OpenShift Console Extensions
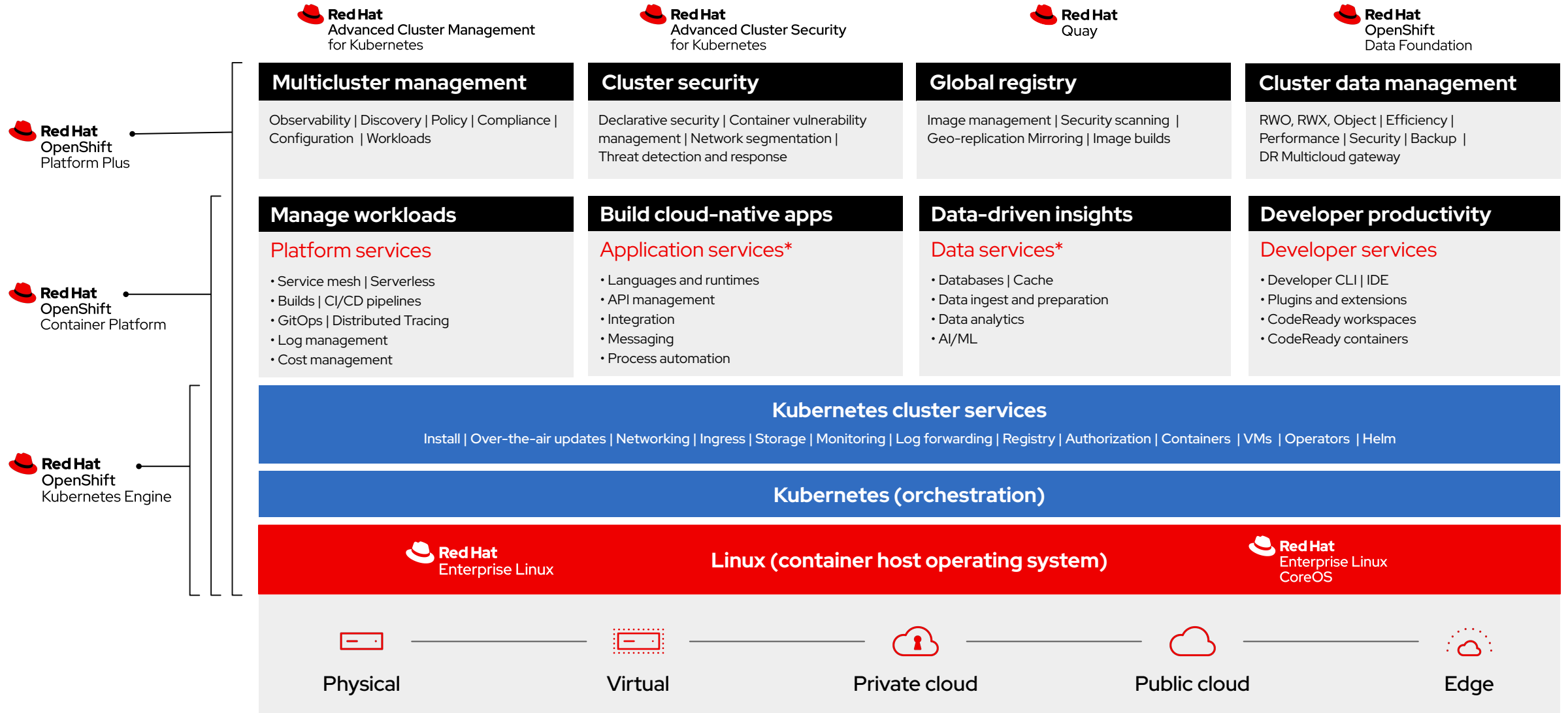
HyperShift

Presenter's Name

Title

Presenter's Name
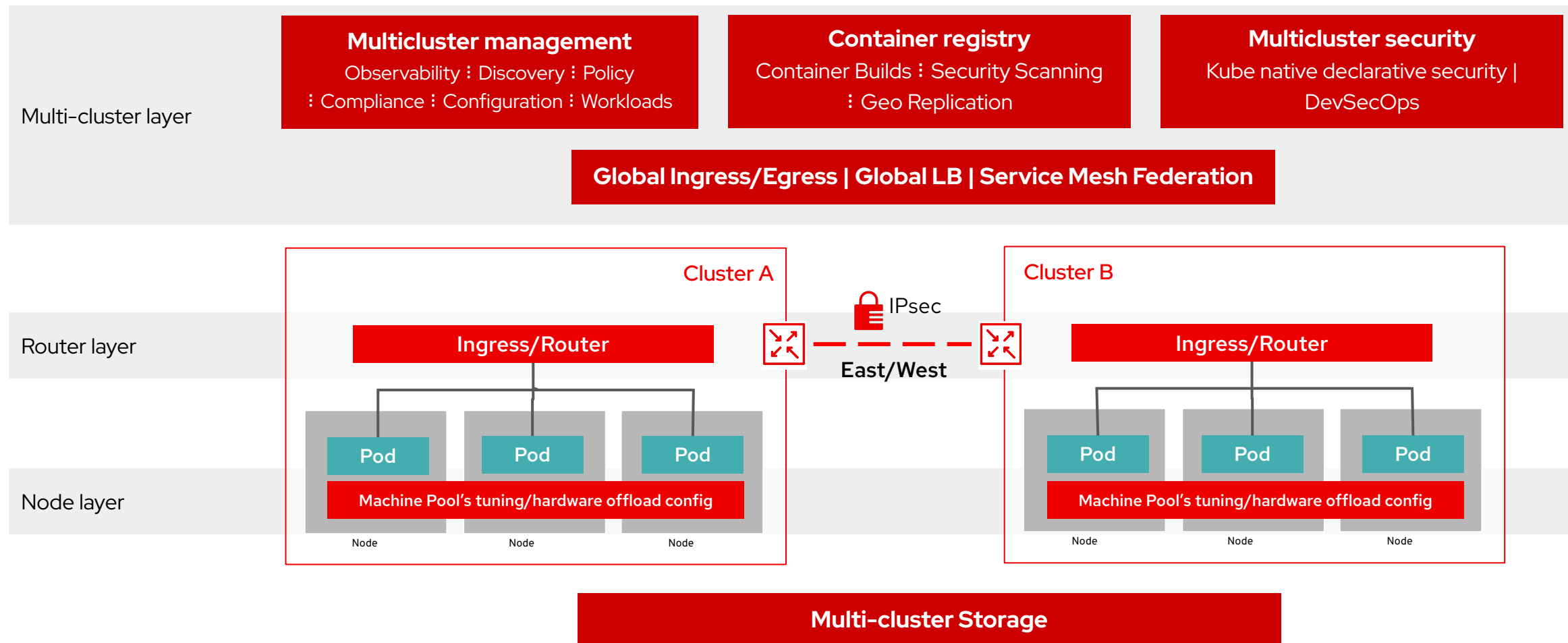
Title

Red Hat

Red Hat open hybrid cloud platform

Red Hat
Advanced Cluster Management
for Kubernetes

Red Hat
Advanced Cluster Security
for Kubernetes

Red Hat
Quay

Red Hat
OpenShift
Data Foundation

Red Hat
OpenShift
Platform Plus

Multicluster management
Observability | Discovery | Policy | Compliance | Configuration | Workloads

Cluster security
Declarative security | Container vulnerability management | Network segmentation | Threat detection and response

Global registry
Image management | Security scanning | Geo-replication Mirroring | Image builds

Cluster data management
RWO, RWX, Object | Efficiency | Performance | Security | Backup | DR Multicloud gateway

Red Hat
OpenShift
Container Platform

Manage workloads
Platform services
- Service mesh | Serverless
- Builds | CI/CD pipelines
- GitOps | Distributed Tracing
- Log management
- Cost management

Build cloud-native apps
Application services*
- Languages and runtimes
- API management
- Integration
- Messaging
- Process automation

Data-driven insights
Data services*
- Databases | Cache
- Data ingest and preparation
- Data analytics
- AI/ML

Developer productivity
Developer services
- Developer CLI | IDE
- Plugins and extensions
- CodeReady workspaces
- CodeReady containers

Red Hat
OpenShift
Kubernetes Engine

Kubernetes cluster services
Install | Over-the-air updates | Networking | Ingress | Storage | Monitoring | Log forwarding | Registry | Authorization | Containers | VMs | Operators | Helm

Kubernetes (orchestration)

Red Hat
Enterprise Linux

Linux (container host operating system)

Red Hat
Enterprise Linux
CoreOS

Physical   Virtual   Private cloud   Public cloud   Edge

V0000000

Red Hat

*   Red Hat OpenShift® includes supported runtimes for popular languages/frameworks/databases. Additional capabilities listed are from the Red Hat Application Services and Red Hat Data Services portfolios.

** Disaster recovery, volume and multicloud encryption, key management service, and support for multiple clusters and off-cluster workloads requires OpenShift Data Foundation Advanced

Standardized tools for your 1st and 100th cluster

Multi-cluster layer

| **Multicluster management** |
| Observability ⋮ Discovery ⋮ Policy ⋮ Compliance ⋮ Configuration ⋮ Workloads |

| **Container registry** |
| Container Builds ⋮ Security Scanning ⋮ Geo Replication |

| **Multicluster security** |
| Kube native declarative security \| DevSecOps |

Global Ingress/Egress | Global LB | Service Mesh Federation

Cluster A

Cluster B

🔒 IPsec

Router layer

Ingress/Router

Ingress/Router

East/West

Pod   Pod   Pod

Pod   Pod   Pod

Node layer

Machine Pool's tuning/hardware offload config

Machine Pool's tuning/hardware offload config

Node   Node   Node

Node   Node   Node

Multi-cluster Storage

Red Hat

Multi-cluster: Seamless networking mesh extends across cluster boundaries

Advanced Cluster Management (ACM) maintains East-West networking between all of your clusters using Submariner

Overview

Multi-cluster networking makes it dead simple to span your apps across failure domains and geographies.

▸ Provides IPsec tunnel cluster to cluster

▸ IPsec = CNCF Submariner

▸ Service Mesh = Istio with federation

What's Next

▸ Support for inter-connecting clusters with overlapping IPs (aka Globalnet), and

▸ Multi-cluster NetworkPolicy

Better than stretched cluster

Easier HA apps across clusters

Securely access shared services

Red Hat
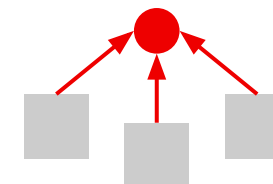
Multi-cluster Gateway for Ingress and Egress

Internet

Gateway API

Private cloud   Public cloud   Managed cloud   Physical   Virtual   Edge

Platform-Native Load Balancing   MetalLB

Ingress Controller   HAPROXY   CONTOUR

OVN

Pod   Pod   Pod   **OVS**

Node   Node   Node
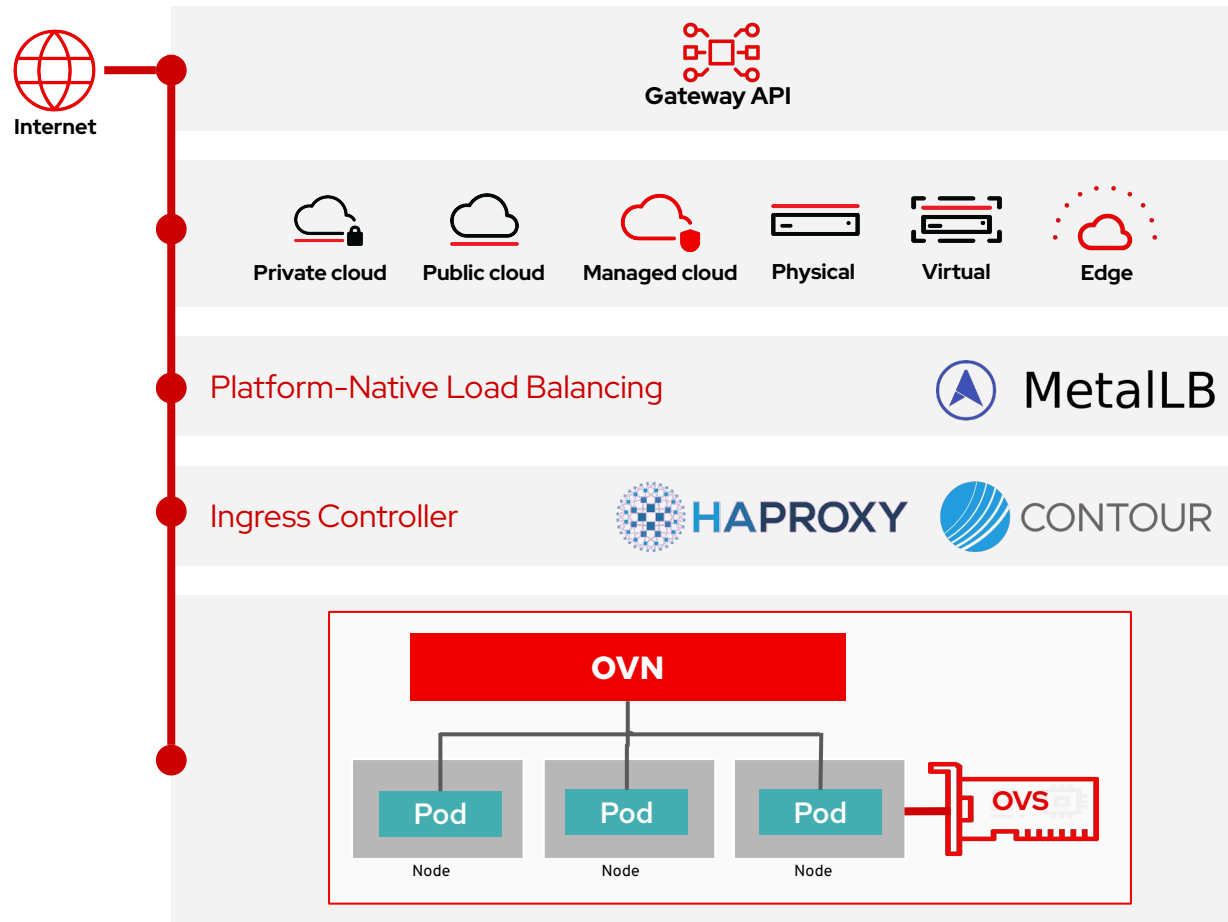
- ▸ Unified traffic handling so you configure all your traffic the same way

- ▸ Any supported platform – add or swap easily, hybrid scenarios

- ▸ Flexibility to use native traffic distribution and filtering (e.g. WAF) for optimal performance

- ▸ Your traffic, your way: L4-L7, Envoy, by-pass

- ▸ OVN for advanced traffic workloads
- ▸ IPv6 single/dual for scale
- ▸ HW Offload (OVS, IPsec, …) for performance
- ▸ Multi-NIC support to align host networking
- ▸ BGP-advertised services (FRR)
- ▸ Observability for improved understanding
- ▸ eBPF precision traffic control
- ▸ No-overlay option
- ▸ Reduced traffic "friction" for Service Mesh, Virtualization

Red Hat
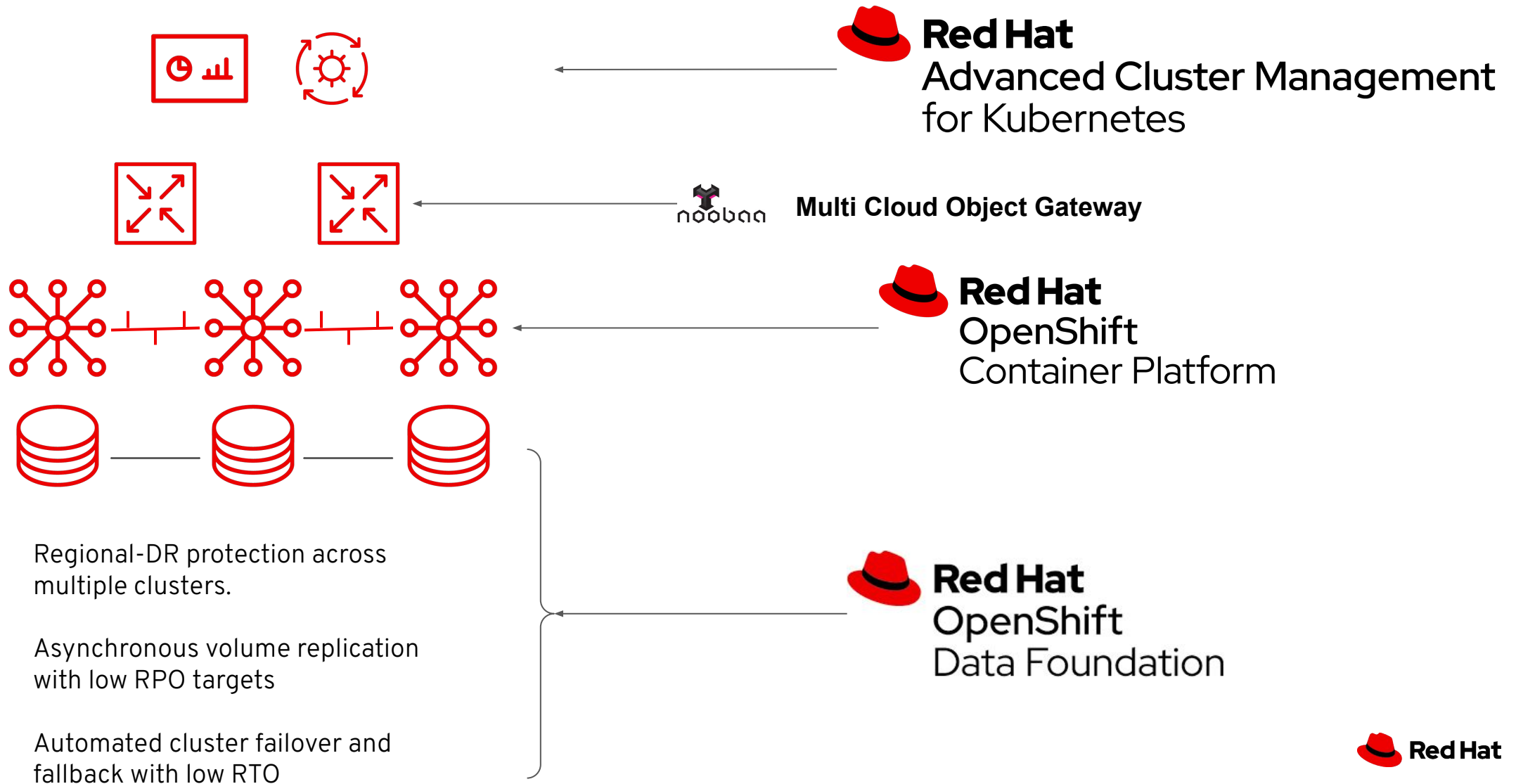
Service Mesh Federation
Adding scalability and high-availability to multi-tenant service mesh

Service Mesh Federation will provided guided resources for sharing services across meshes in different clusters, while maintaining the secure multi-tenant separation that customers have come to expect from OpenShift Service Mesh.

▸ Manage service to service connectivity between meshes in different clusters.

▸ Configure load balancing and "highly available" of services across meshes in different clusters.

6

Multi-cluster Storage

**Red Hat
Advanced Cluster Management
for Kubernetes**

nooboo **Multi Cloud Object Gateway**

**Red Hat
OpenShift
Container Platform**

Regional-DR protection across
multiple clusters.

Asynchronous volume replication
with low RPO targets

Automated cluster failover and
fallback with low RTO

**Red Hat
OpenShift
Data Foundation**

Red Hat
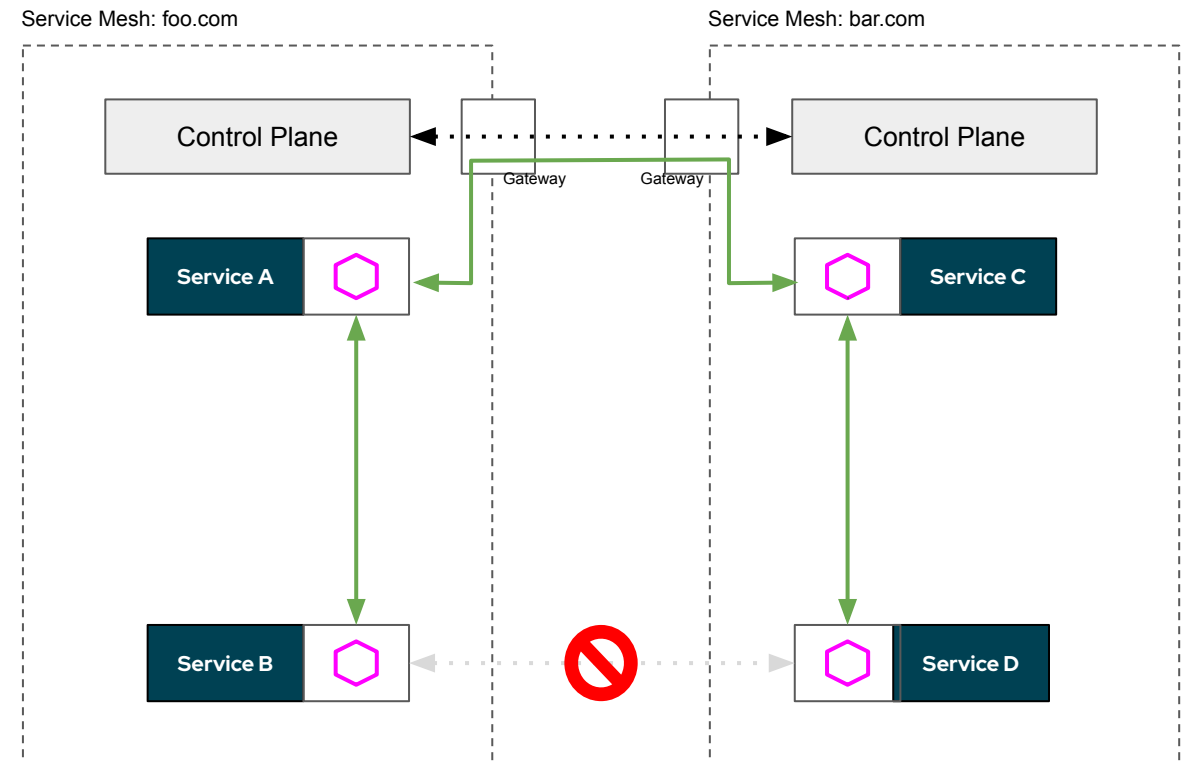
Multi-Cluster Focused

Selectable Cluster Inventory `Tech Preview`

What is this console integration?

Experience allows users to select clusters across their company as they enter the hub cluster's OCP console! Bringing together 3 tools into one UX:

▸ OpenShift Console (OCP) – main user experience for all individual clusters

▸ Multicluster Engine (MCE) – offers basic cluster inventory/create/update/destroy

▸ Advanced Cluster Management (ACM) – full multi-cluster management

Moving from single cluster to a fleet of OpenShift:

1. Start deploying apps on a single OpenShift cluster
2. Use the Multicluster Engine to create more clusters and enable RBAC controlled multi-cluster views
3. Upgrade with Advanced Cluster Management to simplify multi-cluster configuration, application deployment, observability, networking, and more.

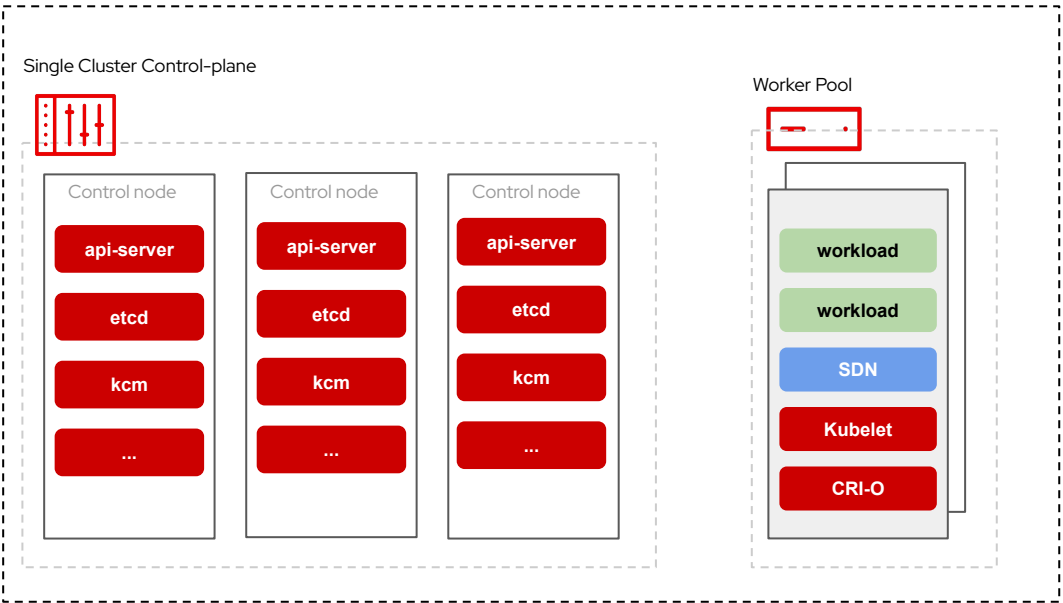**All OCP customers get MCE included in their subscription**

PM: Ali Mobrem, Sho Weimer
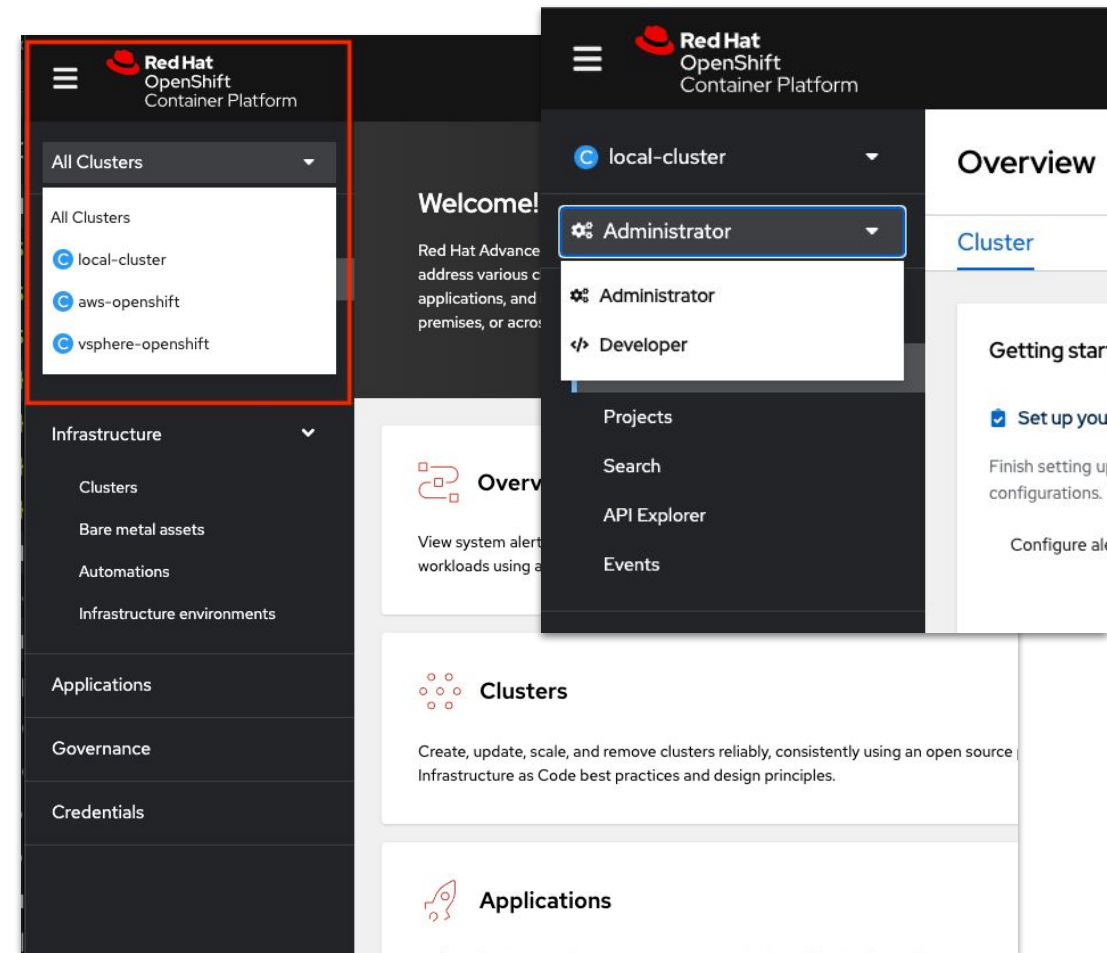
Hypershift Brings Externally Managed Control-Planes

Standalone OpenShift

Control-Plane (CP) + Workers

Standalone OpenShift **Cluster** (dedicated CP nodes)

Single Cluster Control-plane

Worker Pool

Control node	Control node	Control node
api-server	api-server	api-server
etcd	etcd	etcd
kcm	kcm	kcm
...	...	...

Worker Pool:
- workload
- workload
- SDN
- Kubelet
- CRI-O

Low CAPEX and OPEX costs (bundling of CPs + CP as pods)

Central Management of CPs (easy operation & maintenance)
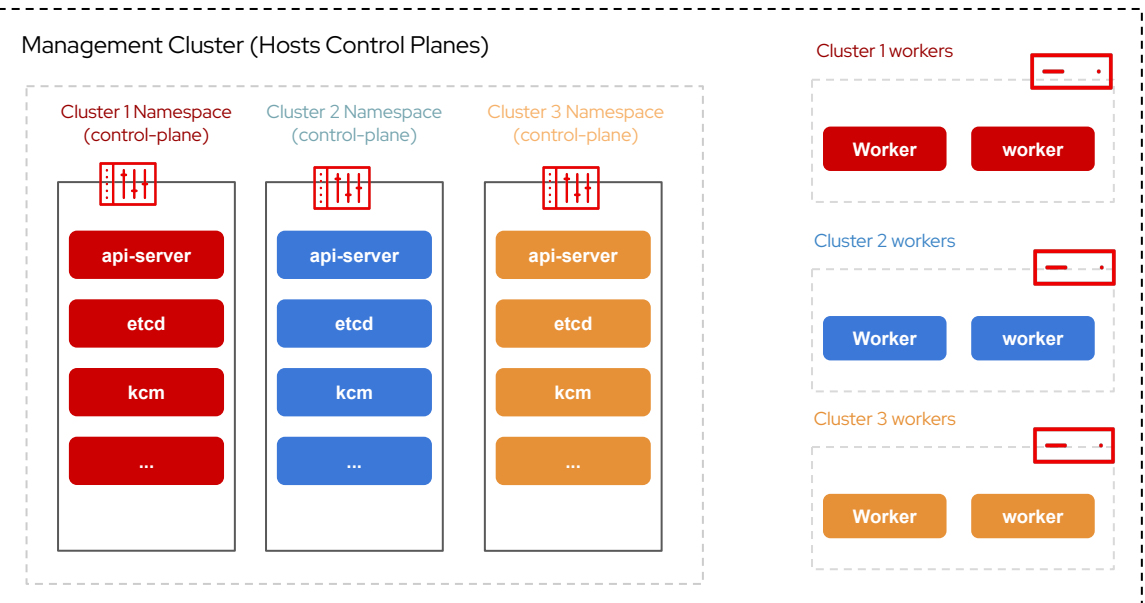
Multi-arch support (e.g. CP x86, workers ARM)

HyperShift

Control-Plane (CP) **+** **Workers**

HyperShift **Clusters** (decoupled CP and workers)

Management Cluster (Hosts Control Planes)

Cluster 1 Namespace (control-plane) | Cluster 2 Namespace (control-plane) | Cluster 3 Namespace (control-plane)

api-server	api-server	api-server
etcd	etcd	etcd
kcm	kcm	kcm
...	...	...

Cluster 1 workers:
- Worker
- worker

Cluster 2 workers:
- Worker
- worker

Cluster 3 workers:
- Worker
- worker

Network & Trust segmentation

Mixed Iaas For CP and Workers

Fast cluster bootstrapping (CP as Pods)

Product Manager: Adel Zaalouk

Red Hat

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.

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