

# Leading With Containers

OpenShift 4.13 – What's new ?

Alfred Bach

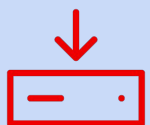
PSA RedHat EMEA

You can find the content here:

<https://github.com/RHEPDS/lwc0723>

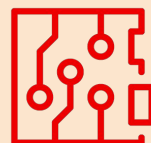
# OpenShift 4.13

## OPERATIONAL



3 Node Cluster Support in AWS,  
Azure, GCP and vSphere  
Single Click Scale of Control  
Plane (Azure, GCP)

## CORE



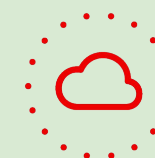
Custom Metric Auto  
Scaler  
Cgroups v2  
Kubernetes 1.26

## SECURITY



Cert-manager operator is GA  
Deploy OpenShift on  
encrypted VMs and encrypted  
storage in vSphere  
User managed key to encrypt  
storage on AWS, Azure, and  
GCP

## EDGE



Single Node OpenShift on  
AWS and Arm bare metal  
LVM Storage resource  
optimization  
crun is GA

# Kubernetes 1.26

## Major Themes and Features

- ▶ CSI migration
- ▶ Azure file in-tree to CSI driver migration
- ▶ Kubernetes metrics improvements
- ▶ Pod scheduling improvements
- ▶ Non-Graceful Node Shutdown for StatefulSet Pods [Beta]
- ▶ Signing Release Artifacts [Beta]
- ▶ Reduction of Secret-Based Service Account Tokens [Beta]

## Significant list of other graduations to stable:

- CSI migration for Azure File and vSphere
- Delegate FSGroup to CSI Driver
- Service Internal Traffic Policy
- Reserve Service IP Ranges for Dynamic and Static IP Allocation
- Mixed Protocols in Services with Type LoadBalancer
- kubelet Credential Provider

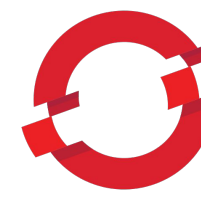
CRI-O  
1.26



Kubernetes  
1.26



OpenShift  
4.13



# OpenShift 4.13 + RHEL 9

**RHEL CoreOS is  
now based on  
RHEL 9.2**

## **RHEL where you are**

The latest generation of RHEL is designed to meet the needs of the hybrid cloud environment, from the edge to the cloud

## **9.2 kernel**

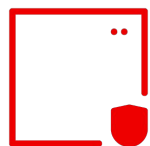
The latest in hardware support & performance  
Cgroups v2 enhancements

## **Security & innovation**

Industry-leading security response & upstream engineering leadership

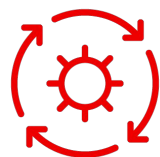
# cert-manager Operator for Red Hat OpenShift GA

Certificate as a Service for Application workloads



## **Secure Application Access**

Certificates made available to 1000s of Applications for Secure Ingress



## **Automate certificate management**

Simplifies obtaining, renewing and using certificates



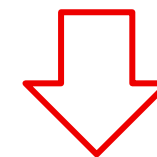
## **Validated Issuers**

Validation for ACME, Self-Signed and CA certificates



## **Operator Configurations**

Ability to configure custom CA for egress, HTTP and DNS Solvers



## **Available in OperatorHub**

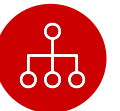
# Utilizing OpenShift Virtualization to Consolidate OpenShift Clusters

## Hosted Control Planes with KubeVirt provider



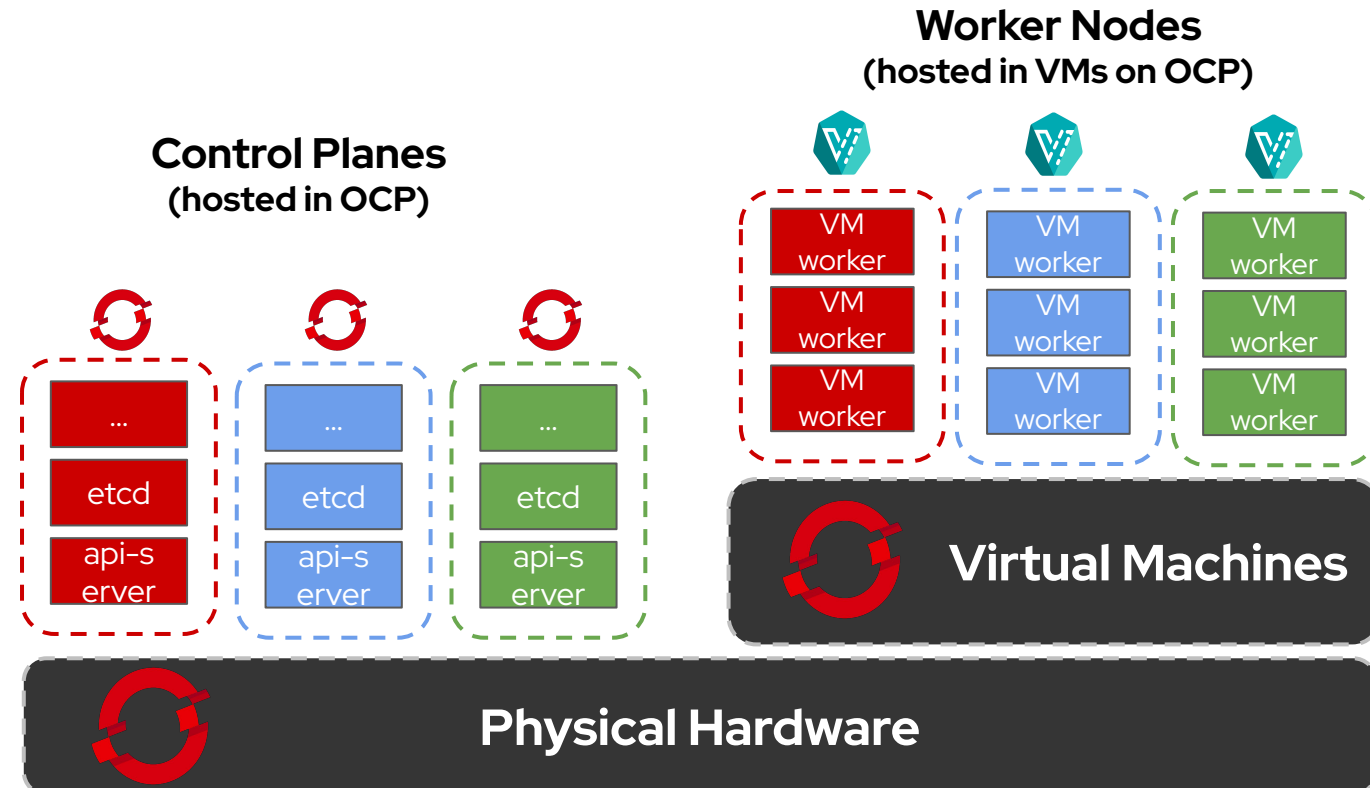
### Increase Utilization of Infrastructure

- Reduce unused and underutilized infrastructure
- Increase bare metal node utilization by deploying multiple hosted clusters.

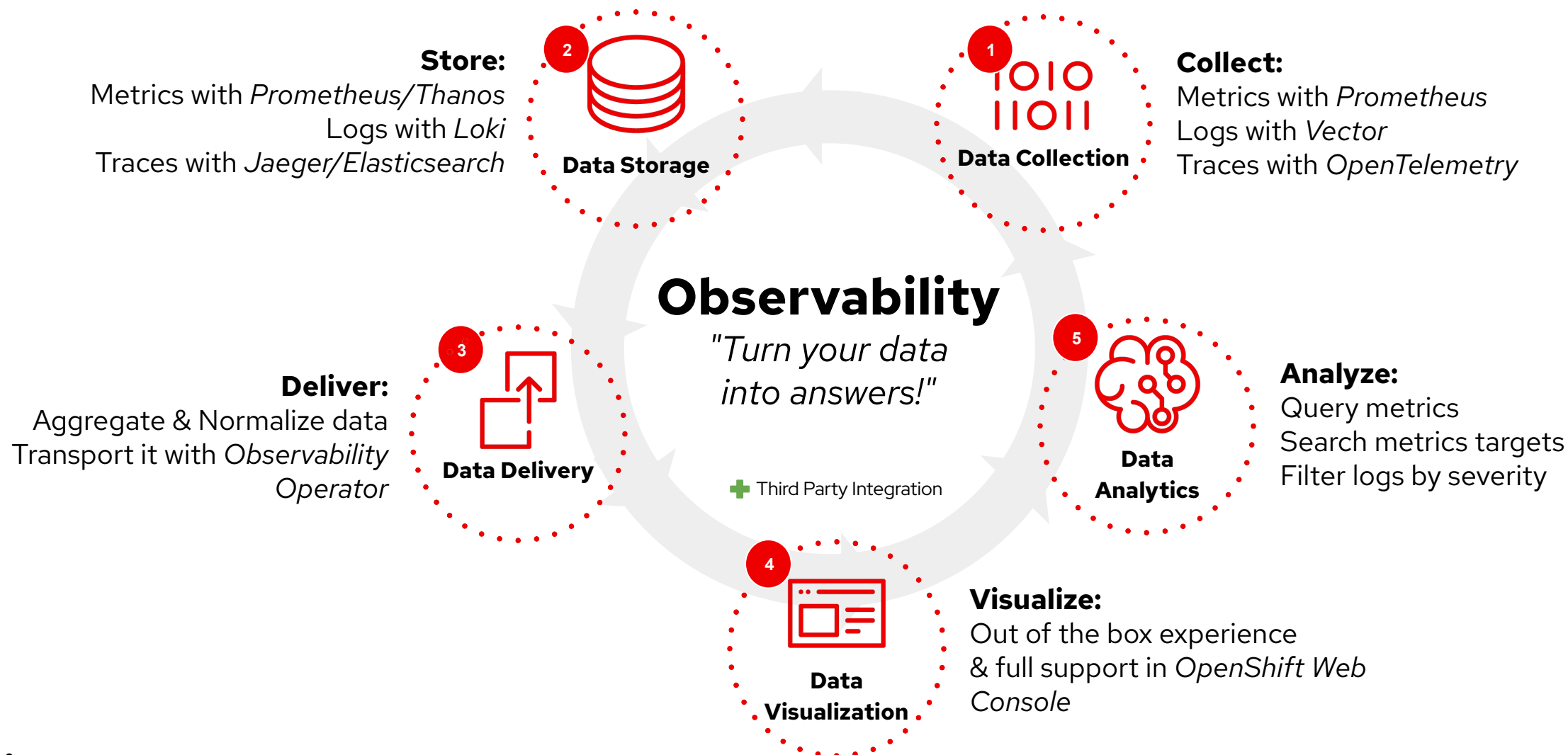


### Reduce Dependency on Legacy Virtualization

- Eliminate legacy hypervisor hosting your container platform.
- Underlying virtualization layer is included with hosted OpenShift cluster entitlements (no separate licensing needed)



## OpenShift Observability: Five Pillars







# Insights Advisor for OpenShift

- ▶ **Free service leveraging Red Hat experience with supporting and operating OpenShift**
- ▶ Insights Advisor UI adds **Upgrade risks (Preview)** - ML powered technology to identify potential blockers that could interrupt OCP upgrade flow
- ▶ **New Insights recommendations** focusing on preventing issues with OpenShift Data Foundation (ODF), OpenShift Cluster Version Operator (CVO) and OpenShift Cluster Autoscaler Operator (CAO)
- ▶ Insights recommendations available in Hybrid Cloud Console -> **Cluster History** page

Red Hat Hybrid Cloud Console

Services Favorites

Beta on **Turn on Beta!**

60e1fbfb-308f-4f1f-a212-c21a5097d05f

UUID: 60e1fbfb-308f-4f1f-a212-c21a5097d05f  
Last seen: 24 Apr 2023 07:40 UTC

**Resolve upgrade risks**  
There are risks present that could impact the success of your cluster upgrade. For the best performance, resolve these risks in the **Upgrade risks** tab before upgrading.

Recommendations **Upgrade risks**

**Alerts firing** (3 upgrade risks)

Learn how to resolve your alert firing risks.

Name	Status	Namespace
ClusterOperatorDown	Critical	openshift-cluster-version
ClusterOperatorDown	Critical	openshift-cluster-version
etcdMembersDown	Critical	openshift-etcd

**Cluster operators** (10 upgrade risks)

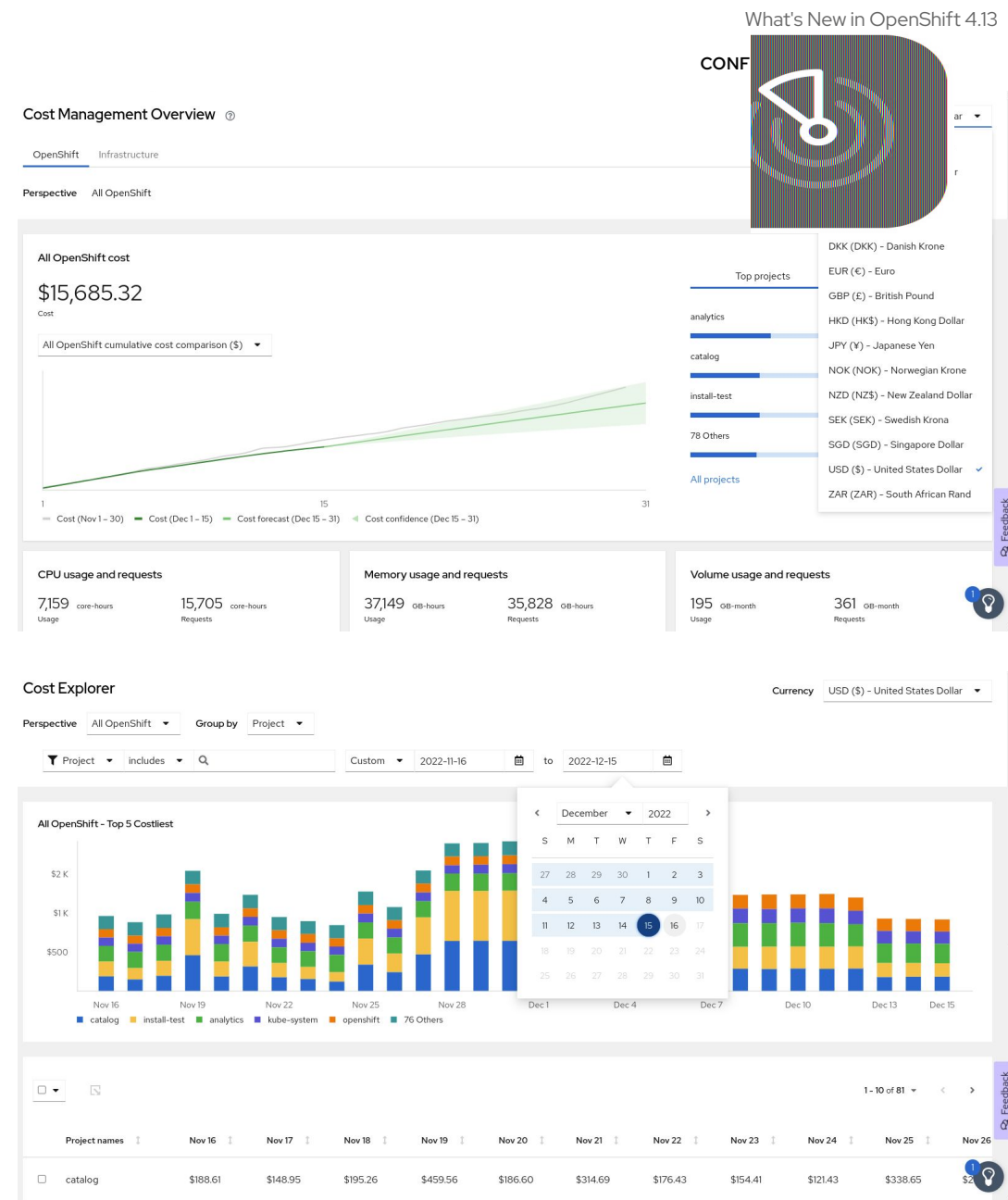
Learn how to resolve your cluster operator risks.

Name	Status	Message
authentication	Available	WellKnown_NotReady
machine-config	Available	-
authentication	Available	APIServerDeployment_UnavailablePod:WellKnownReadyController_SyncError

Feedback

# Insights Cost Management

- ▶ **Free service to monitor per-resource (namespace, cluster, node, tag) usage and spending on-prem and major clouds**
- ▶ **Cost of running Openshift**, i. e. reporting and distributing cost of control plane and unallocated capacity
- ▶ Lots of enhancements for **more accurate cost reporting** and including additional AWS costs
- ▶ **Upload past data** and fill data gaps (improve continuity of reports)
- ▶ **Customer-side filtering** of billing data. Users no longer need to share all their cloud data.
- ▶ Initial support of **Oracle Cloud Infrastructure**



# OpenShift Roadmap

## Near Term

(2Q 2023)

### PLATFORM

- Custom tags on Azure (TP)
- IPI for GCP shared VPC (XPN)
- Confidential computing and Shielded VMs on GCP
- vSphere multi-cluster, multi-datacenter support (GA)
- vSphere 8 support
- vSphere VMcrypt support (UPI)
- IBM Secure Execution on IBM zSystems and IBM LinuxONE GA
- Control node Scaling with ControlPlane Machine sets (AWS, Azure, GCP & vSphere)
- Stronger Cipher support for etcd encryption (AESGCM)
- Support for multiple values for ServiceAccountIssuer
- GCP cloud provider for OpenShift on ARM
- CoreOS Layering off-cluster builds (GA)
- Gateway API / Ingress Controller support
- Network Topology and Analysis Tooling
- SmartNIC Integrations, eBPF Support
- Utilize cgroups v2 (GA); Crun in Openshift (GA)
- Run once duration override
- CMA (custom metric autoscaler) GA
- Hosted Control Planes on AWS (incl. Arm control plane) TP
- Hosted Control Planes in ACM/MCE AWS/BM (TP)
- Hosted Control Planes in ACM/MCE KubeVirt (TP)
- Hosted Control Planes TP for Agent in ACM & MCE
- Node firewall support
- Azure CSI migration
- IBM PowerVS IPI (GA)

## Mid Term

(2H 2023)

### PLATFORM

- OpenShift on Oracle Cloud Infrastructure with VMs
- KMM in-tree kmod replacement, kmod granular upgrade flow
- Azure managed identity support
- Custom tags on GCP (TP)
- Agent Installer install OpenShift from ISO
- vSphere static IPs and multi-subnet support
- vSphere datastore clusters without storage vMotion
- vSphere CSI migration
- Multi-Arch Hosted Control Planes (Hypershift)
- Hosted Control Planes in ACM/MCE AWS/BM (GA)
- Multi-Architecture Compute support
- CoreOS Layering on-cluster build option
- Pod Security Admission enforcement GA
- Agent Installer (air-gapped installs) GUI
- Assisted Installer enable MCE and Hypershift
- ACM support for ZTP of BM clusters from ROSA
- BGP Advertised Services (FRR)
- Multi cluster Network Observability
- Automated etcd backup
- SWAP in Openshift (TP)
- CRI-O support for sigstore

## Long Term

(CY 2024+)

### PLATFORM

- OpenShift on Oracle Cloud Infrastructure with Baremetal
- Alibaba Cloud IPI (GA)
- Azure China
- Hosted Control Planes in ACM/MCE KubeVirt (GA)
- Stretched Cluster support on multiple Openstack AZs (GA)
- OpenStack Full Dual Stack support (control & workload) (GA)
- User Namespace
- Bandwidth-Aware Scheduler (QoS)
- Gateway API (GA)
- Ingress traffic mirroring/splitting
- Network Policy v2
- Routable IPs for Pods
- ESNI/ECH Support
- Automatic Intelligent Sharding
- Automatic etcd restore
- Kube KMS w/user provided plugin
- OpenShift CLI manager (via KREW) GA
- CoreOS Layering custom first-boot images
- CoreOS y-stream updated first-boot images
- Enable user namespaces

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# Leading With Containers

OpenShift BackUp / DR / HA?

Alfred Bach

PSA RedHat EMEA

# BACKUP an OPENSIFT Cluster

The screenshot shows the Red Hat Customer Portal interface. The top navigation bar includes the Red Hat logo, 'Red Hat Customer Portal', and links for 'Products & Services', 'Tools', 'Security', and 'Community'. Below this, a breadcrumb trail reads: 'Products & Services > Product Documentation > OpenShift Container Platform > 4.11 > Backup and restore'.

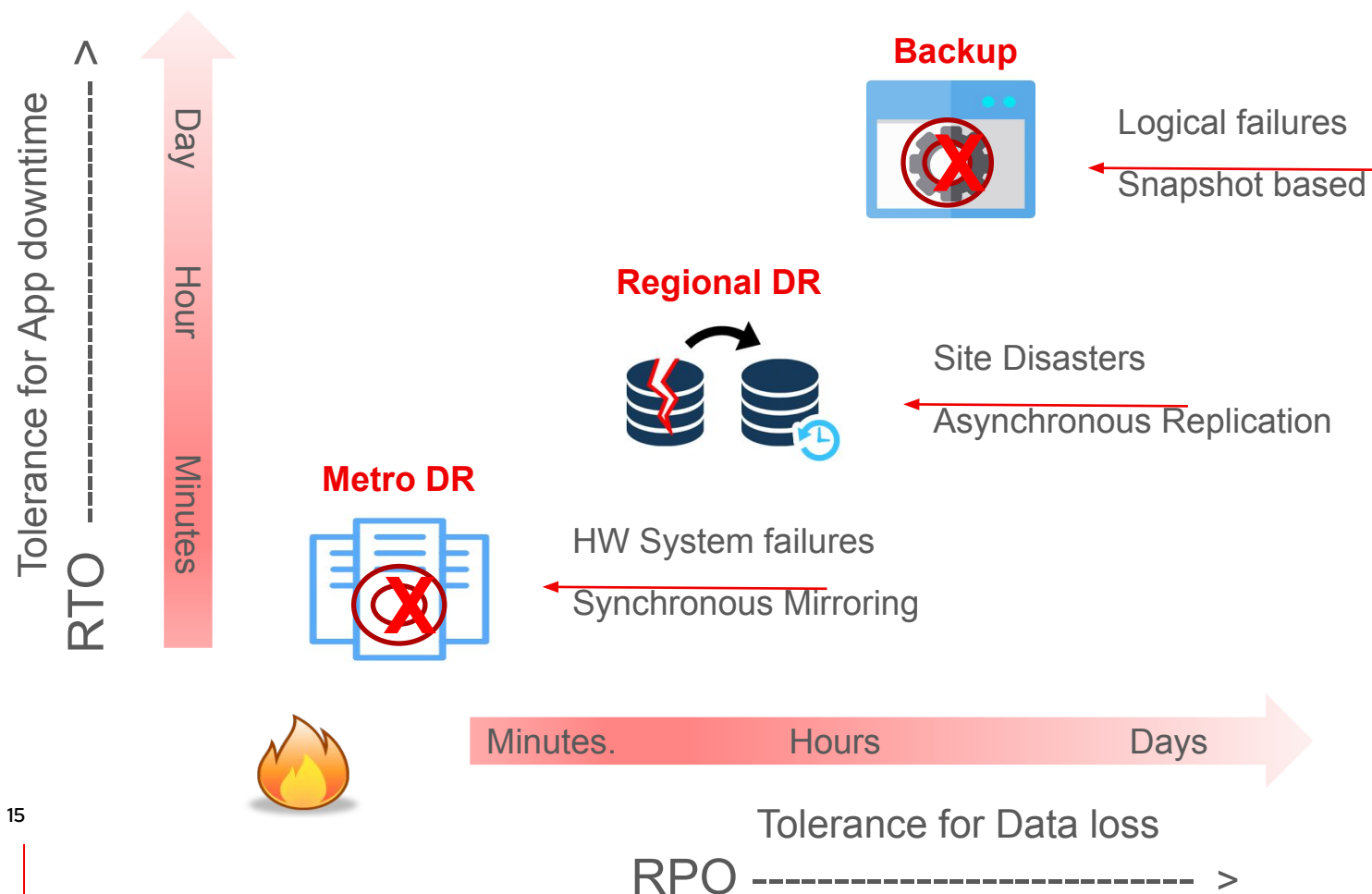
On the left side, there is a sidebar with a toggle for 'Expand all' and 'Collapse all'. The sidebar contains a list of topics under the heading 'Backup and restore':

- 1. Backup and restore >
- 2. Shutting down the cluster gracefully >
- 3. Restarting the cluster gracefully >
- 4. Application backup and restore >
- 5. Control plane backup and restore >
- Legal Notice

The main content area on the right is titled 'Backup and restore'. It specifies 'OPENSIFT CONTAINER PLATFORM 4.11' and the main heading 'Backing up and restoring your OpenShift Container Platform cluster'. Below this, it lists 'Red Hat OpenShift Documentation Team' and a link to 'Legal Notice'. An 'Abstract' section follows, stating: 'This document provides instructions for backing up your cluster's data and for recovering from various disaster scenarios.'

At the bottom right of the main content area, there is a 'NEXT →' link.

# Resiliency Solutions for different service level objectives



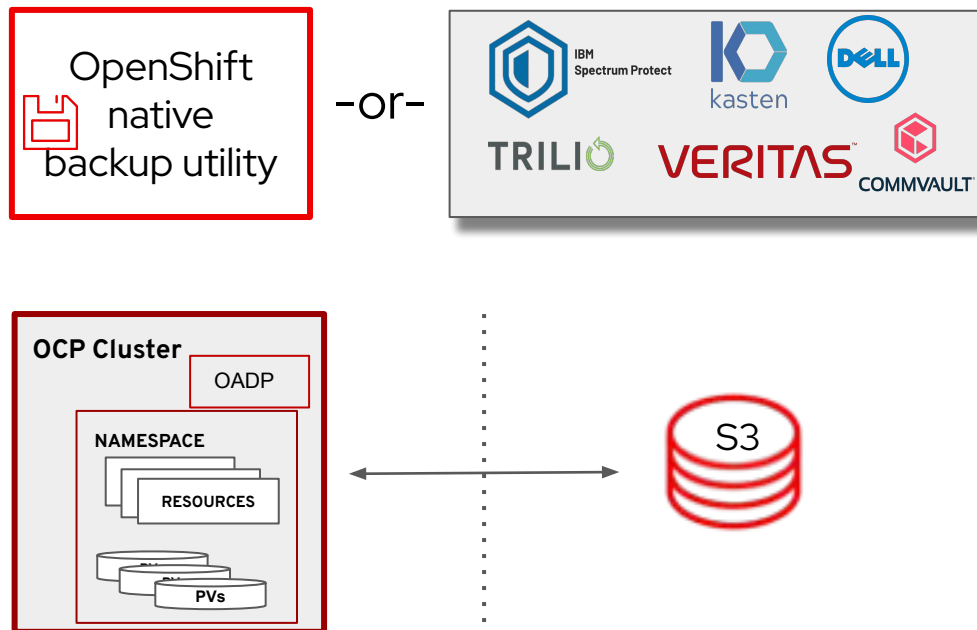
- ▶ Comprehensive protection solutions against wide spectrum of failures
- ▶ Beyond Data Protection --> Full Application protection
- ▶ Resiliency built into the platform – Available to all stateful and stateless applications on OpenShift
- ▶ OCP + ODF + ACM integrated stack lends towards Automated and Simplified Application granular protection



# Backup Solutions for Red Hat OpenShift

## Business Continuity

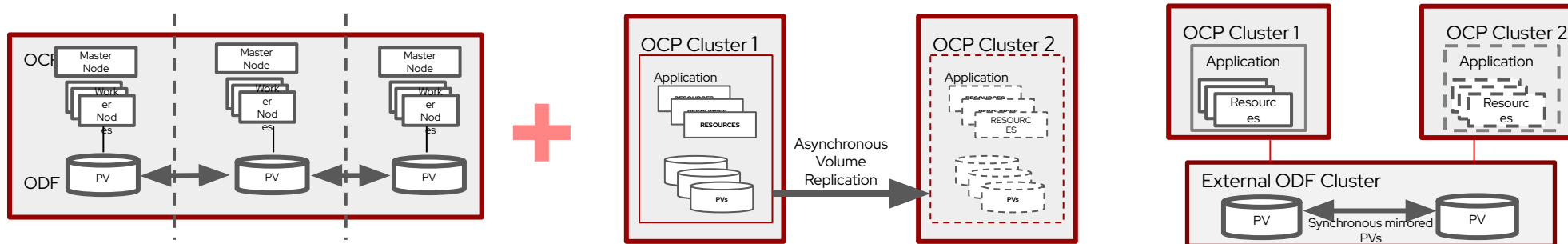
OpenShift OADP 1.1 – Native backup utility with 4.12



- **Application level (Namespace), consistent backups with OADP**
- CLI based **scheduling and management** of backups
- **Built-in data mover** enables CSI-based storage snapshots to be backed up to a remote S3 compatible object store.
  - **Pluggable DataMover** support is Tech Preview (ie. VolSync)
- **Supports all OpenShift storage provisioners** that also support CSI Snapshots



# OCP Cluster HA + DR for stateful Applications



## Cluster HA

## Regional-DR

## Metro-DR

Topology	Single OCP+ODF clusters deployed over multiple AZs in a single region	Multi OCP + ODF clusters spread over multiple regions	Multi OCP clusters + single external ODF stretched cluster deployed over low latency networks
RTO (Downtime)	RTO=0 (Continuous)*	RTO = minutes DR Automation from ACM+ODF reduces RTO	RTO = minutes DR Automation from ACM+ODF reduces RTO
RPO (Data loss exposure)	RPO=0 No Data loss due due to Synchronous mirroring of ODF data	RPO > 0; Usually 5 min or higher Depends upon network bandwidth & change rate	RPO=0 No Data loss due due to Synchronous mirroring of ODF data
Infra Requirements	Multi-AZ supported public clouds (vSphere support in OCP 4.10)	All ODF supported platforms No network latency limits	On-prem only (vSphere, bare metal) <10ms network latency between sites

V0000000



\* Subject to RWO PV limitations

# Want to learn more about Upcoming Trainings:

## Architecture workshop - OpenShift infrastructure

<https://connect.redhat.com/en/training/emea/architecture-workshop-openshift-infrastructure>

07 - 08 Aug 2023      Online instructor-led

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16 - 17 Oct 2023      Online instructor-led

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04 - 05 Dec 2023      Online instructor-led

# Thank you

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