



Advanced Cluster Management for Kubernetes

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PSA EMEA

Presenter's Name
Title

Introducing Red Hat Advanced Cluster Management For Kubernetes

Robust. Proven. Award winning.



Multicloud lifecycle management



Policy driven governance, risk, and compliance



Advanced application lifecycle management

The screenshot displays two main panels. The left panel, titled 'Overview', shows multicloud management with sections for Google (1 clusters), Amazon (2 clusters), and 'All clouds' (8 Apps, 7 Clusters, 736 Pods). It includes a 'Cluster compliance' section with a 66% compliant status, 2 compliant, and 1 non-compliant. The right panel, titled 'Governance and risk', shows policy management for NIST CSF and NIST SP 800-53, with 1/3 cluster violations and 3/8 policy violations. A table lists policies across various categories like PR DS Data Security and PR AC Identity Management Authentication And Access Control.

The bottom part of the screenshot shows the 'Resource topology' and 'Application delivery' sections. The 'Resource topology' shows a guestbook app with a resource graph. The 'Application delivery' section shows a detailed diagram of a Redis application across three clusters, with components like Service frontend, Service redis-master, Service redis-slave, Deployment frontend, Deployment redis-master, Deployment redis-slave, and Replicaset redis-slave.

Unified Multi-Cluster Management

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Single Pane for all your Kubernetes Clusters

The screenshot displays the Red Hat Advanced Cluster Management for Kubernetes interface. At the top, there's a navigation bar with the Red Hat logo and the title "Advanced Cluster Management for Kubernetes". Below the navigation bar is an "Overview" section with four cards: "Azure" (1 cluster, 01 AKS), "Amazon" (1 cluster, 01 RHCP), "auto-detect" (2 clusters, 01 Other), and "MyDataCenter" (1 cluster, 01 RHCP). A button "Add connection" is located below these cards. Below the overview is a summary bar with metrics: 4 Apps, 5 Clusters, 3 Kubernetes types, 1 Regions, 17 Nodes, and 646 Pods. At the bottom left, there are three cards: "Cluster: nodes" (5), "VCPU usage (CPU)" (94), and "Used" (38 | 40%). The main content area is titled "Clusters" and contains a table with columns: Name, Namespace, Labels, Endpoint, Status, Nodes, Klusterlet Version, Kubernetes Version, Storage, Memory, and CPU. The table lists six clusters: exec2-iks, social-dev-1, social-dev-2, social-dev-gke, social-prod-1, and social-prod-eks. Each cluster row includes a "Show details" link.

- **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

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The screenshot displays a dashboard for policy-based governance, risk, and compliance. At the top, there are four summary cards: 'POLICY VIOLATIONS' (3), 'CLUSTER VIOLATIONS' (1), 'HIGH SEVERITY FINDINGS' (1), and 'MEDIUM SEVERITY FINDINGS' (1). Below these are sections for 'Top violations' and 'Top security findings'. A central panel shows a 'Policy violation finding' for 'training-1 (2)' with a note: 'No other security findings. We will continue to monitor and display any security findings so you can easily find them here.' On the left, a sidebar shows 'Most impacted controls' with a chart of PTI (Posture Trend Index) and a table of controls. A modal window titled 'compliancePolicy' shows details for 'policy-prod' (Type: Standard, Name: policy-prod, Message: -, Status: -, Enforcement: -, Exclude Namespaces: kube*, Include Namespaces: default). To the right of the modal is a large block of YAML code for a 'LimitRange' object template. The bottom section shows a table of 'Object Templates' with columns: Name, Compliance Type, API version, Kind, Last Transition, and Compliant. The table includes entries for 'restricted-mcm', 'deny-from-other-namespaces', and 'mem-limit-range'. At the bottom of the page, there is a footer with a page number '5' and navigation links.

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

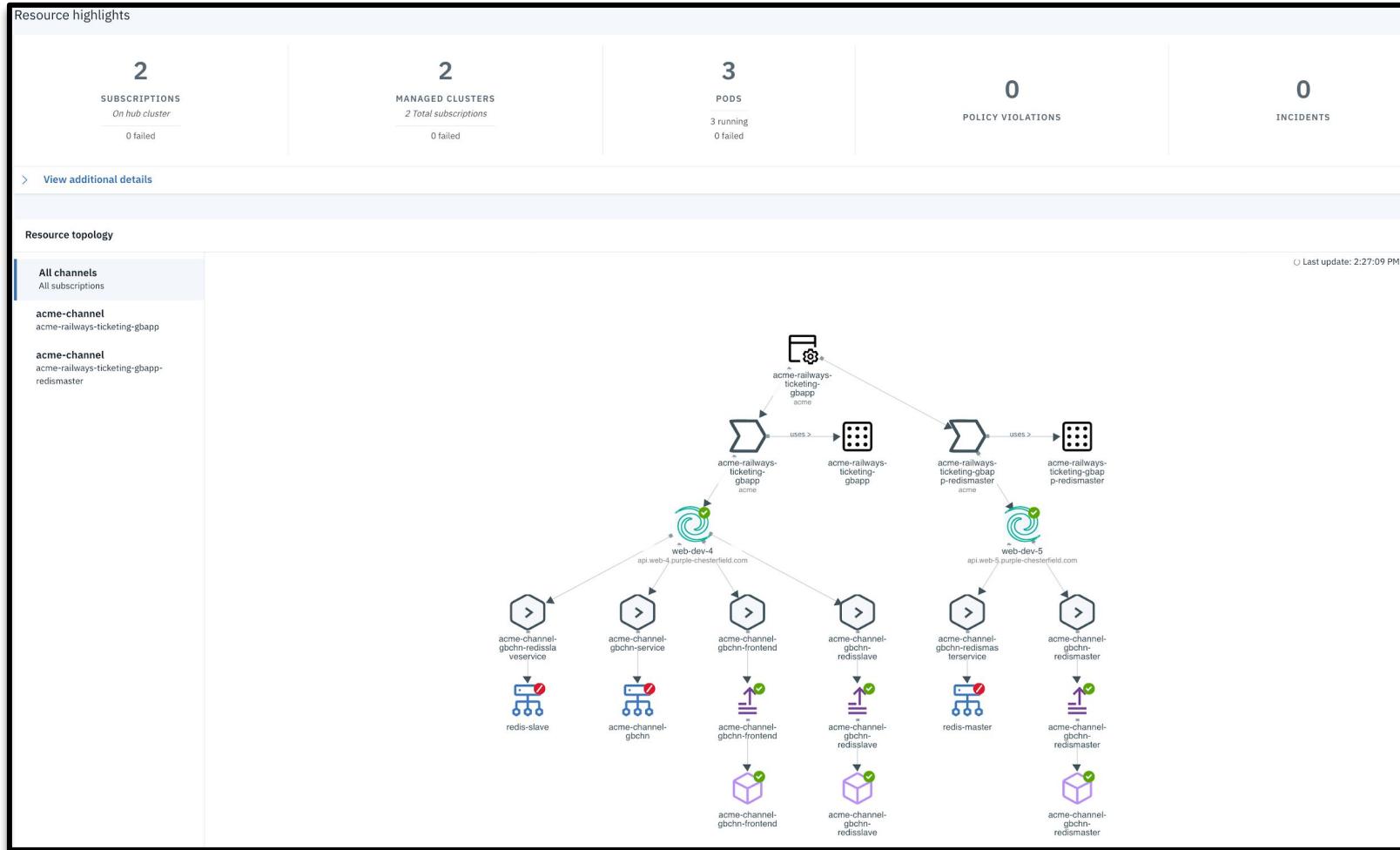
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Advanced Application Lifecycle Management

Simplify your Application Lifecycle

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- **Easily Deploy Applications at Scale**
- Deploy Applications from **Multiple Sources**
- Quickly **visualize** application relationships **across** clusters and those that **span** clusters

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.

Detailed Use Cases

Multi-Cluster Lifecycle Management

Overview

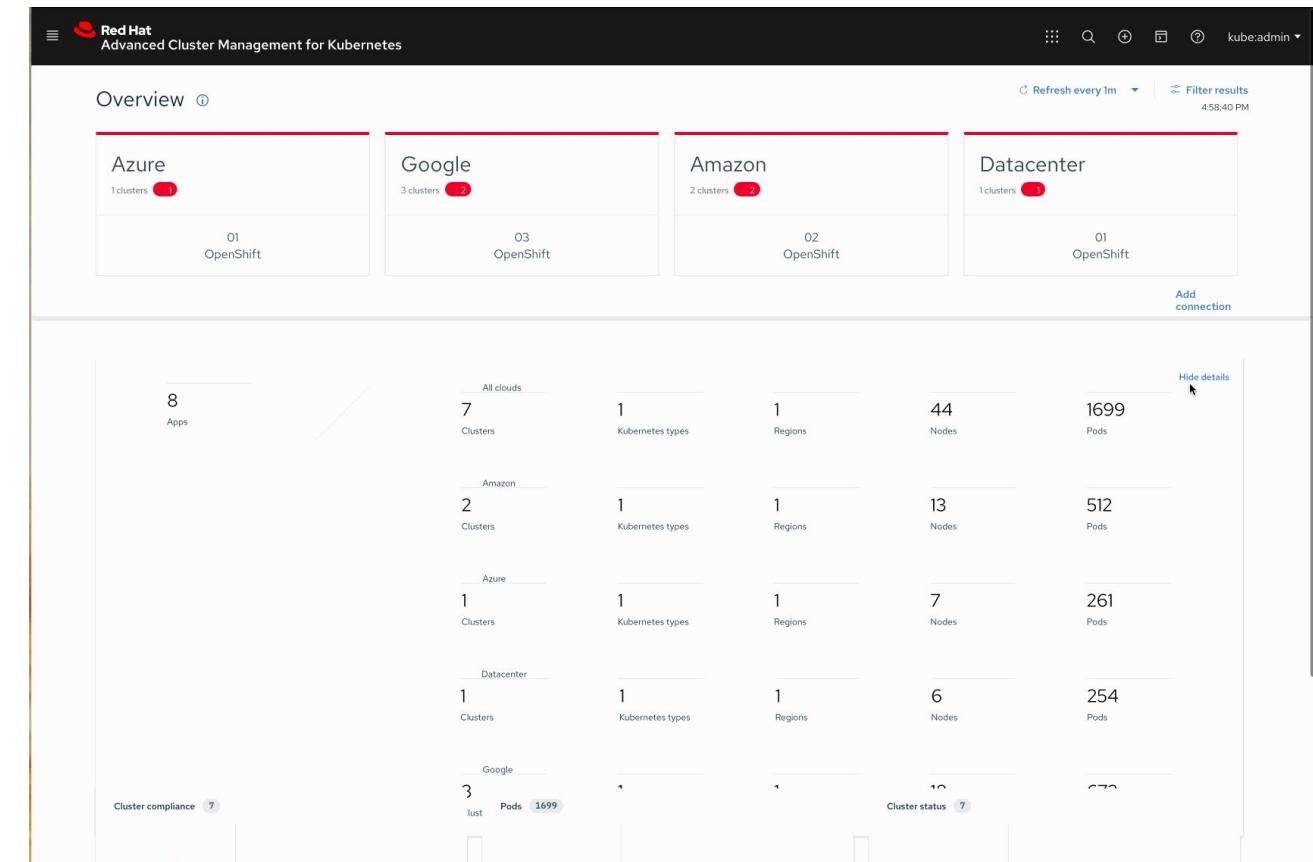
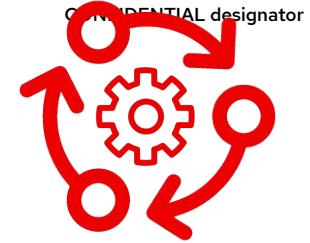
- Full Management of OCP Kubernetes
 - OpenShift 3.11, 4.1.x - 4.5.x
 - Public cloud hosted: OCP
- Public cloud managed kubernetes: EKS, AKS, GKE, IKS
 - Search, find and modify kubernetes resources.
- See high level summaries across all clusters
 - Misconfiguration
 - Pod status
 - Resource capacity
- Troubleshoot and resolve issues across the federated domain
 - See in dashboard or via a list/table form
 - Table shows custom tagging
 - Regions
 - Business Purpose
 - Version



IT Operations



DevOps/SRE



Multi-Cluster Lifecycle Management

Creating & Importing Clusters

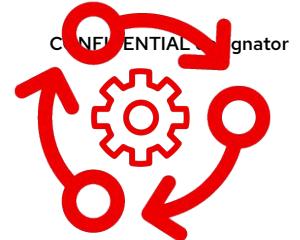
- **Create, Upgrade and Destroy** OCP clusters running on **Bare-metal** as well as public cloud
- Leverage Hive API for OCP cluster deployment
- Wizard or YAML based create cluster flow
- Launch to an OCP Console from ACM
- Access cluster login credentials and download kubeadmin configuration



IT Operations



DevOps/SRE



The screenshot shows the Red Hat Advanced Cluster Management (ACM) interface. On the left, the 'Create a cluster' wizard is open, allowing users to define a cluster name ('mynewclus') and select a distribution ('Red Hat OpenShift'). It also provides options to choose an infrastructure provider (AWS, Google Cloud, Microsoft Azure). On the right, a code editor displays the generated Cluster YAML configuration, which includes details like cluster name, vendor, and various secret references.

```
apiVersion: hive.openshift.io/v1
kind: ClusterDeployment
metadata:
  name: mynewclus
  namespace: mynewclus
  labels:
    cloud: ''
    vendor: 'OpenShift'
spec:
  baseDomain:
  clusterName: mynewclus
  controlPlaneConfig:
  servingCertificates: {}
  installed: false
  platform:
  provisioning:
    installConfigSecretRef:
      name: mynewclus-install-config
    sshPrivateKeySecretRef:
      name: mynewclus-ssh-private-key
    pullSecretRef:
      name: mynewclus-pull-secret
  ...
  apiVersion: cluster.open-cluster-management.io/v1
  kind: ManagedCluster
  metadata:
    labels:
      name: mynewclus
      vendor: OpenShift
      namespace: mynewclus
    spec:
      hubAcceptsClient: true
  ...
  apiVersion: v1
  kind: Secret
  metadata:
    name: mynewclus-install-config
    namespace: mynewclus
    type: Opaque
  data:
    # Base64 encoding of install-config yaml
    install-config.yaml:
  ...
  apiVersion: v1
  kind: Secret
  type: Opaque
  ...
  apiVersion: agent.open-cluster-management.io/v1
  kind: KlusterletAddonConfig
```

Multi-Cluster Lifecycle Management

Dynamic Search

- 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



IT Operations



DevOps/SRE



Red Hat Advanced Cluster Management for Kubernetes

Search ⓘ

Unhealthy pods Open new search tab

kind:pod status:Pending,Error,Failed,Terminating,ImagePullBackOff,CrashLoopBackOff,RunContainerError,ContainerCreating

2 RELATED CLUSTER 2 RELATED SECRET 6 RELATED NODE 1 RELATED APPLICATION 2 RELATED DEPLOYMENT

2 RELATED REPLICASET 1 RELATED CHANNEL 2 RELATED SERVICE 3 RELATED SUBSCRIPTION

Pod (6) ▾ Show all (9) ▾

Name	Namespace	Cluster	Status	Restarts	Host IP	Pod IP	Created	Labels	⋮
frontend-6cb7f8bd65-8izq7	guestbook-app	kilo-bravo	CrashLoopBackOff	35	10.0.135.156	10.129.2.79	3 hours ago	app=guestbook +2	⋮
frontend-6cb7f8bd65-fjw77	guestbook-app	kilo-alpha	CrashLoopBackOff	35	10.0.167.117	10.129.2.161	3 hours ago	app=guestbook +2	⋮
frontend-6cb7f8bd65-rgqlkx	guestbook-app	kilo-alpha	CrashLoopBackOff	35	10.0.128.146	10.128.2.177	3 hours ago	app=guestbook +2	⋮
frontend-6cb7f8bd65-4grqm	guestbook-app	kilo-alpha	CrashLoopBackOff	35	10.0.147.26	10.131.0.172	3 hours ago	app=guestbook +2	⋮
frontend-6cb7f8bd65-wpv2m	guestbook-app	kilo-bravo	CrashLoopBackOff	35	10.0.154.41	10.131.0.92	3 hours ago	app=guestbook +2	⋮
frontend-6cb7f8bd65-kr7ic	guestbook-app	kilo-bravo	CrashLoopBackOff	35	10.0.174.99	10.128.2.36	3 hours ago	app=guestbook +2	⋮

Items per page: 20 | 1-6 of 6 items

1 of 1 pages < >

Multi-Cluster Lifecycle Management

Visual Web Terminal **Tech-Preview**

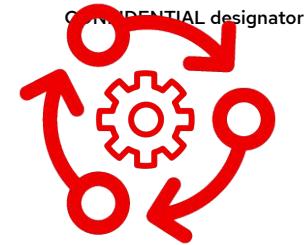
- Interactive terminal combines command input with visual output
- One **Terminal** for **all**
- Works with **helm**, **kubectl**, **oc**, **istioctl**
- Single interface for multi-cluster
- Drive ops directly from dashboards
- Bash commands allow for grep



IT Operations



DevOps/SRE



A screenshot of a web-based terminal interface. The title bar reads "Red Hat Advanced Cluster Management for Kubernetes". Below the title bar, there are tabs for "Visual Web Terminal" and "Tab 1", with "Tab 1" currently selected. The main area is a dark terminal window showing a command-line session. The command "kubec" is typed into the input field at the bottom. The status bar at the bottom shows "kubernetes-default-svc" and "@ default". In the bottom right corner of the terminal window, there is a red button labeled "Tech Preview".

Policy Driven Governance Risk and Compliance

Architecture Overview

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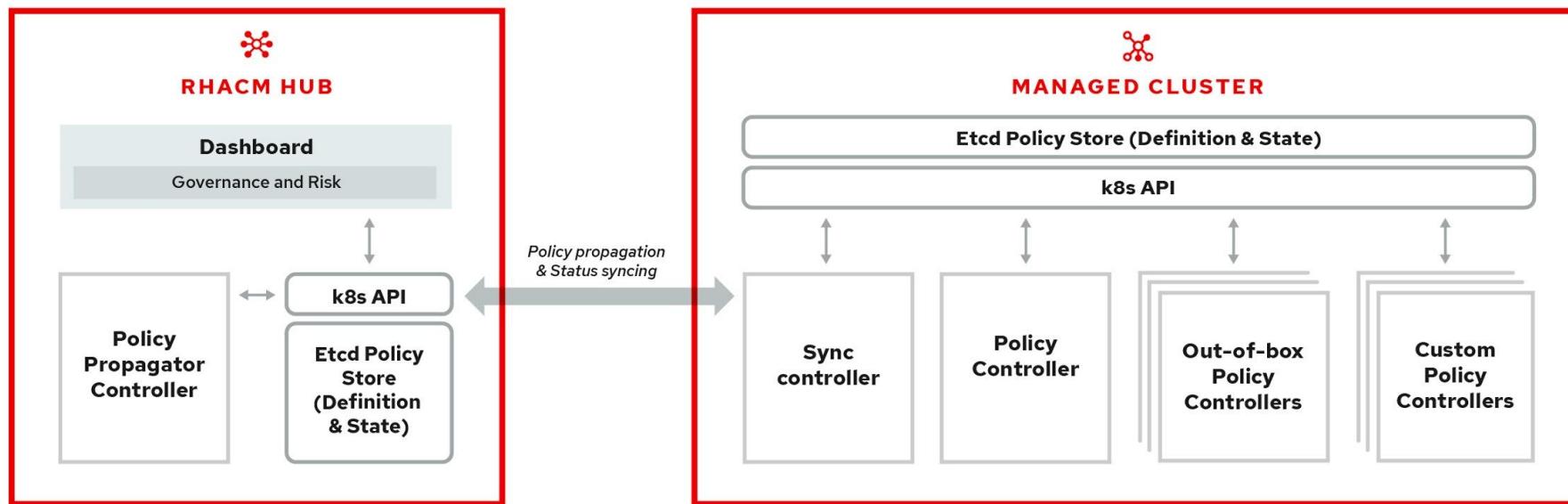
Security Ops



IT Operations

Managed Cluster and GRC Controllers

- Driven by Kubernetes CRDs and controllers
- Governance capability for managed clusters covering both security and configuration aspects.
- Out of box policies and an extensible policy framework



Policy based Governance, Risk and Compliance

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



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

Red Hat Advanced Cluster Management for Kubernetes

Governance and risk / Policies / Create policy YAML: On Cancel Create

All fields marked with an asterisk (*) are mandatory.

Name *

Namespace *

Specifications *

Cluster binding

Standards

Categories

Controls

Enforce if supported ?

Policy YAML

```
1 apiVersion: policy.open-cluster-management.io/v1
2 kind: Policy
3 metadata:
4   name: policy-grc
5   namespace:
6   annotations:
7     policy.open-cluster-management.io/standards:
8       policy.open-cluster-management.io/categories:
9         policy.open-cluster-management.io/controls:
10    spec:
11      remediationAction: inform
12      disabled: false
13    ...
14  apiVersion: policy.open-cluster-management.io/v1
15  kind: PlacementBinding
16  metadata:
17    name: binding-policy-grc
18    namespace:
19    placementRef:
20      name: placement-policy-grc
21      kind: PlacementRule
22      apiGroup: apps.open-cluster-management.io
23    subjects:
24      - name: policy-grc
25      kind: Policy
26      apiGroup: policy.open-cluster-management.io
27    ...
28  apiVersion: apps.open-cluster-management.io/v1
29  kind: PlacementRule
30  metadata:
31    name: placement-policy-grc
32    namespace:
33    spec:
34      clusterConditions:
35        - status: "True"
36        type: ManagedClusterConditionAvailable
37      clusterSelector:
38        matchExpressions:
```

Policy based Governance, Risk and Compliance

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

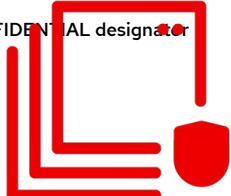
- Standard Policies out of the box
 - FISMA
 - HIPAA
 - NIST
 - PCI
- Leverage Different Categories to Represent more standards (if Needed)
- Use Labels to enforce policies against clusters
- Use **inform** to view policy violations
- Use **enforce** to view violations and automatically remediate



Security Ops



IT Operations



The screenshot shows the Red Hat Advanced Cluster Management for Kubernetes interface. The title bar reads "Red Hat Advanced Cluster Management for Kubernetes". Below it, the navigation bar includes "Governance and risk" and "Policies". The main area is titled "Create policy" with a "YAML: On" toggle. The left side contains several input fields: "Name" (set to "policy-grc"), "Namespace" (dropdown menu), "Specifications" (dropdown menu), "Cluster binding" (dropdown menu), "Standards" (dropdown menu), "Categories" (dropdown menu), and "Controls" (dropdown menu). At the bottom of this section is a checkbox for "Enforce if supported". To the right is a "Policy YAML" editor window displaying the following YAML code:

```
apiVersion: policy.open-cluster-management.io/v1
kind: Policy
metadata:
  name: policy-grc
  namespace:
  annotations:
    policy.open-cluster-management.io/standards:
    policy.open-cluster-management.io/categories:
    policy.open-cluster-management.io/controls:
spec:
  remediationAction: inform
  disabled: false
---
apiVersion: policy.open-cluster-management.io/v1
kind: PlacementBinding
metadata:
  name: binding-policy-grc
  namespace:
  placementRef:
    name: placement-policy-grc
    kind: PlacementRule
    apiGroup: apps.open-cluster-management.io
subjects:
  - name: policy-grc
    kind: Policy
    apiGroup: policy.open-cluster-management.io
  -
    apiVersion: apps.open-cluster-management.io/v1
    kind: PlacementRule
    metadata:
      name: placement-policy-grc
      namespace:
      spec:
        clusterConditions:
        - status: "True"
          type: ManagedClusterConditionAvailable
        clusterSelector:
          matchExpressions:
```

Advanced Application Lifecycle Management

Simplify your Application Lifecycle

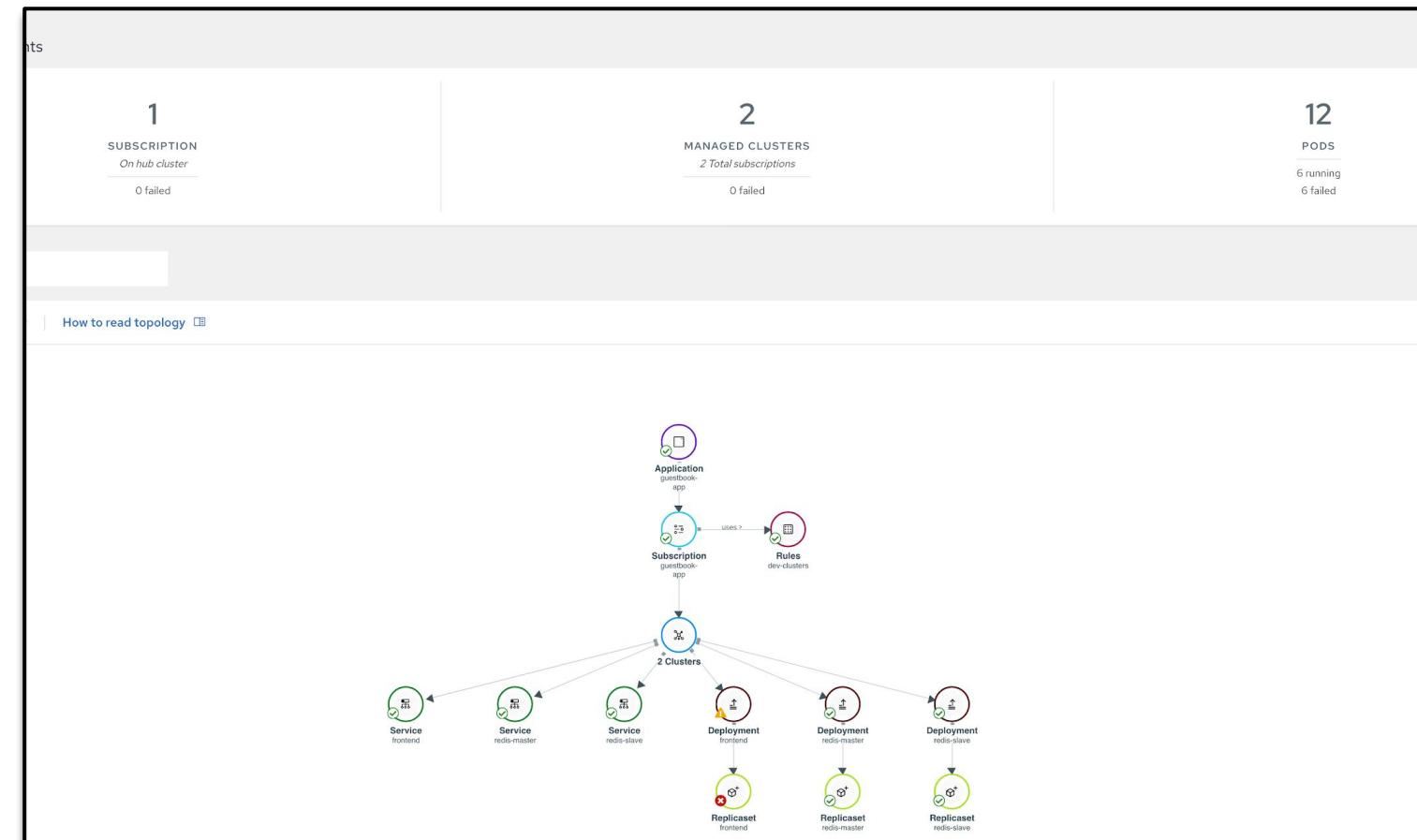
- Deploy Applications at Scale
- Deploy Applications from Multiple Sources and Clusters
- Quickly Visualize Application Relationships
- Using the subscription & channel model, the latest application revisions are delivered to appropriate clusters, automatically.



IT Operations



DevOps/SRE

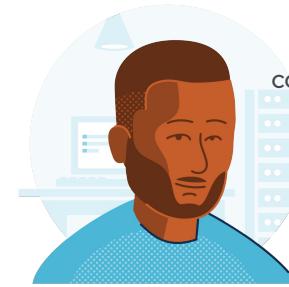


Advanced Application Lifecycle Management

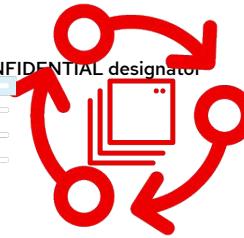
Subscriptions Bring Enterprise to Kubernetes



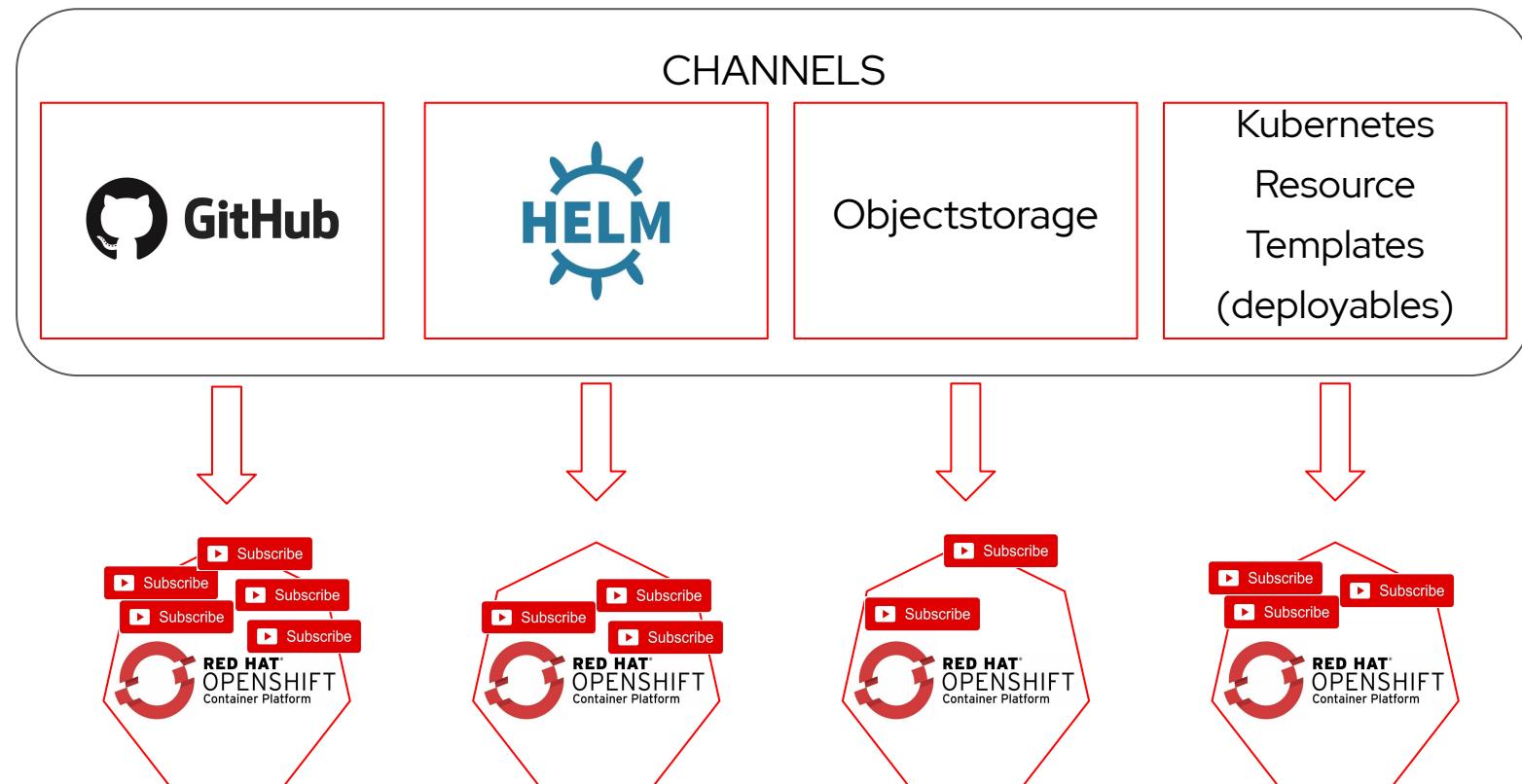
IT Operations



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



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



A screenshot of a GitHub repository page titled "open-cluster-management / demo-subscription-gitops". The repository has 57 commits, 3 branches, 0 packages, 0 releases, 1 contributor, and Apache-2.0 license. The commit history shows several updates by users "jnpacker", "blueGreen", "bma", "placement", ".gitignore", "CONTRIBUTE.md", "LICENSE", and "README.md". Below the commit history, a section titled "This repository contains examples of GitOps" lists "Examples": 1. Bare Metal Assets via gitops, 2. Blue-Green Application Management via gitops, and 3. Placement Rules example. At the bottom, there is a "Help" section with contact information: "Reach out to jnpacker@redhat.com or Slack `@jnpacker` in coreos.slack.com for help".

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

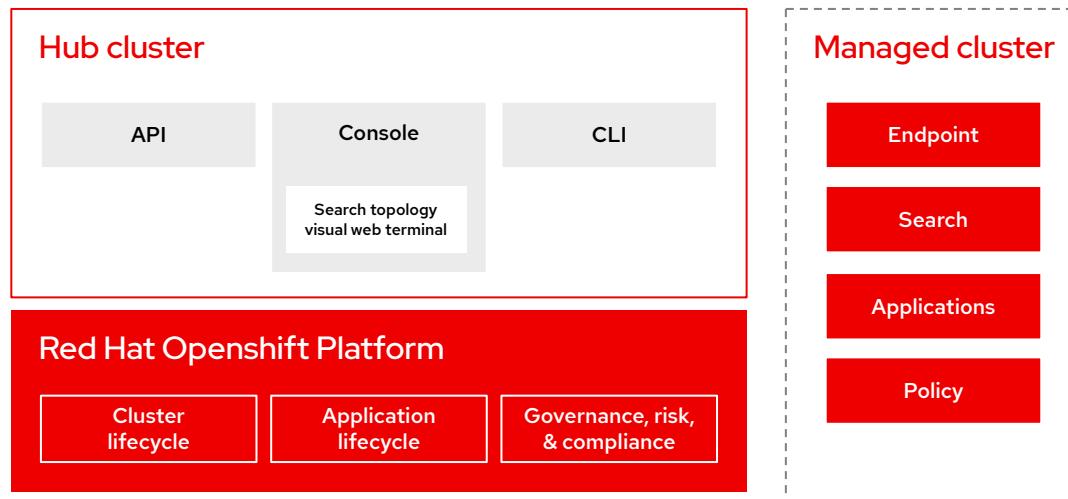
Architecture

Red Hat Advanced Cluster Management For
Kubernetes

Architecture overview



IT Operations



Hub architecture and components

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

Managed cluster architecture and components

Red Hat Advanced Cluster Management managed clusters use the multicloud-endpoint operator which runs in the multicloud-endpoint namespace

Installation

Advanced Cluster Management For Kubernetes

Installation and Foundation

Operator Install for Hub

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IT Operations

Hub Cluster

- Operator based installation
- Available on OperatorHub
- Requires OCP 4.3.x - 4.5.x

Full Management of OCP clusters

- OpenShift 3.11, 4.1.x - 4.5.x
- Public cloud hosted: OCP

Limited Support for Public cloud managed Kubernetes

- EKS, AKS, GKE, IKS

High Availability

- Supports OCP Availability Zone
- Limitation for Search component based on RedisGraph

Resource Requirements

- **Test:** 3 master, 3 workers, 6 vCPU and 16GB RAM
- **Production:** 3 masters, 3 workers, 16vCPU and 24GB RAM*

* Production requirements vary based on number of clusters in the management domain and types of workloads being run.

* vCPU/RAM Numbers are per node.

Name	Namespace	Status	Deployment	Provided APIs
Advanced Cluster Management for Kubernetes	open-cluster-management	Succeeded Up to date	multicloudhub-operator	MultiClusterHub Hive Config Subscription Channel View 4 more...
etcd	open-cluster-management	Succeeded Up to date	etcd-operator	etcd Cluster etcd Backup etcd Restore

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

Role-Based Access Control

How to control User access

- There are no RHACM specific Roles or Personas, we rely on the default roles included in OCP
 - Cluster Admin** - Super User can perform all actions
 - Admin** - Can perform some actions
 - Edit** - Read access
 - View** - Read access
- Default User after installation is Kube Admin



UI Panel	Cluster Admin	Admin	Edit	View
Home Page	Read	Read	Read	Read
Overview Page	Read	Read	Read	Read
Topology View	Read	Read	Read	Read
Cluster View	CRUD*	Read	Read	Read
Manage Applications	CRUD*	CRUD*	Read	Read
Manage Policies	CRUD*	CRUD*	No Access	No Access

Pricing and Packaging

ACM SKUs

ALL ACM SKUs will be in the Private Pricebook until 1QCY21

- ▶ Ordering from the Private Pricebook requires a BU Guidance ticket
- ▶ Primary SKUs:

SKU	Offering Name	List Price (USD)
MCT3946	Red Hat Advanced Cluster Management for Kubernetes, Standard (2 Core or 4 vCPU)	\$675.00
MCT3945	Red Hat Advanced Cluster Management for Kubernetes, Premium (2 Core or 4 vCPU)	\$1,000.00

- ▶ Other SKUs are available, including SKUs for Telco, CSS, Cloud Suite add-ons, etc. but are not in the Private Pricebook until 4QCY20. Contact Greg Bowman for information and assistance. gbowman@redhat.com.

Refer to the [subscription and sizing guide for details](#)

Production SKUs

New SKU#	Existing SKUs Description
MCT3945	Red Hat Advanced Cluster Management for Kubernetes, Premium (2 Core or 4 vCPU)
MCT3946	Red Hat Advanced Cluster Management for Kubernetes, Standard (2 Core or 4 vCPU)
SER0599	60 Day Evaluation of Red Hat Advanced Cluster Management for Kubernetes, Self-Support (2 Cores or 4vCPU)
SER0600	60 Day Evaluation of Red Hat Advanced Cluster Management for Kubernetes, Standard (2 Cores or 4vCPU)
SER0601	Red Hat Advanced Cluster Management for Kubernetes, Self-Support (2 Cores or 4vCPUs, NFR, Partner Only)
SER0602	Red Hat Advanced Cluster Management for Kubernetes, Standard (2 Cores or 4vCPUs, NFR, Partner Only)

ACM Subscription Types

- ACM Subscriptions are only based on the number of logical cores in the Kubernetes clusters to be managed, so called *Managed Clusters*.
 - No cost per application managed
- One base subscription type:
 - Advanced Cluster Management - 2 Core
 - Available with Standard or Premium support
- Stackable (can be combined to cover “bigger” hosts/VMs)
- Cannot split 2-core subscription
 - Systems, when registered and subscribed in a managed cluster, consume in 2-core units
 - There is no way at present to consume one core from a subscription
 - If a system only effectively needs 3 cores, two 2-core subscriptions would be consumed.
- Red Hat does not offer disaster recovery (DR)/cold backup type of subscription
 - Any system with ACM installed, powered-on or powered-off, running workload or not, requires an active subscription.
- ACM has Supported and Self-supported Evals as well as NFR SKUs.
 - Supported Evals are available through the [Sales Assisted Eval](#) page
 - Self Supported Evals are available through the [main product page](#)

Cores vs. vCPUs and hyperthreading

- Virtual machines use virtualized CPUs.
- For hyperthreaded systems
 - To determine whether a particular system supports hyperthreading, visit <https://access.redhat.com/solutions/7714>
 - You can see two vCPU per underlying physical core
 - Red Hat calculates cores with a ratio of 2 core = 4 vCPUs
 - In other words, a 2-core subscription covers 4 virtual CPUs in a VM

Example: An 8 vCPU VM has 4 effective “cores”, and would need two (2) 2 core subscriptions.

- For non-hyperthreaded systems
 - You can see one vCPU per underlying physical core
 - Red Hat calculates cores with a ratio of 2 cores = 2 vCPUs
 - In other words, a 2-core of a subscription covers 2 virtual CPUs in a VM on a non-hyperthreaded system

Example: An 4 vCPU VM has 4 effective “cores”, and would need two (2) 2 core subscriptions.

Where can I run Red Hat ACM?

Anywhere OCP x86 is supported and tested:

- Bare metal (Tech Preview in RHACM 2.0)
- Virtual
 - VMware vSphere
 - Hyper-V
 - Red Hat Virtualization
- Private cloud
 - Red Hat OpenStack Platform
- Any OCP-certified public cloud
 - Amazon Web Services, Google Cloud Platform, Microsoft Azure, etc.
 - **Cloud Access subscription transfer is required**
 - <https://www.redhat.com/en/technologies/cloud-computing/cloud-access>
- For more information on tested platforms: [RHACM 2.0 Support Matrix](#)

Red Hat Advanced Cluster Management for Kubernetes

Roadmap :: 2020 And Beyond



Technical Preview 1.0

- Create, upgrade & delete OCP clusters with **Hive**
- Import and manage existing OCP, IKS, ROKS, EKS, AKS, GKE clusters
- Security compliance configuration, IAM, and certificate policies out of the box
- Multi-cluster application delivery with subscription and channel
- Disconnected installation for hub and managed clusters

May 2020

July 2020

General Availability 2.0

- Upstream strategic elements of the ACM control plane
- Application topology status improvements for SRE
- Validate upstream projects including **Cincinnati** (disconnected upgrades), and **Observatorium** (multi-cluster monitoring)
- Serviceability alignment with **Telemetry** and **Insights**
- Tech Preview Bare Metal Cluster Lifecycle with **Hive**

General Availability 2.1

- GA Bare Metal, vSphere, RHV, OpenStack IPI using **Hive**
- Discover and import OpenShift from cloud.redhat.com
- GitOps Collaboration with **ArgoCD** community
- GA Multi-cluster monitoring with Observatorium/**Thanos**
- Integrate **Ansible** into key ACM Lifecycle events.
- Improve the SRE user experience with Visual Web Terminal
- Compliance as code (**Compliance Operator**) Phase 1

Oct 2020

Beyond

- Cluster Lifecycle for ARO, OSD, MOA
- Lifecycle and portability for Stateful Applications HA/DR/Migration use cases
- Multi-cluster network configuration with **Service Mesh** and **Submariner**
- Management for OpenShift **Virtualization**
- Integrate **Cost Management** from OCM for Chargeback and App Placement use cases

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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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 youtube.com/user/RedHatVideos

 facebook.com/redhatinc

 twitter.com/RedHat