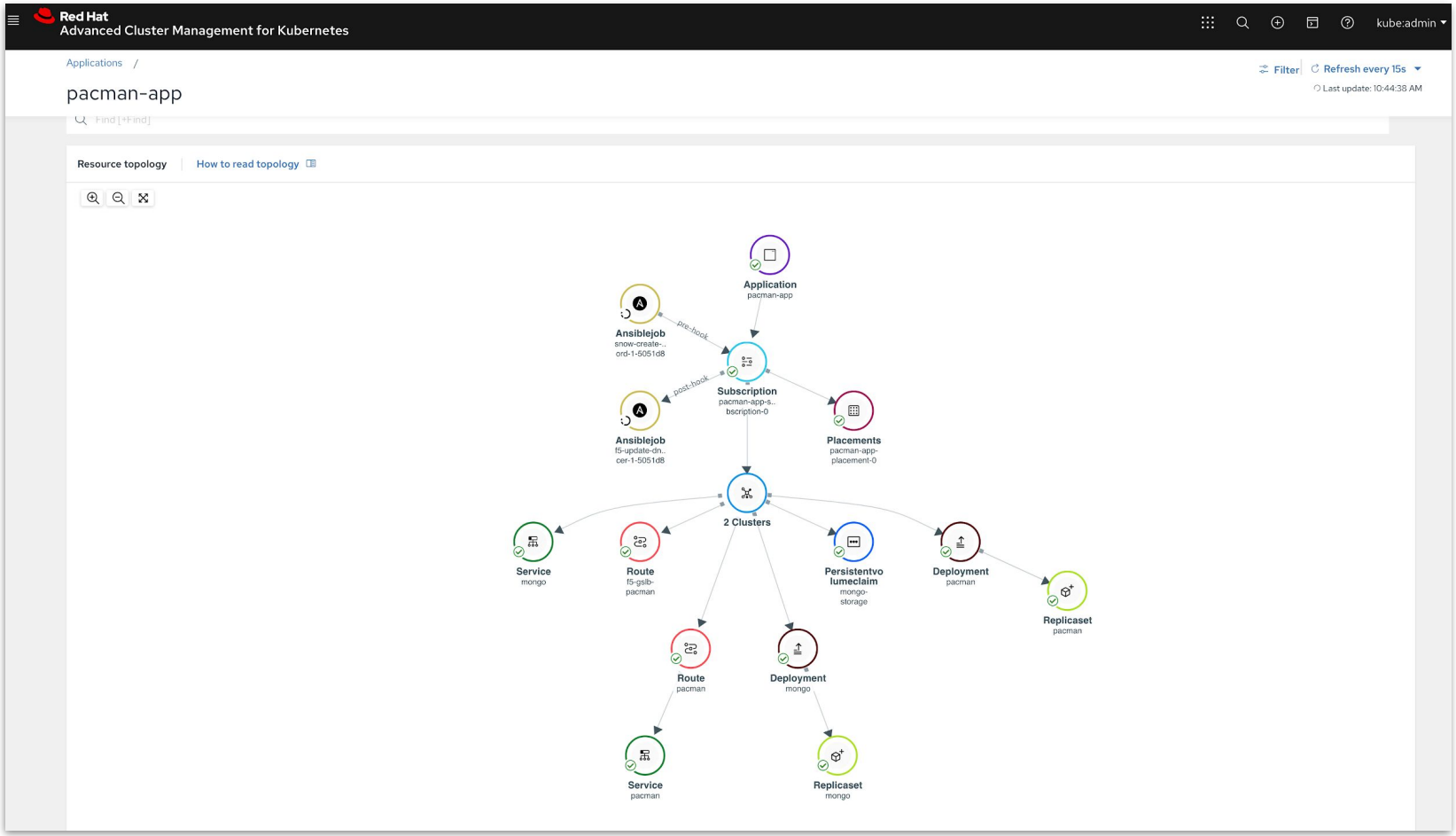
Advanced Application Lifecycle Management

Simplify your Application Lifecycle

IT Operations

DevOps/SRE

- Deploy Applications at Scale
- Deploy Applications from Multiple Sources and Clusters
- Quickly Visualize Application Relationships
- Integrate with the Red Hat Ansible Automation Platform



Red Hat

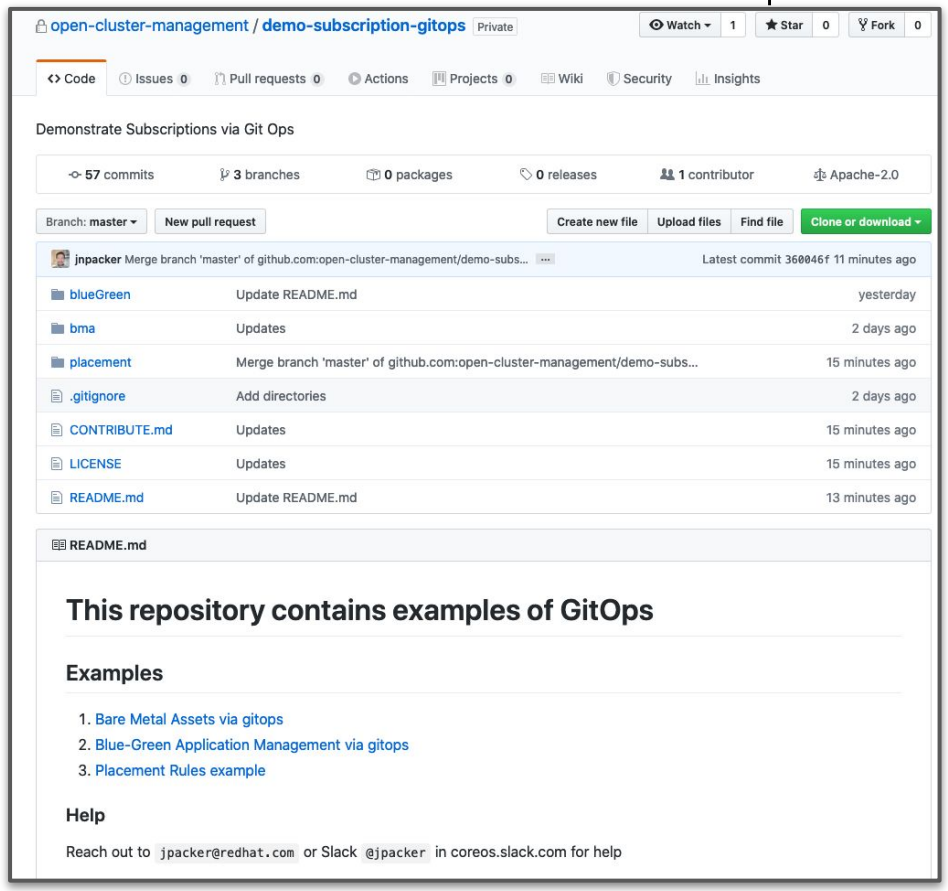
Advanced Application Lifecycle Management

GitOps as the source of truth

- Create, modify & delete, just as you would any source code. Git becomes your source of truth controlling your data center.
- Have a record of who, what & when for every change precipitated in your environments
- Through code Reviews & Approvals, take full control of all changes to your data center(s)
- Restore your environment, via the Git commit history (system of record)

IT Operations

DevOps/SRE



https://github.com/open-cluster-management/demo-subscription-gitops

Red Hat

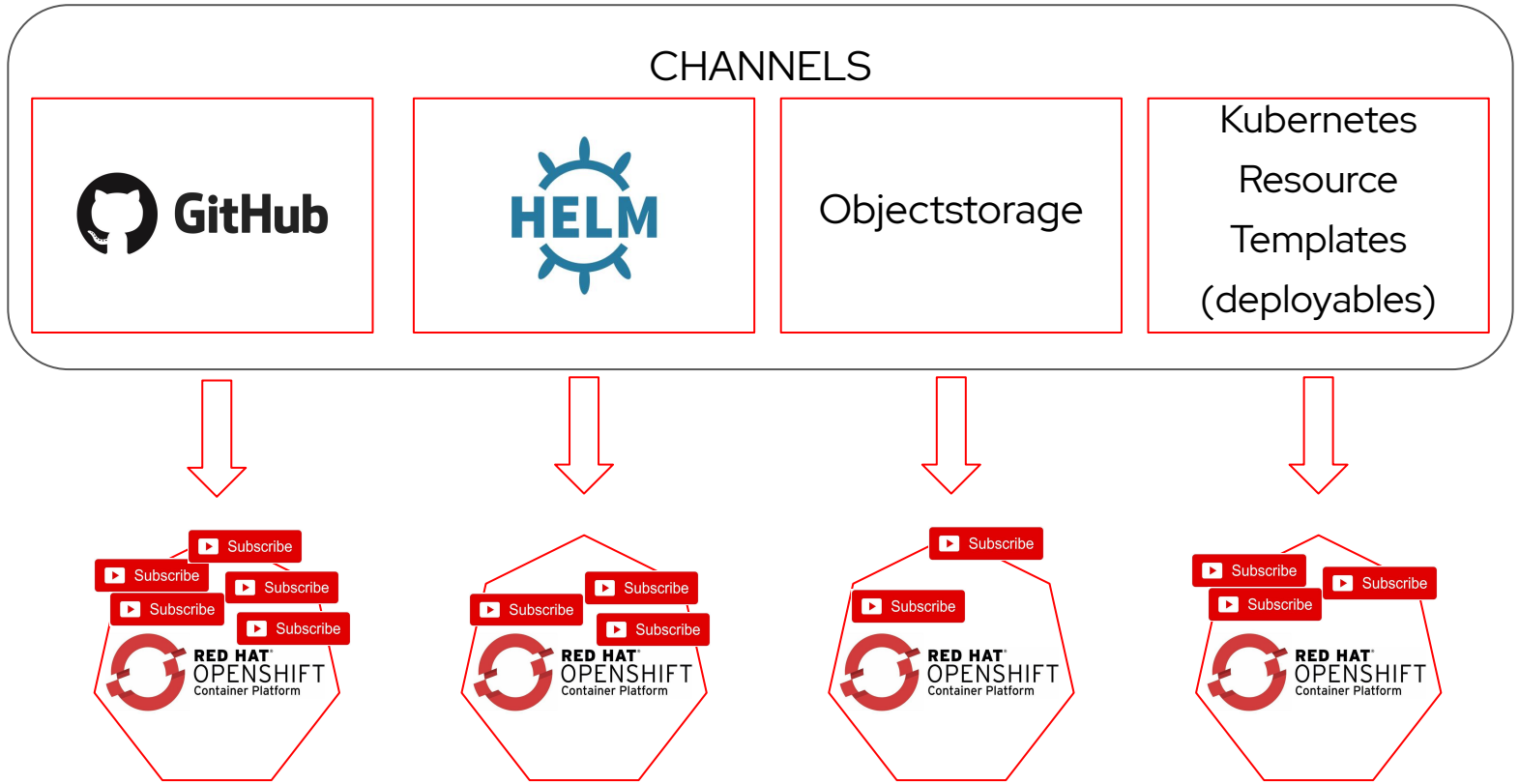
Advanced Application Lifecycle Management

Subscriptions Bring Enterprise to Kubernetes

IT Operations

DevOps/SRE

- Extending the best of Enterprise into a desired state methodology
- Time Windows: New releases during your maintenance windows
- Rolling Updates: Control the rate and load on your growing infrastructure



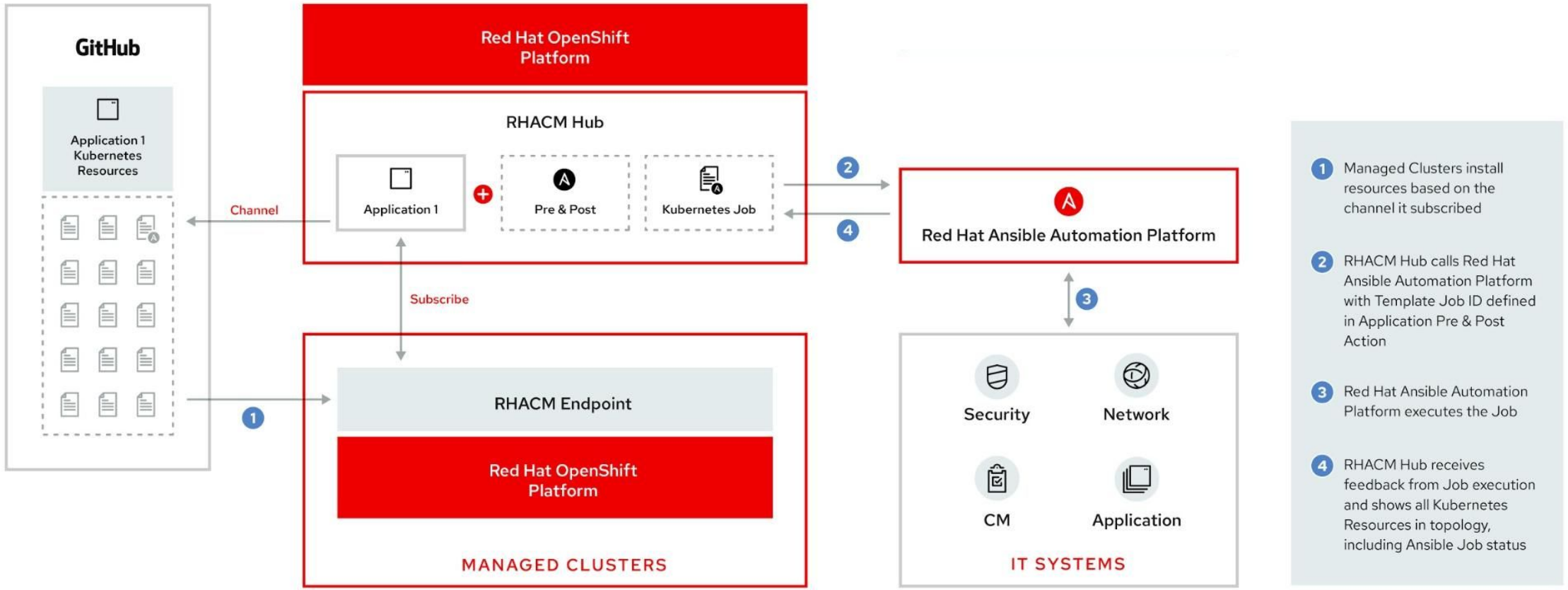
Red Hat

Tech preview

Architecture Overview

for Application Lifecycle

Red Hat Advanced Cluster Management for Kubernetes



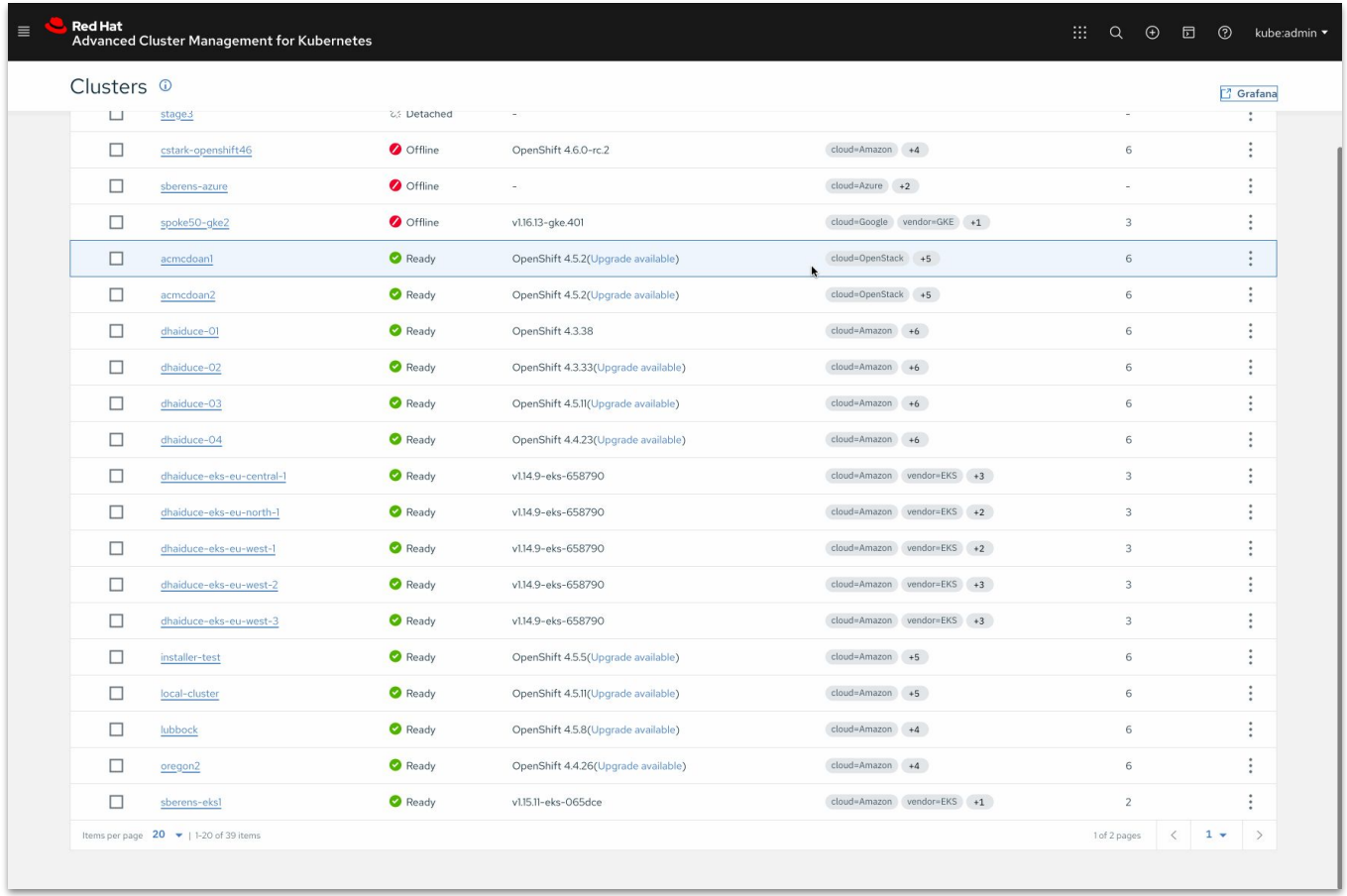
1. Managed Clusters install resources based on the channel it subscribed
2. RHACM Hub calls Red Hat Ansible Automation Platform with Template Job ID defined in Application Pre & Post Action
3. Red Hat Ansible Automation Platform executes the Job
4. RHACM Hub receives feedback from Job execution and shows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

Red Hat

Multi-Cluster Observability

Overview

- Global Query view with **Grafana**
  - Out of the Box multi cluster health monitoring dashboards
  - PromQL compliant - Build your own queries
- Centralized **Database**
  - Optimized set of metrics collected from managed clusters
  - Focused on Cluster Management
- Unlimited **Data Retention**
  - Observe Metric trends
  - Set Alert Patterns
  - Supported Object Storage
    - AWS S3 (and compatible)
    - Ceph for on-premise
    - Google Cloud Storage
    - Azure Storage



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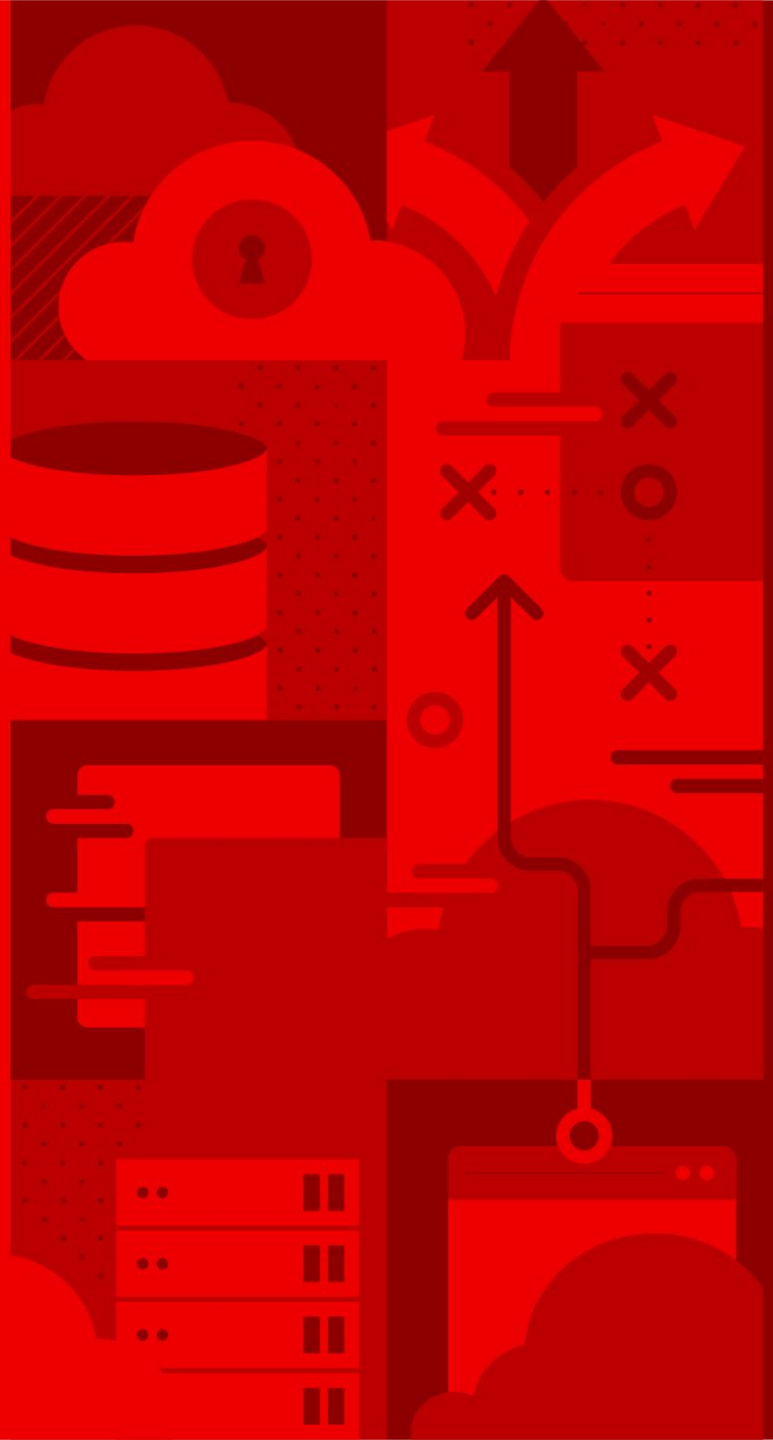
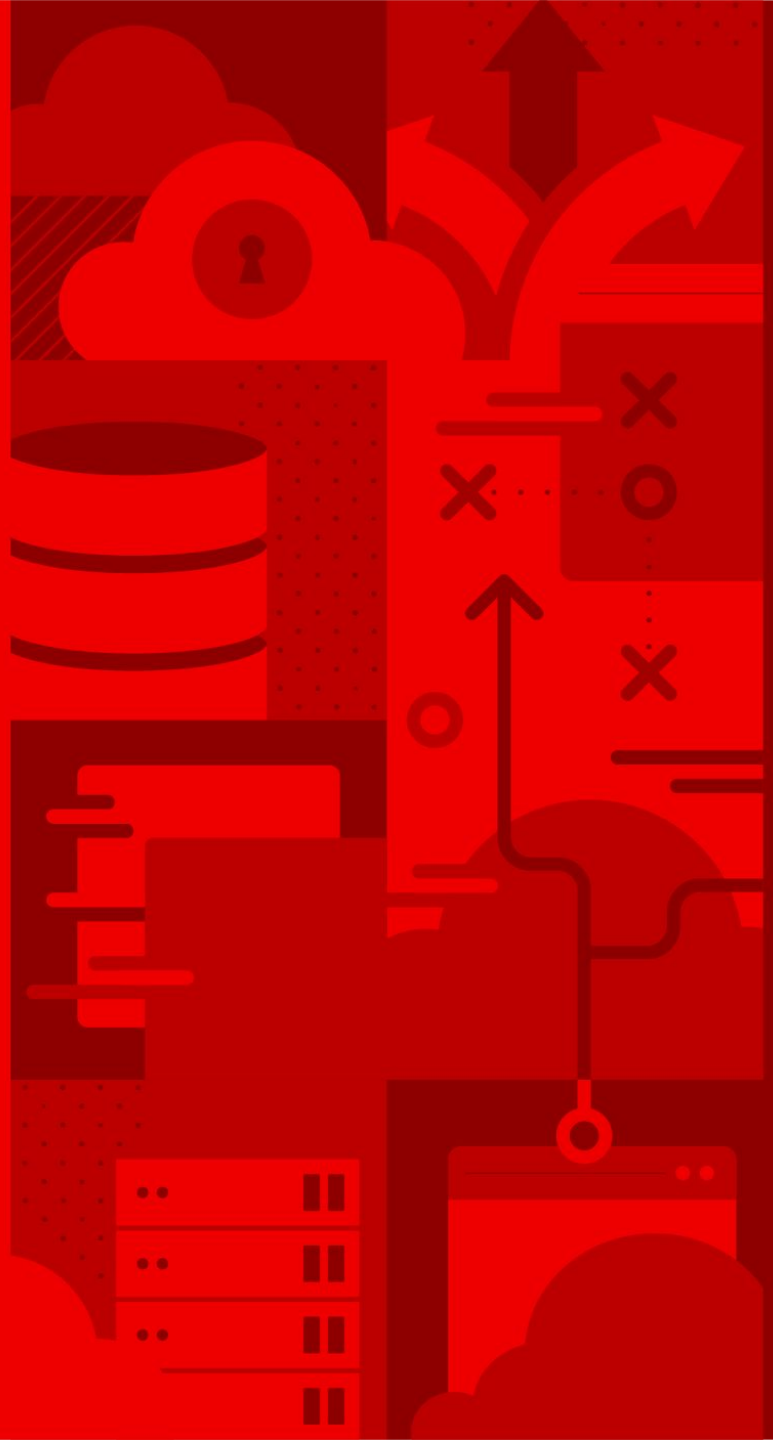


Demo



Installation

Red Hat Advanced Cluster Management For Kubernetes

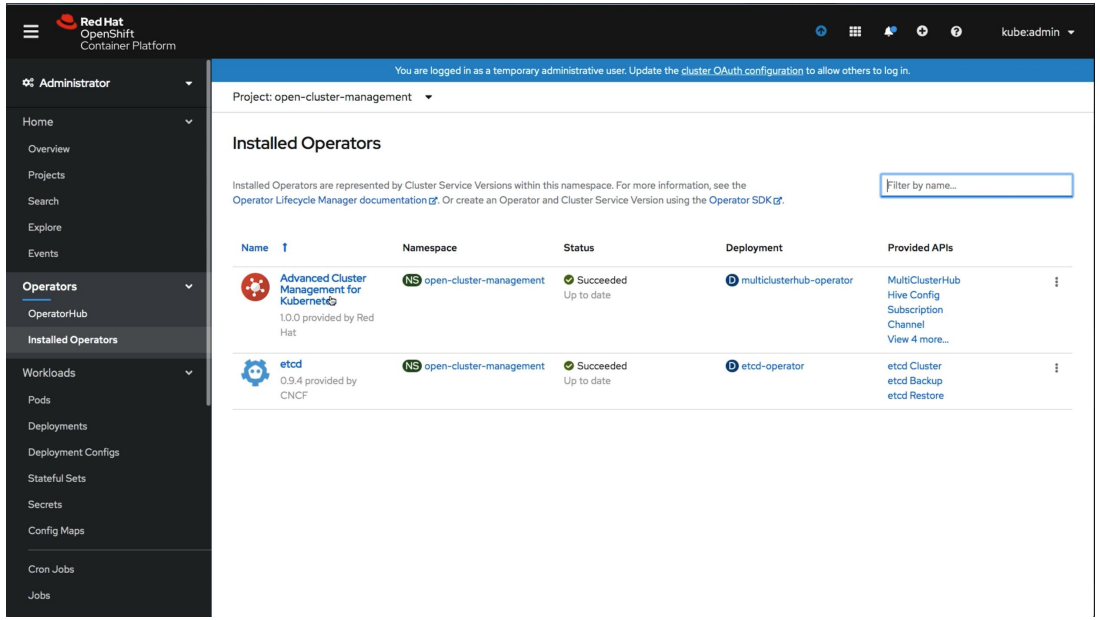
Red Hat

Installation and foundation

IT Operations

Hub Cluster

- Requires OCP 4.4.x - 4.6.x
  - (managed cluster can be 3.11)
- Operator based installation
- Available on OperatorHub



High Availability

- Supports OCP Availability Zone

Backup/Restore

- Backup/Restore etcd database of hub OpenShift cluster

Red Hat

Installation and foundation

Operator install for managed cluster

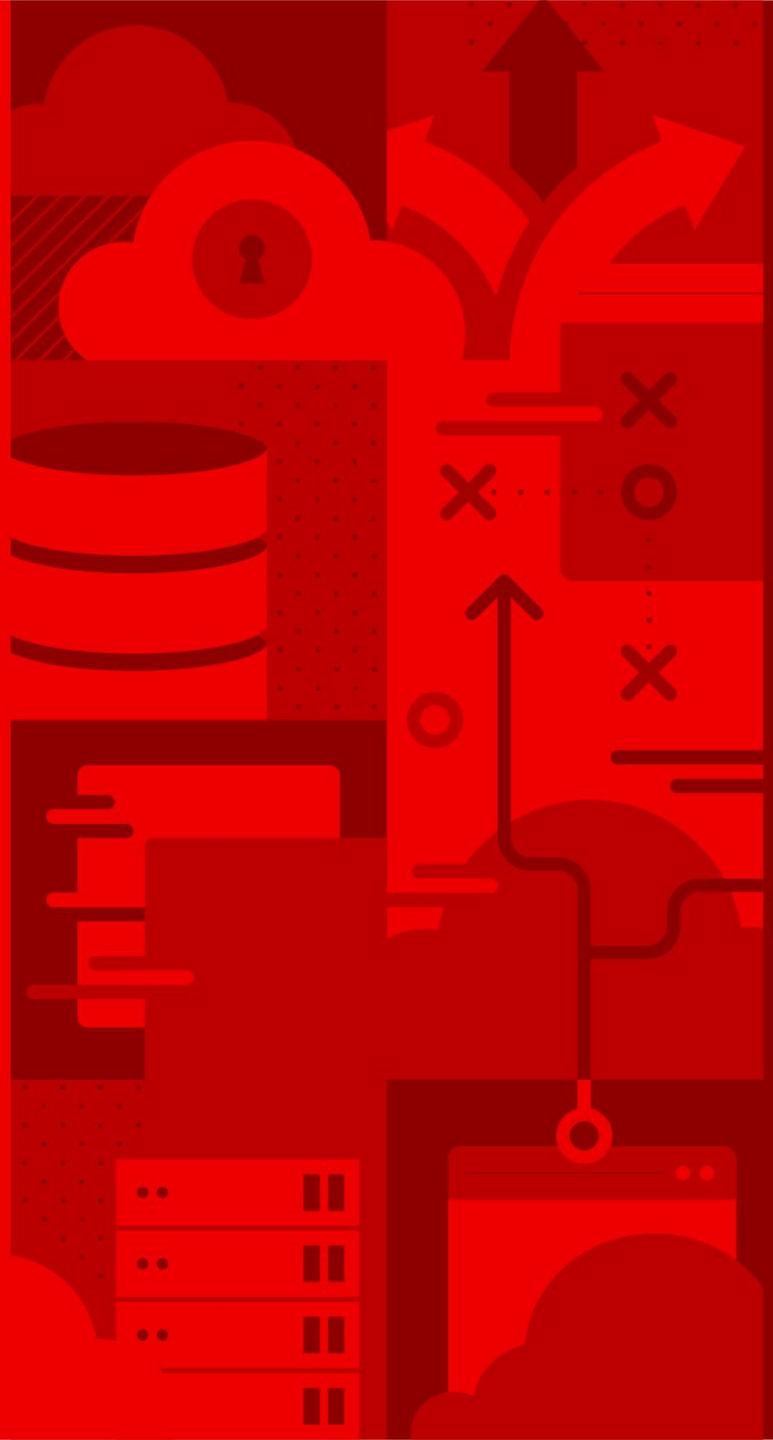
IT Operations

Managed cluster

The multicluster-endpoint operator controls the deployment of components on the managed cluster.

List of included components:

- Application manager
- Connection manager
- Work manager
- Policy controller
- Search collector
- Service registry
- IAM policy controller
- Certificate policy controller
- CIS policy controller



Wrap up

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.

A KUBERNETES MANAGEMENT TEAM

Our Red Hat-led Kubernetes management projects integrate you and our experts into a joint management team. With a constant feedback loop maintained through our agile development processes, we actively and collaboratively move development forward.

COLLABORATIVE

IDEATE	DESIGN	BUILD & ITERATE	LAUNCH
DISCOVERY SESSION 1 Day	NAVIGATE TO KUBERNETES MANAGEMENT	MINIMUM VIABLE PRODUCT 4 - 8 weeks	SCALED DELIVERY Varies By Customer

RED HAT LEADS

YOU LEAD

Red Hat

Resources

Product Overview

YouTube Playlist

Datasheet

Infographic

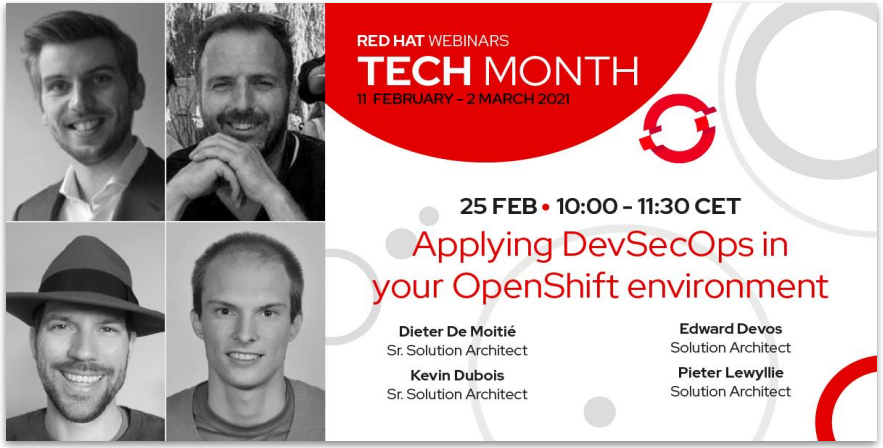
Twitch Playlist

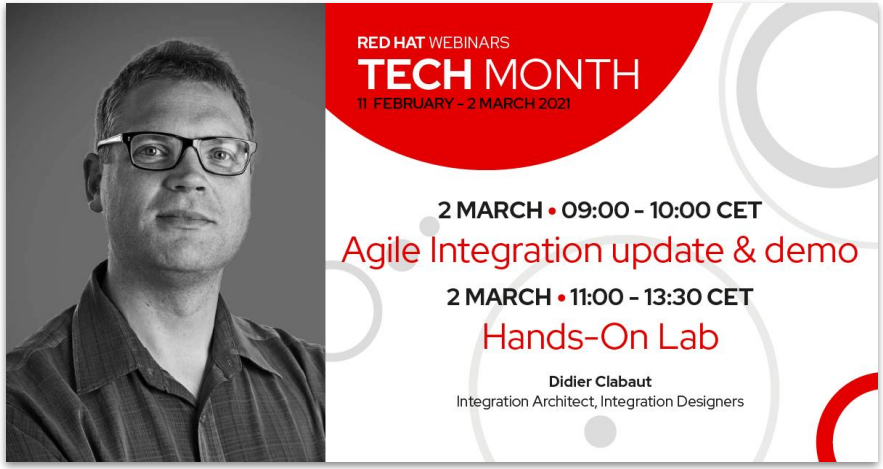
RHACM Blogs

FAQ

Red Hat

Tech month agenda





Feb 25th Bonus session:

"We have been hacked!"

Romuald Vandepoel, Sr Cloud Architect at Red Hat

https://red.ht/techmonth

Red Hat

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.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