



# OpenShift Container Storage

Past, present, and future

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May 8, 2019

# Presentation Outline

**Key market trends & storage biz focus**

**OCS overview & use-cases**

**OCP 4 Direction**

**OCS 4 Past, Present & Future**

**Focus Areas**

**Migration**

# KEY MARKET TRENDS



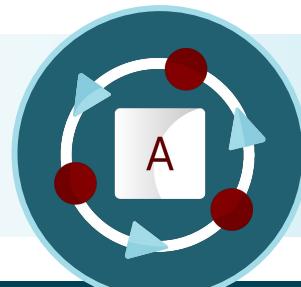
NON TRADITIONAL STORAGE BUYERS

Developers, Cloud Admins, and DevOps are decision makers



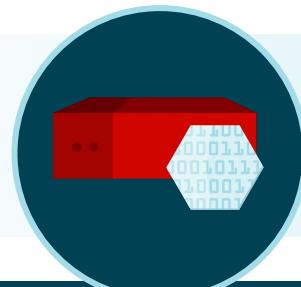
CLOUD NATIVE IS THE NEW NORMAL

Driven by the rise of Kubernetes for infrastructure orchestration



MODERN, STORAGE INTENSIVE APPLICATIONS

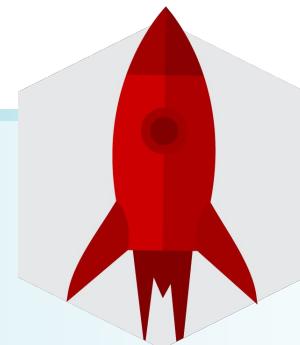
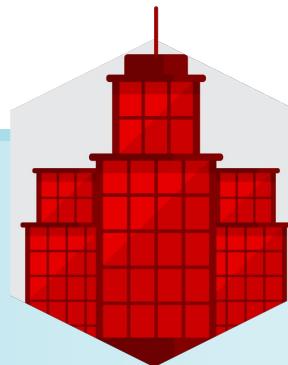
AI, ML and emerging workloads need scalable object storage



HYPERCONVERGENCE

Customers value simplicity and completeness of infrastructure

# STORAGE FOR THE OPEN HYBRID CLOUD



## OPENSIFT CONTAINER STORAGE

### COMPLETE DATA PORTABILITY

For OpenShift Across the Hybrid Cloud

## HYBRID CLOUD OBJECT STORAGE

### MOST SCALABLE DATA PLATFORM

For Data Analytics, AI/ML, and emerging workloads

## HYPERCONVERGENCE

### ELASTIC INFRA ACROSS THE DATA CENTER AND EDGE

Built to enable flexibility, scale, and ease of use

# FIND US AT RED HAT SUMMIT

redhat.com/storage

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hat.com

- At the Storage lockers
- At the Red Hat booth
- At one of Storage dedicated sessions ([red.ht/storageatsummit](http://red.ht/storageatsummit))
- At the Community Happy Hour (Tues 6:30, Harpoon Brewery)
- At the Hybrid Cloud Party (Wed, 7:30, “Committee” restaurant)



Red Hat OpenShift Container Storage  
[red.ht/videos-RHOCS](http://red.ht/videos-RHOCS)



Red Hat data analytics infrastructure solution  
[red.ht/videos-RHDAIS](http://red.ht/videos-RHDAIS)



Red Hat Hyperconverged Infrastructure  
[red.ht/videos-RHHI](http://red.ht/videos-RHHI)

# OCS Overview & Use Cases

# 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 Cluster services
- Developed, released and deployed in synch with Red Hat OpenShift
- Supported via a single contract with Red Hat OpenShift in all environments/infra

# Why do you need it?

## OCP Infrastructure



Registry

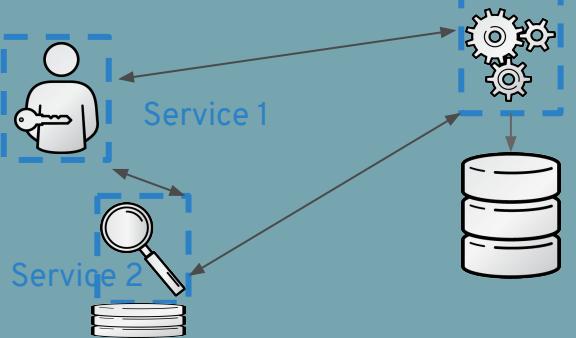


Metrics  
Prometheus



Logging

## OCP Application



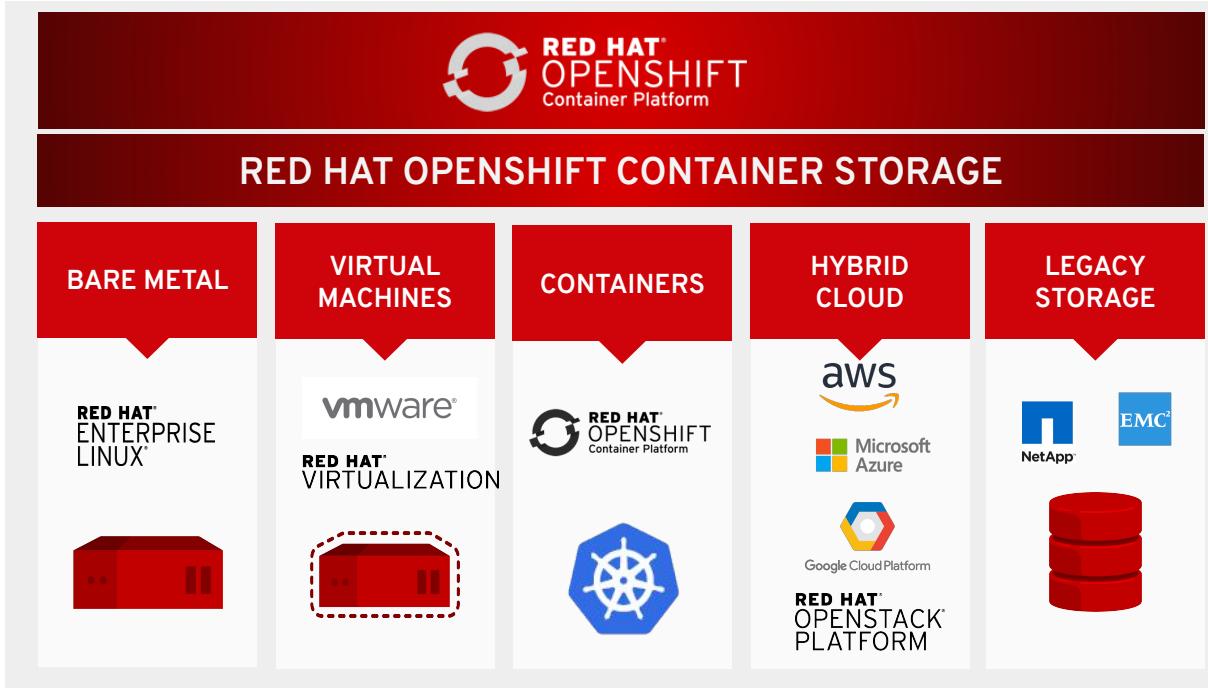
## Local/Ephemeral Storage



Red Hat OpenShift Container Storage Focus  
RWX/RWO backed by File, Block, S3

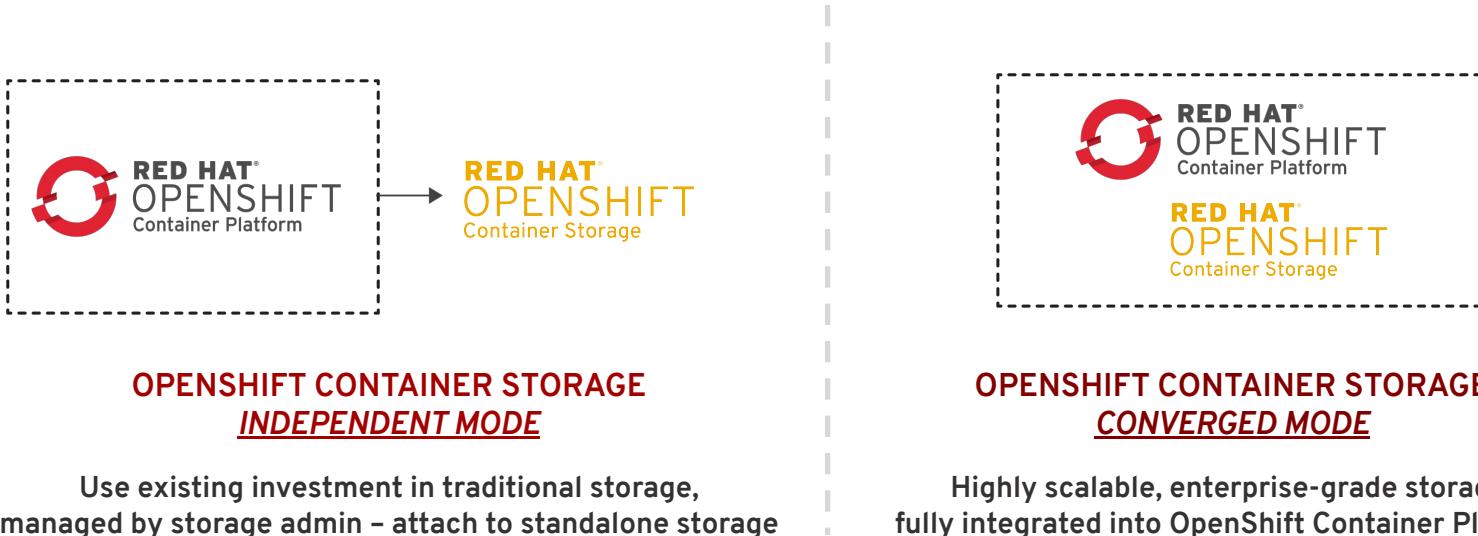
# EXPLOIT THE FULL POWER OF OPENSHIFT

consistent storage consumption, management, and operations



ANY CLOUD. ANY APP. NO LOCK IN.

# TWO FLAVORS OF CONTAINER STORAGE



# CONTAINER PLATFORM - COMPLETE FROM Red Hat



UNIFIED CLUSTER | COMPLETE PLATFORM UNIFIED | INTEGRATED & TESTED  
SINGLE VENDOR | SINGLE POINT OF SUPPORT

# OpenShift 4



## Trusted enterprise Kubernetes

- Trusted Host, Content, Platform
- Full Stack Automated Install
- Over the Air Updates & Day 2 Mgt

## A cloud-like experience, everywhere

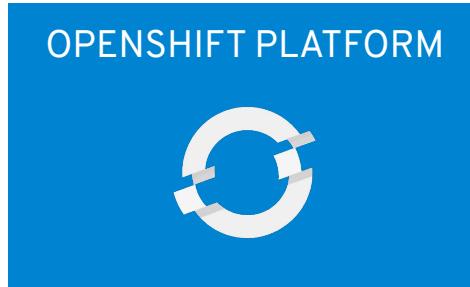
- Hybrid, Multi-Cluster Management
- Operator Framework
- Operator Hub & Certified ISVs

## Empowering developers to innovate

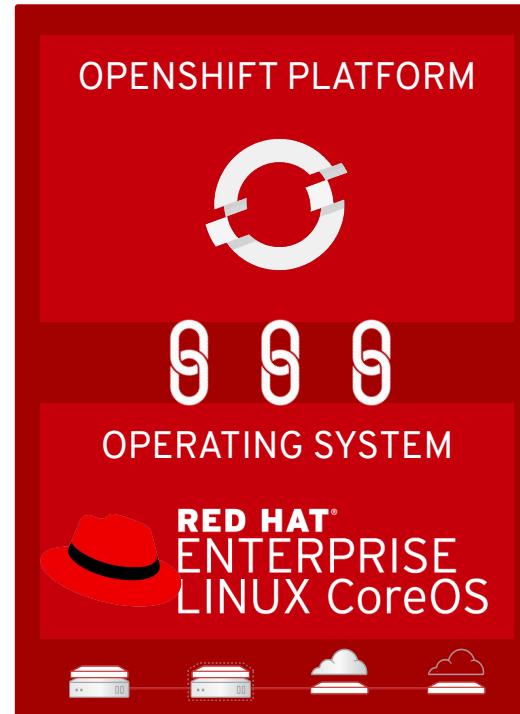
- OpenShift Service Mesh (Istio)
- OpenShift Serverless (Knative)
- CodeReady Workspaces (Che)

# FULL STACK AUTOMATED INSTALL

OPENShift 3



OPENSIFT 4



# OCS Past & Present

# We have been rewarded!

400+ customers and counting



redhat

Technologies

Services & support

Success stories

About Red Hat

PRESS RELEASE

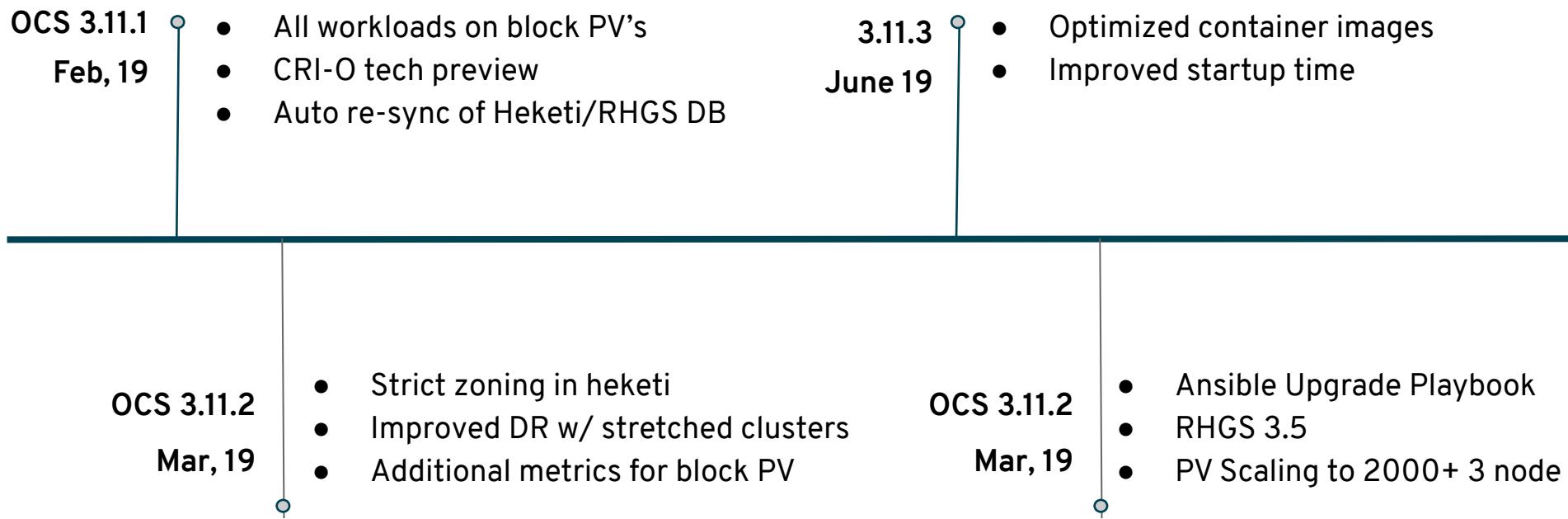
## **Growing Number of Organizations Around the World Choose Red Hat Container-Native Storage with Red Hat OpenShift Container Platform**

# Container Storage Success

## THE ROAD TO 400+ OCS/CNS CUSTOMERS



# OCS 3.11.z Roadmap



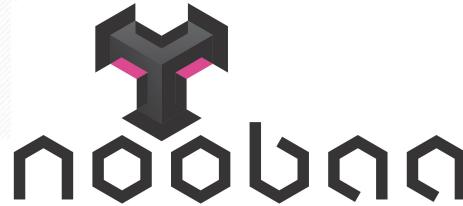
# OCS Future

# LEGAL DISCLAIMER

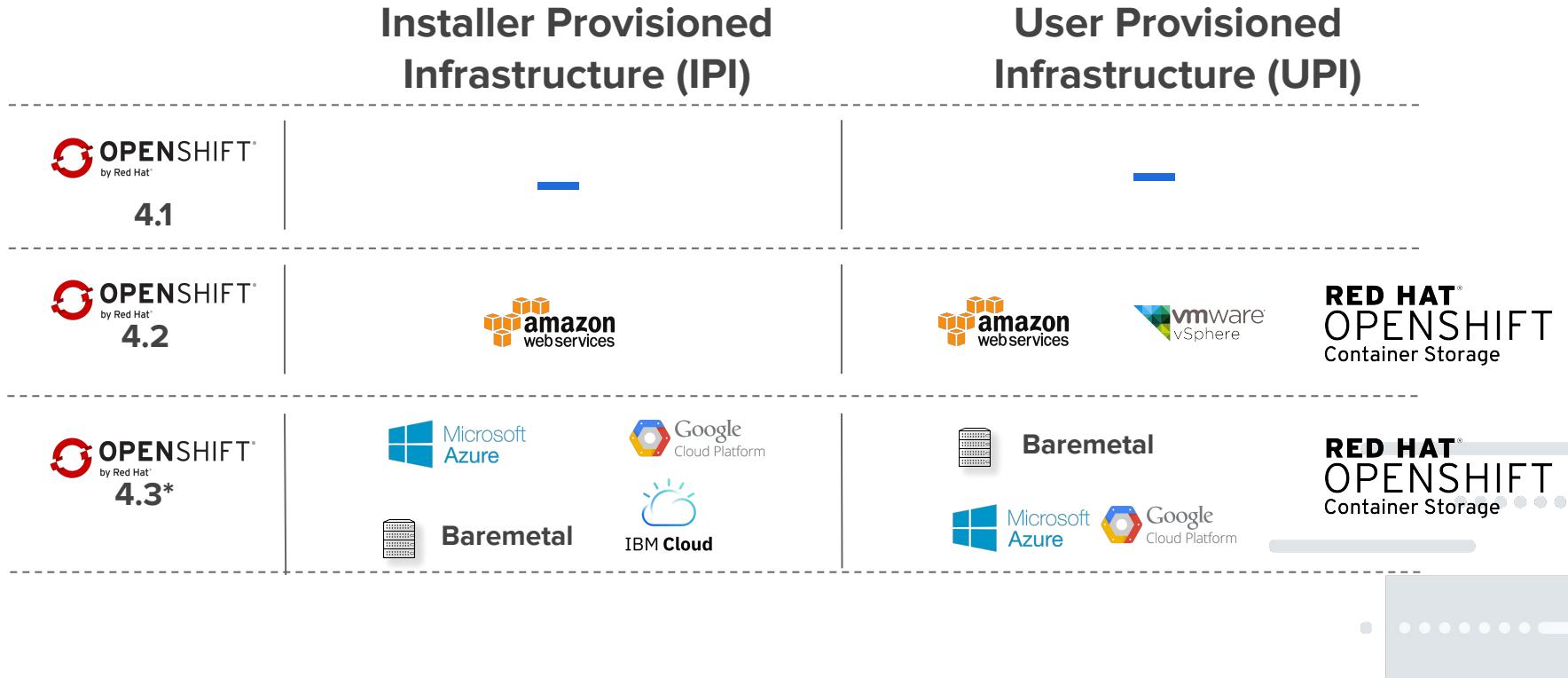


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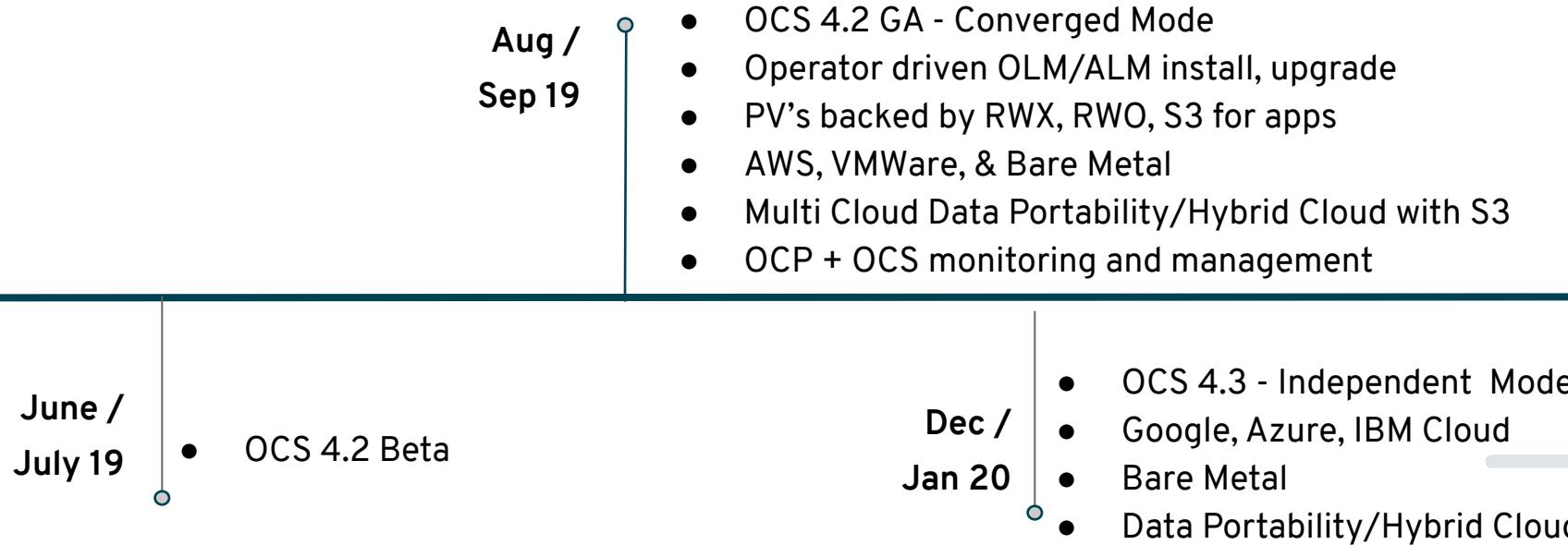
# OCS 4 Technology Stack



# PROVIDER ROADMAP FOR OCS 4



# RHOCS 4.x Roadmap

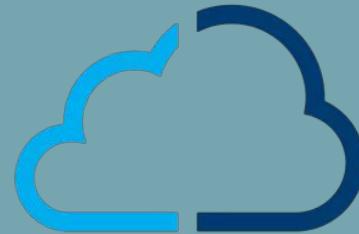


# OCS 4.X - Focus Areas



easy

EASE OF USE



HYBRID CLOUD  
& DATA SERVICES



kubernetes

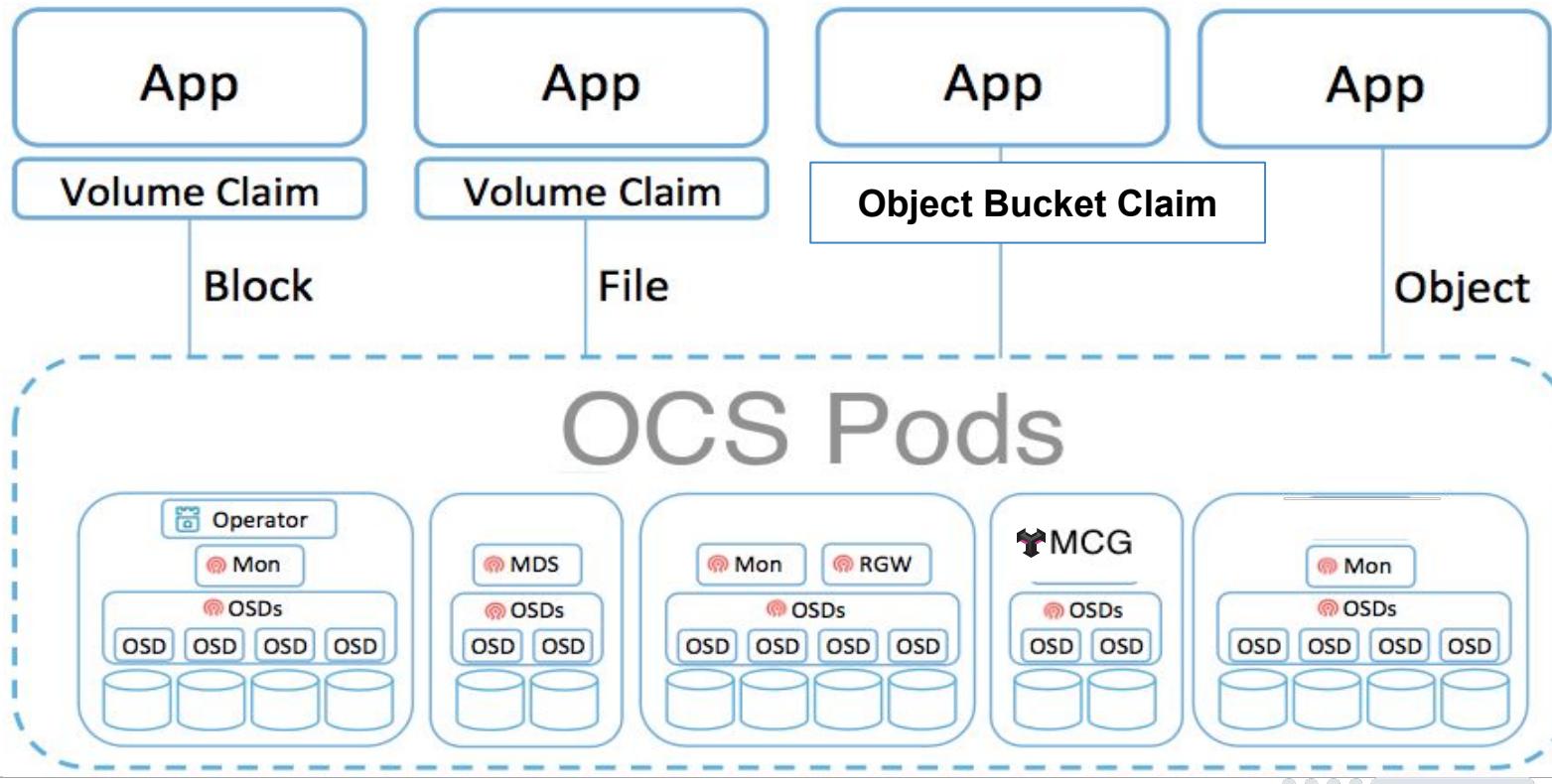
STORAGE  
ENHANCEMENTS



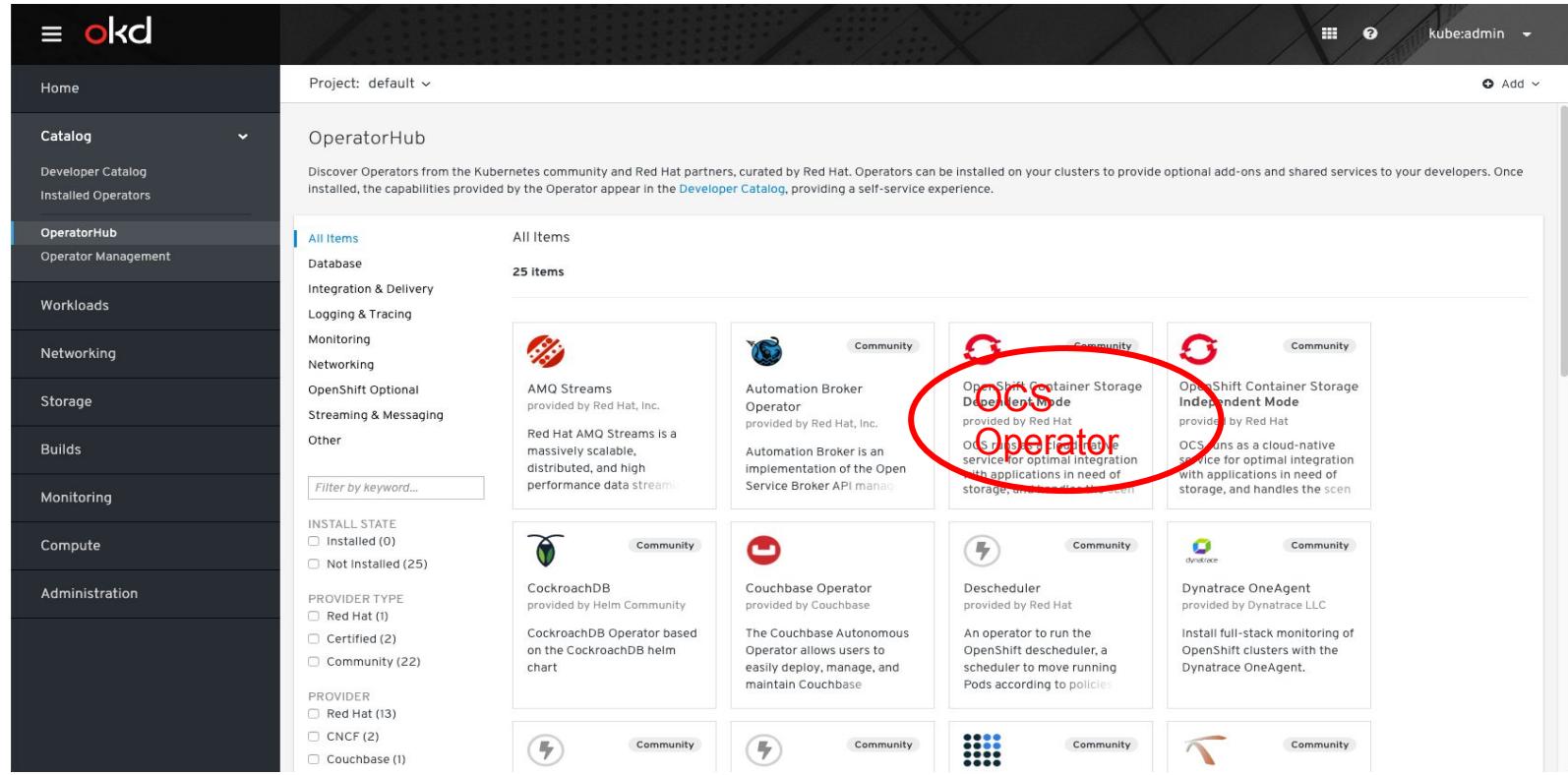
Ease of Use  
Hybrid Cloud  
Kubernetes Storage

# OCS 4.x Operator Install, Upgrade, Expansion

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



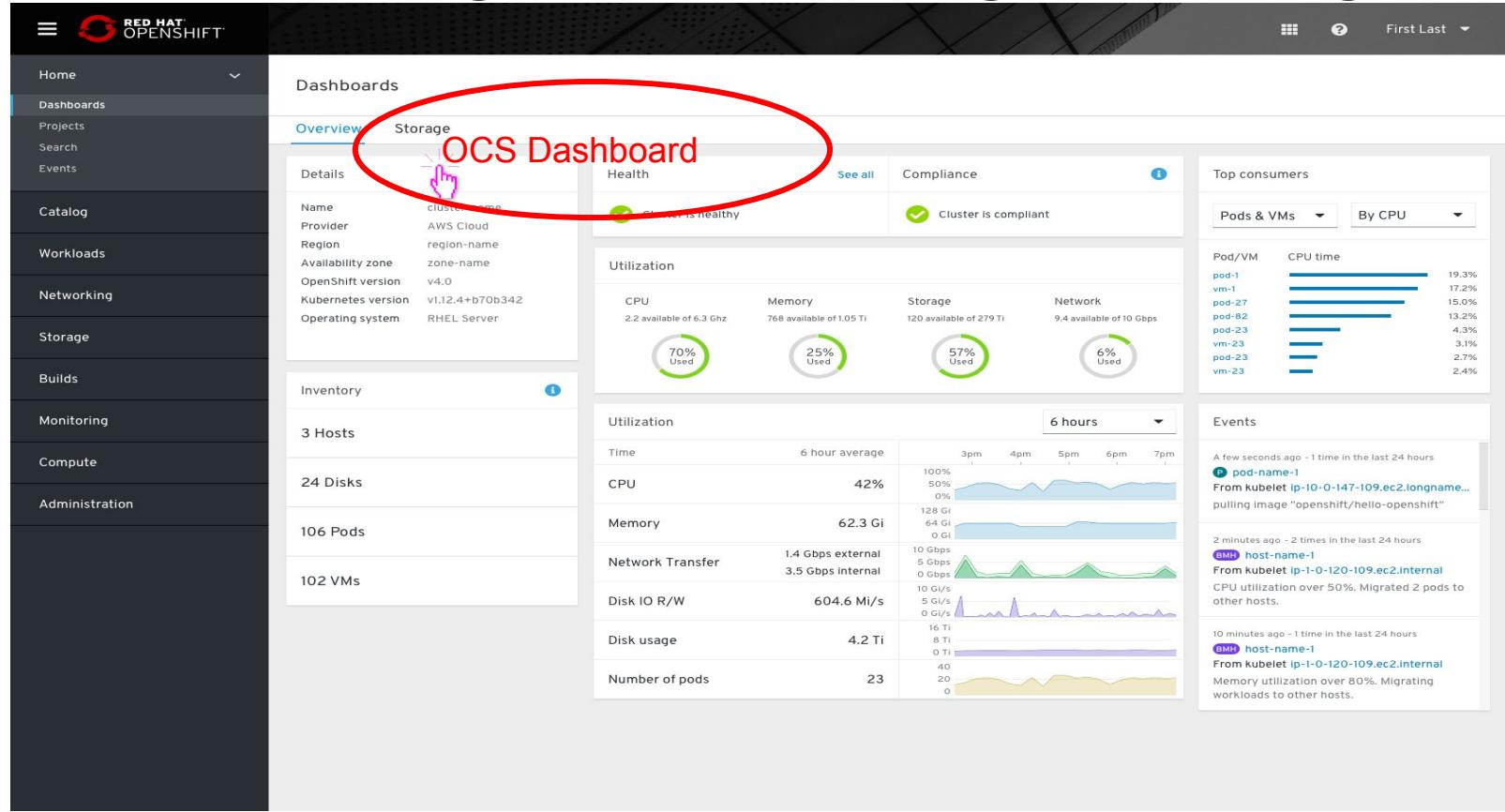
# OCS 4.x Operator Driven Install from OLM



The screenshot shows the OKD OperatorHub interface. The left sidebar has a 'Catalog' section with 'OperatorHub' selected, which is highlighted in blue. The main content area is titled 'OperatorHub' and displays a list of operators. A red circle highlights the 'OCS Operator' card. The card for 'OCS Operator' includes the text 'OCS runs as a cloud-native service for optimal integration with applications in need of storage, and handles the scene'.

Category	Operator	Description
Database	AMQ Streams	Red Hat AMQ Streams is a massively scalable, distributed, and high performance data stream.
	Automation Broker Operator	Automation Broker is an implementation of the Open Service Broker API managed by Red Hat.
Monitoring	OpenShift Container Storage Independent Mode	OCS runs as a cloud-native service for optimal integration with applications in need of storage, and handles the scene.
	Descheduler	An operator to run the OpenShift descheduler, a scheduler to move running Pods according to policies.
Networking	CockroachDB Operator	CockroachDB Operator based on the CockroachDB helm chart.
	Couchbase Operator	The Couchbase Autonomous Operator allows users to easily deploy, manage, and maintain Couchbase.
Storage	Dynatrace OneAgent	Install full-stack monitoring of OpenShift clusters with the Dynatrace OneAgent.
	OpenShift Container Storage Independent Mode	OCS runs as a cloud-native service for optimal integration with applications in need of storage, and handles the scene.

# OCP + OCS Integrated Monitoring and Management



The screenshot shows the Red Hat OpenShift integrated monitoring and management interface. The left sidebar contains navigation links for Home, Dashboards, Projects, Search, Events, Catalog, Workloads, Networking, Storage, Builds, Monitoring, Compute, and Administration. The main content area is titled 'Dashboards' and shows an 'Overview' section for 'Storage'. A red oval highlights the 'Storage' section. The 'Storage' section displays cluster details: Name (cluster-name), Provider (AWS Cloud), Region (region-name), Availability zone (zone-name), OpenShift version (v4.0), Kubernetes version (v1.12.4+b70b342), and Operating system (RHEL Server). It also shows utilization metrics: CPU (70% Used), Memory (25% Used), Storage (57% Used), and Network (6% Used). Below this, there are sections for 'Utilization' (3 hosts, 24 disks, 106 pods, 102 VMs) and 'Events' (listing recent events like pod migrations and memory utilization over 80%).

# OCS Integrated Dashboard

The screenshot displays the Red Hat OpenShift integrated dashboard for the OpenShift Container Storage (OCS) component. The left sidebar contains navigation links for Home, Dashboards, Projects, Status, Search, Events, Catalog, Workloads, Networking, Storage, Builds, Monitoring, Compute, and Administration. The main content area is titled 'Dashboards' and shows the 'Storage' tab selected. The 'Overview' section on the left lists cluster details (Name: cluster-name, Provider: Bare Metal, OCS version: v1.0), storage inventory (3 Nodes, 24 Disks, 20 Pods, 12 PVs, 18 PVCs), and top consumers (Used capacity: 63 Gi Project 5, 61 Gi Project 2, 42 Gi Project 10, 37 Gi Project 4, 26 Gi Project 9). The central 'Health' section indicates 'OCS is healthy' with a green status icon. It includes a 'Capacity' chart showing 59% used of 120 Gi total, a 'Data Resiliency' section stating 'Your Data is Resilient' with a green checkmark, and a 'Top Consumers' line chart showing capacity usage over time. The 'Performance' section on the right shows 151,215 IOPS, 3.35 ms latency, 2.32 Gi/s throughput, and 7.5 Gi/s recovery rate. The 'Events' section lists recent events: 'rook OSD 10-328949 crashed' (24 hours ago), 'Rebuild initiated as Disk 5 failed' (24 hours ago), 'host-name-1 CPU utilization over 50%' (24 hours ago), and 'host-name-1 CPU utilization over 50%' (10 minutes ago).

Health, Capacity, Performance, Configuration

# OCS Integrated Dashboard - Alerts

Monitoring and Alerts

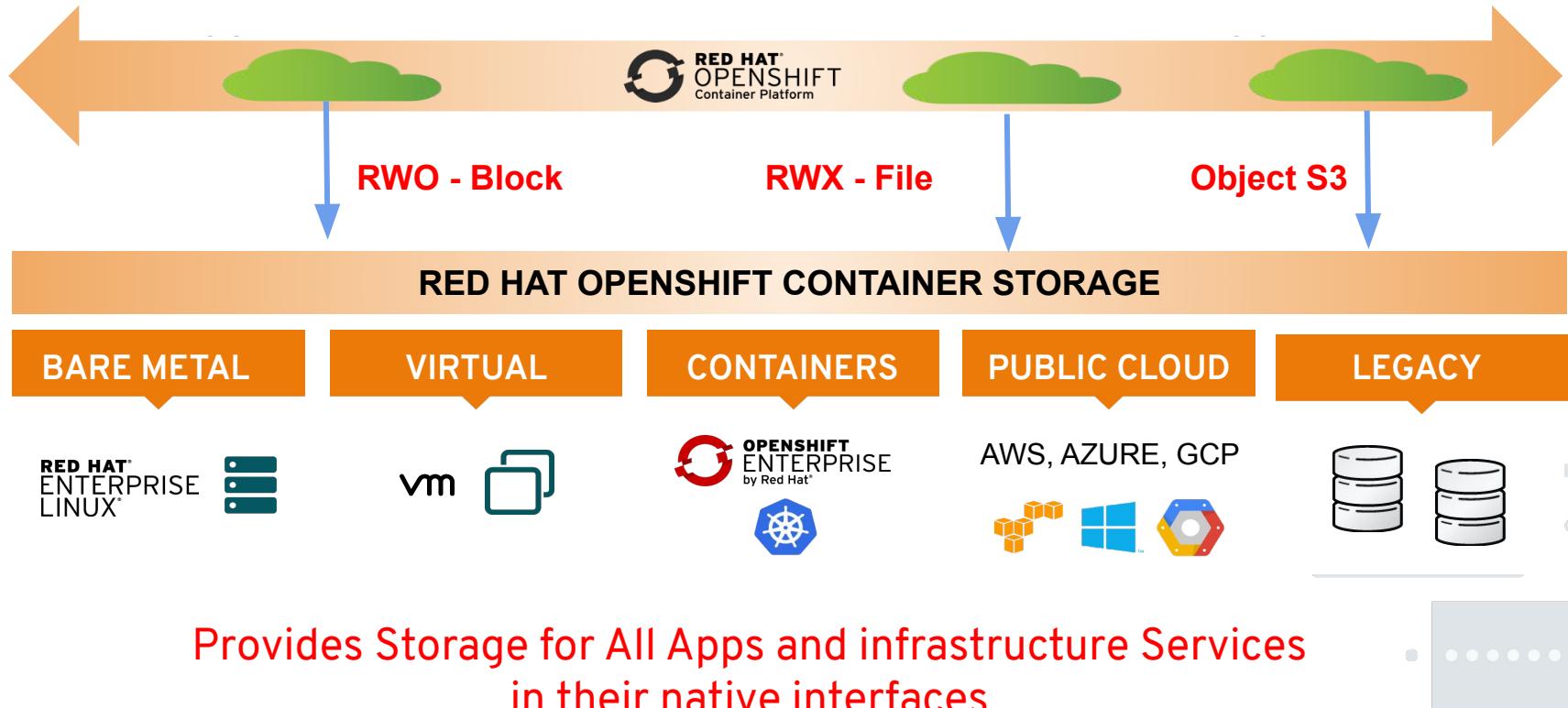


Ease of Use  
Hybrid Cloud  
Kubernetes Storage

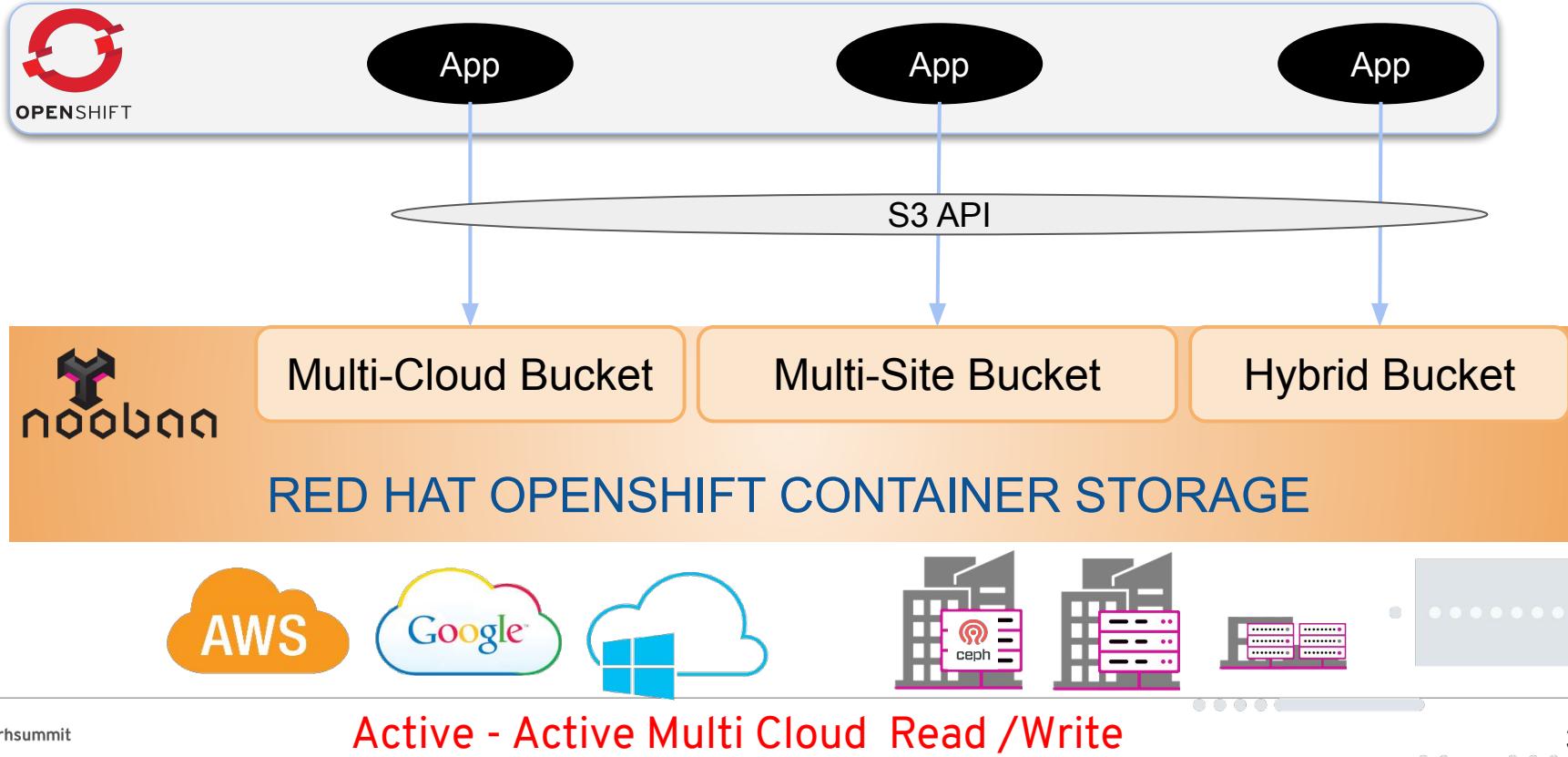
# Any Cloud, Any App, One Storage Experience



# Complete Storage for Container Platform



# Multi-Cloud Object Gateway (NooBaa)





Ease of Use  
Hybrid Cloud  
Kubernetes Storage

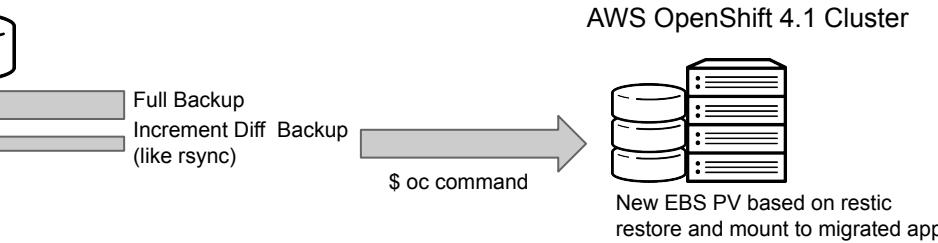
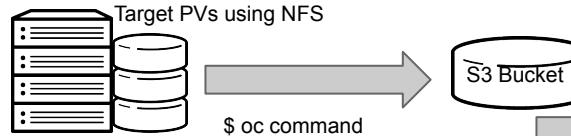
# Kubernetes Storage Enhancements

- CSI Compliance 1.0
- Snapshot and Restore at K8s
- Local Persistent Volume
- Raw Block Device
- S3 bucket dynamic provisioning
- Storage for federated OpenShift/Kubernetes

# Migration

# CLUSTER MIGRATION OPENSHIFT 3 to 4

vSphere OpenShift 3.10 Cluster



- Deploy a replication of your applications from one OpenShift cluster to a different OpenShift cluster
- Enable cluster specific configuration from OpenShift 3 to work on a OpenShift 4 cluster
- Documentation on how to handle common network, storage, and machine/node re-use scenarios between OpenShift 3 and OpenShift 4 clusters



## Migration Plans

[+ Add plan](#)

Name	Migrations	Source	Target	Repository	Persistent Volumes	Last Status
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 OCP3_to_4 Migration	 0	OCP 3 source	OCP 4 destination	OCS_S3	 2	Not Started	<a href="#">Stage</a>	<a href="#">Migrate</a>	
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# THANK YOU



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Visit the User Experience Design team in the **Feedback Zone**.



**Ecosystem Expo**  
Exhibit Hall A

#### **Activity Title**

Get early insights into OCS and influence its direction

#### **Contact Name**

Ju Lim, [julim@redhat.com](mailto:julim@redhat.com)





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