

OpenShift Multi-Cluster Management with RHACM

Mario Vázquez
mario@redhat.com
Senior Solutions Engineer

Andrés Valero
valero@redhat.com
Openshift Specialist Solution Architect

AGENDA

- ▶ Hybrid Cloud and k8s Multi-Cluster Management challenges
- ▶ Red Hat Advanced Cluster Management for Kubernetes
- ▶ RH ACM and GitOps
- ▶ Demos:
 - ↳ RH ACM Overview
 - ↳ RH ACM Applications
 - ↳ RH ACM Governance, Risk and Compliance

An abstract graphic on the left side of the slide, rendered in various shades of red. It features a vertical stack of icons: a cloud with a keyhole, a database cylinder, a server rack, and a web browser window. Arrows and geometric shapes like 'X' and 'O' are scattered around, suggesting a complex system or workflow.

Hybrid Cloud and OpenShift Multi-Cluster Management Challenges

Multi-Cluster Management in a Hybrid, Multi-Cloud world is really hard

- Managing clusters across different clouds is complicated and error prone
- Configuration management and security enforcement can be overwhelming
- Deploying applications and manage updates in different clusters across clouds is very challenging
- Find and manage resources in such landscape is time consuming



Red Hat Advanced Cluster Management for Kubernetes

Red Hat Advanced Cluster Management for Kubernetes



Multicluster lifecycle management



Policy driven governance, risk, and compliance



Advanced application lifecycle management



Multicluster observability for health and optimization

Red Hat Advanced Cluster Management for Kubernetes

Overview

Google 1 cluster OpenShift

Amazon 2 clusters

Control Plane Health

API Server

Governance and risk

Summary Standards

NIST CSF 1 CLUSTER VIOLATIONS 3 POLICY VIOLATIONS

NIST SP 800-53 No violations found

Policy name	Namespace	Remediation	Cluster violations	Standards	Controls	Categories
policy-certificates	fraud-management	inform	0/3	NIST CSF	PR DS 2 Data in Transit, DE CM 8 Vulnerability Scans, PR AC 4 Access Control	PR DS Data Security
policy-auth-connector	open-cluster-management-policies	enforce	0/3	NIST CSF	PR IP 1 Baseline Configuration	PR IP Information Protection Processes And Procedures
policy-certificates	open-cluster-management-policies	enforce	0/3	NIST CSF	PR DS 2 Data in Transit	PR DS Data Security
policy-console	open-cluster-management-policies	enforce	0/3	NIST CSF	PR IP 1 Baseline Configuration	PR IP Information Protection Processes And Procedures
policy-identity	open-cluster-management-policies	inform	1/1	NIST CSF	PR AC 4 Access Control	PR AC Identity Management Authentication And Access Control
policy-logging	open-cluster-management-policies	enforce	0/1	NIST SP 800-53	SI 4 Information System Monitoring	SI System And Information Integrity
policy-namespaces	open-cluster-management-policies	enforce	0/0	NIST CSF	PR IP 1 Baseline Configuration	PR IP Information Protection Processes And Procedures
policy-namespace	open-cluster-management-policies	enforce	0/2	NIST CSF	PR IP 1 Baseline Configuration	PR IP Information Protection Processes And Procedures
policy-roles	open-cluster-management-policies	inform	1/1	NIST CSF	PR AC 4 Access Control	PR AC Identity Management Authentication And Access Control
policy-visibility	open-cluster-management-policies	inform	1/1	NIST CSF	PR AC 4 Access Control	PR AC Identity Management Authentication And Access Control

Applications / pacman-appl

Resource topology

How to read topology

Application pacman-appl

Subscription pacman-appl-0

Placements pacman-appl-placement-0

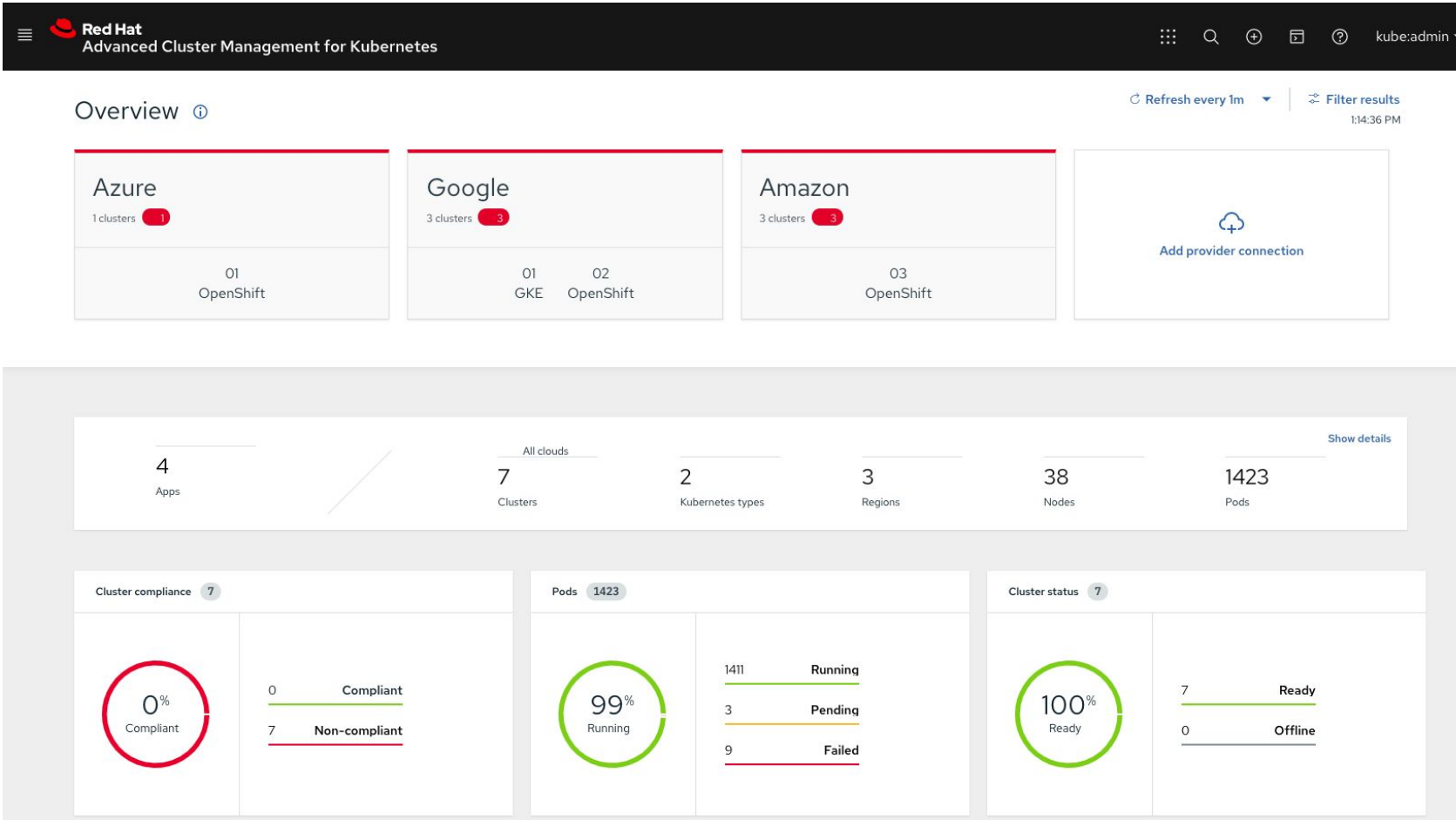
3 Clusters

Deployment mongo

Replicaset mongo

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

Policy based Governance, Risk and Compliance

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

The screenshot displays the Red Hat Advanced Cluster Management for Kubernetes (ACM) interface, specifically the 'Governance and risk' section. The top navigation bar includes the Red Hat logo and the text 'Advanced Cluster Management for Kubernetes'. The main content area is divided into several sections:

- Summary:** Shows '80 / 80 Cluster violations' and '8 / 12 Policy violations'.
- NIST CSF:** A section with a red circle icon and the text '80 / 80 Cluster violations'.
- NIST SP 800 53:** A section with a green checkmark icon and the text 'No violations found. Nice job, you currently have no cluster or policy violations.'
- Find items...:** A search bar with the text 'Find items...'.
- Policies:** A tab that is currently selected, showing a list of policies.
- Cluster violations:** A tab that is currently not selected.

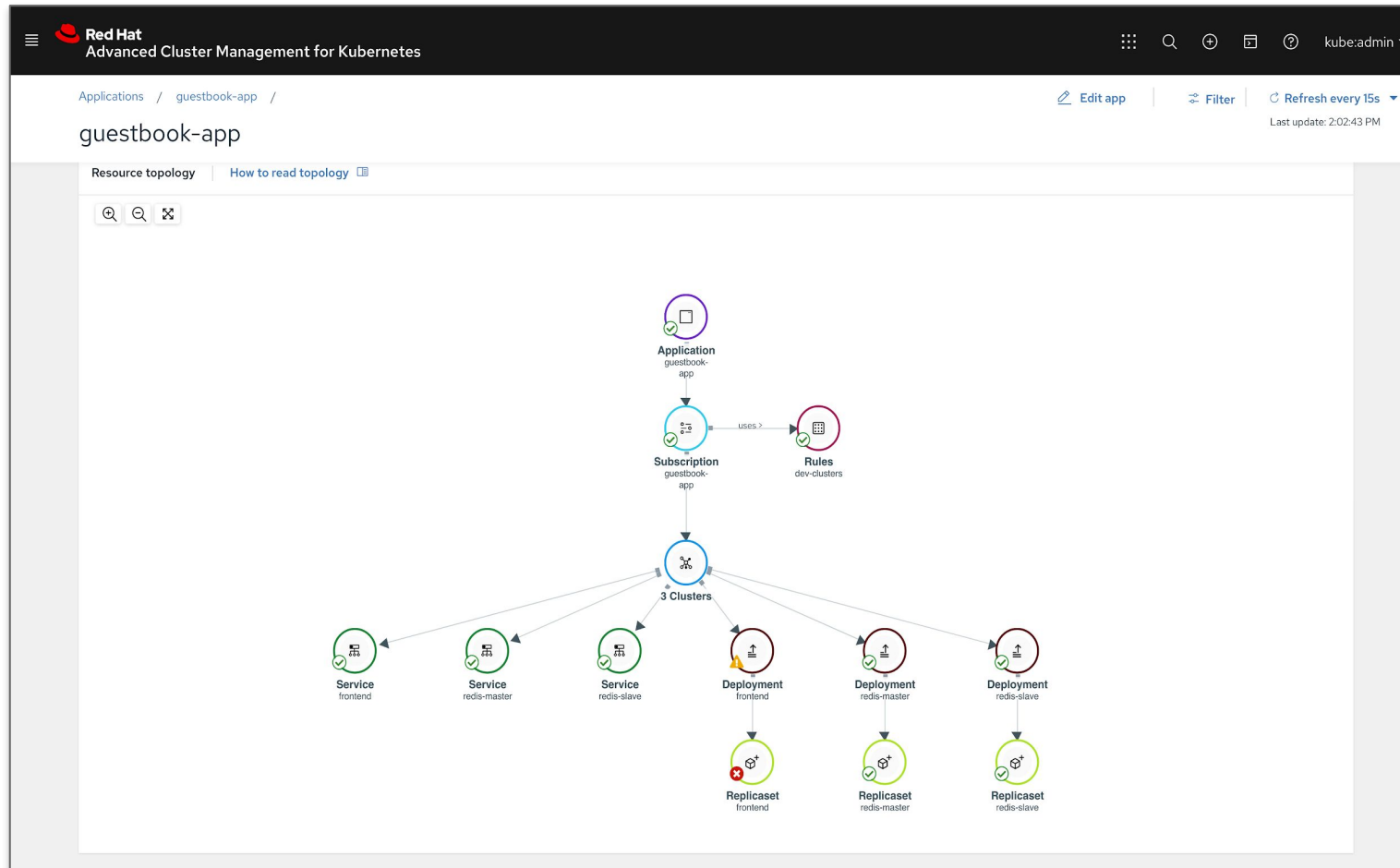
The 'Policies' tab displays a table with the following columns: Name, Namespace, Remediation, Cluster violations, Standards, Categories, Controls, and Last updated. The table contains 10 rows of policy data, each with a 'Policy ABC' name and various violation counts and standards.

Name	Namespace	Remediation	Cluster violations	Standards	Categories	Controls	Last updated
Policy ABC	default	Inform	41/80	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	disabled	Inform	---	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	68/80	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	4/4	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	22/32	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	4/4	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	0/7	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	0/9	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	0/4	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am
Policy ABC	default	Inform	0/6	NIST, HIPPA	PR AC Ide...Control	PR AC 4 A...Control	Jul 27, 11:07 am

- **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
- Integration with **OPA Policy Agent**

Advanced Application Lifecycle Management

Simplify your Application Lifecycle



- **Easily** Deploy Applications at **Scale**
- Deploy Applications from **Multiple** Sources
- Quickly **visualize** application relationships **across** clusters and those that **span** clusters
- Integration with **Ansible Automation Platform** (Tech Preview)



RH ACM and GitOps

Using Git as your source of truth, manage your data center via code

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)



GitOps in ACM, how does it work?

Channel - Source

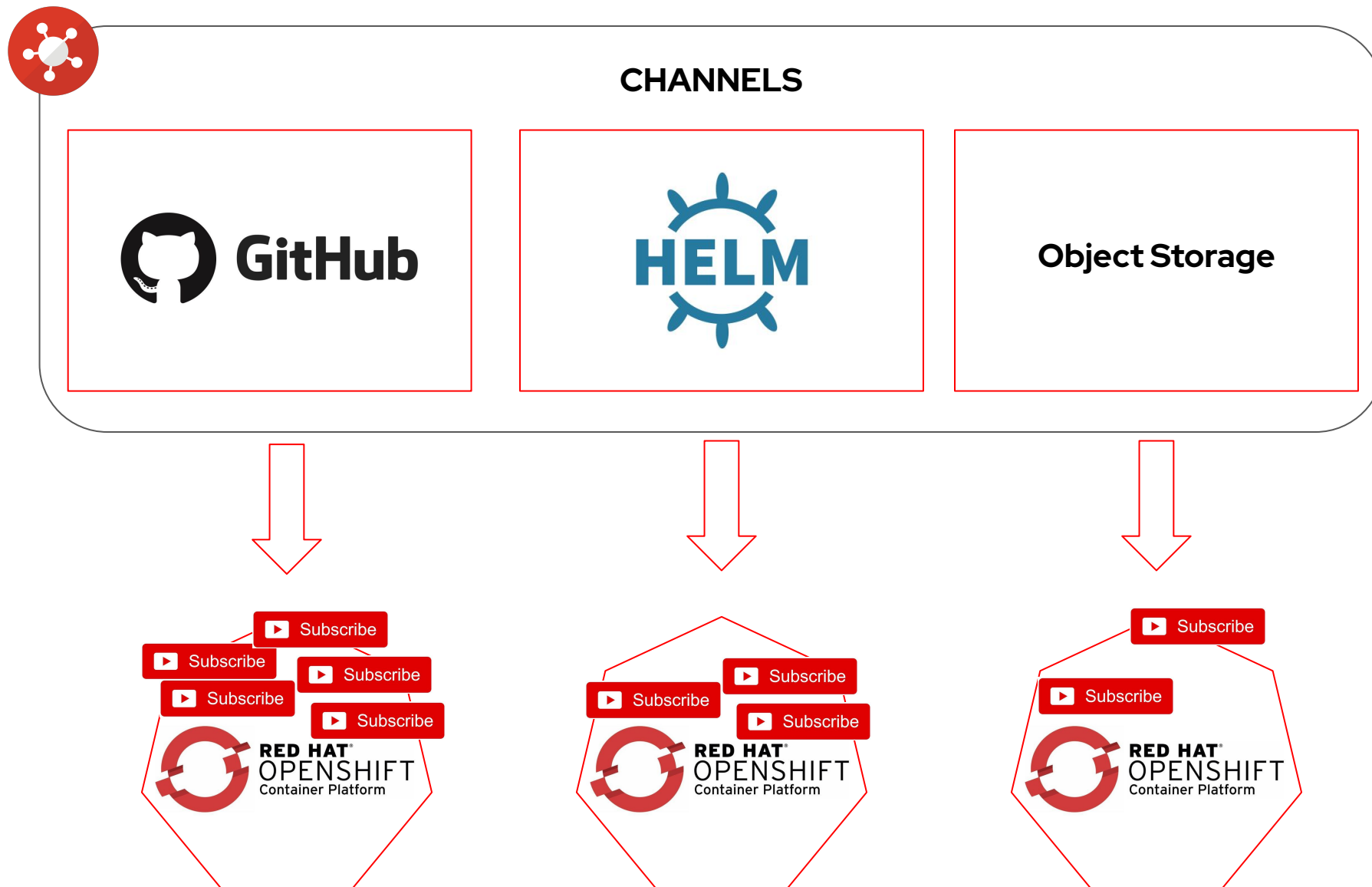
```
1 ---
2 apiVersion: apps.open-cluster-management.io/v1
3 kind: Channel
4 metadata:
5   name: etherpad-app-latest
6   namespace: etherpad
7 spec:
8   type: GitHub
9   pathname: https://github.com/avaleror/nvs_demo.git
```

Subscription - What

```
1 apiVersion: apps.open-cluster-management.io/v1
2 kind: Subscription
3 metadata:
4   name: etherpad-app
5   namespace: etherpad
6   labels:
7     app: etherpad-app
8   annotations:
9     apps.open-cluster-management.io/git-path: app-lifecycle/etherpad
10    apps.open-cluster-management.io/git-branch: main
11 spec:
12   channel: etherpad/etherpad-app-latest
13   placement:
14     placementRef:
15       kind: PlacementRule
16       name: etherpad-pr
```

Placement Rule - Where

```
1 apiVersion: apps.open-cluster-management.io/v1
2 kind: PlacementRule
3 metadata:
4   name: etherpad-pr
5   namespace: etherpad
6   labels:
7     app: etherpad-app
8 spec:
9   clusterReplicas: 1
10  clusterConditions:
11    - type: ManagedClusterConditionAvailable
12      status: "True"
13  clusterSelector:
14    matchLabels:
15      environment: dev
```





DEMO

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enterprise open source software solutions.
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services make
Red Hat a trusted adviser to the Fortune 500.



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