

Red Hat
Summit

Connect

Flexible, scalable and resource efficient IT infrastructure based on nested OpenShift clusters build with:



Red Hat
OpenShift
Hosted
Control Planes

&



Red Hat
OpenShift
Virtualization

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Principal Product Manager



Intro and Roadmap

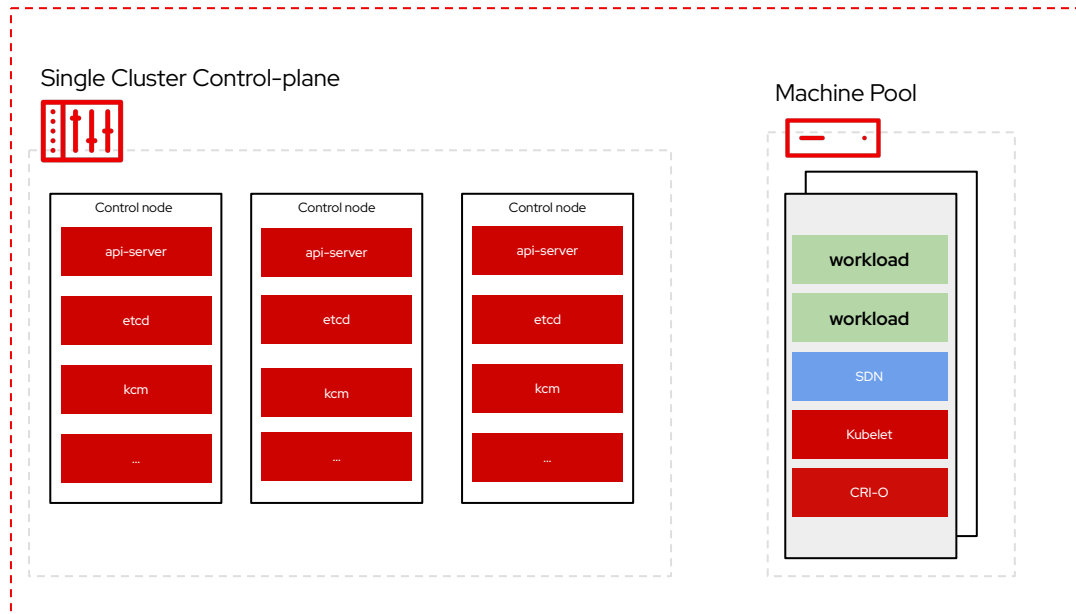


From a horizontal cluster to Hosted Control Plane

One Standalone Cluster

Control-Plane (CP) + Compute nodes

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

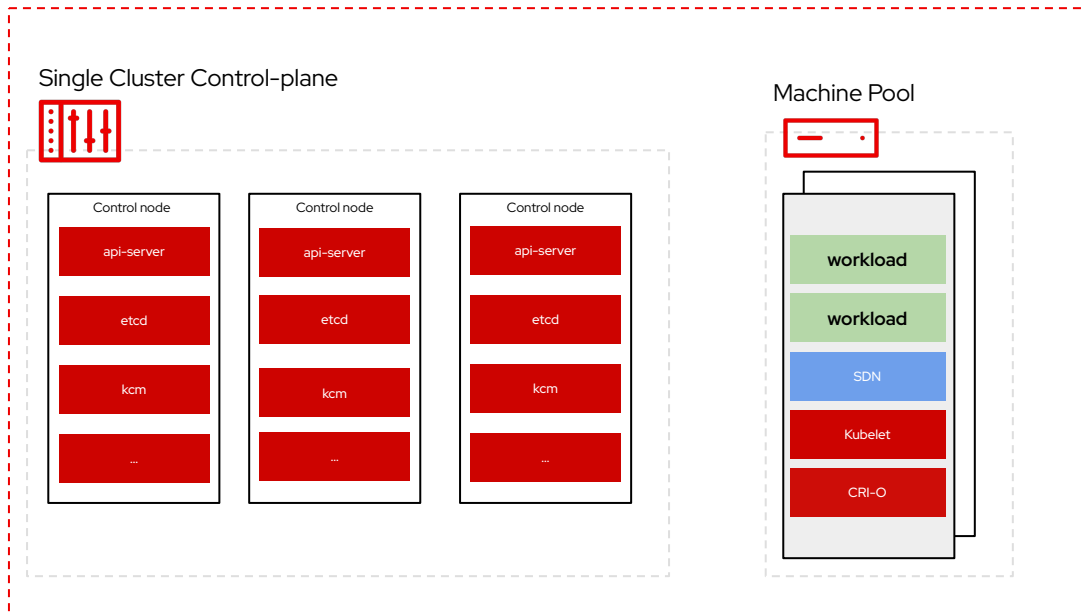


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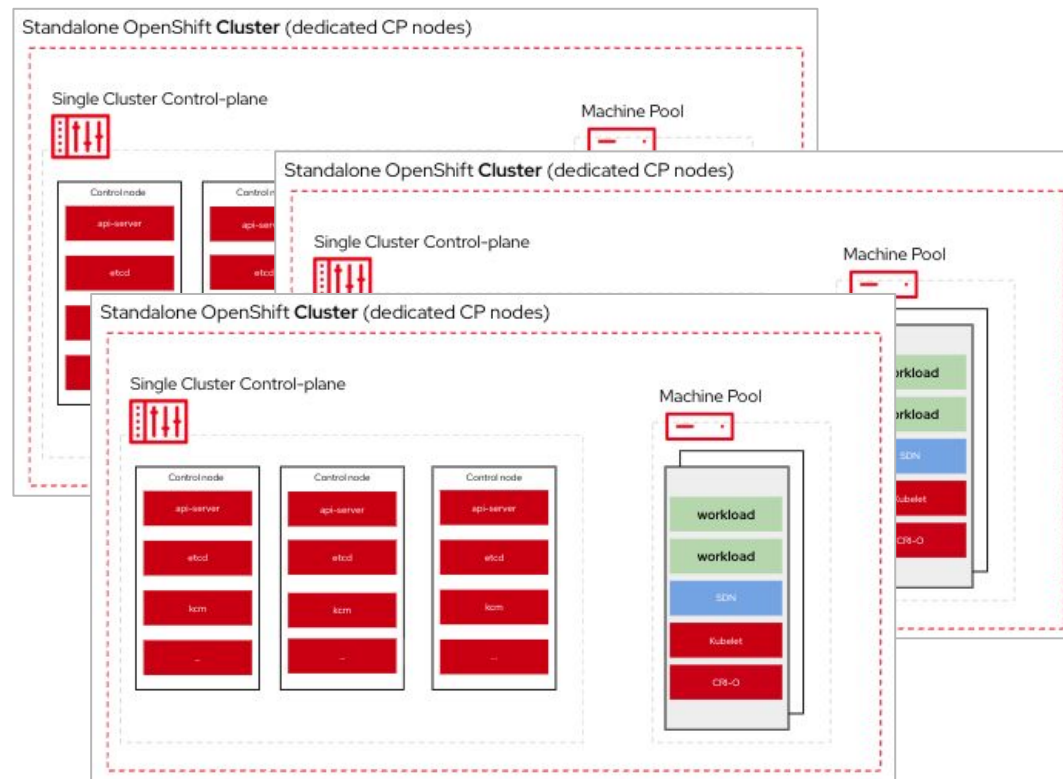
Control-Plane (CP) + Compute nodes

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



Many Smaller Standalone Cluster

Control-Plane (CP) + Compute nodes



Short Stories / Use cases



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It takes longer than expected for me to create a cluster

I don't want Workload admins/Developers to have access to control-plane.

Prevent CRD conflicts between tenants



Short Stories / Use cases



It takes longer than expected for me to create a cluster

I don't want Workload admins/Developers to have access to control-plane.

Prevent CRD conflicts between tenants

It takes a lot of compute to host my control-plane.

I want more space for workloads on my cluster.

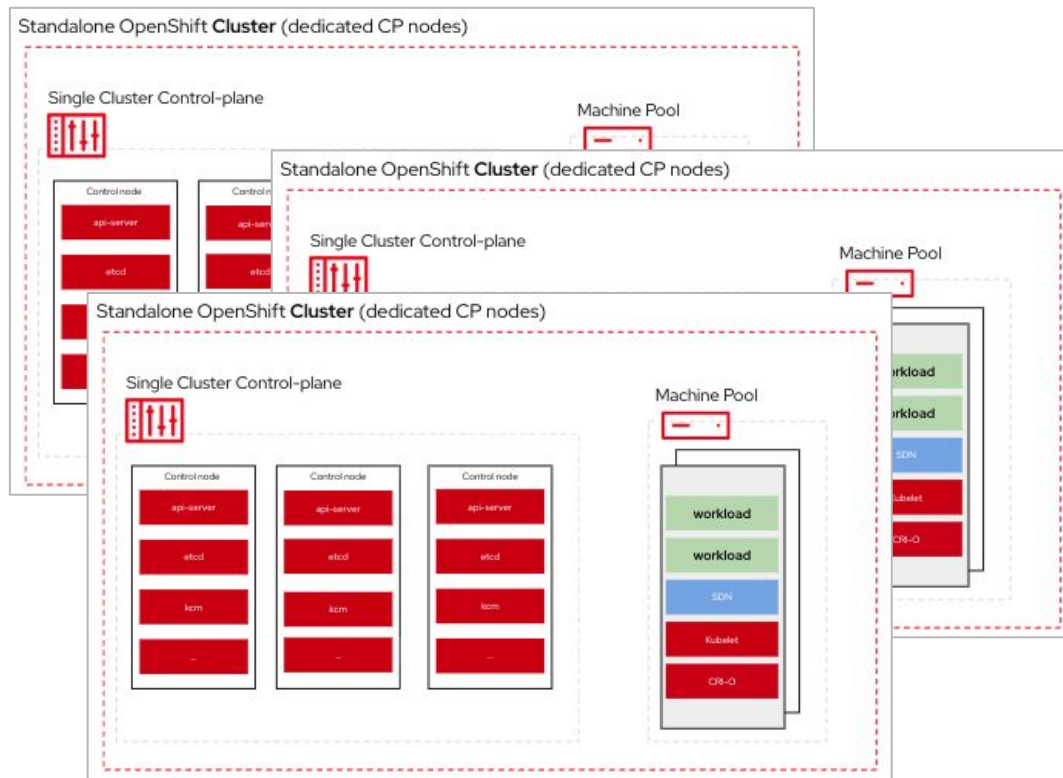
I have one large server, but it's too much to host just one cluster.



From a horizontal cluster to Hosted Control Plane

Many Smaller Standalone Cluster

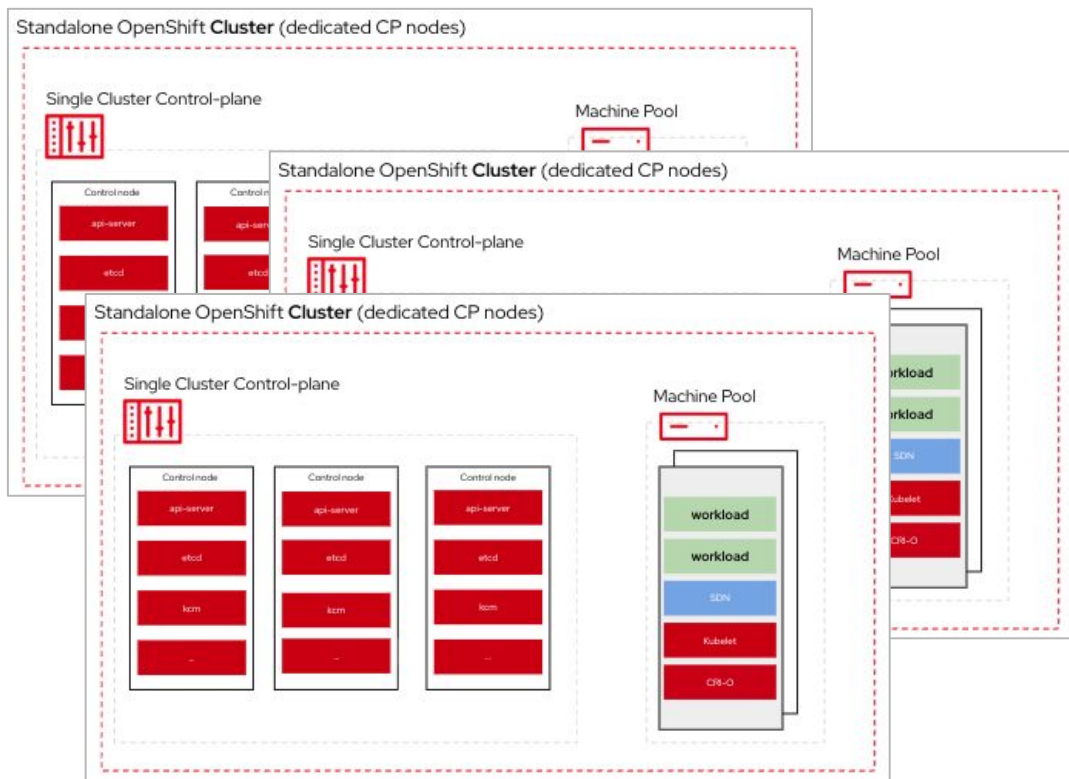
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From a horizontal cluster to Hosted Control Plane

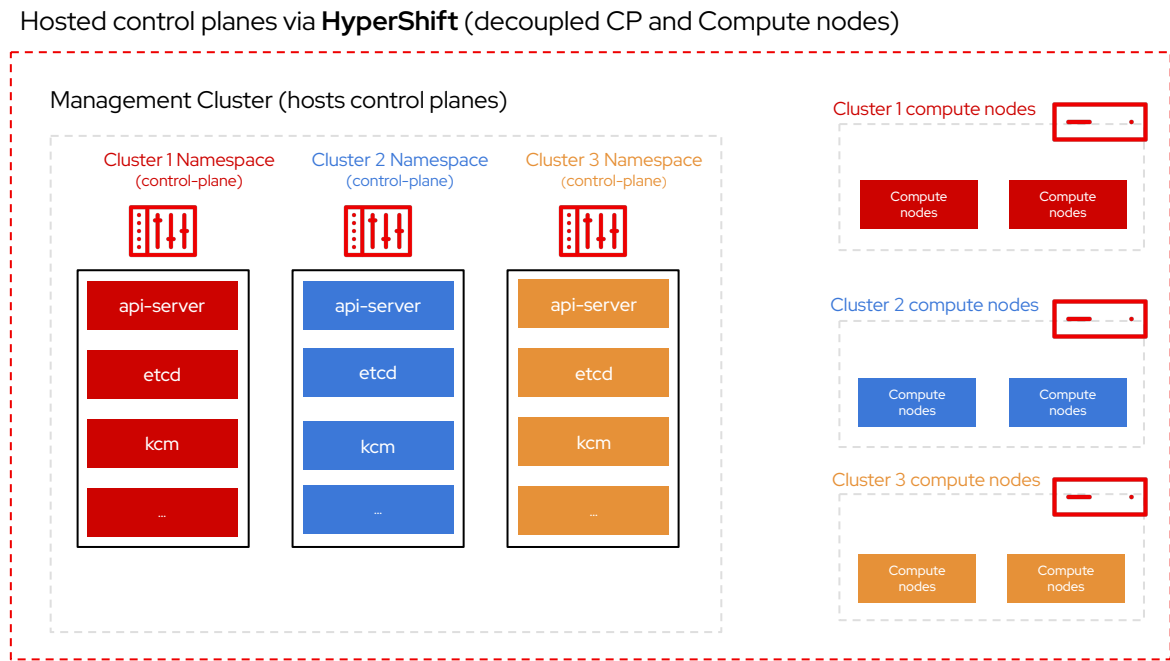
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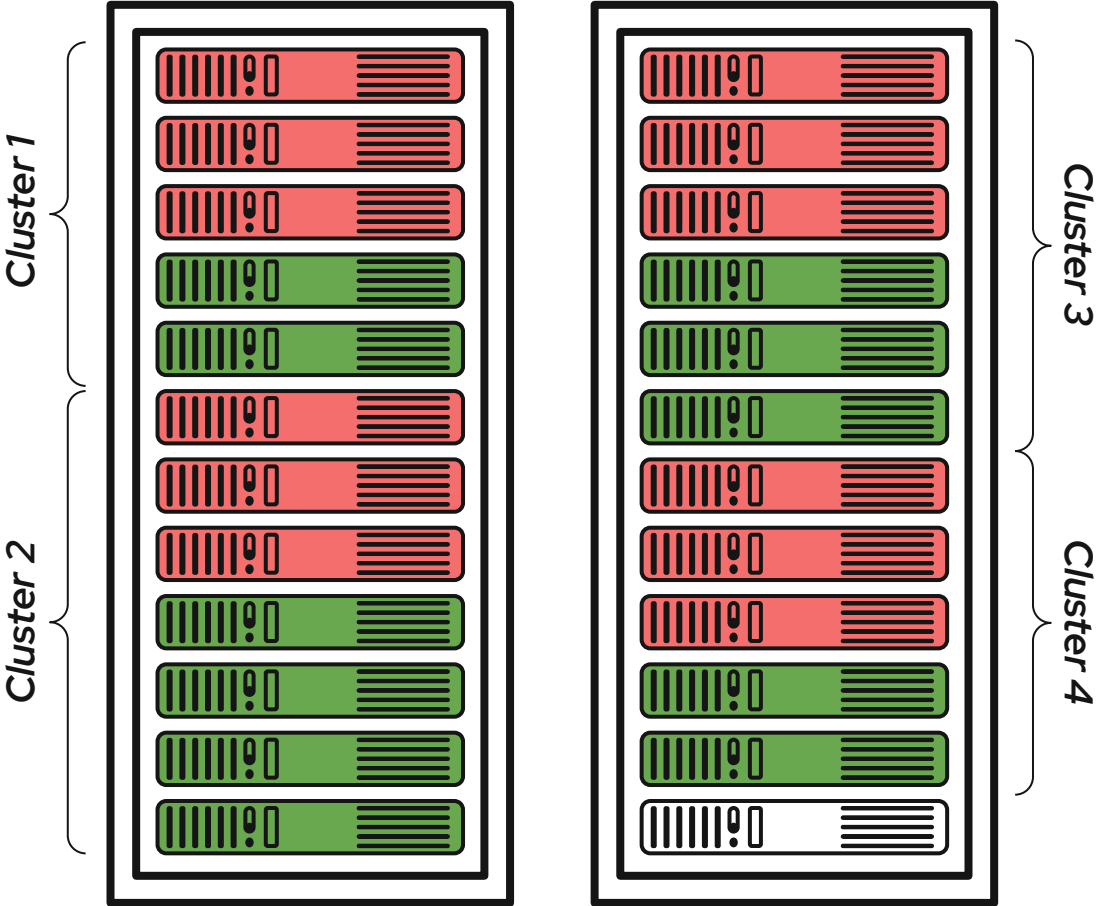
Hosted Control Planes for Red Hat OpenShift

Control-Plane (CP) + Compute nodes



From a horizontal cluster to Hosted Control Plane

Many Smaller Standalone Cluster



4 Clusters with 12 Control Plane (CP) and 11 Compute Nodes with workload (W)

Control Plane Node

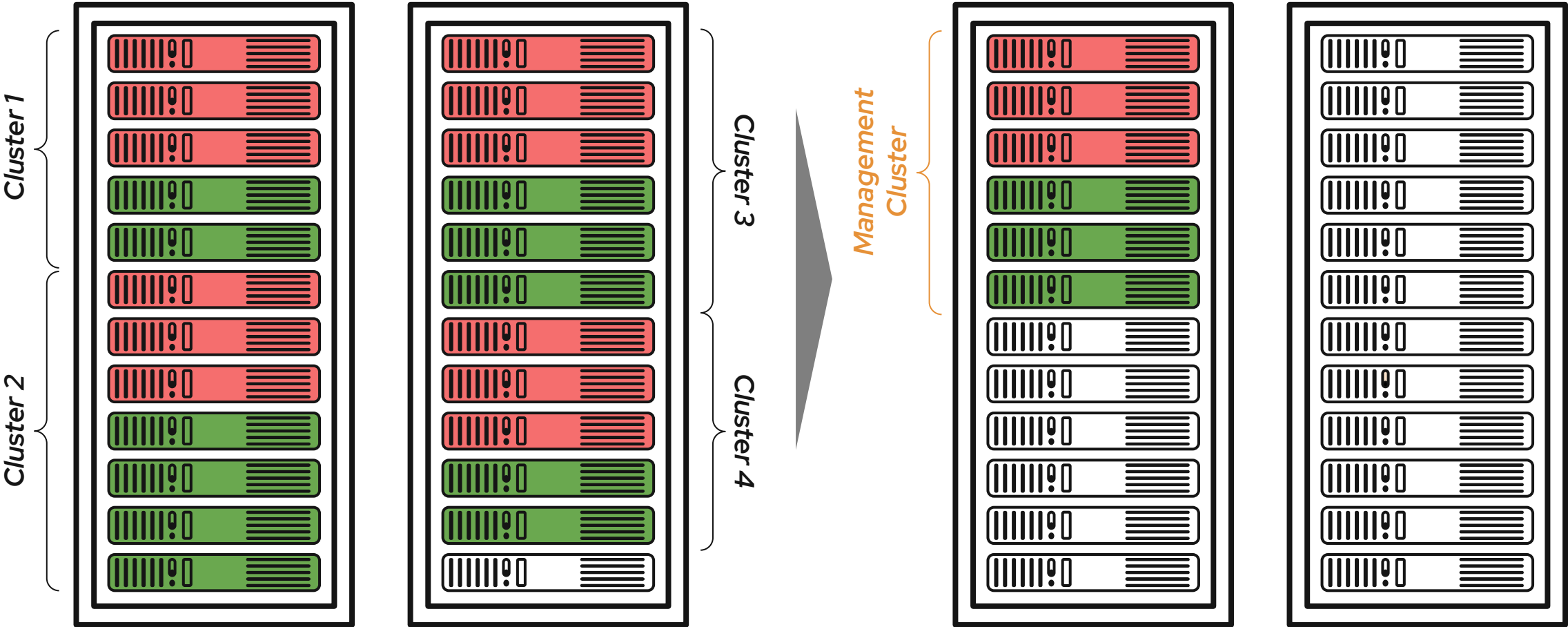
Compute Node



From a horizontal cluster to Hosted Control Plane

Many Smaller Standalone Cluster

Hosted Control Planes for Red Hat OpenShift



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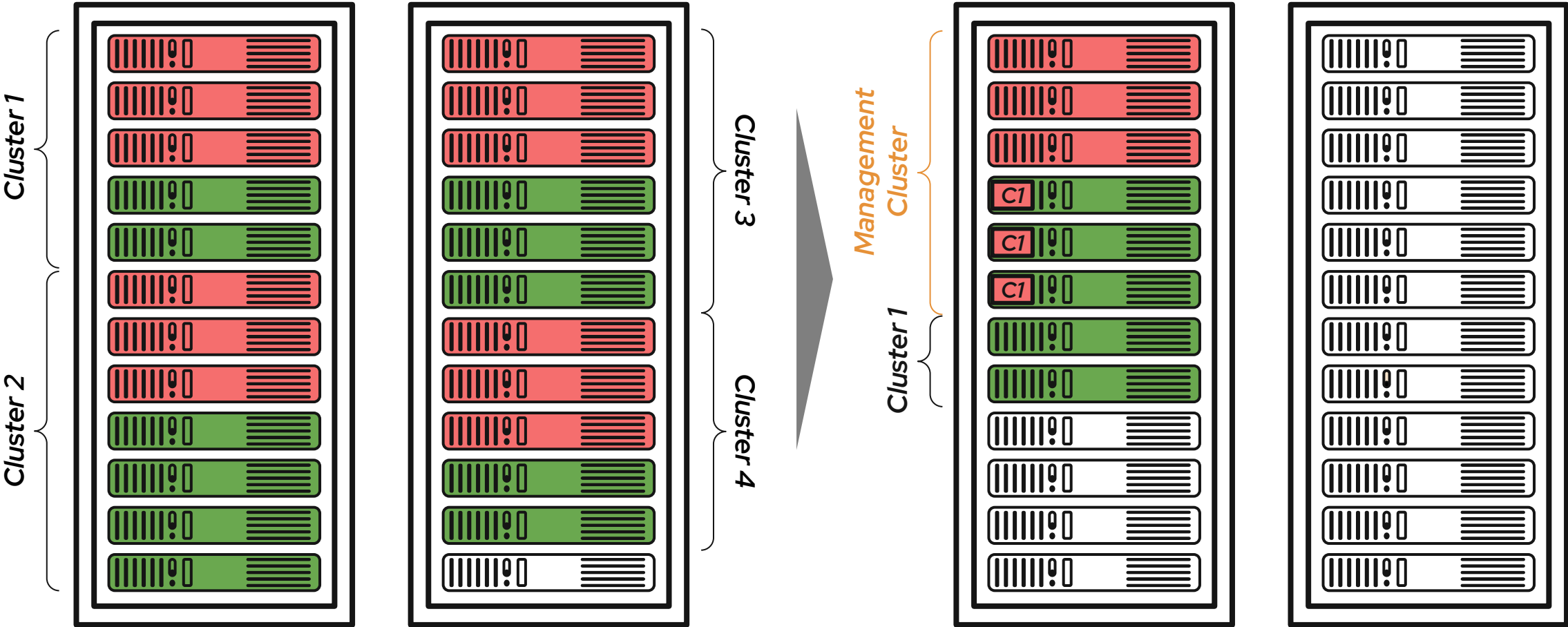
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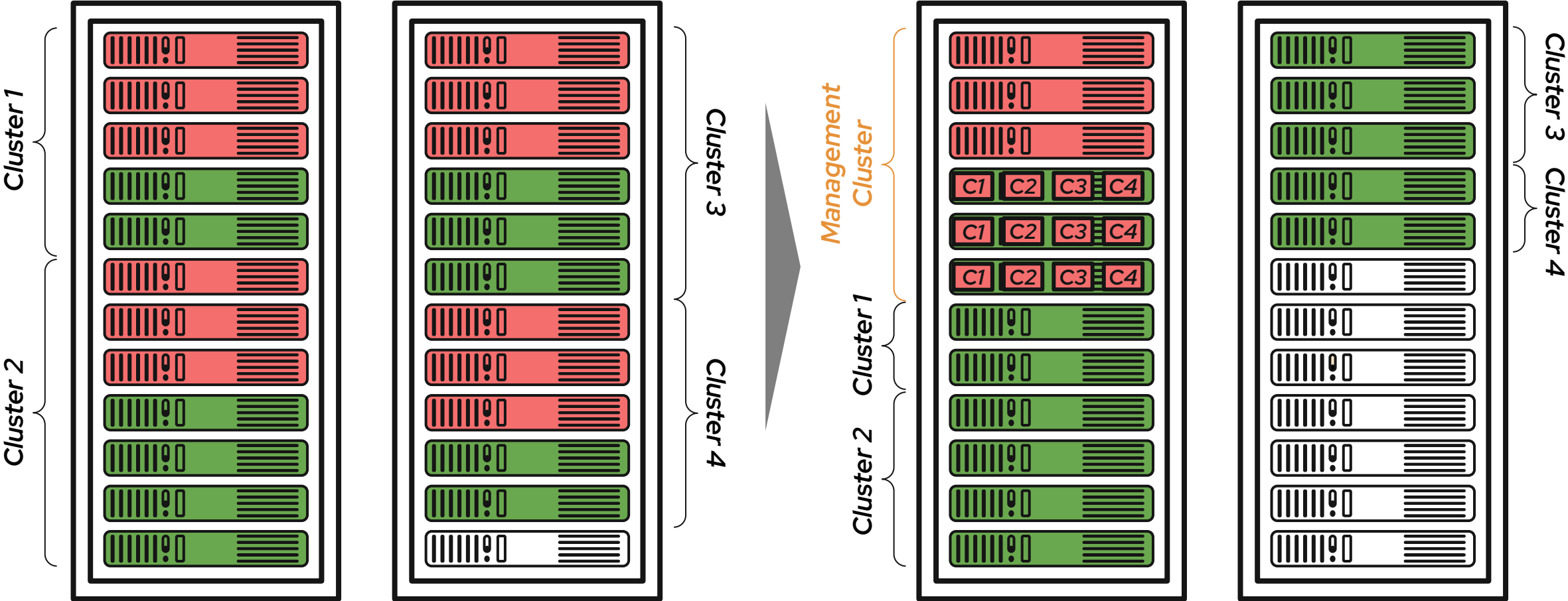
Control Plane Node Compute Node



From a horizontal cluster to Hosted Control Plane

Many Smaller Standalone Cluster

Hosted Control Planes for Red Hat OpenShift



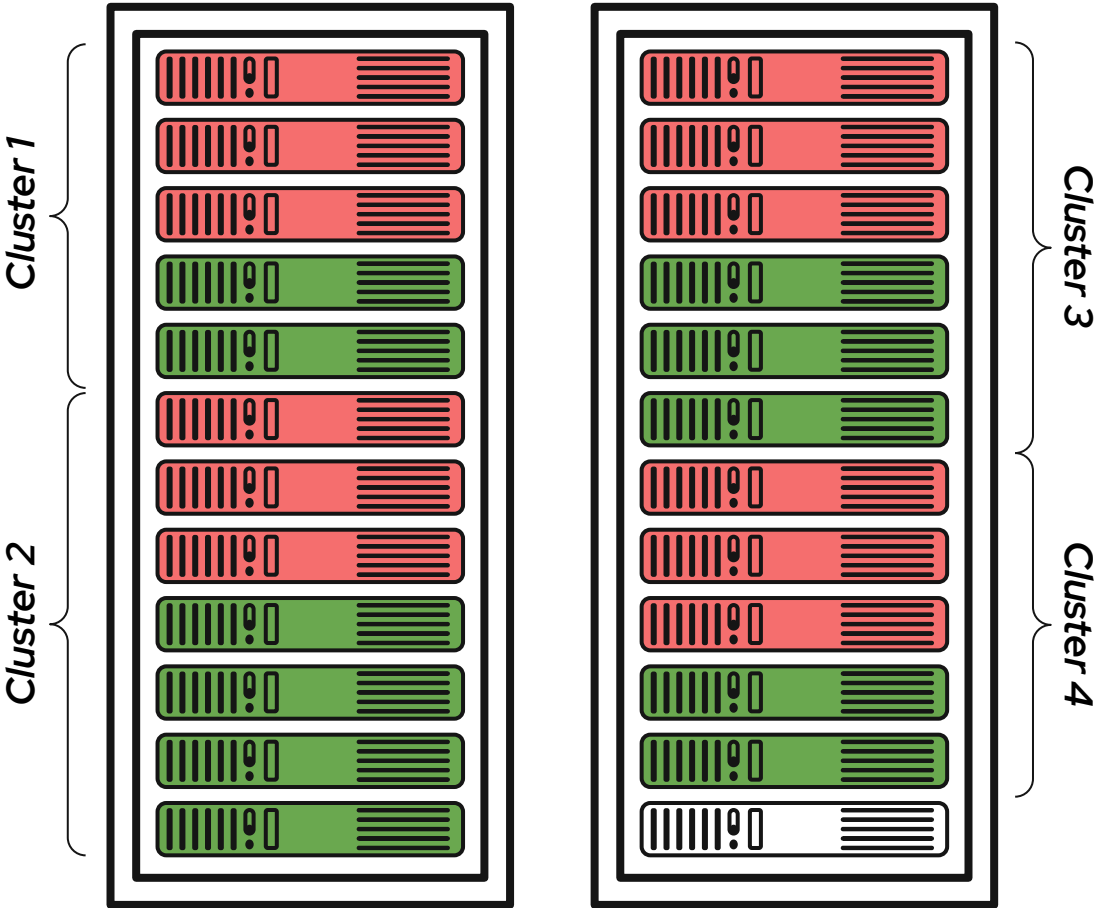
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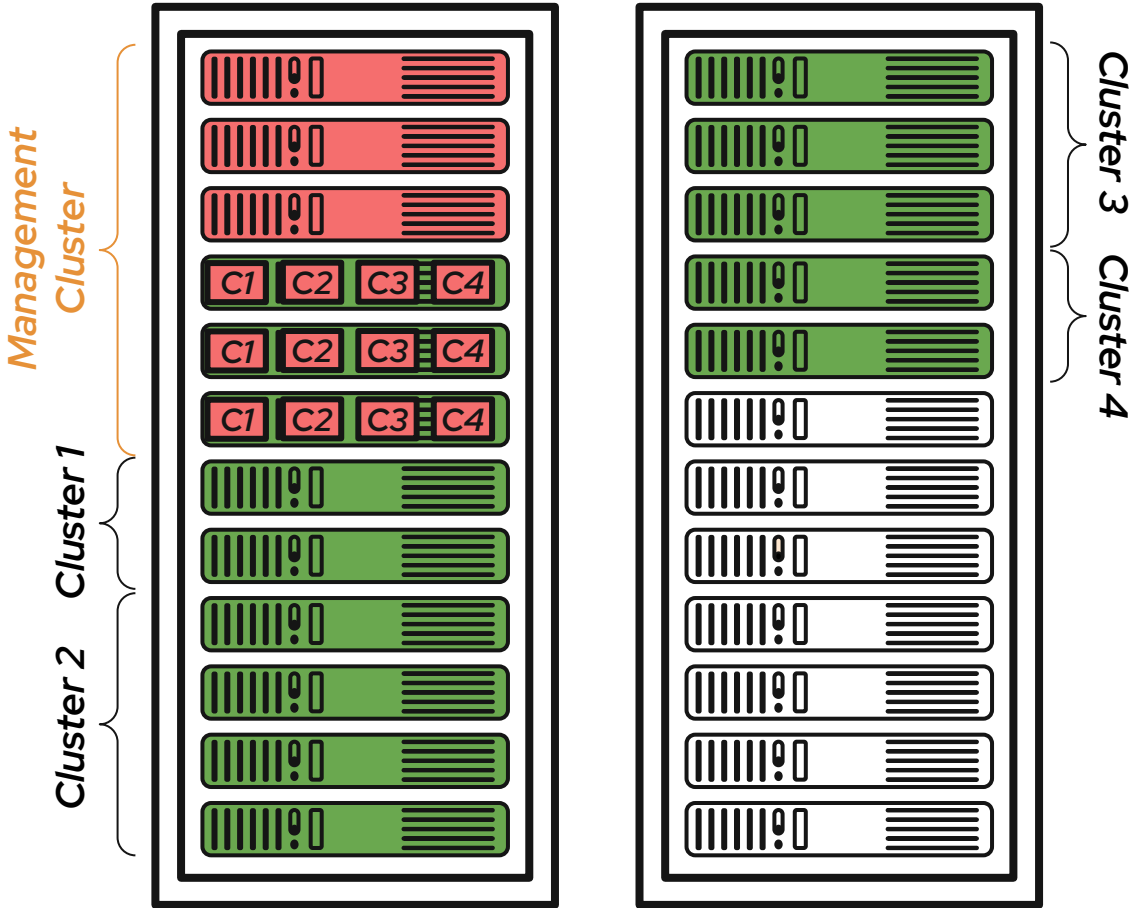
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Hosted Control Planes for Red Hat OpenShift

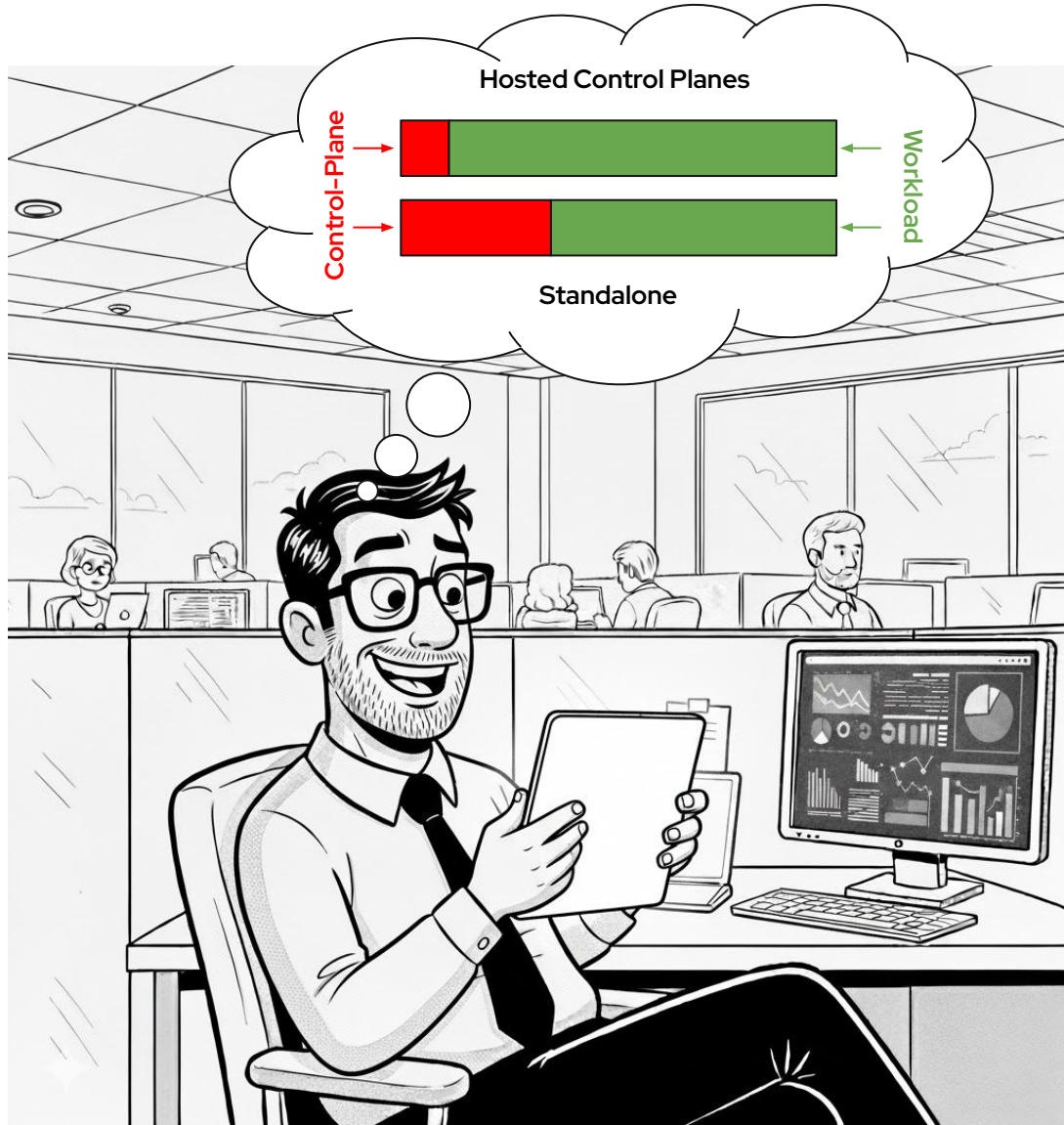


5 Clusters with 3 dedicated Control Plane (CP), 3 nodes with Control Plane as workload, and 11 Compute Nodes with workload (W)

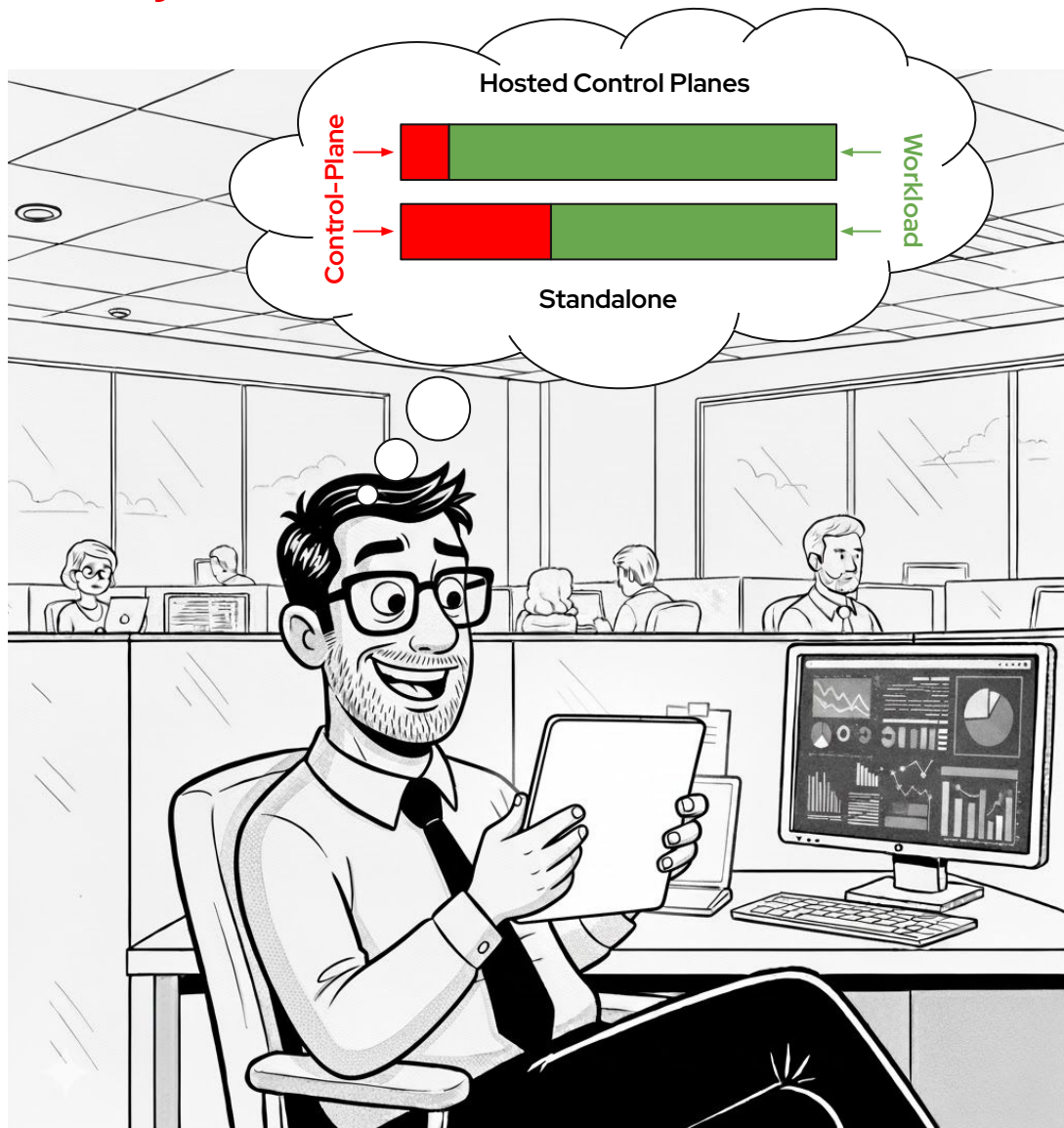
Control Plane Node Compute Node



Why Hosted Control Plane?



Why Hosted Control Plane?



 Supported OpenShift topology

 Reduced infrastructure costs / densification

 Faster cluster creation

 Strong separation between control and workload

 Support multi-arch / multi-env
(on AWS, IBM Z/Power, OCP-Virt, bare metal, and non-bare-metal agent machines (TP))

 Centralized management in a "Managed" model



Hosted Control Plane Roadmap

Key goals

ROSA HCP by default

Support ARO HCP
(managed by Red Hat)

Support Azure
*(stand alone for both
management and ho)*

Non-Bare Metal GA:
vSphere, Nutanix,
Hyper-V, etc.



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Non-Bare Metal GA:
vSphere, Nutanix,
Hyper-V, etc.

- Streamlined and simplified upgrades for control planes and NodePools
- Dynamic Control Planes Scaling
- 3rd-Party CNI Conformance Tests for Cilium and Calico CNIs
- Enhanced Observability for seamless installation and life cycle
- Improvements in ROSA HCP and work towards ARO HCP GA
- All new ROSA clusters using HCP by default

- Scale down to zero
- Decouple control plane and data plane upgrades
- GA for non-bare metal support (vSphere/Nutanix/Hyper-V. etc.)
- Azure support
- Backup and restore hosted clusters on a different management cluster
- User-Defined Networking support
- IPsec/networking config parity with standalone
- Documentation improvements



Use Case

The real life problems that HCP helps to solve

Requirements



- I want to create and destroy k8s clusters on-demand
- I want to update my infrastructure software seamlessly
- I want k8s control plane to be resistant to site and HW failures
- I want multi-site deployment
- I want my HW to be highly utilized
- I want it on-prem
- I want it multi-tenant



Ideas

- ▶ Nested (tenant) OpenShift clusters
- ▶ VMs as worker nodes
- ▶ k8s Hypershift / OpenShift HCP
- ▶ Integrated platform

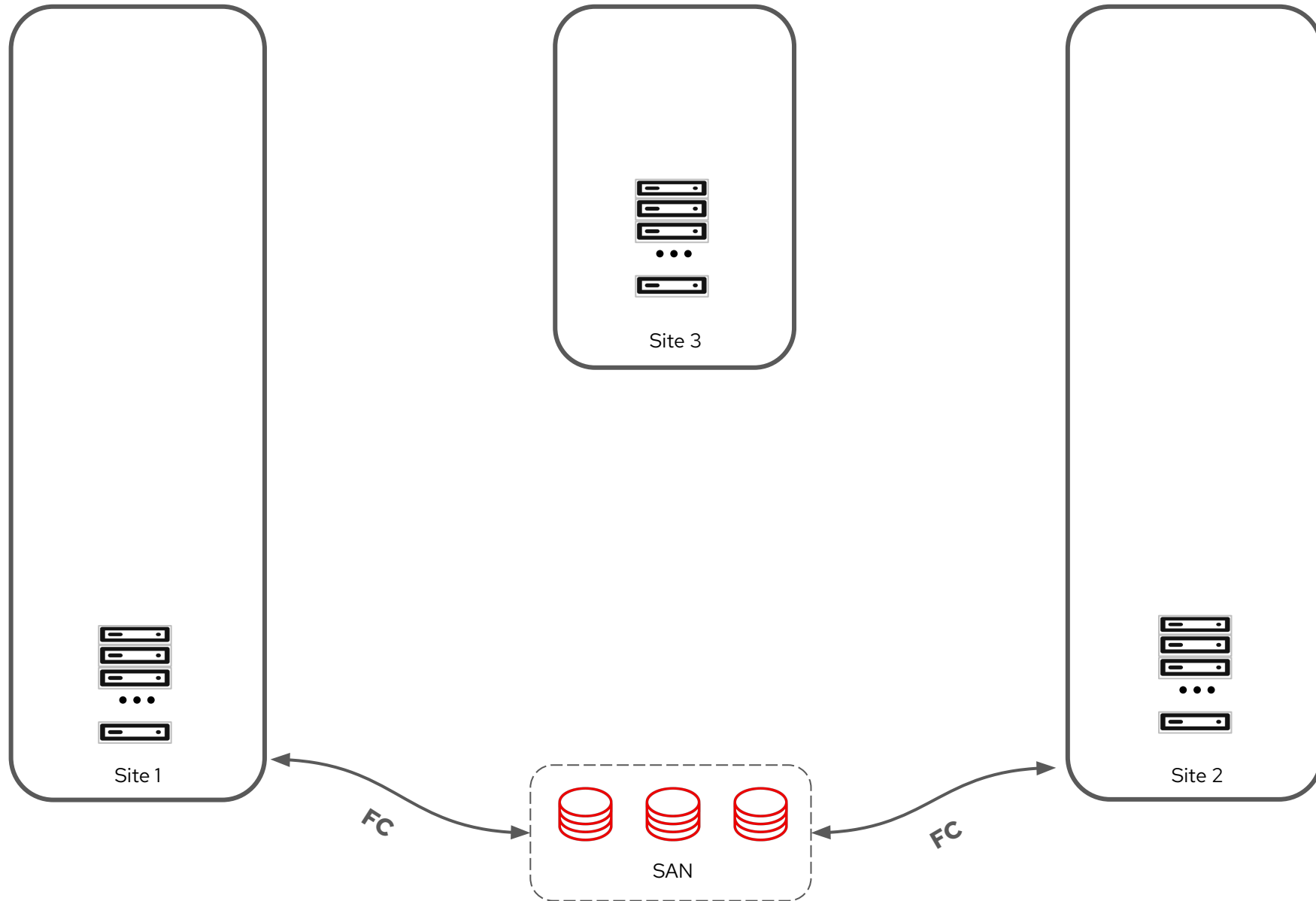
 **Red Hat**
OpenShift
Virtualization

 **Red Hat**
OpenShift
Hosted Control Planes

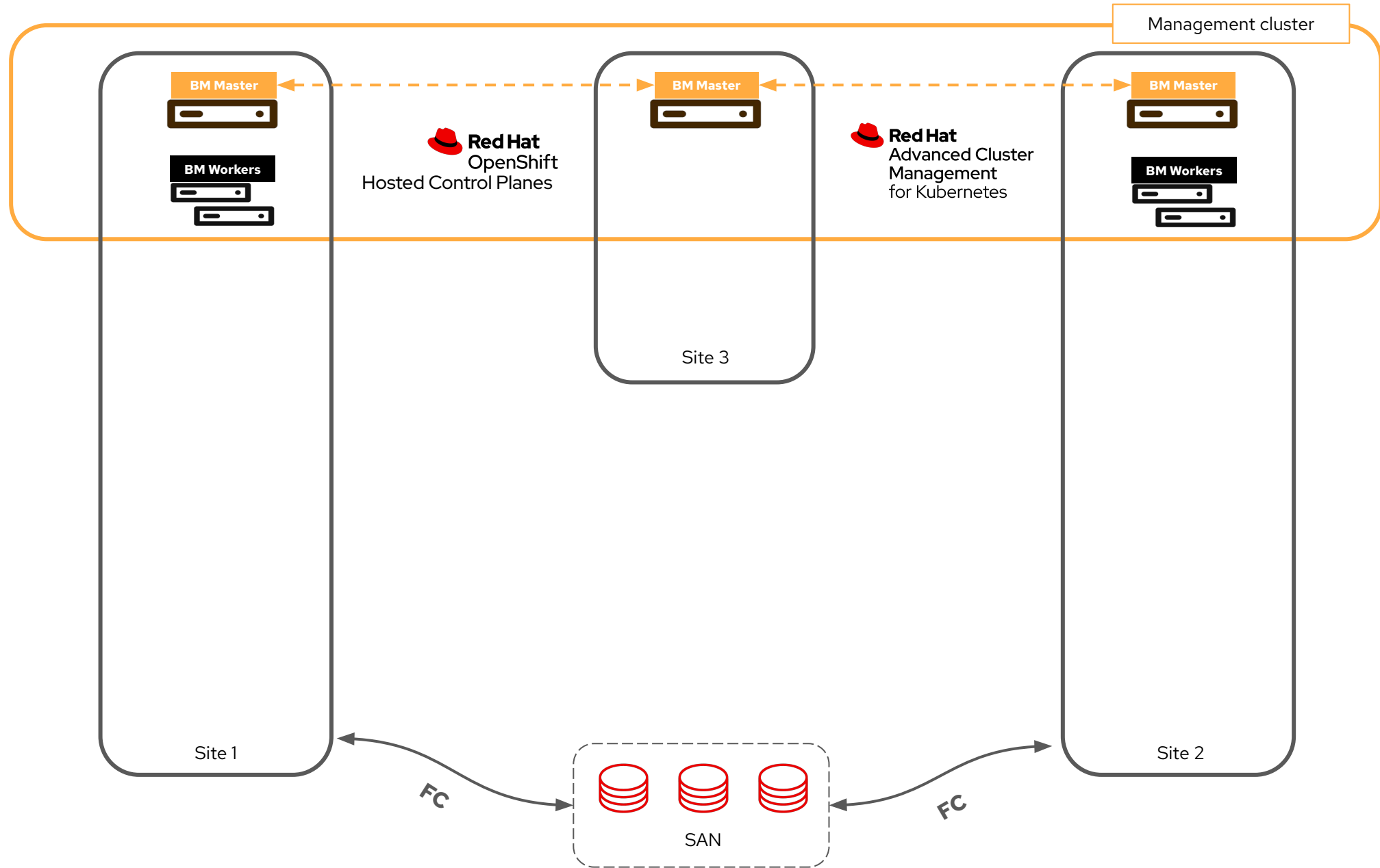
 **Red Hat**
Advanced Cluster
Management
for Kubernetes



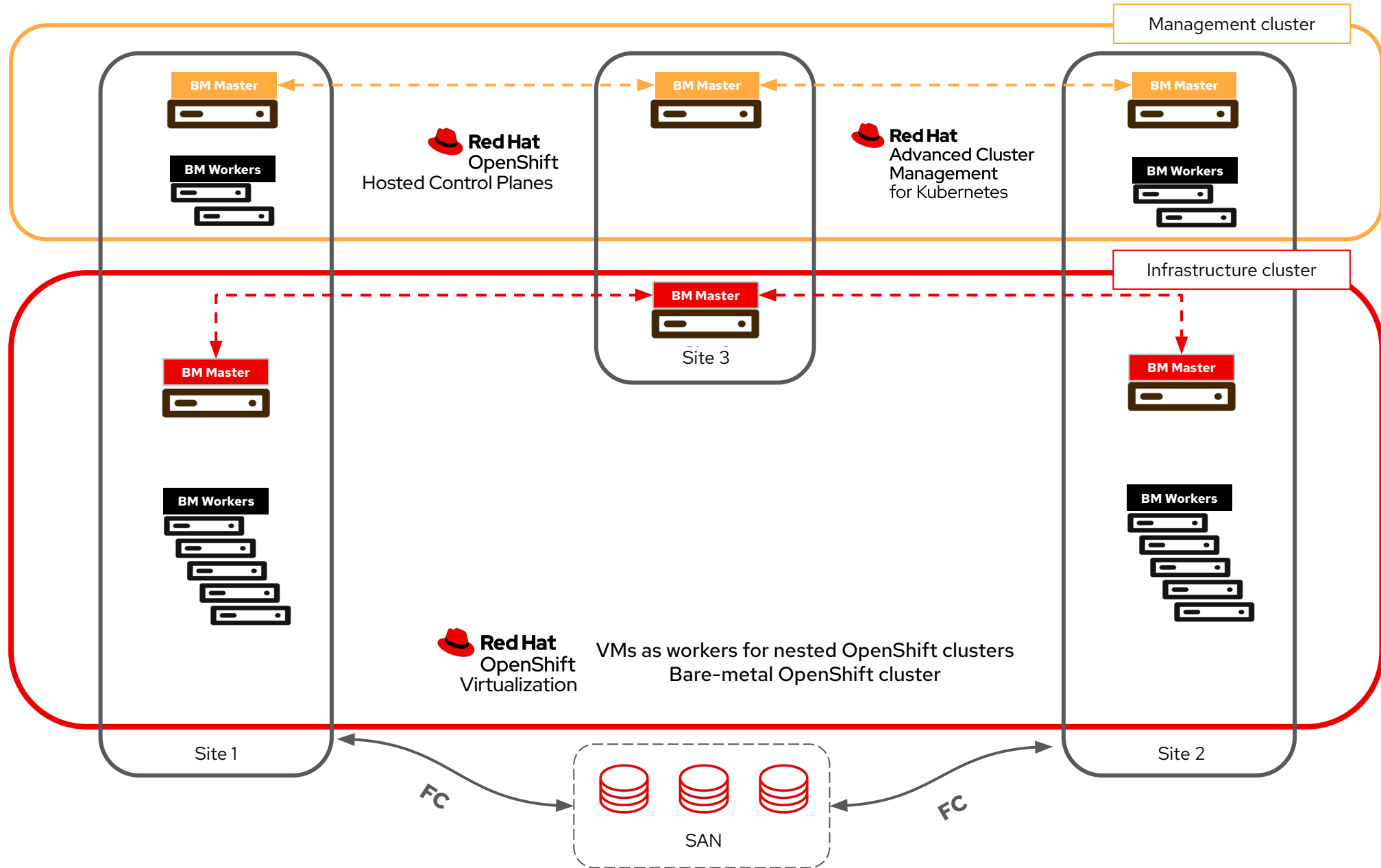
Architecture - Infrastructure available



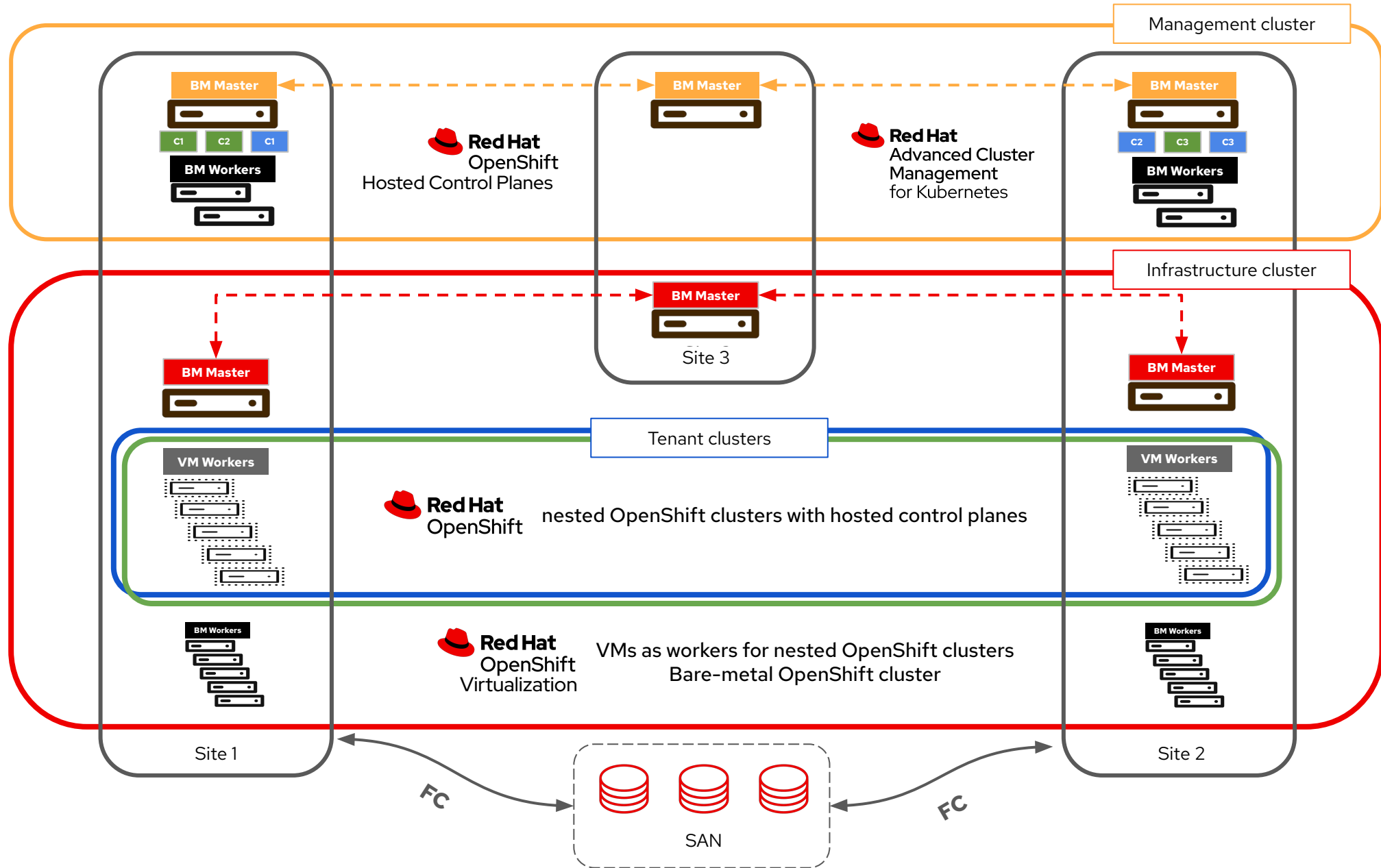
Architecture - Management cluster (HCP)



Architecture - Infrastructure cluster (OpenShift Virtualization)



Architecture - nested OpenShift clusters on top of OpenShift Virtualization



Business outcomes

- ▶ Lower CAPEX
 - high HW utilization
- ▶ Lower OPEX & TTM
 - automation and integrated LCM
 - dynamic environment - tenant clusters on demand
 - multi-tenant platform - hosts plethora of applications
- ▶ Improved security
 - separation of concerns
- ▶ Assured high availability and scalability
 - platform built-in



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