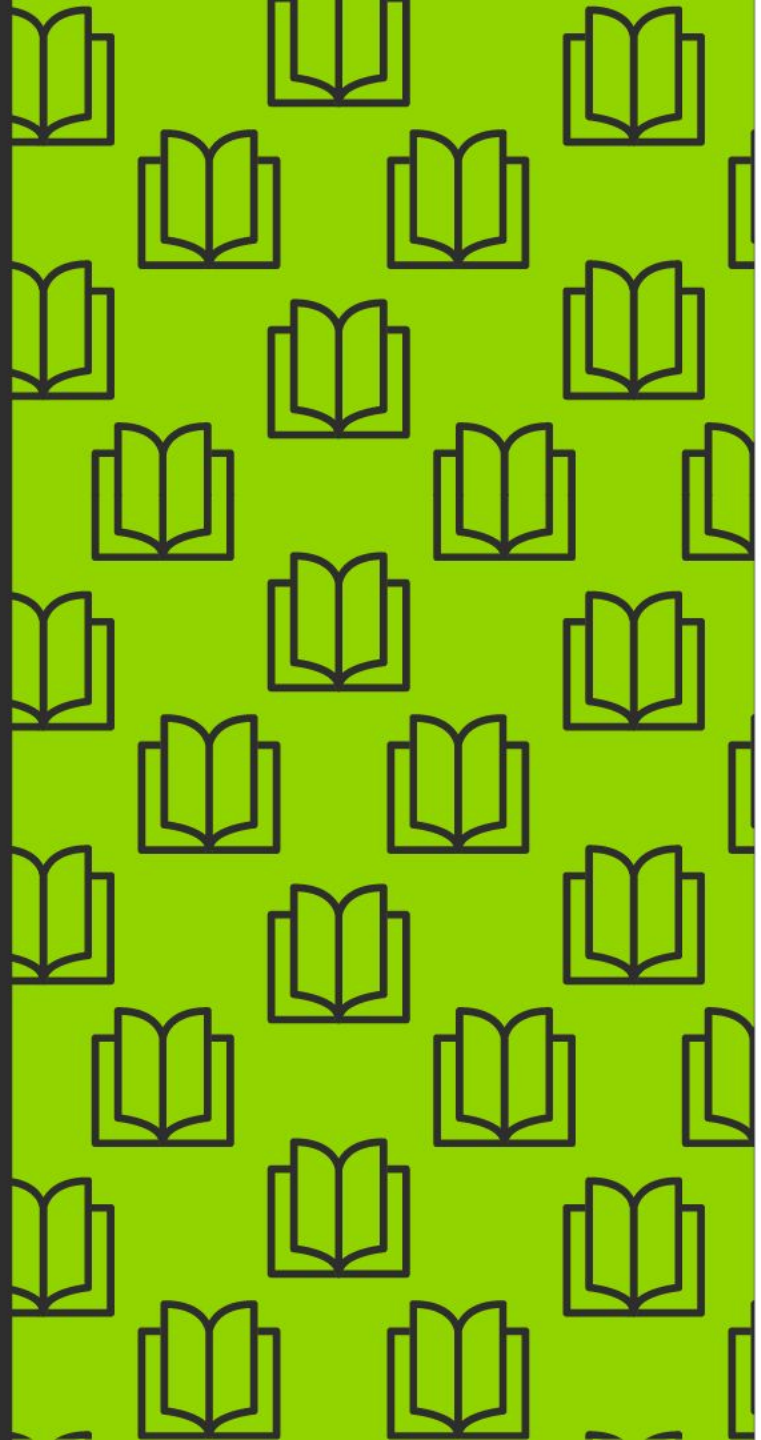


OpenShift Commons

OpenShift Update and Roadmap

OpenShift Product Management

Daniel Messer

Ramon Acedo Rodriguez

OpenShift Technical Marketing

Daniel Oh

Red Hat OpenShift

Red Hat Open Hybrid Cloud

Enabling any application, on any infrastructure, in any location

Traditional N-Tier Apps

Cloud Native Microservices

Data, Analytics & AI/ML

ISV Packaged Apps

Red Hat OpenShift

Red Hat Enterprise Linux

A self-managed Platform or fully managed Cloud Service

Start quickly, we manage it for you

Cloud managed

Managed Red Hat OpenShift services

aws	Microsoft Azure	IBM Cloud	aws Google Cloud
Red Hat OpenShift Service on Amazon Web Services[1] (ROSA)	Microsoft Azure Red Hat OpenShift (ARO)	Red Hat OpenShift on IBM Cloud (ROKS)	Red Hat OpenShift Dedicated (OSD)

You manage it, for control and flexibility

Customer managed

Self-managed Red Hat OpenShift

Red Hat OpenShift Platform Plus	Red Hat OpenShift Container Platform	Red Hat OpenShift Kubernetes Engine	On public cloud, or on-premises on physical or virtual infrastructure

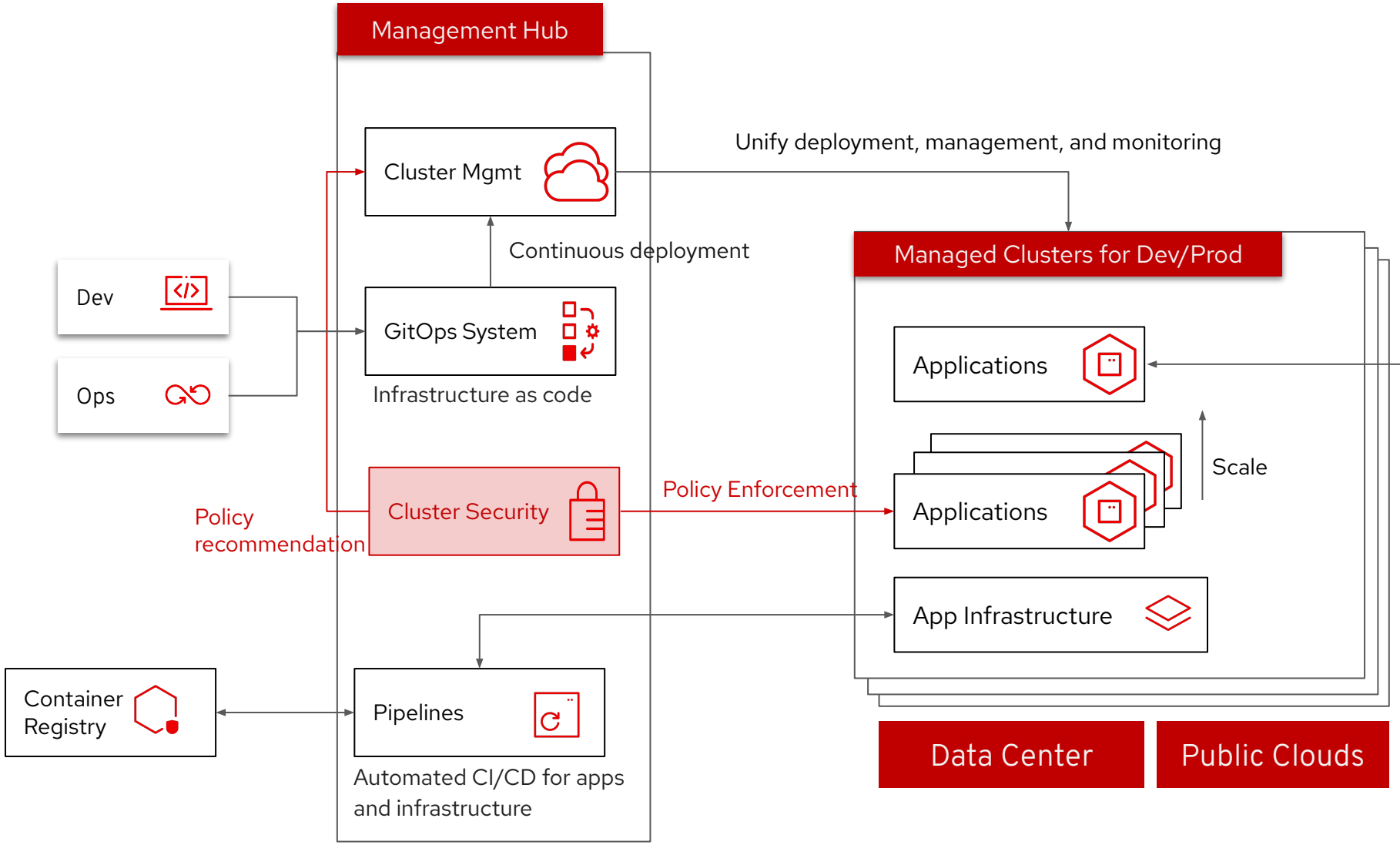
Demo

Multi-Cluster Deployment Flexibility Standardization

Demo Architecture

Build your own Open Hybrid Cloud with Red Hat

Full Demo Video



Red Hat Technologies

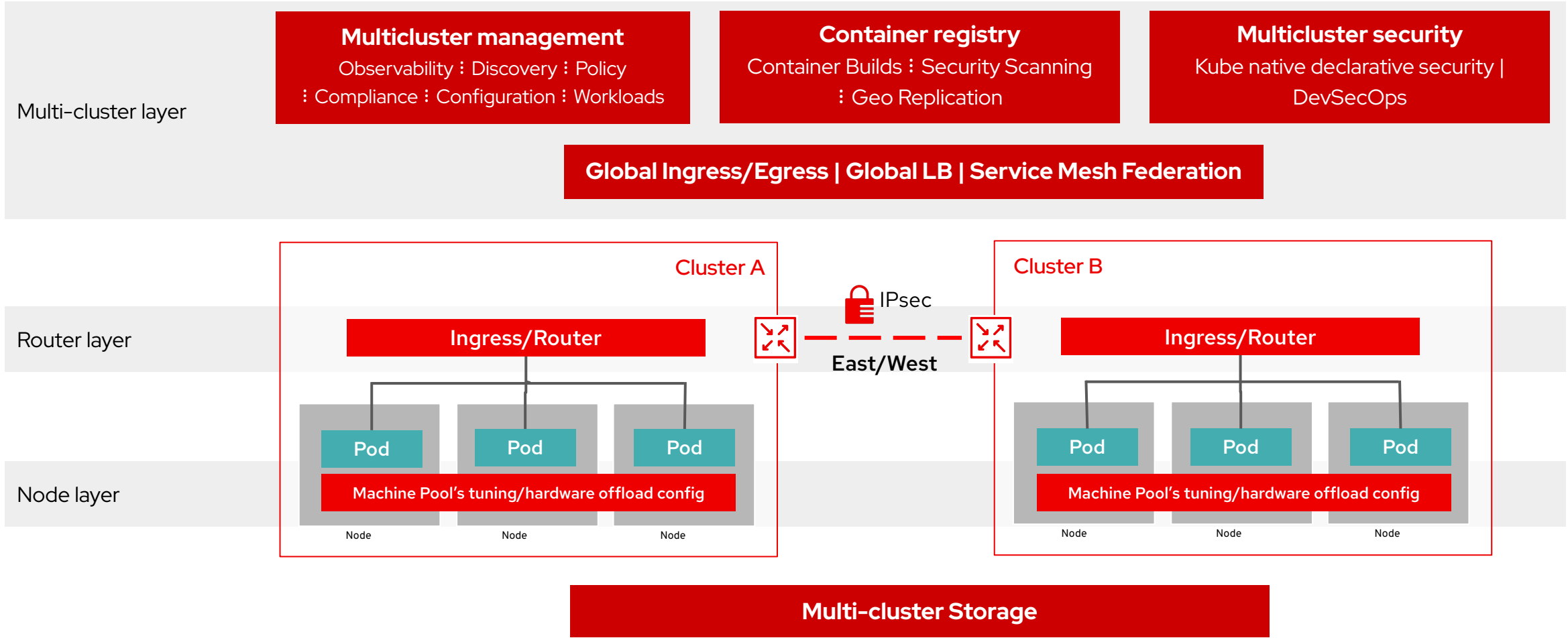
- Red Hat OpenShift
- Advanced Cluster Management
- Advanced Cluster Security for Kubernetes
- OpenShift Pipelines
- OpenShift GitOps
- Quarkus
- Red Hat Quay

OpenShift Commons

Red Hat

Demo
Multi-Cluster
Deployment Flexibility
Standardization

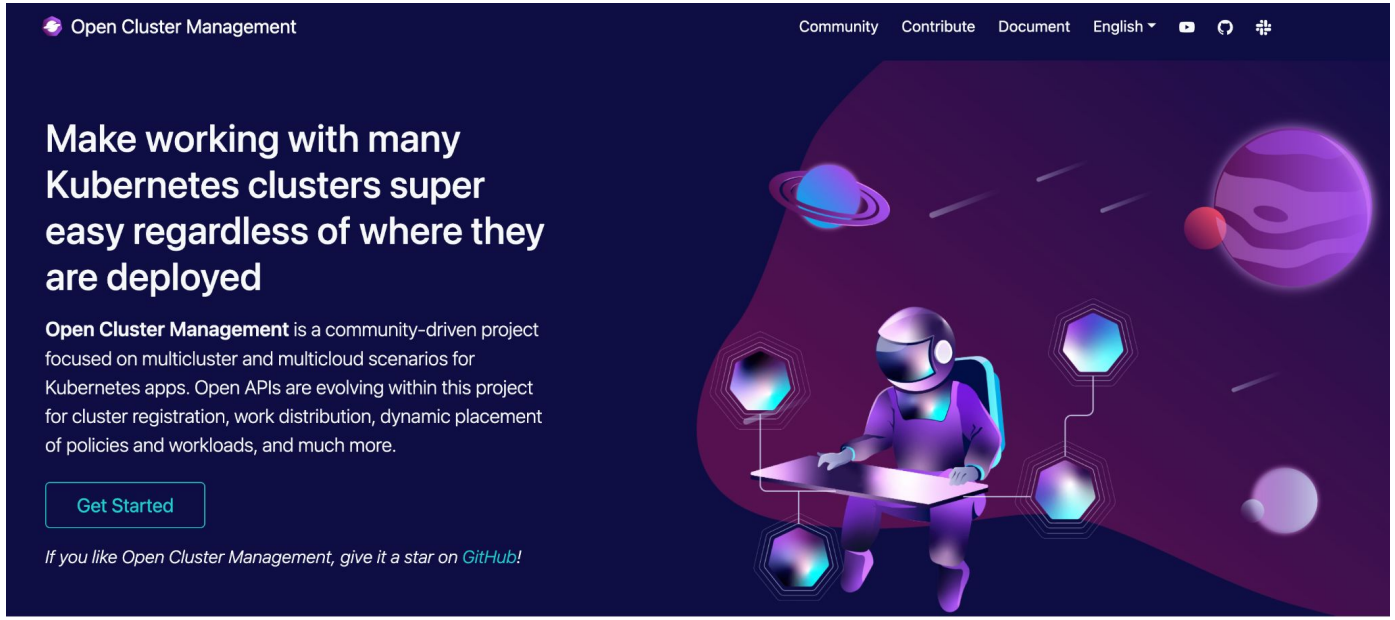
Standardized tools for your 1st and 100th cluster



Open Source Commitment

Open Cluster Management

- Open Cluster Management has been accepted as a CNCF Sandbox
  - https://www.cncf.io/projects/open-cluster-management/
- Collaboration in Key Kubernetes Special Interest Groups
  - Sig-MultiCluster
  - Sig-Application
  - Sig-Policy
- Growing together with support from partners and contributors
  - Ant Group
  - Alibaba
  - Tencent
  - Microsoft



Feature Overview

Cluster inventory
Registration of multiple clusters to a hub cluster to place them for management.

Work distribution
The work API that enables resources to be applied to managed clusters from a hub cluster.

Content placement
Dynamic placement of content and behavior across multiple clusters.

Vendor neutral APIs
Avoid vendor lock-in by using APIs that are not tied to any cloud providers or proprietary platforms.

Multi-cluster: What's going on upstream

open-cluster-management.io

CNCF sandbox project focused on simplification of fleet management:

- Leverages OpenShift Hive for cluster provisioning
- Provides a Governance & Compliance framework for delivering and auditing fleet readiness
- Provides dynamic placement and visibility to applications running across the fleet
- Integrates other projects like ArgoCD, Open Policy Agent, Thanos along with additional capabilities

Stolostron (github.com/stolostron/)

OKD/OCP-specific extensions for Open Cluster Management

- Allows to create & manage OKD/OCP clusters from a multi-cluster perspective
- Contains console and search capability
- Includes support for Hive, Submariner, Volume Sync

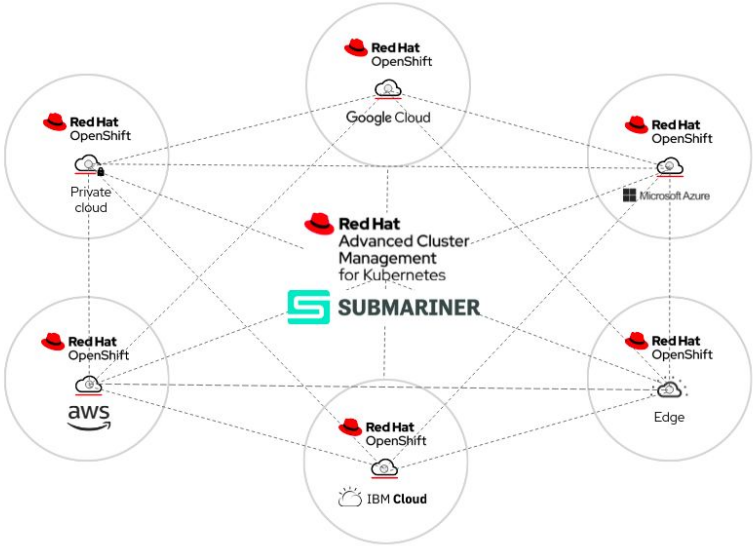
Multi-cluster Roadmap

Open Cluster Management

Multi-Cluster Networking

The OpenShift networking experience moves up to fleet level:

- Submariner add-on to Stolostron, leveraging ClusterSet
- Enables direct networking between Pods in different clusters



Enhanced ACM features

Use ACM to aid management of your fleet:

- Import and Manage OKD/OCP clusters on Arm
- VolSync Integration (async replication of PVs)
- Regional Backup & Restore using a regional Open Cluster Management/ACM hub cluster
- Support for Hosted Control Planes of OKD/OCP deployments
- Support for SigStore for Manifest Signing
- Additional support for Kyverno policies in Governance and Compliance

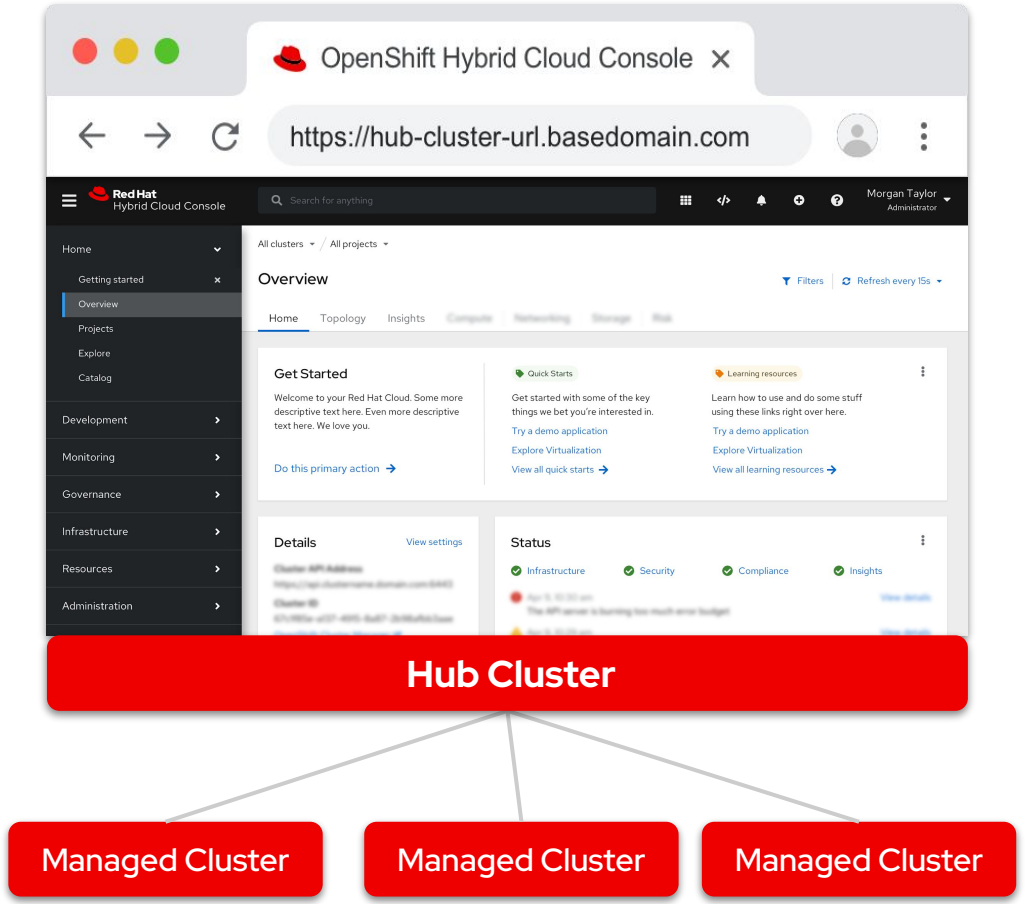
Multi-Cluster Console

New Hub⇆Managed Cluster Intelligence

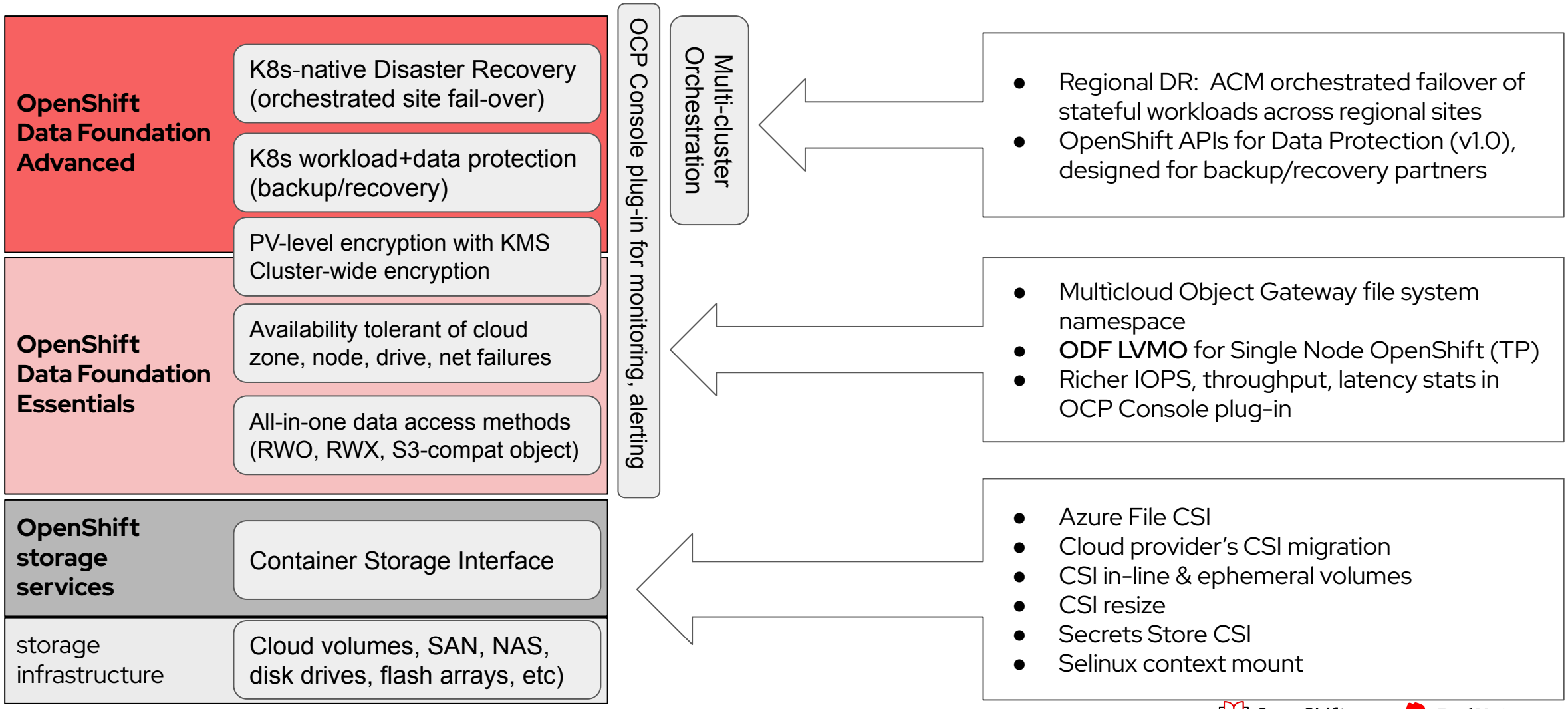
- Activate the fleetwide experience and enable cluster lifecycle from the OCP Console with the new **multicluster engine operator (MCE)**
- **Fleet-wide auth** for managed clusters

Unified OpenShift Platform Plus UX

- Extend the fleet level views with new **layered experiences**
- **Dynamic plugins** enable partners & customers to create native integrations at the fleet or cluster level



Multi-Cluster Storage



Project QUAY

Multi-Cluster Container Registry

Unified Experience

Visual consistency with a completely new UI

Integration of quay.io into console.redhat.com

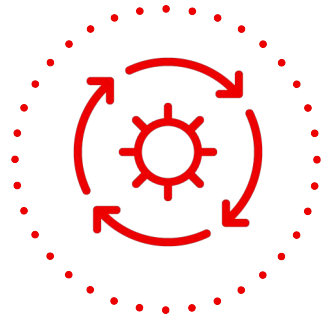
Consistent UX from self-managed to hosted

Security Everywhere

Scanning coverage beyond container base images (Java / Go packages)

Trust & verify with signatures

Remediate security risk before production



Platform Consistency

New RBAC model for unprivileged tenants

Granular control over content creation and growth

Consistent permission model

StackRox

Multi-Cluster Security

Security Innovation

- Workload Vulnerabilities
  - Admission controller to validate images signed with cosign
  - Identify inactive software components for faster remediation
  - Full host level vulnerability scanning starting with Red Hat CoreOS
- Network Policy
  - Identify missing network policies
  - Intelligent recommendation for network policy creation
  - Visual network policy editor
- Policy Management
  - Bulk operations with resource sets and policy sets
  - RH ACS / OPA Gatekeeper integration
- New KPI Dashboard
- New Compliance GUI

Demo

Multi-Cluster

Deployment Flexibility

Standardization

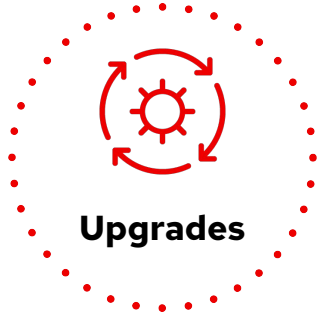
Installation, Updates, and Provider Integration

- Add new platforms
- Add new regions to existing platforms
- Add more instances types and capabilities

Enable Hybrid Cloud

- Agent-based installer
- Hosted Control Planes (HyperShift)
- Composable installation

Simplify onboarding



- Improve update behavior and conditional updates
- Enhance update documentation

Mitigate risk

Alibaba Cloud

IBM Cloud

NUTANIX

OpenShift on Bare Metal

Hardware support for nodes

More hardware supported through Redfish improvements.

Hardware integration Improvements

SaaS Installer

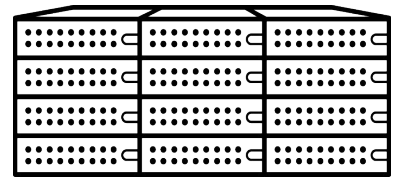
Cloud-based Assisted Installer promoted to GA from Tech Preview.

Assisted Installer GA

Agent-based Installer

Agent-based installer to easily create initial cluster. Automate on-premises clusters installations. Install via UI.

Faster, easier on-premises installations



OpenShift Virtualization

Unified Experience

New VM creation Wizard flow

VM centric overview page

Performance tuned VM templates

Improved flexibility with live migration policies

Support RHEL High Availability

Manage VMs at Scale

Security Everywhere

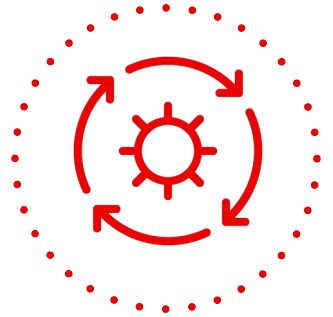
RBAC for VM templates

Isolate Live Migration with dedicated network

Multi-tenant virtual OpenShift clusters with Hosted Control Planes (HyperShift)

Enhanced secondary network using micro-segmentation on OVN

Enhanced security and controls for VMs



Platform Consistency

More choices with Public Cloud & Bare Metal providers

RHEL 9 & Windows 11 guests

Network latency checks for telco and high performance workloads

Enhanced Ecosystem of Data Protection partners

Broader Compatibility

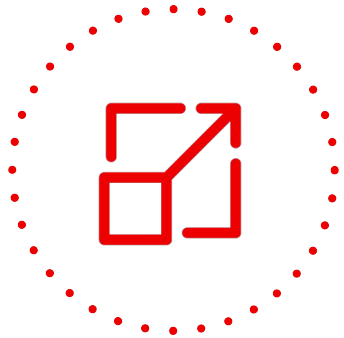
KubeVirt is now a CNCF incubating project!

The complexities of edge computing and 5G Radio Access Networks

Variability

Different edge sites can vary in network connectivity, space, and power/cooling/performance

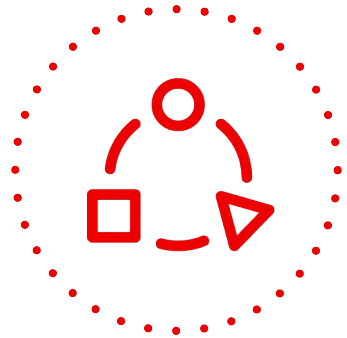
Versatile footprints and infrastructure cost saving



Scale

Need to deploy and manage hundreds to thousands sites and nodes

Ease of management through Red Hat Advanced Cluster Management and Zero Touch Provisioning



Advanced Timing and Synchronization

Nodes are tuned so that RAN realtime workloads can leverage advanced timing/synchronization and hardware accelerations.

(RAN) Technology Evolution

Single Node OpenShift

Control plane and worker on a single server

- Introduced in OpenShift 4.9 (Q4 2021) for bare-metal
- Adding footprints through 2022:
  - **Red Hat Virtualization** and **vSphere**
- Reduced memory requirements to **16 GB RAM**
- **Worker node based capacity expansion** for edge scenarios requiring extra capacity, but not HA (failover to another site is the HA model instead)
- Will switch to **OVN-Kubernetes** by default to better align with edge networking requirements

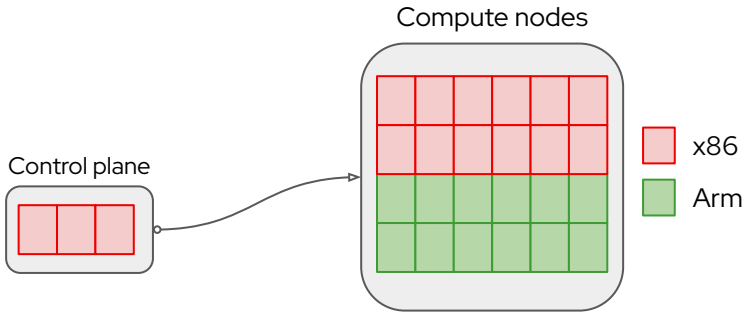
OpenShift on Arm

Today

- OpenShift on Arm in AWS and bare metal
- On any hardware supported by RHEL

Coming

- Heterogeneous clusters: different architectures, single cluster



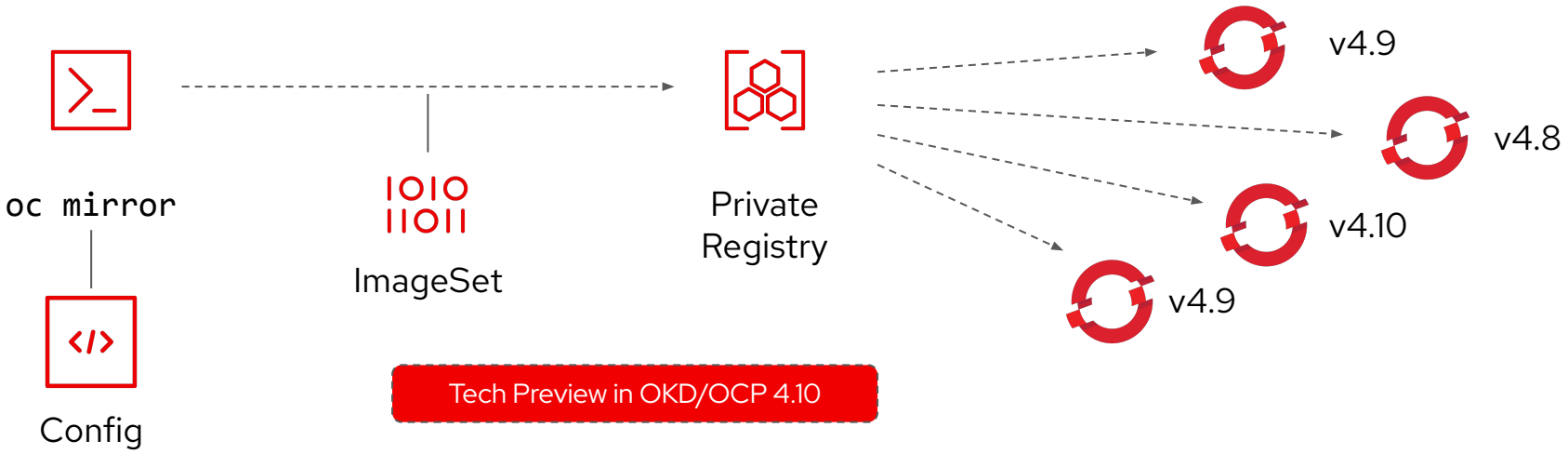
Fully Automated Installers (IPI)	✓
Customizable Installers (UPI)	✓
RHEL or CoreOS entitlement	✓
CRIO Runtime	✓
Over the Air Smart Upgrades	✓
Operating System (CoreOS) Management	✓
Enterprise Secured Kubernetes	✓
Kubectl and oc automated command line	✓
Auth Integrations	✓
Operator Lifecycle Manager (OLM)	✓
Administrator Web console	✓
Node Feature Discovery	✓
Embedded OperatorHub	✓
Embedded Marketplace	✓
Embedded Registry	✓
Helm	✓

Cluster Monitoring	✓
Log Forwarding	✓
Telemeter and Insights	✓
OVS and OVN SDN	✓
HAProxy Ingress Controller	✓
Ingress Cluster Wide Firewall	✓
Egress Pod	✓
Ingress Non-Standard Ports	✓
Network Policies	✓
IPv6 Single and Dual Stack	✓
CNI Plugin ISV Compatibility	✓
CSI Plugin ISV Compatibility	✓
Service Binding Operator	✓
Platform Logging	✓
OpenShift Elasticsearch Operator	✓
Developer Web Console	✓

Demo
Multi-Cluster
Deployment Flexibility
Standardization

OpenShift Disconnected

Upcoming: Single command to mirror content



- A single CLI tool to mirror all OCP content (images, operators, helm charts): `oc mirror`
- Smart: maintains update paths of OCP & operators
- Declarative: config to filter for particular OCP & operator catalogs / releases / channels
- Fast: Incremental mirroring

Compute Standardization

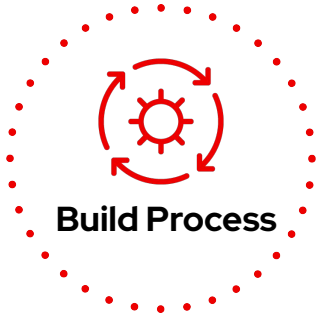
- Enable pluggability with cloud native solutions: KMS, DNS, LB
- GA Cert-manager
- Enable Pod Security Admission by default
- Alert when the etcd container memory consumption exceeds threshold

Accelerates Projects and Enables Hybrid Cloud

- Mixed architecture support within a cluster
- Introducing OpenShift CoreOS Layering
- Improved Audit Logging
- Improved API Server Alerting

More choice and flexibility to meet standards and compliance

OpenShift CoreOS Layering



- Derive and configure customized RHEL CoreOS images through a container build pipeline
- The output is a standard OCI container
- Validate the build
- Push to node: rpm-ostree applies the changed layers to disk (normal block device)
- Maintain a redeployable process

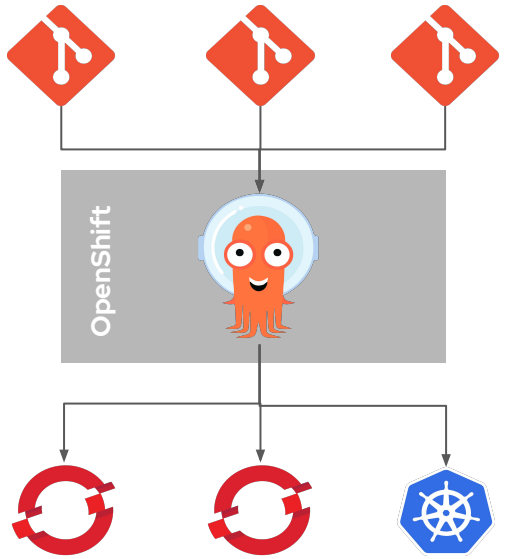
Create a golden build process

- 3rd party RPMs
- RHEL packages not shipped in RHCOS
- RHEL hotfix packages

Meet the needs of your environment & reduce issue resolution times

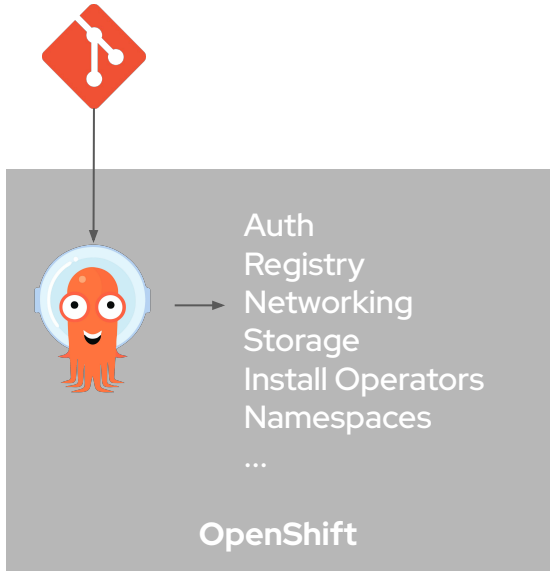
Continuous Delivery: OpenShift GitOps and Argo CD

*Flexible, **Standardized** Deployment Strategies*



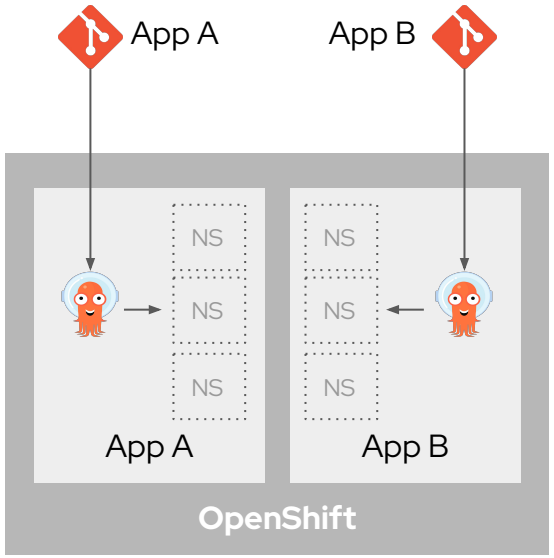
Central Hub (Push)

A central Argo CD pushes Git repository content to remote OpenShift and Kubernetes clusters



Cluster Scoped (Pull)

A cluster-scoped Argo CD pulls cluster service configurations into the OpenShift cluster



Application Scoped (Pull)

An application scoped Argo CD pulls application deployment and configurations into app namespaces

OpenShift Commons

Red Hat OpenShift

Before we wrap up

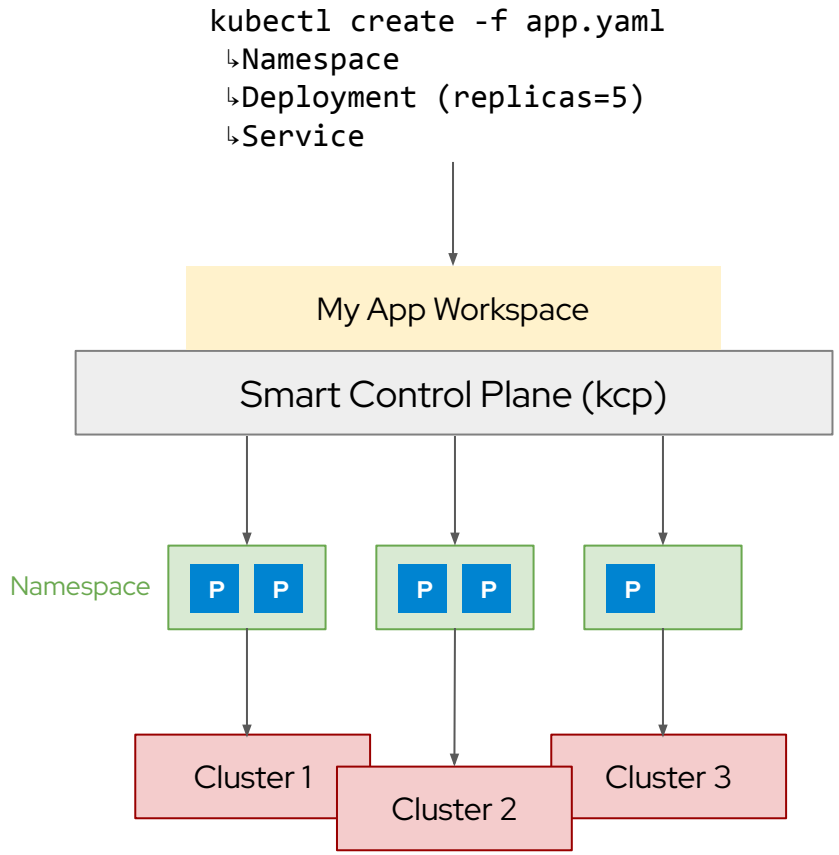
kcp: transparent multi-cluster for your fleet

Transparent multi-cluster for developers

- Works with any Kube YAML
- Spread workload across clusters
- Don’t worry about clusters

Easier management for infrastructure admins

- Solve scale issues by breaking down into smaller clusters
- Apps can be assigned to groups of clusters
- Cordon off a cluster for upgrade, removal, debugging



Open source project: https://github.com/kcp-dev/kcp/

Launch will be later this year

Join us for the AMA Session

Today, Tuesday May 17, 2022

4:50pm

Pavilion 3, Room G | Level 2 | Central Forum