

# OpenShift Storage

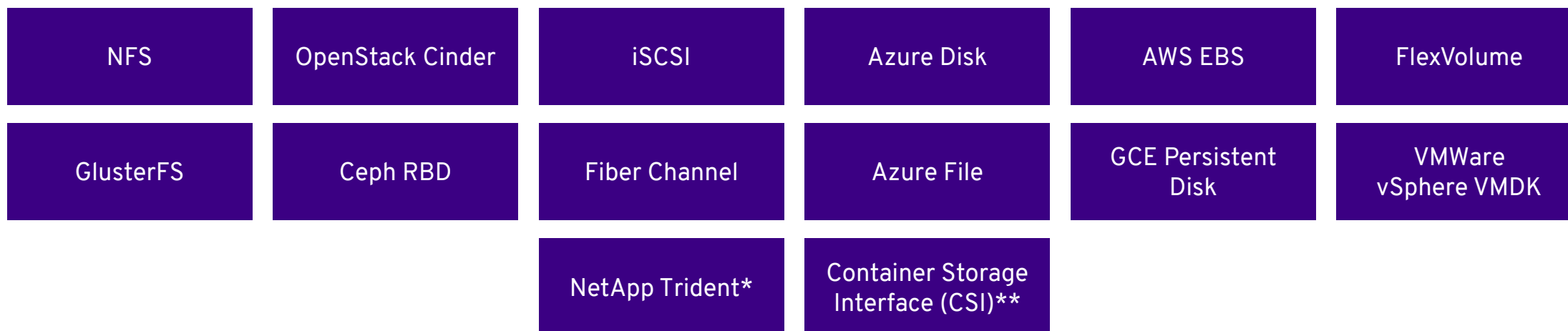
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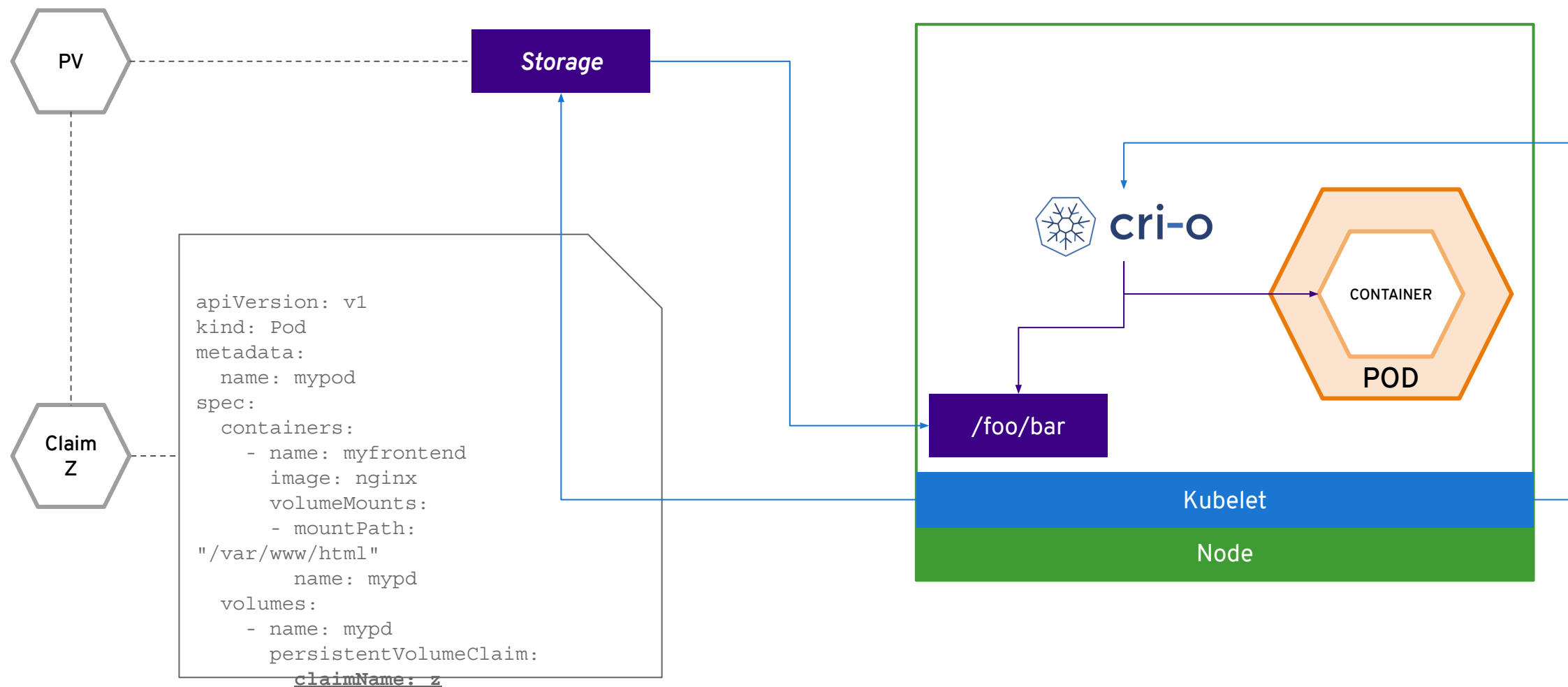
# Persistent Storage

Connecting real-world  
storage to your  
containers to enable  
stateful applications

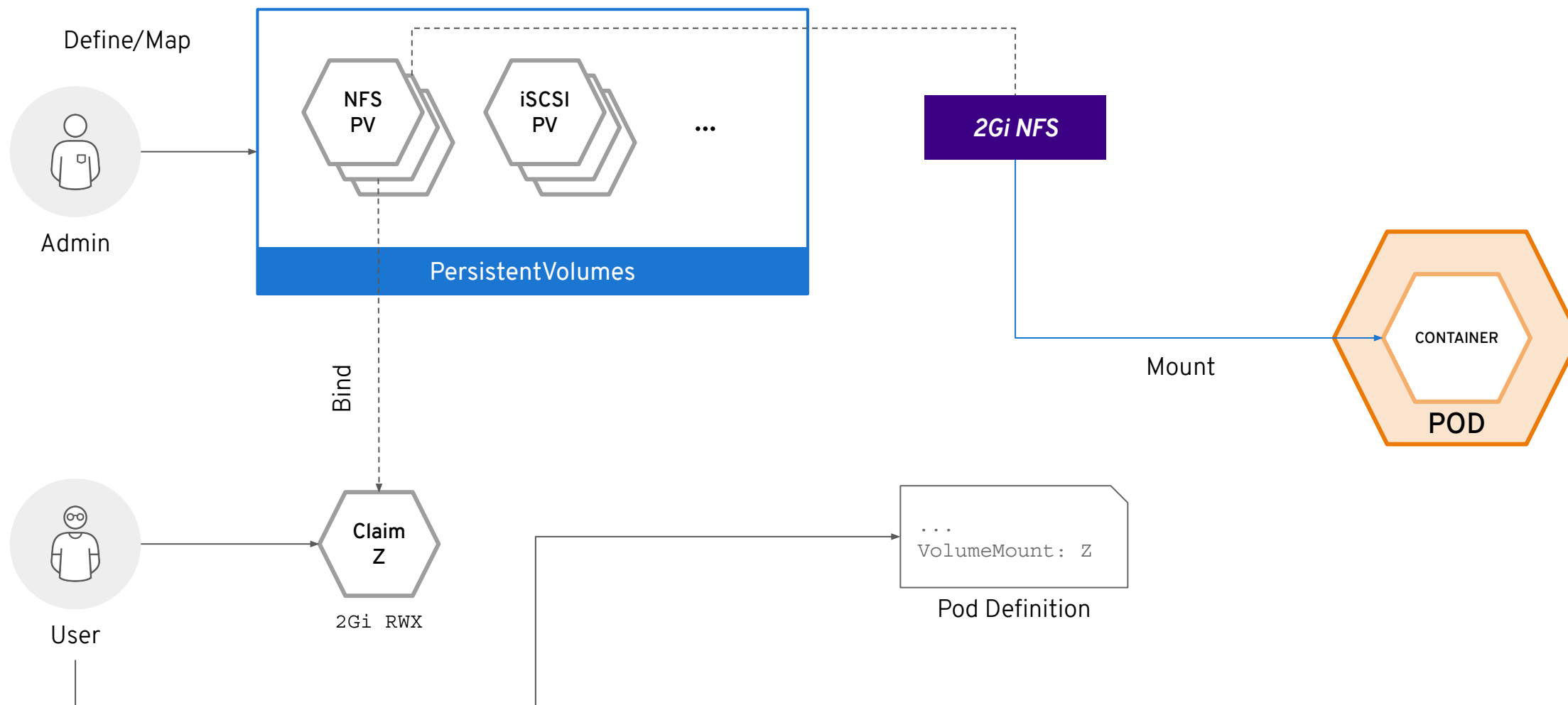
# A broad spectrum of static and dynamic storage endpoints



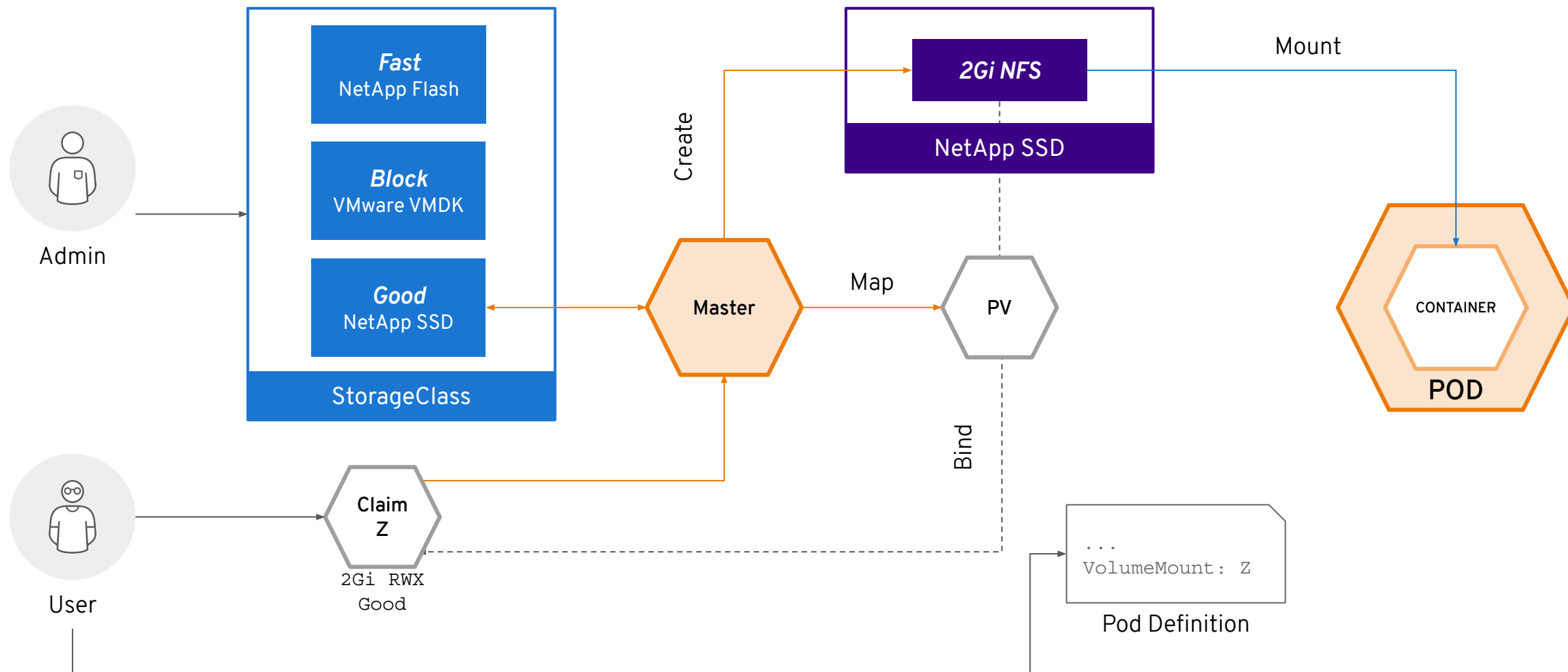
# PV Consumption



# Static Storage Provisioning



# Dynamic Storage Provisioning



# Red Hat OpenShift Container Storage

## What & Why

# What is it?

Add-On for OpenShift for running stateful apps

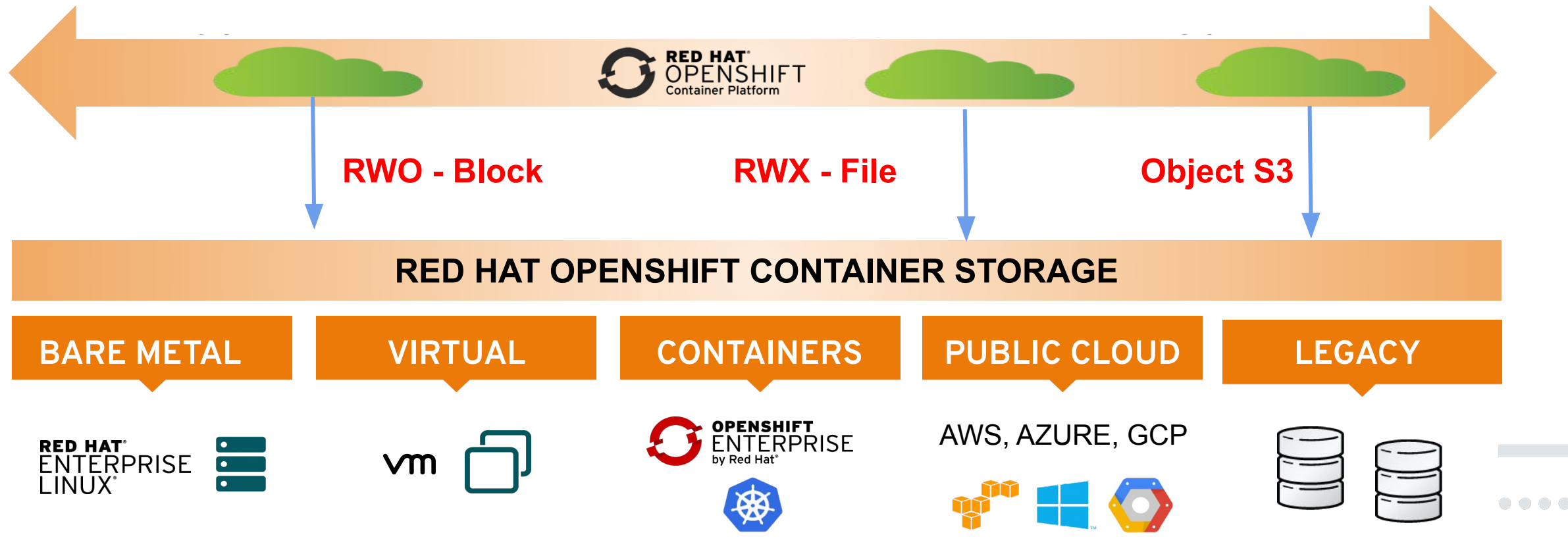
## Highly scalable, production-grade persistent storage

- For **stateful applications** running in Red Hat® OpenShift
- Optimized for Red Hat **OpenShift Infrastructure services**
- Developed, released and deployed in synch with Red Hat OpenShift
- Supported via a single contract with Red Hat OpenShift
- Complete persistent storage fabric across hybrid cloud for OCP



# Complete Storage for Container Platform

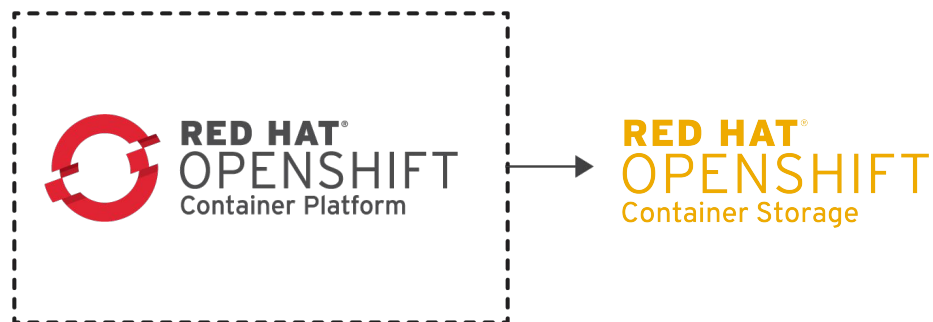
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Provides Storage for All Apps and infrastructure Services  
in their native interfaces

# TWO FLAVORS OF CONTAINER STORAGE

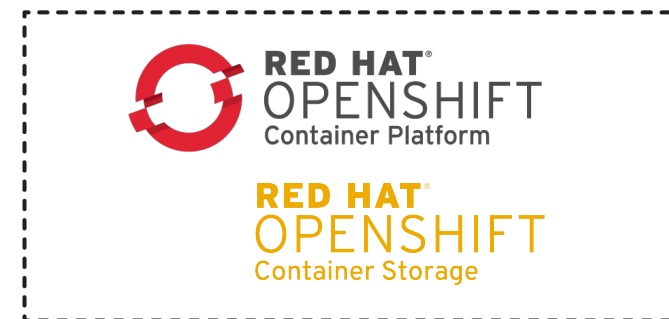
## Flexibility in Deployment



### OPENSIFT CONTAINER STORAGE INDEPENDENT MODE

Use existing investment in traditional storage,  
managed by storage admin – attach to standalone storage

OCS 4.3

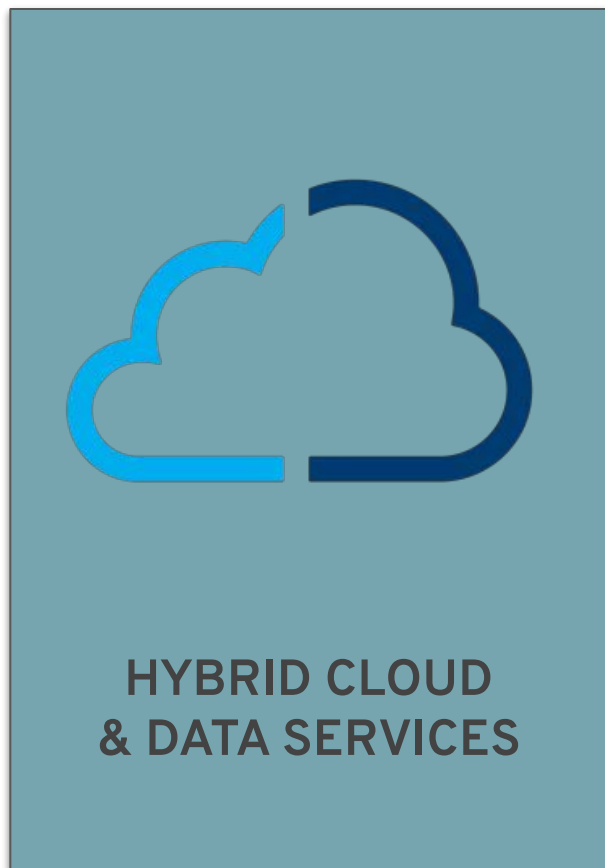
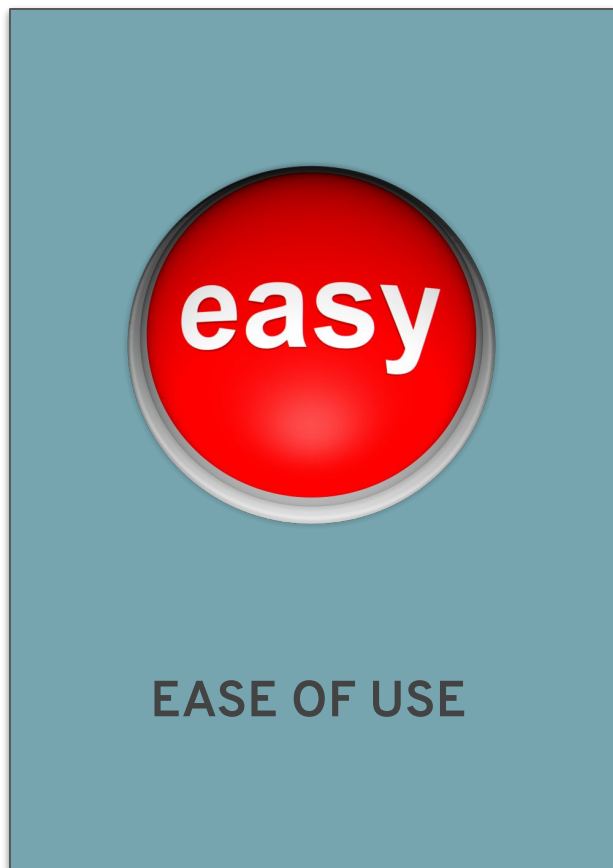


### OPENSIFT CONTAINER STORAGE CONVERGED MODE

Highly scalable, enterprise-grade storage,  
fully integrated into OpenShift Container Platform

OCS 4.2

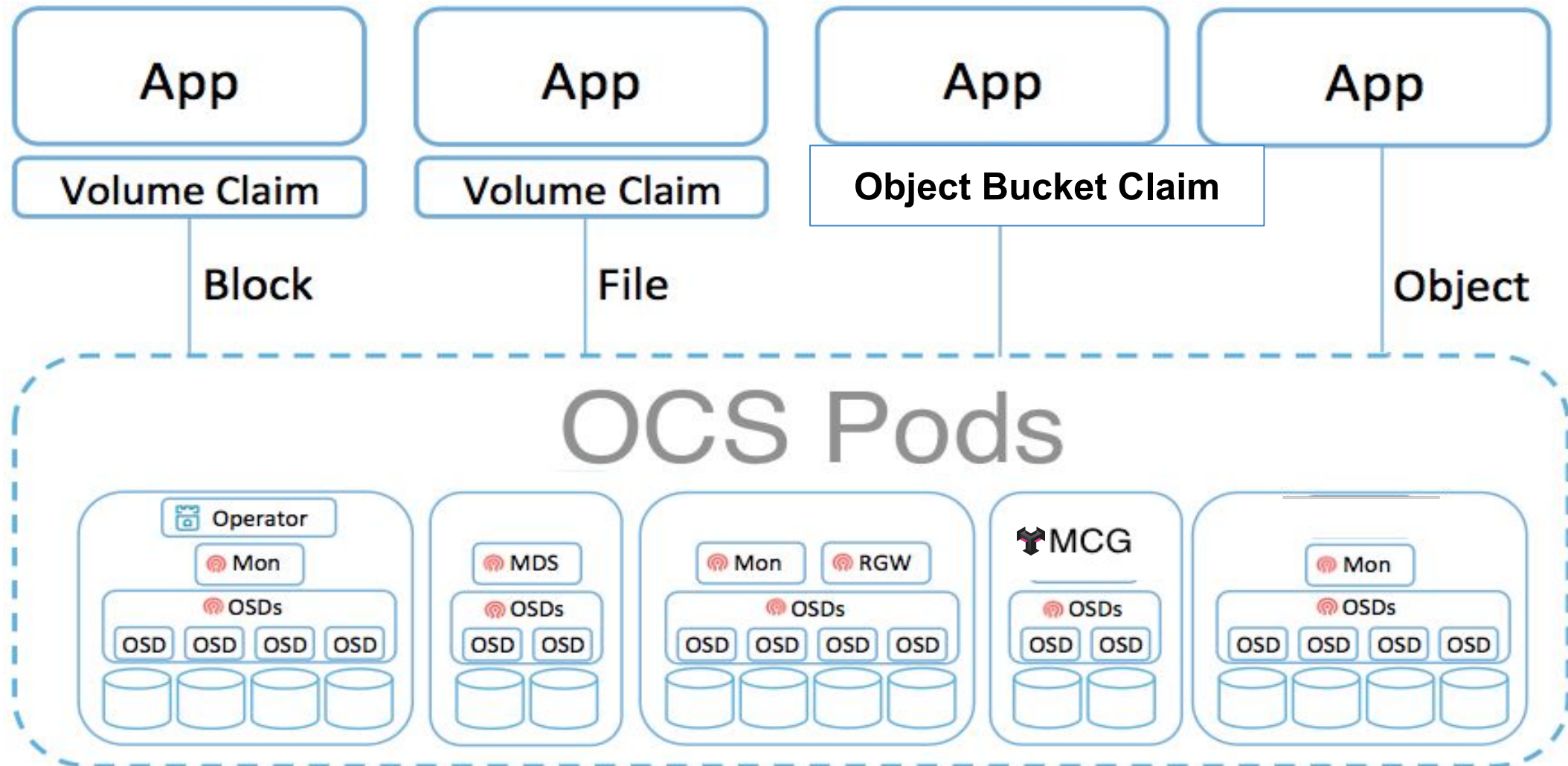
# OCS 4.X - Focus Areas



# Ease of Use Hybrid Cloud Kubernetes Storage

# OCS 4.x Operator Install, Upgrade, Expansion

OCS Operator based on Rook.io with Operator Lifecycle Manager (OLM)



# OCS 4.x Operator Driven Install from OLM

The screenshot displays the Red Hat OpenShift Container Platform OperatorHub interface. The left sidebar contains navigation links: Administrator, Home, Dashboards, Projects, Search, Explore, Events, Operators (selected), OperatorHub, Installed Operators, Workloads, Networking, Storage, Builds, Monitoring, Compute, and Administration. The main content area shows the OperatorHub page with a search bar and a list of operators. The 'Storage' category is selected, showing 6 items. The 'OCS 4.x Operator' is highlighted with a red circle and a pink arrow. The operator card for the OCS 4.x Operator includes the following details:

- Operator:** OCS 4.x Operator
- Provider:** Red Hat
- Version:** 4.12.0
- Category:** Storage
- Install State:** Not Installed (5)
- Provider Type:** Certified (3)

The operator card also includes a description: "Manage the full lifecycle of installing, configuring and managing AWS S3 Provisioner." and a link to the "Developer Catalog" for more information.

# OCS 4.x Simple Install

**Administrator** | You are logged in as a temporary administrative user. Update the [cluster OAuth configuration](#) to allow others to log in.

Project: openshift-storage

Openshift Container Storage Operator > Create OCS Cluster Service

## Create New OCS Service

[Edit YAML](#)

OCS runs as a cloud-native service for optimal integration with applications in need of storage, and handles the scenes such as provisioning and management.

**Select Nodes \***

A minimum of 3 nodes needs to be labeled with `cluster.ocs.openshift.io/openshift-storage=""` in order to create the OCS Service.

**Info:** An AWS bucket will be created to provide the OCS Service.

Select at least 3 nodes you wish to use. \*

Filter by name...

	Name	Role	CPU	Memory
<input type="checkbox"/>	ip-10-0-130-15.ec2.internal	worker	2 CPU	7.2 GiB
<input type="checkbox"/>	ip-10-0-130-197.ec2.internal	master	4 CPU	15.07 GiB
<input type="checkbox"/>	ip-10-0-149-152.ec2.internal	master	4 CPU	15.07 GiB
<input checked="" type="checkbox"/>	ip-10-0-156-133.ec2.internal	worker	2 CPU	7.2 GiB
<input checked="" type="checkbox"/>	ip-10-0-160-15.ec2.internal	worker	2 CPU	7.2 GiB
<input checked="" type="checkbox"/>	ip-10-0-161-253.ec2.internal	master	4 CPU	15.07 GiB

3 node(s) selected

**Storage Class**

gp2

[Create](#) [Cancel](#)



# OCP + OCS Integrated Monitoring and Management

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The screenshot displays the Red Hat OpenShift Container Platform OCS Dashboard. The interface includes a sidebar with navigation options like Administrator, Home, Dashboards, Projects, Search, Explore, Events, Operators, Workloads, Serverless, Networking, Storage, Persistent Volumes, Persistent Volume Claims, Storage Classes, Builds, Monitoring, Compute, and Administration. The main content area shows the OCS Dashboard with a red circle highlighting the title. The dashboard provides an overview of the cluster's health, alerts, capacity, and utilization. A red circle highlights the 'OCS Dashboard' title.

**Cluster Details:**

- Cluster ID: 31e527d4-0c22-4a25-8680-870ee113cfd
- Provider: AWS
- OpenShift Version: 4.2.0-0.ci-2019-08-20-173300

**Cluster Inventory:**

- 6 Nodes (6 green, 0 red)
- 423 Pods (416 green, 6 red, 1 warning)
- 6 PVCs (5 green, 1 warning)
- VMs (0 green, 0 red, 0 warning)
- 3 Bare Metal Hosts (0 green, 0 red, 0 warning)

**Cluster Health:**

- Multiple errors: Cluster health is degraded.

**Alerts:**

- API server is returning errors for 100% of requests for GET /apis/custom.metrics.k8s.io/v1beta1.
- Cluster Autoscaler has 1 unschedulable pods.
- API server is returning errors for 100% of requests for GET /apis/custom.metrics.k8s.io/v1beta1.
- The average time between iptables resyncs is too high. NOTE - There is some scrape delay and other offsets, 90s isn't exact but it is still too high.

**Cluster Capacity:**

- CPU: 79% available out of 100% (21% used)
- Memory: 66.81 Gi available out of 70.33 Gi (5% used)
- Storage: Not available
- Network: 7.5 GBps available out of 7.5 GBps (0% used)

**Cluster Utilization:**

Resource	Usage	Available
CPU	21%	79%
Memory	3.52 Gi	66.81 Gi
Disk Usage		

**Events:**

- a minute ago: istio-pilot-577ff6784c-w5xk8: pod didn't trigger scale-up (it wouldn't fit if a new node is added):
- 2 minutes ago: istio-pilot-577ff6784c-w5xk8: 0/6 nodes are available: 3 Insufficient cpu, 3 node(s) had taints that the pod didn't tolerate.
- 2 minutes ago: imag111-1-28bit: Back-off restarting failed container
- 3 minutes ago: istio-ingressgateway-54968c8854-vrbm9: Readiness probe failed: HTTP probe failed with statuscode: 503
- 3 minutes ago: cluster-local-gateway-58758f588-6qnzr: Readiness probe failed: HTTP probe failed with statuscode: 503

**Top Consumers:**

Pods: By CPU

Pods by CPU time

Pod	CPU Time
prometheus-k8s-0	0.431
prometheus-k8s-1	0.33
kube-apiserver-ip-10-0-146-123.us-east-2.compute.internal	0.16
kube-apiserver-ip-10-0-162-138.us-east-2.compute.internal	0.09
kube-apiserver-ip-10-0-136-50.us-east-2.compute.internal	0.02

**Cluster Utilization:**

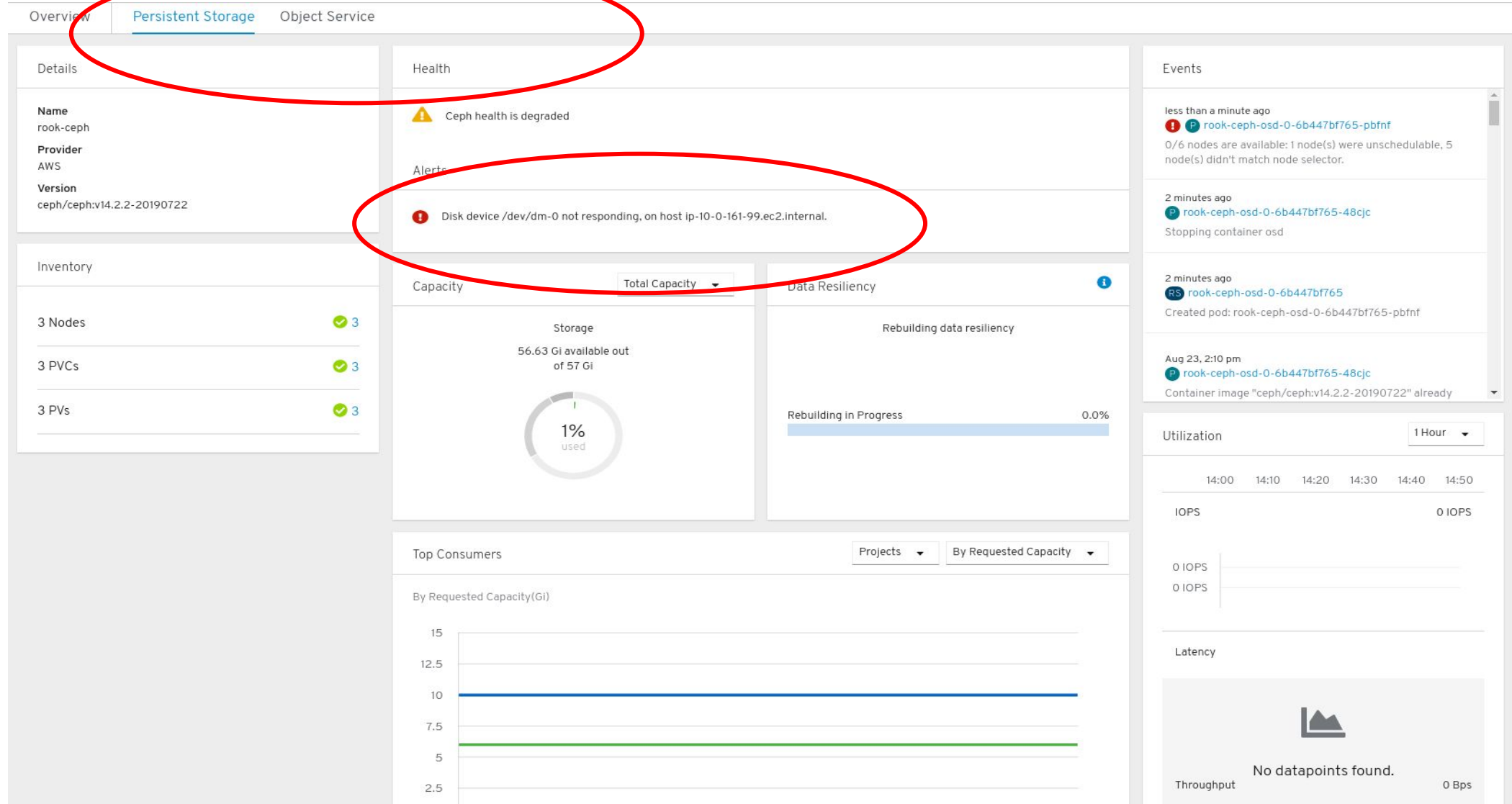
No datapoints found.

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# OCS Integrated Dashboard

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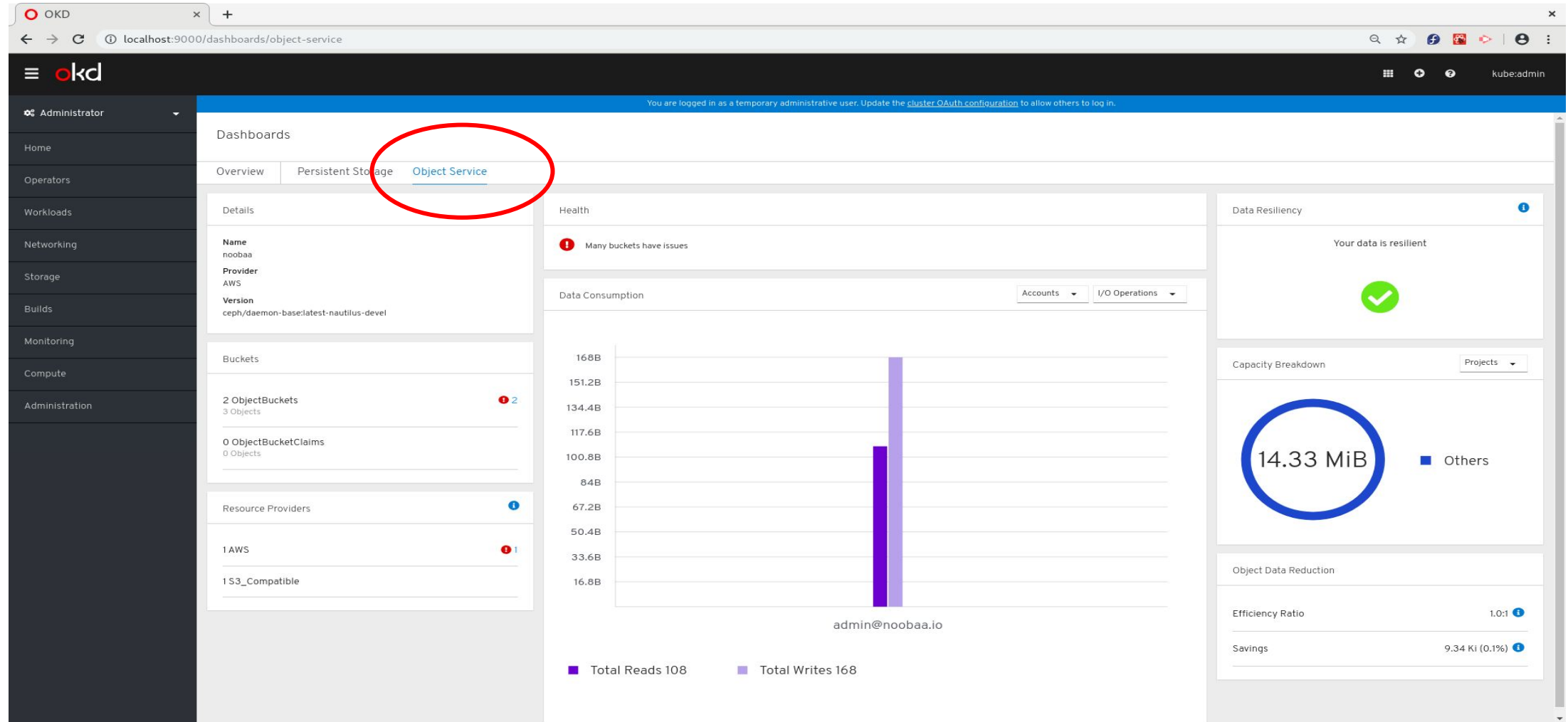


Health, Capacity, Performance, Configuration, Alerts

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# OCS Integrated Dashboard - Object Storage

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Monitoring and Alerts

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# Ease of Use Hybrid Cloud Kubernetes Storage

# Red Hat OpenShift Container Storage

## Consistent Set of OpenShift Stateful Service

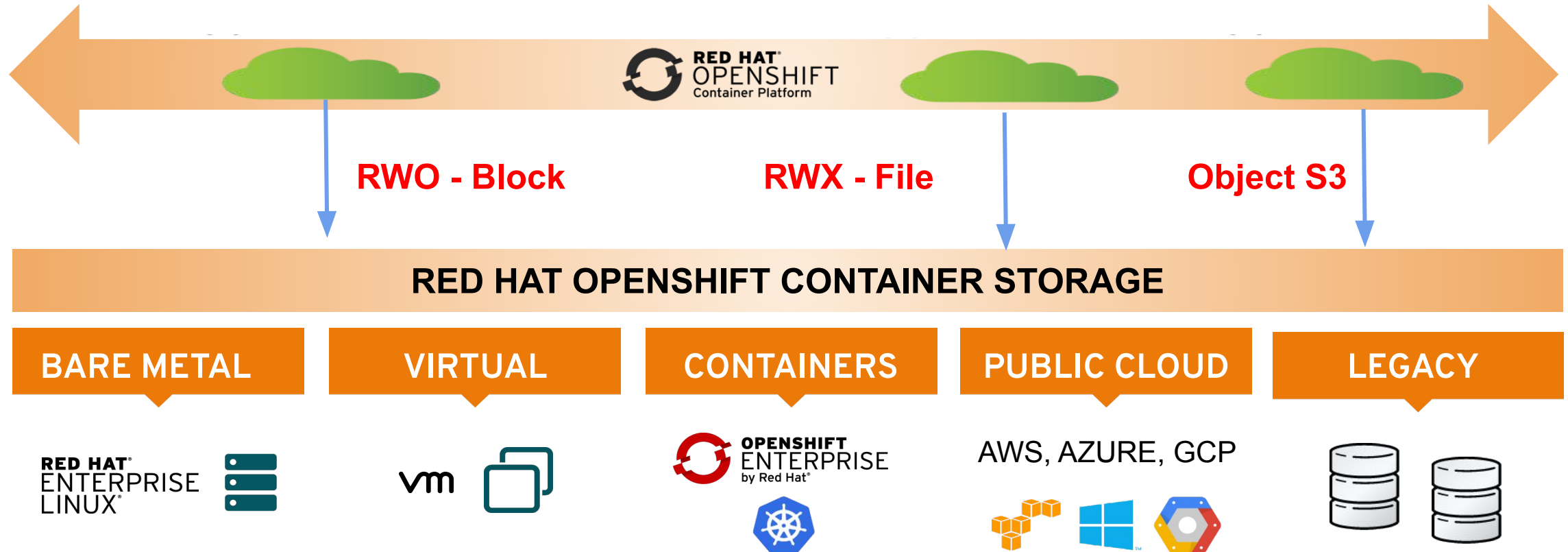


### OPEN HYBRID CLOUD IMPERATIVES

Application Portability | Platform Independence | Elastic

# Complete Storage for Container Platform

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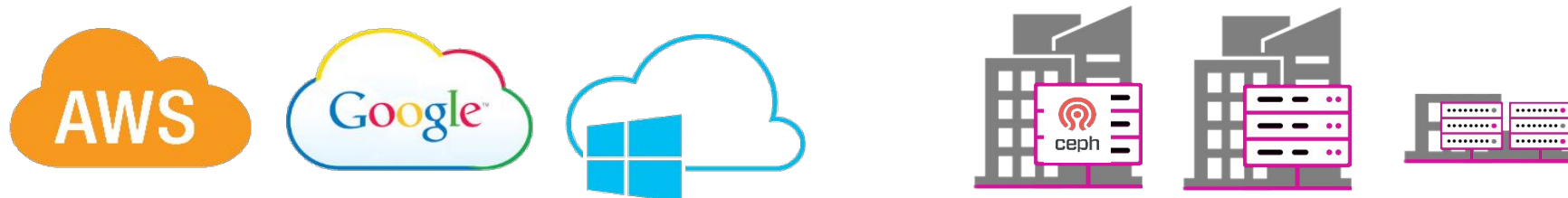
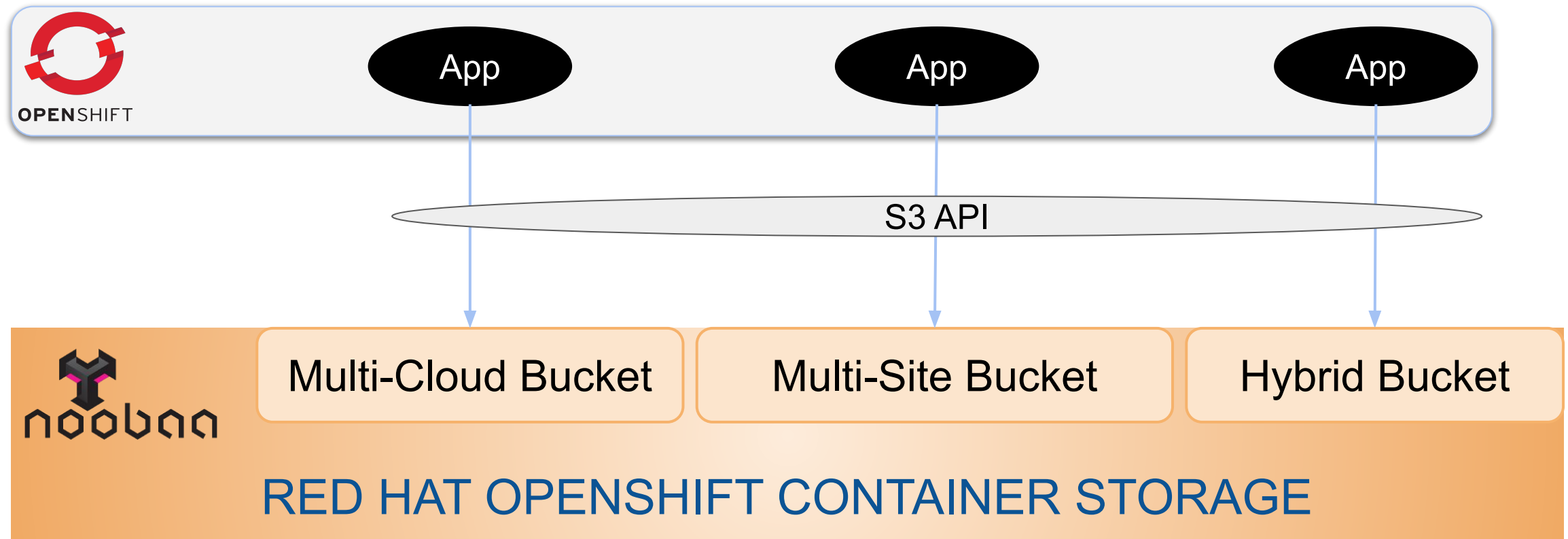


Addition of Object S3 completes the storage stack  
OCS- MCG (Noobaa) backed by RGW or cloud native S3

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# Multi-Cloud Object Gateway (NooBaa)

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Active - Active Multi Cloud Read /Write, First Iteration

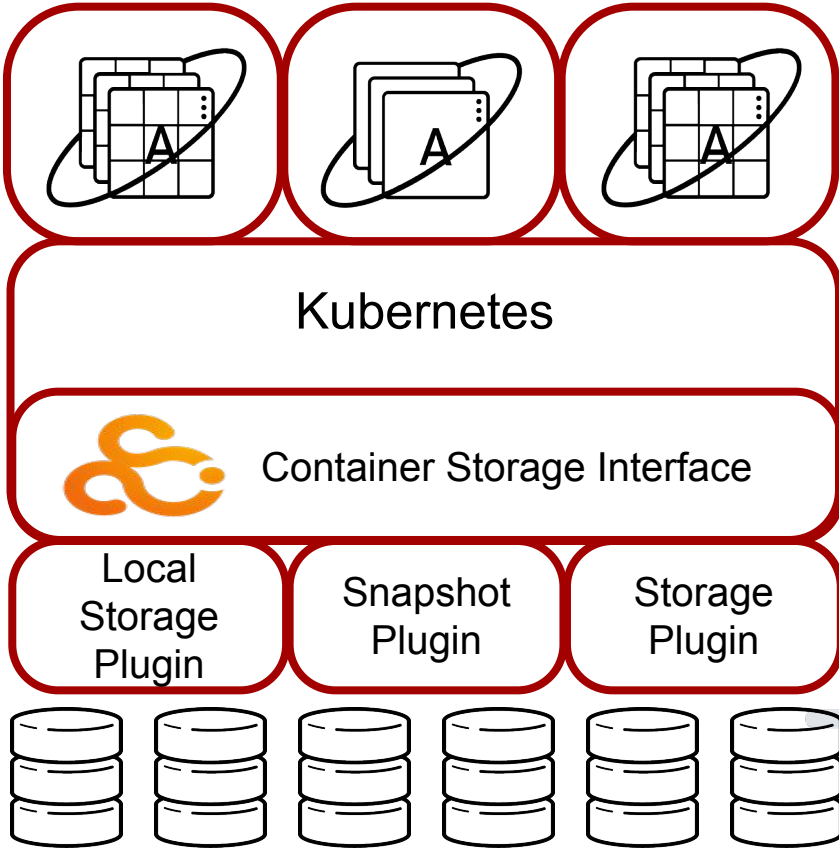
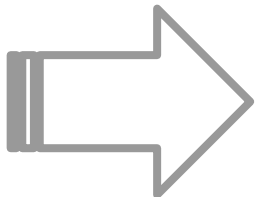
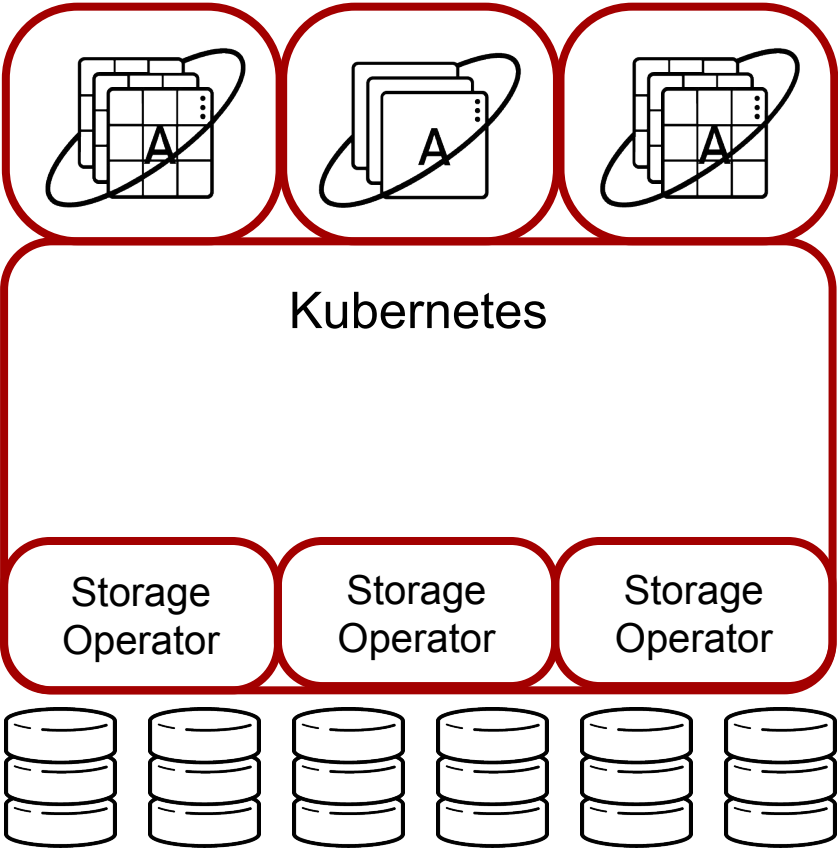
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# Ease of Use Hybrid Cloud OpenShift/Kubernetes Storage

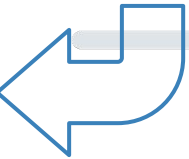
# OpenShift Storage - CSI

4.0

OCS 4.2



Updated Storage Plugin



Independant Update



# Thank you

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