



Connect

OpenShift als perfekte Basis für den Betrieb der SAP Edge Integration Cell



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Let's talk after the session

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Agenda

Value for Day1 Operations

- Deployment methods of OpenShift
- Components relevant for SAP EIC

Value for Day2 Operations

- Observability
- Backup & Disaster Recovery
- Security
- Lifecycle Management & Updates
- Automation
- Unified Management

What is the value of OpenShift for SAP EIC

Just open the trunk, put EIC in and successfully drive along with Openshift.



vs.



=

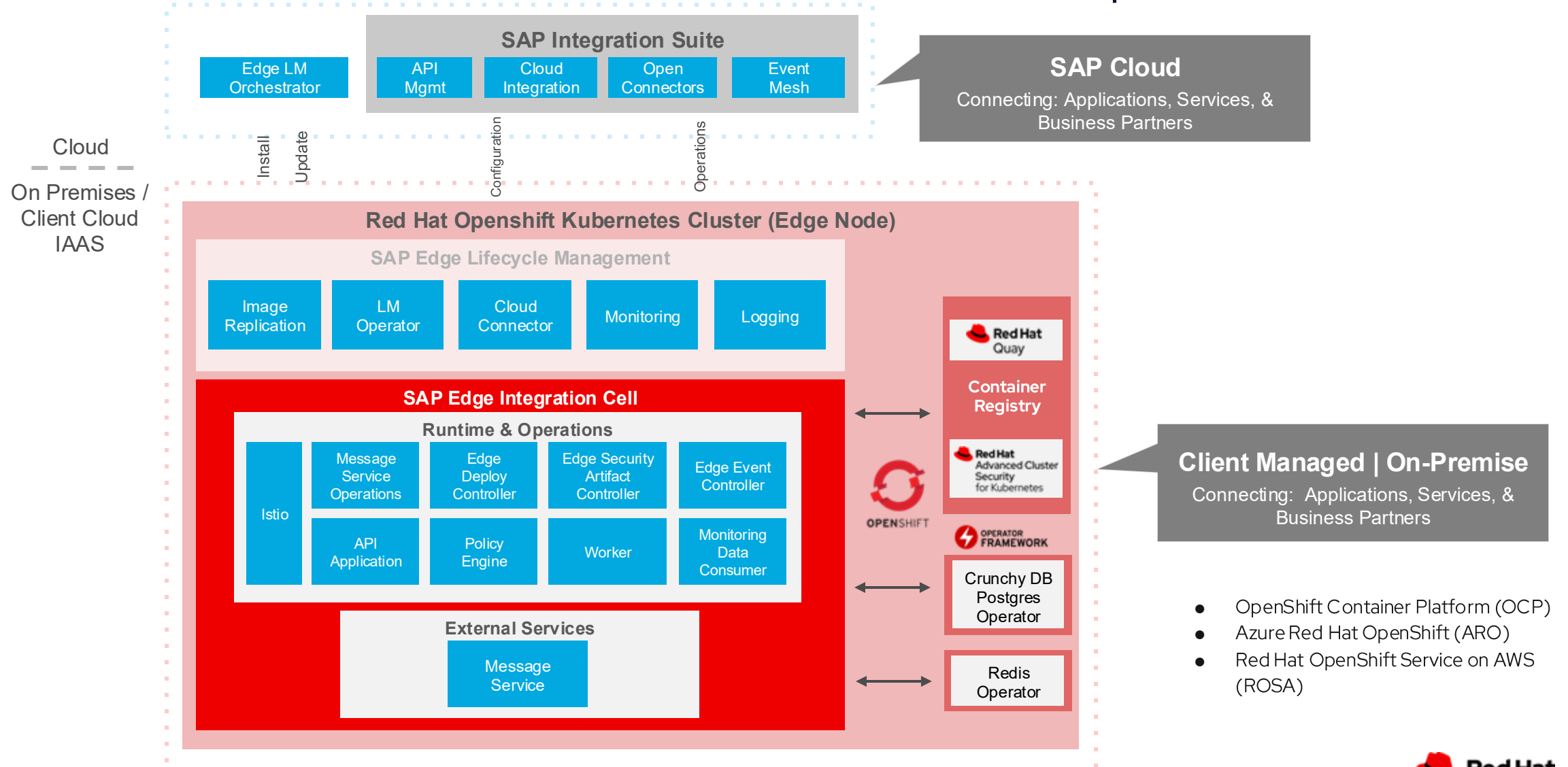


Red Hat
OpenShift

Comprehensive and complete open source
Application Platform.
"Ready to Drive" and long-term maintained

Our customers tell us that they want to focus on "driving" their applications while **Red Hat helps to build and maintain a solid and secure platform** out of the vast world of open source projects and partner solutions

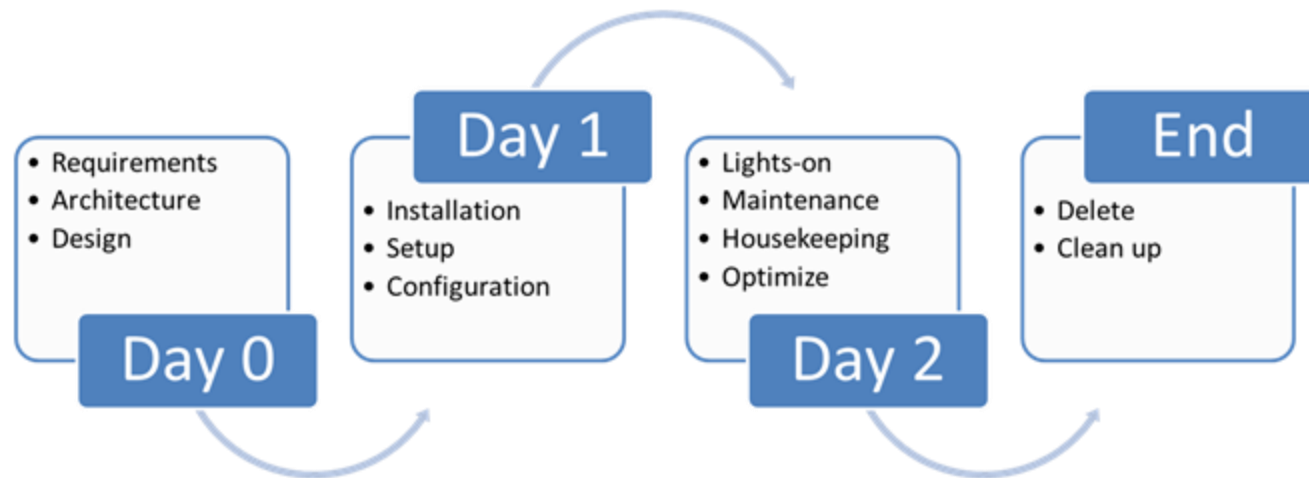
How to maintain SAP EIC EIC on Red Hat Openshift?



- OpenShift Container Platform (OCP)
- Azure Red Hat OpenShift (ARO)
- Red Hat OpenShift Service on AWS (ROSA)

What are Day 2 Operations?

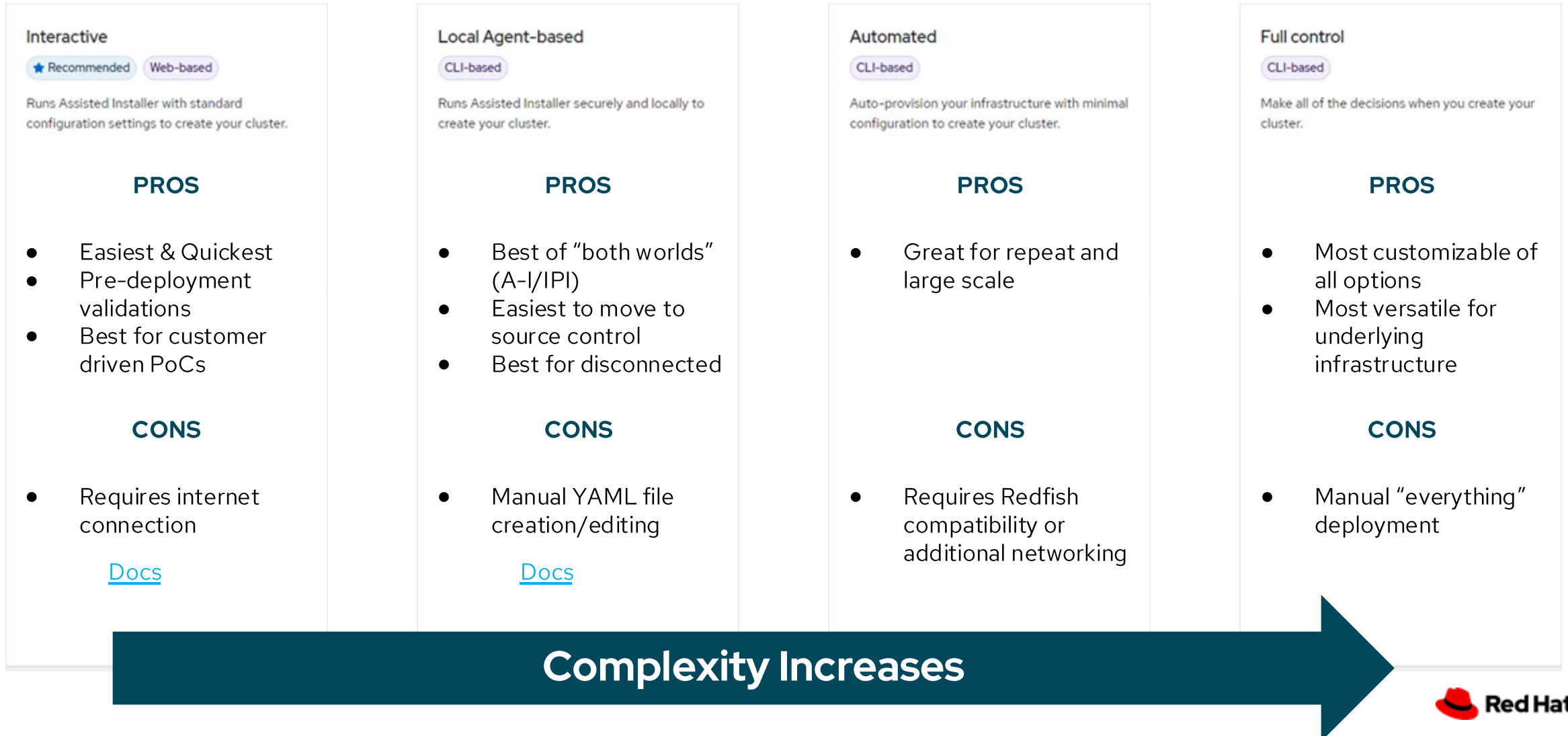
Activities that occur after an OpenShift cluster is deployed (Day 1)



Key Focus:

- Maintenance
- Upgrades
- Scaling
- Monitoring
- Security
- Automation
- Backup & Restore

Deploying on Bare Metal – Day 1



Get it started: Day 1 Operations – Deployment configurations

		EIC	
		HA	Non-HA
OpenShift	HA	<ul style="list-style-type: none">• <u>3 Master Nodes + 3 Worker Nodes + 3 ODF Nodes</u>• <u>3 Master Nodes + 3 Worker Nodes</u>• <u>3 Nodes Cluster</u>• <u>3 Master Nodes + 3 Worker Nodes (Without ODF)</u>	<ul style="list-style-type: none">• <u>3 Master Nodes + 3 Worker Nodes</u>• <u>3 Master Nodes + 3 Worker Nodes (Without External Services)</u>• <u>3 Nodes Cluster</u>• <u>3 Master Nodes + 3 Worker Nodes (Without ODF)</u>
	Non-HA	N/A	<u>Single Node OpenShift</u>

The table above presents various **deployment configurations for OpenShift** tailored for the SAP Edge Integration Cell (EIC), segmented into **High Availability (HA)** and **Non-HA setups**. Each configuration details the specific node composition, including master, worker, and OpenShift Data Foundation (ODF) as well as dependent external services. This comprehensive overview accommodates a range of operational needs, from resilient HA deployments to streamlined single-node setups, offering flexibility to optimize OpenShift implementations for diverse infrastructure environments.

Red Hat Quay features and benefits (Container Registry)



Reliability

Fast and robust at any scale



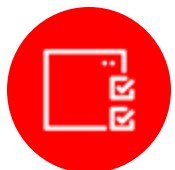
Security

Continuous security scanning



Control

Enterprise authentication and granular access control



Automation

- Automation-friendly API
- Automated ingest from external registries
- Automated installation & updates

Registry Platform

- ▶ High Availability
- ▶ Full Standards and Spec Support
- ▶ Long-Term Protocol Support
- ▶ OCI compatibility
- ▶ Enterprise Grade Support
- ▶ Regular Updates
- ▶ OpenShift Integration

Red Hat Quay features and benefits (Container Registry)

Operators simplify management of complex applications on Kubernetes



- Encode human operational knowledge
- **Automatically patch, upgrade, recover, and tune container-based apps and services**
- Kubernetes-native
- Purpose-built for a specific application or service
- Enable "day 2" management

Red Hat OpenShift Data Foundation



Basic storage classes

Kubernetes RWO, Kubernetes RWX and S3-compatible Object storage.

Encryption capabilities

Provides standard OpenShift cluster level encryption.

Batteries included

Red Hat OpenShift Data Foundation Essentials edition is included with Red Hat OpenShift Platform Plus at no additional cost

Deployment and Testing of SAP EIC on Red Hat OpenShift

Process flow

1 Installation Openshift Cluster

Ensure to fulfill the installation prerequisites

Create the installation directory

Create the installer configuration file install-config.yaml

Generate the Kubernetes manifests

Generate the ignition config files

Deploy the Openshift cluster

Verify the Openshift cluster health

Design OCP architecture

Preparation Openshift Installation

Deployment Openshift

Infra Architect team

Infrastructure System Admin

2 Activate, deploy and run SAP ELM and SAP EIC on OCP

Activate and enable Edge Integration Cell

Create edge nodes and deploy Edge Integration Cell solution

Activate SAP EIC

Tenant Admin

3 SAP Integration Suite: Discover - Design - Test

Copy from prebuilt standard content in tenant for SAP Integration Suite to the designer

Configure the standard content, select runtime profile and deploy it to EIC

Select EIC runtime, check the deployment status and retrieve the end point

Trigger the message for deployed integration scenario and check the message processing logs

Create an API with respective policies and deploy to EIC

Prepare Integration

Configure Integration and deploy Runtime

Monitor and execute Integration

Create API with API policies

Integration Manager, API Developer

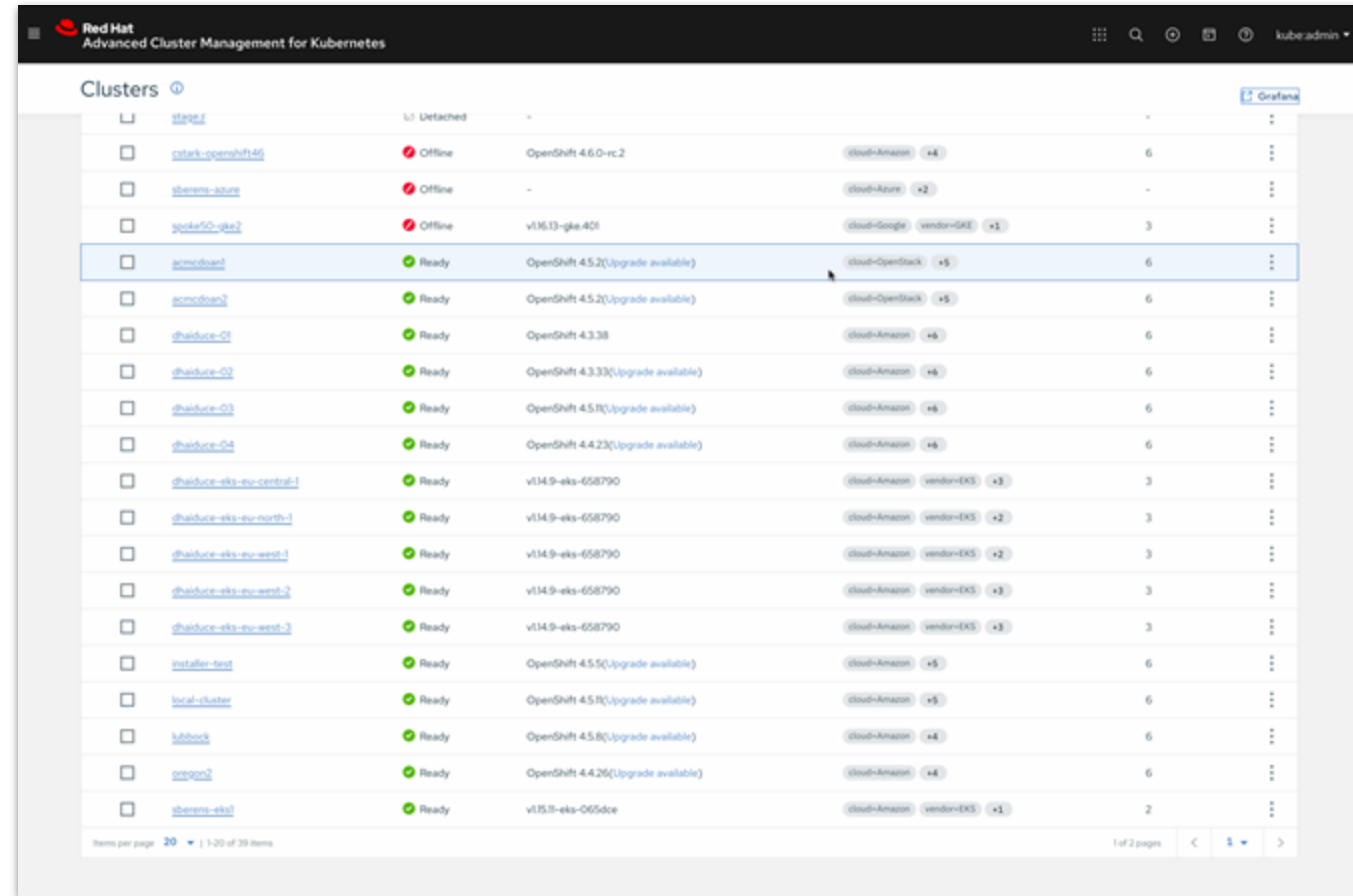
Observability: Insights Advisor for OpenShift

Name	Added	Category	Total risk	Clusters
Cluster upgrade will fail when default SCC gets changed	2 years ago	Service Availability	Important	1
Workloads are still using the deprecated APIs which will be removed in the next release	5 months ago	Service Availability	Important	6
SystemMemoryExceedsReservation alerts when the system daemons memory usage on nodes exceeds 90% of the reservation for them	4 months ago	Service Availability	Important	1
Workloads are using the deprecated PodSecurityPolicy API	5 months ago	Performance	Moderate	3
CVE-2021-30465: runc vulnerable to privilege escalation	9 months ago	Security	Moderate	1
Nodes will become Not Ready due to a CRI-O PID leak in the running OpenShift Container Platform version	5 months ago	Service Availability	Moderate	13
The running OpenShift version has reached its End of Life	2 years ago	Service Availability	Moderate	1
Pods could fail to start if openshift-samples is degraded due to FailedImageImport which is caused by a hiccup while talking to the Red Hat registry	2 years ago	Service Availability	Moderate	1
Prometheus metrics data will be lost when the Prometheus pod is restarted or recreated	1 year ago	Service Availability	Moderate	50
The authentication operator is degraded when cluster is configured to use a cluster-wide proxy	2 years ago	Security	Moderate	1
An OCP node behaves unexpectedly when it doesn't meet the minimum resource requirements	2 years ago	Performance	Moderate	2

- **Free service leveraging Red Hat experience with supporting and operating OpenShift**
- New recommendations based on analysis of Kubernetes YAML files
- Alerts in OpenShift WebConsole for most critical recommendations
- **New recommendations** focused on storage performance, etcd issues etc.
- Improved internal integrations for more stable upgrades

Observability: Monitoring OpenShift, Redis, Postgres

- Global Query view with **Grafana** for OCP Clusters
 - Out of the Box multi cluster health monitoring dashboards
 - PromQL compliant - Build your own queries
- **Centralize Alerts** and notifications on the **RHACM Hub**. Forward to 3rd Party Systems (PagerDuty / Slack)
- Centralized **Database**
 - Optimized set of metrics collected from managed clusters
 - Focused on Cluster Management
- Long Term **Data Retention**
 - Observe Metric trends
 - Set Alert Patterns
 - Supported Object Storage
 - AWS S3 (and compatible)
 - Ceph for on-premise
 - Google Cloud Storage
 - Azure Storage



Red Hat Advanced Cluster Management for Kubernetes					
Clusters					
<input type="checkbox"/>	cluster1	Detached	-	-	0
<input type="checkbox"/>	cluster-openshift46	Offline	OpenShift 4.6.0-rc2	cloud-Amazon	6
<input type="checkbox"/>	cluster-azure	Offline	-	cloud-Azure	-
<input type="checkbox"/>	cluster-gke2	Offline	v1.13-gke-401	cloud-Google vendor-GKE	3
<input type="checkbox"/>	acm-cluster1	Ready	OpenShift 4.5.2(Upgrade available)	cloud-OpenStack	6
<input type="checkbox"/>	acm-cluster2	Ready	OpenShift 4.5.2(Upgrade available)	cloud-OpenStack	6
<input type="checkbox"/>	cluster-C1	Ready	OpenShift 4.3.38	cloud-Amazon	6
<input type="checkbox"/>	cluster-C2	Ready	OpenShift 4.3.33(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-C3	Ready	OpenShift 4.5.0(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-C4	Ready	OpenShift 4.4.23(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-eks-eu-central-1	Ready	v1.14.9-eks-658790	cloud-Amazon vendor-EKS	3
<input type="checkbox"/>	cluster-eks-eu-north-1	Ready	v1.14.9-eks-658790	cloud-Amazon vendor-EKS	3
<input type="checkbox"/>	cluster-eks-eu-west-1	Ready	v1.14.9-eks-658790	cloud-Amazon vendor-EKS	3
<input type="checkbox"/>	cluster-eks-eu-west-2	Ready	v1.14.9-eks-658790	cloud-Amazon vendor-EKS	3
<input type="checkbox"/>	cluster-eks-eu-west-3	Ready	v1.14.9-eks-658790	cloud-Amazon vendor-EKS	3
<input type="checkbox"/>	cluster-test	Ready	OpenShift 4.5.5(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-cluster	Ready	OpenShift 4.5.0(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-lab	Ready	OpenShift 4.5.0(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-ops	Ready	OpenShift 4.4.26(Upgrade available)	cloud-Amazon	6
<input type="checkbox"/>	cluster-eks	Ready	v1.15.0-eks-065dce	cloud-Amazon vendor-EKS	2

Comprehensive Monitoring of Non-EIC Components
with Prometheus/Grafana

Backup & Disaster Recovery

Data Protection

- Application Data (aka Persistent volumes)
- Configuration Data

Disaster Recovery

- Human Error
- Infrastructure Failures
- Cybersecurity Threats
- Natural Disasters

Compliance and Regulatory Requirements

Migration and Portability

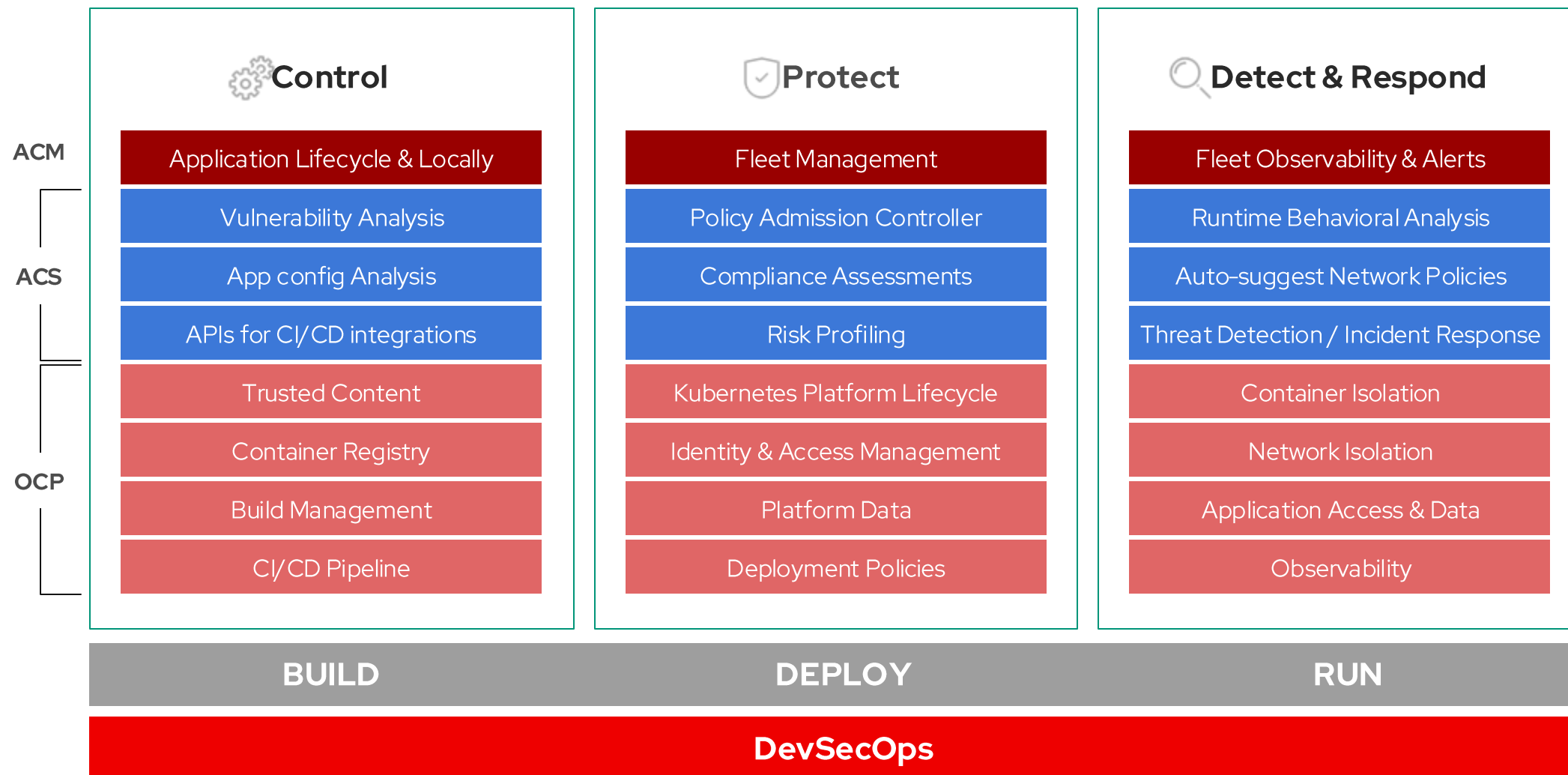
Operational Efficiency and Risk Management

Red Hat OADP supports Velero API.

Supported in

- cloud casa
- Trillio
- Storware
- DELL EMC
PowerProtect
- Bacula Enterprise

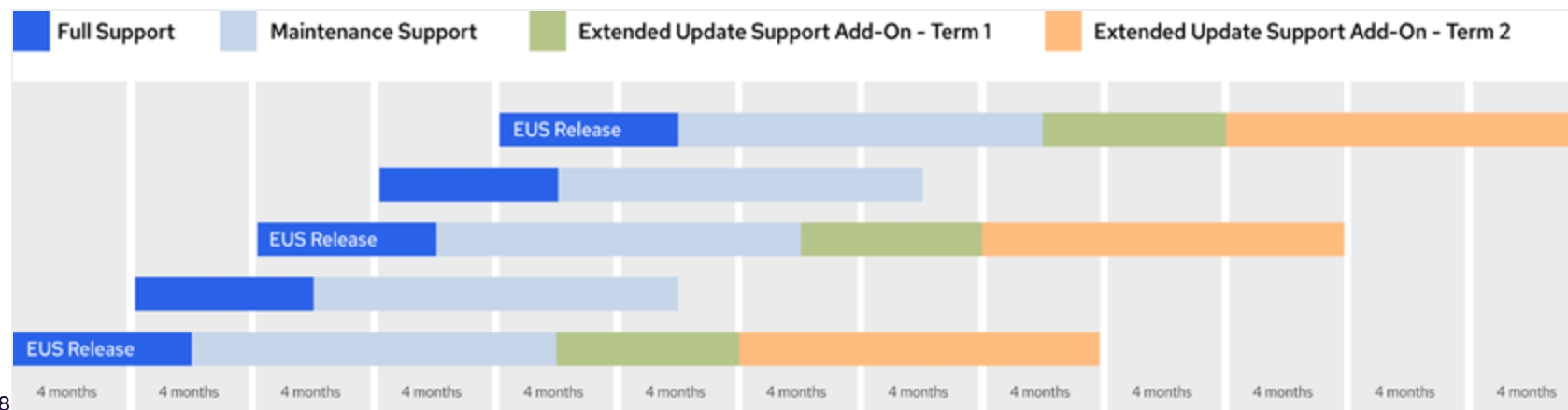
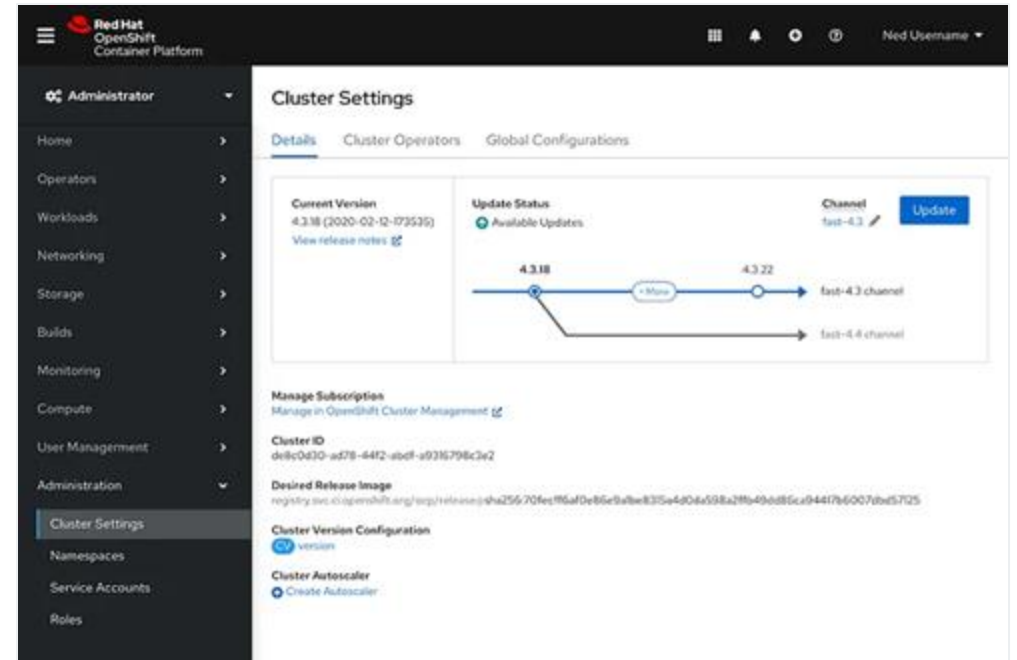
OpenShift Platform Plus Delivers Defense in Depth



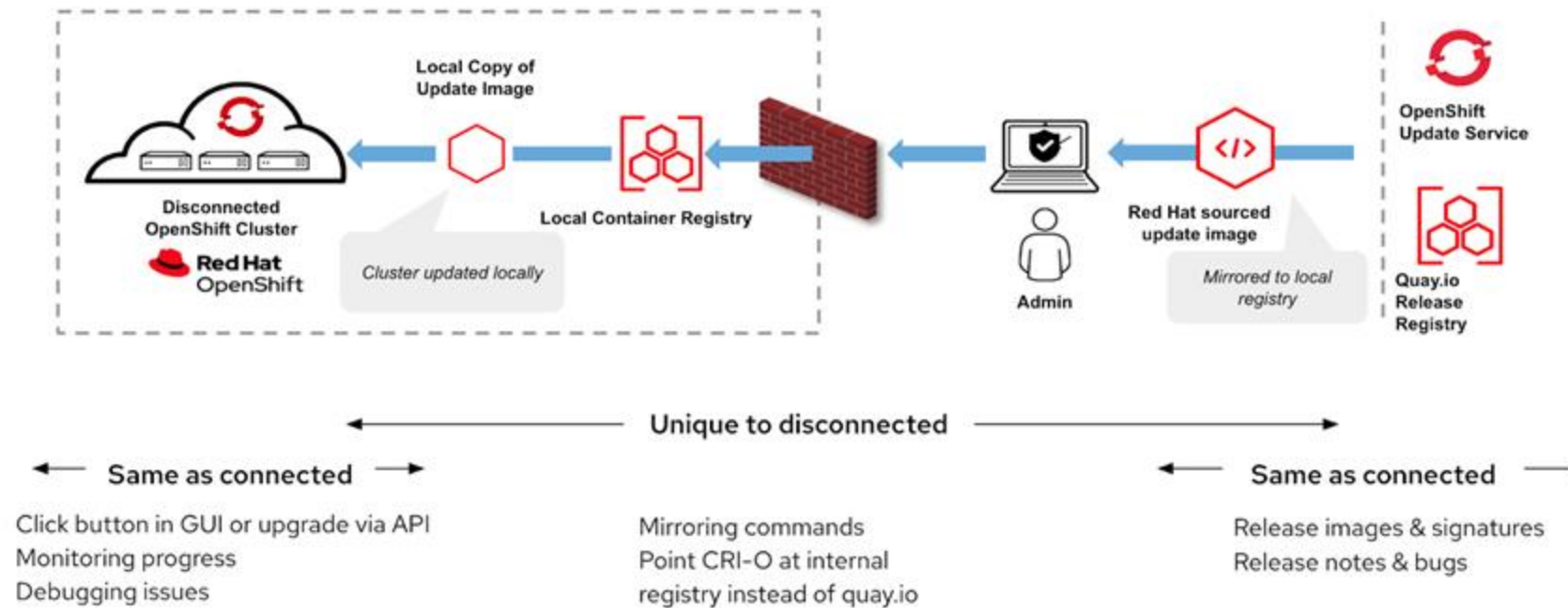
Lifecycle Management and Update

- Predictive Lifecycle
- Longterm Support
- Easy OTA-Update via UI

Remark: please consider the alignment of supported versions of Edge Integration Cell and OpenShift

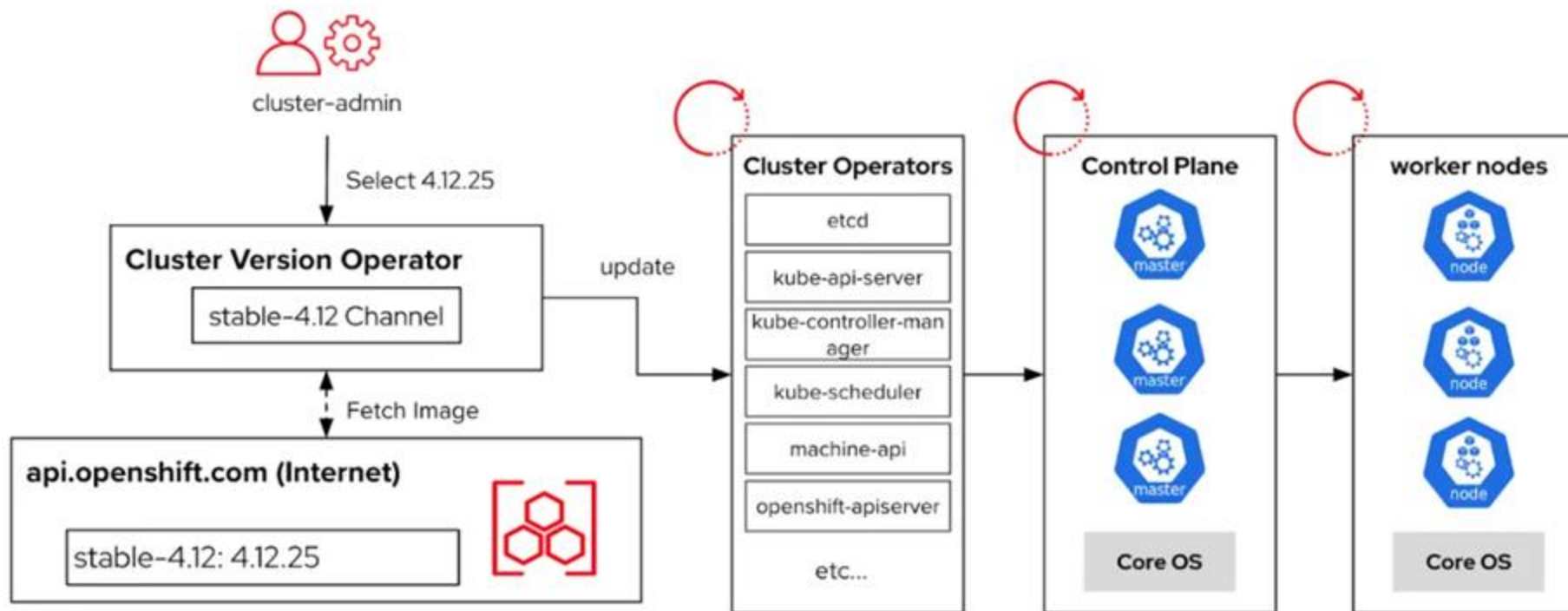


OpenShift Over the air Updates!



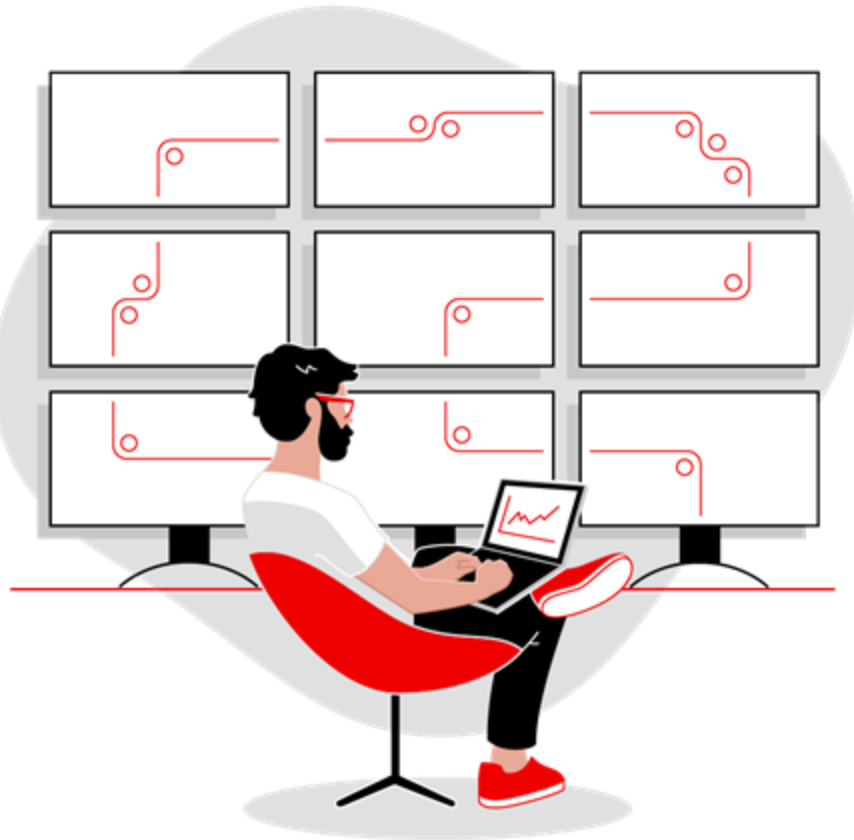
Reliably and consistently manage clusters at scale

OpenShift Over the air Updates also for SAP EIC components



Red Hat Ansible Automation Platform integration

Automating life cycle management

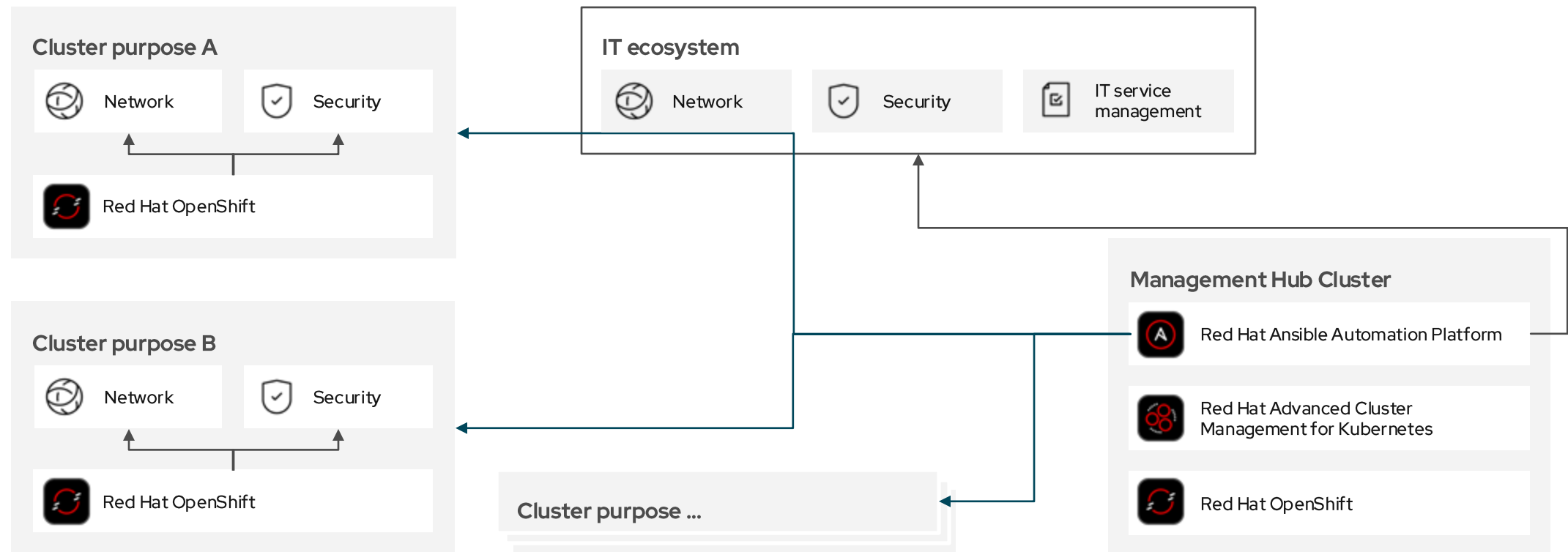


Create Ansible-native access across your Kubernetes fleet:

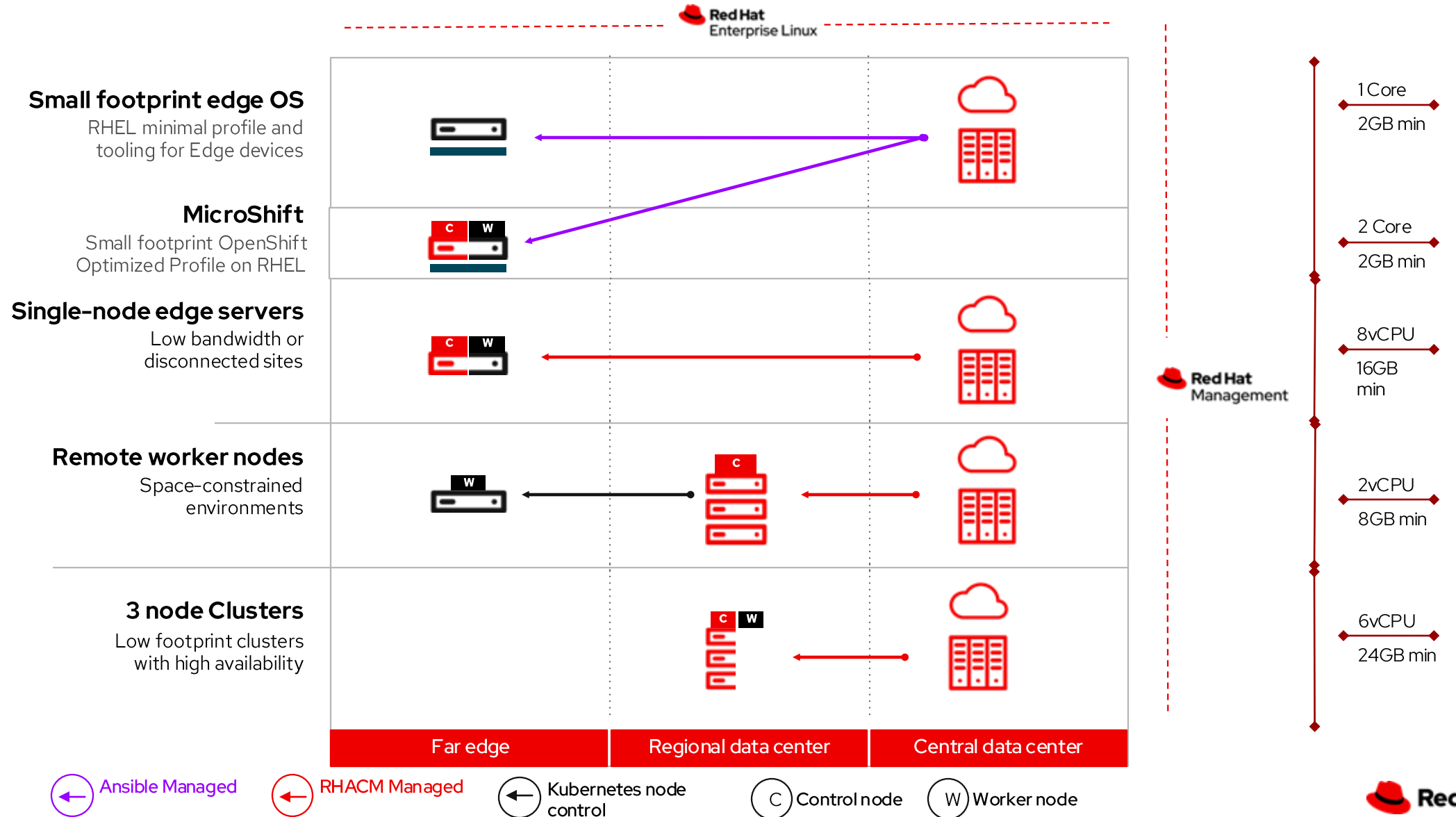
- ▶ Ansible integration allows for the delivery of straightforward and security-focused playbooks across your Kubernetes fleet.
- ▶ Uses the multicluster engine for Kubernetes operator, Red Hat Advanced Cluster Management, and the [stolostron.core](https://www.stolostron.com/) Ansible Collection.

Automating OpenShift: Automation Platform Integration

Automating life cycle management



Standardize: Unified Management



Key Takeaways

Openshift offers a tested, robust and complete solution to deploy and manage SAP EIC on OpenShift

- Easy and fast deployments
- OCP is an Enterprise grade platform (**Comprehensive**)
 - Operator framework integrated for managing applications
 - Integrated enterprise registry with Quay
 - Complete Cluster Management
- Security - RH ACS (**Trusted**)
- All customer deployments and operations based on one dashboard from Edge to DC (**Consistent**)
- Existing OCP footprint and operations



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