



Red Hat



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LEAP
Academy



MAKING OF YOUR APPLICATION CONTAINER READY

A Journey through expertise...



@TechProdevans

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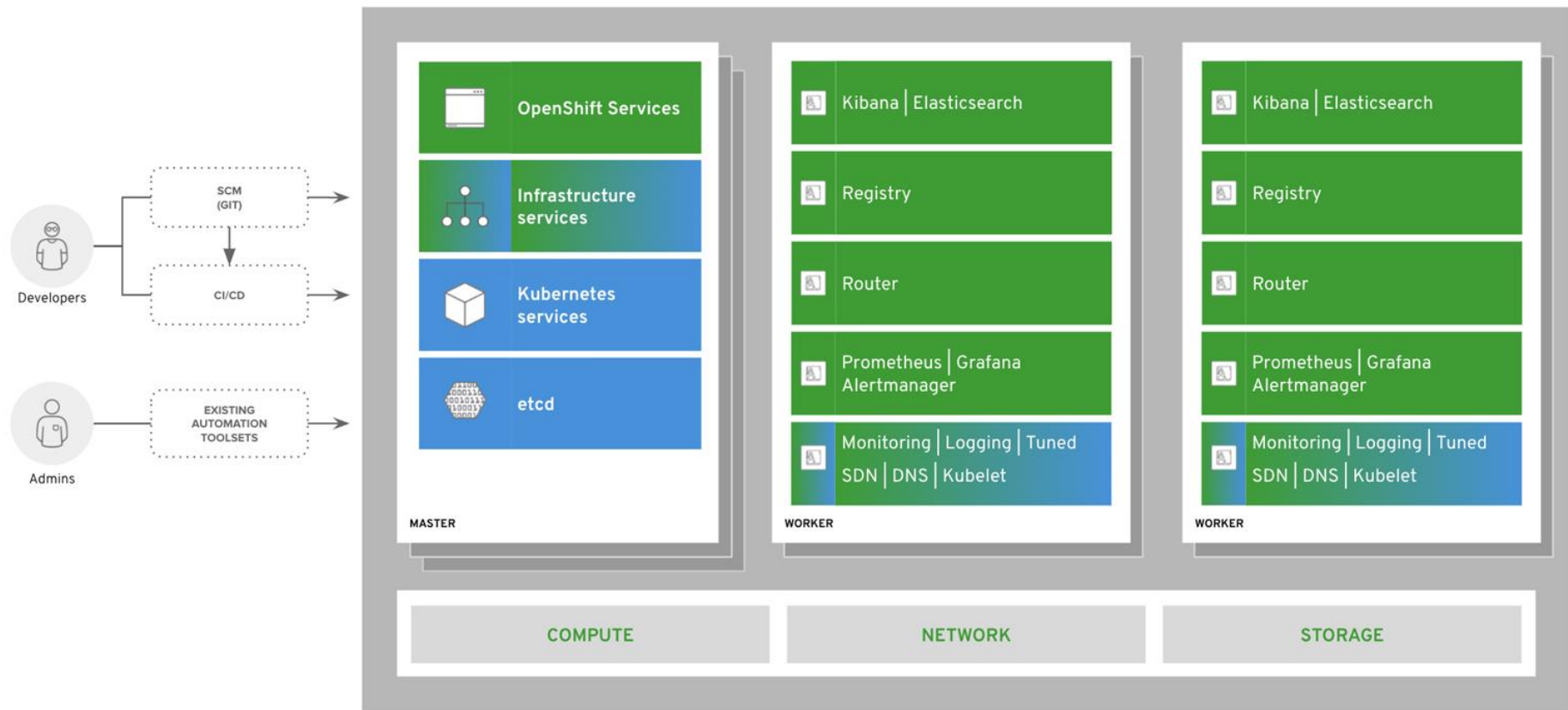


AGENDA

- Openshift Architecture & Core pieces
- Overview of Operators
- Overview of Openshift 4
- Overview of Container Native Storage
- Openshift 4 Administration
- Setup Infrastructure Nodes in Openshift



OpenShift - High Level Architecture





OpenShift - Core Components

- Pod
 - Build config
 - Deployment config
 - Image streams
 - Services
 - Routes
 - Secrets
 - Replication Controller
 - Service account
- RBAC
 - Persistent Volume
 - Persistent Volume Claim
 - Templates
 - Resource Quota
 - Limit Range
 - Statefulset pods
 - Config maps
 - SCC

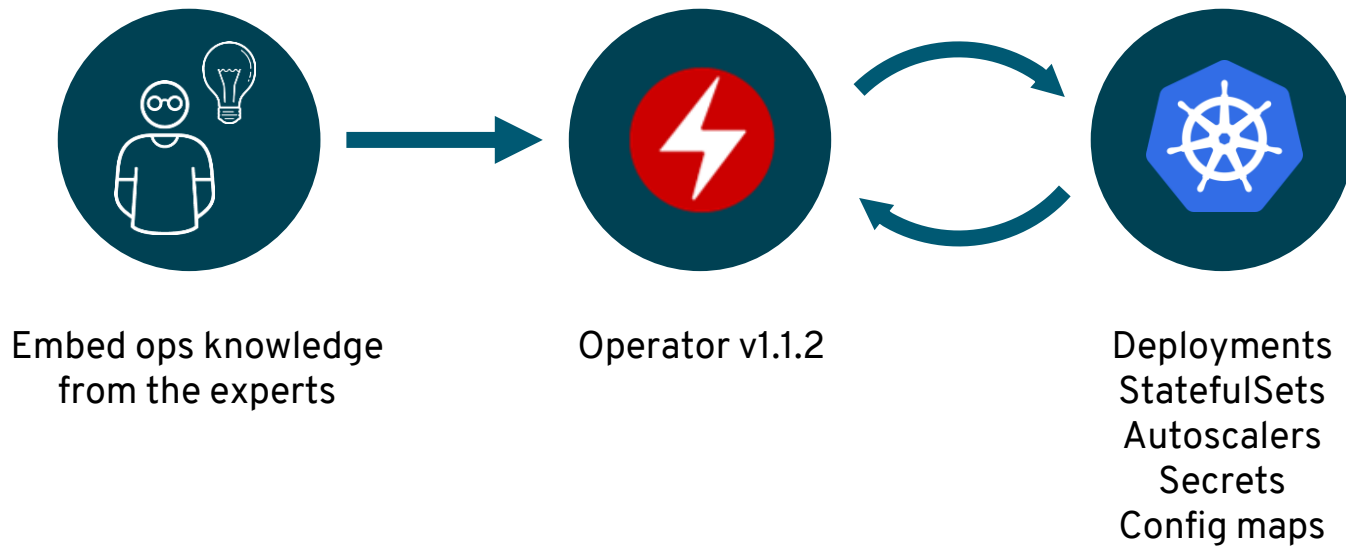


- | | |
|---|--|
| <ul style="list-style-type: none">• Pod• Build config• Deployment config• Image streams• Services• Routes• Secrets• Replication Controller• Service account | <ul style="list-style-type: none">• RBAC• Persistent Volume• Persistent Volume Claim• Templates• Resource Quota• Limit Range• Statefulset pods• Config maps• SCC |
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How can I manage all Openshift Core Components ?

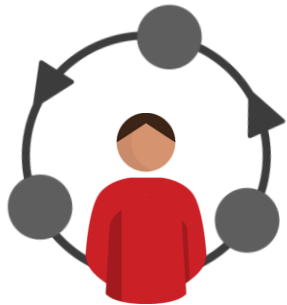


WHAT IS AN OPERATOR?



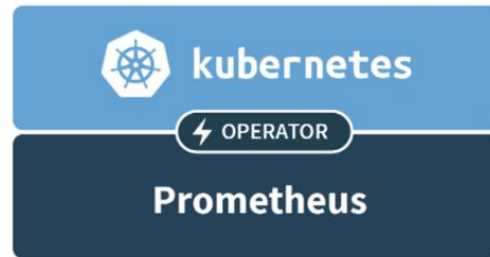


Encoding and automating Ops Knowledge



WITHOUT OPERATORS: **REACTIVE**

- Continually checks for anomalies
- Alert humans for response
- Requires manual change to fix

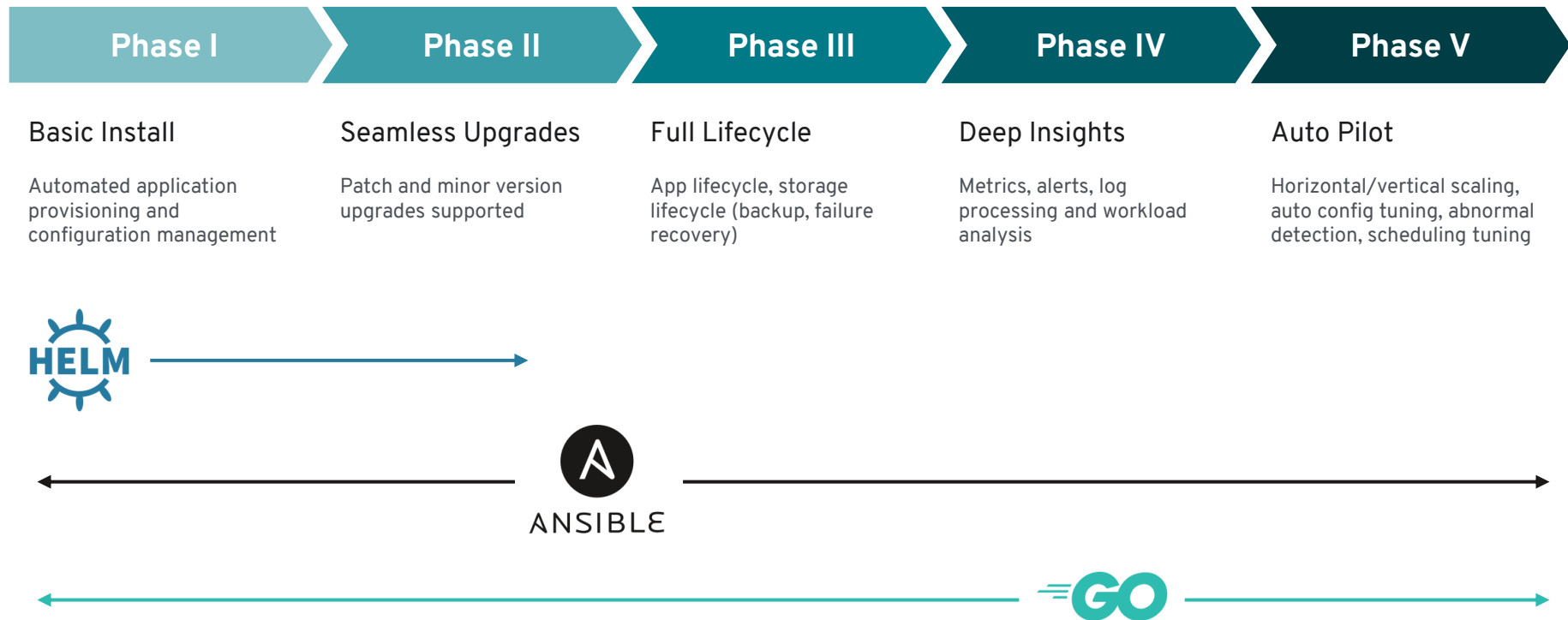


WITH OPERATORS: **PROACTIVE**

- Continually adjusts to optimal state
- Automatically acts in milliseconds



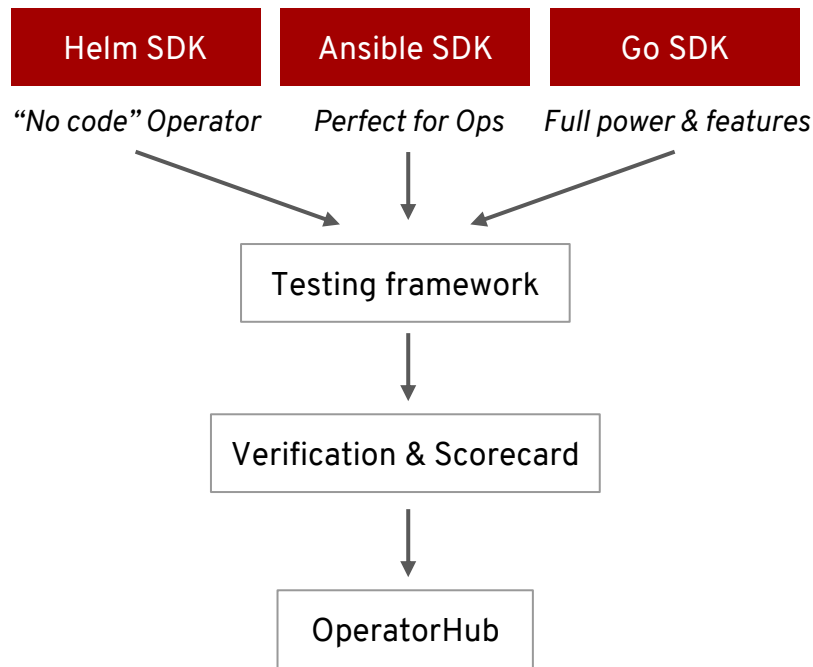
OPERATOR MATURITY MODEL





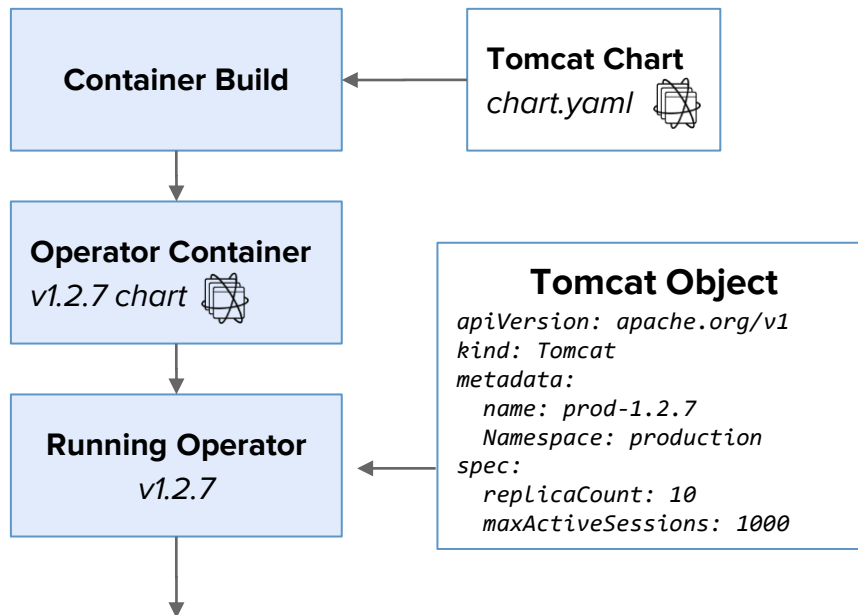
OPERATOR SDK

- “No code” improvements to Helm SDK user experience
- Testing is extremely important for Operators, we have a testing framework built in
- SDK includes a “scorecard” to ensure your Operator is technically correct





HELM SDK



```
$ oc get Tomcats --all-namespaces
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
production	prod-1.2.7	1/1	Running	0	4d
staging	staging-v1.2.8	1/1	Running	1	2h



OpenShift Container Platform 4

A smarter Kubernetes platform

Advanced
cluster
management

Multi-cluster management

Discovery : Policy : Compliance : Configuration : Workloads

Manage workloads

Build cloud-native apps

Data driven insights

Developer productivity

OpenShift
Container
Platform

Platform services

Service Mesh
Serverless : Builds
CI/CD Pipelines
Log Management :
Cost Management

Application services

Languages & Runtimes
API Mgmt :
Integration :
Messaging :
Process Automation

Data services

Databases : Cache
Data Ingestion &
Preparation
Data Analytics : AI/ML
Data Mgmt & Resilience

Developer services

Developer CLI : IDE
Plugins & Extensions :
Cloud-native IDE :
Local developer sandbox

OpenShift
Kubernetes
engine

Kubernetes cluster services

Install : Operators : Over-the-air updates : Monitoring : Logging : Registry : Storage : Networking : Security : Ingress routing

Kubernetes (container orchestration)

Linux (container host OS)



Physical



Virtual



Private cloud



Public cloud



Edge

Automated, full-stack installation
from the container host to application
services

Seamless Kubernetes deployment
to any cloud or on-premises
environment

Autoscaling of cloud resources

One-click updates for platform,
services, and applications



RED HAT ENTERPRISE LINUX

RED HAT® ENTERPRISE LINUX®

General Purpose OS

BENEFITS

- 10+ year enterprise life cycle
- Industry standard security
- High performance on any infrastructure
- Customizable and compatible with wide ecosystem of partner solutions

WHEN TO USE

When customization and integration with additional solutions is required

RED HAT® ENTERPRISE LINUX

Immutable container host

- Self-managing, over-the-air updates
- Immutable and tightly integrated with OpenShift
- Host isolation is enforced via Containers
- Optimized performance on popular infrastructure

When cloud-native, hands-free operations are a top priority



IMMUTABLE OPERATING SYSTEM FOR CONTAINERS

Red Hat Enterprise Linux CoreOS is versioned with OpenShift

CoreOS is tested and shipped in conjunction with the platform. Red Hat runs thousands of tests against these configurations.

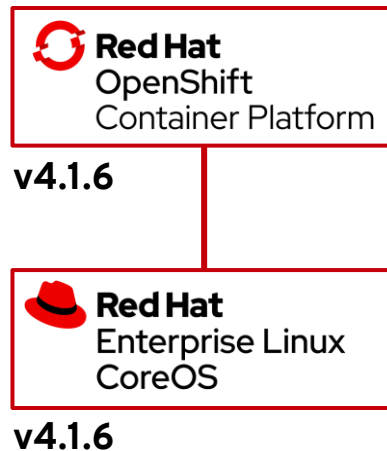
Red Hat Enterprise Linux CoreOS is managed by the cluster

The Operating system is operated as part of the cluster, with the config for components managed by Machine Config Operator:

- CRI-O config
- Kubelet config
- Authorized registries
- SSH config

RHEL CoreOS admins are responsible for:

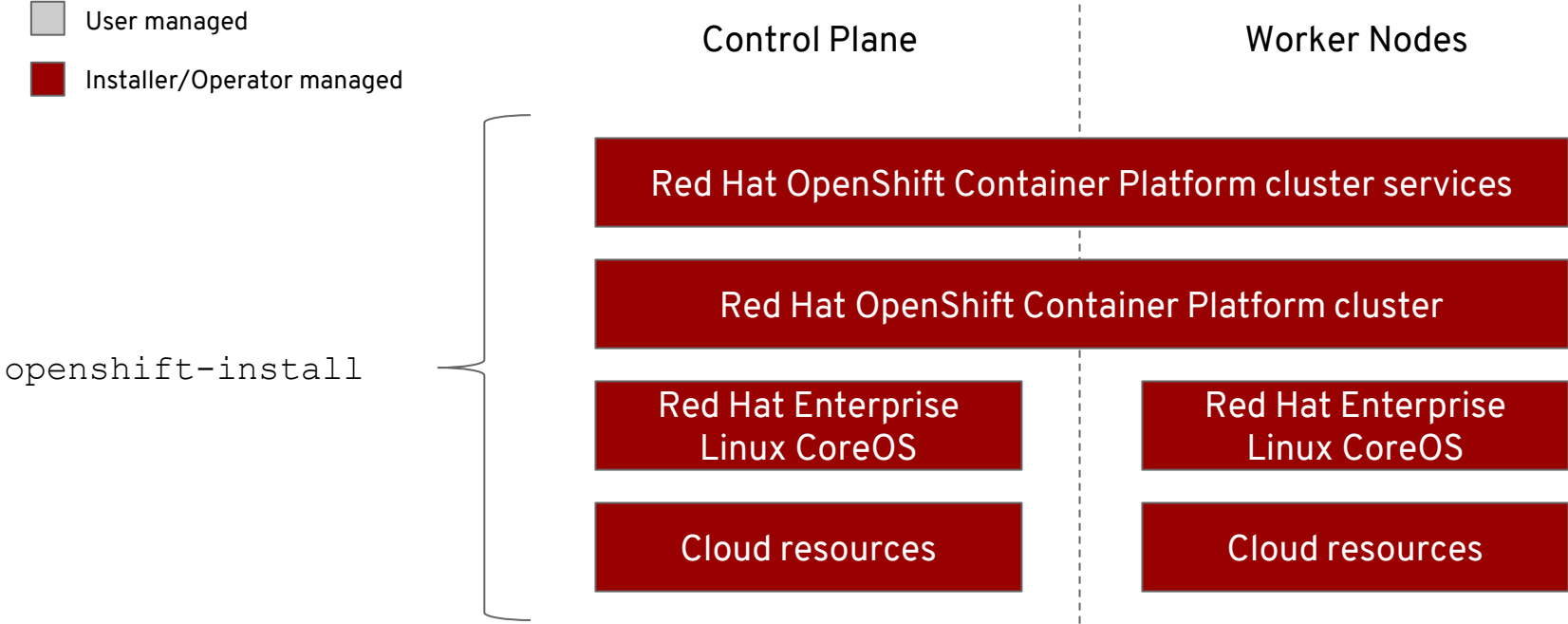
Nothing. 🤖 🙌





FULL STACK AUTOMATED DEPLOYMENTS

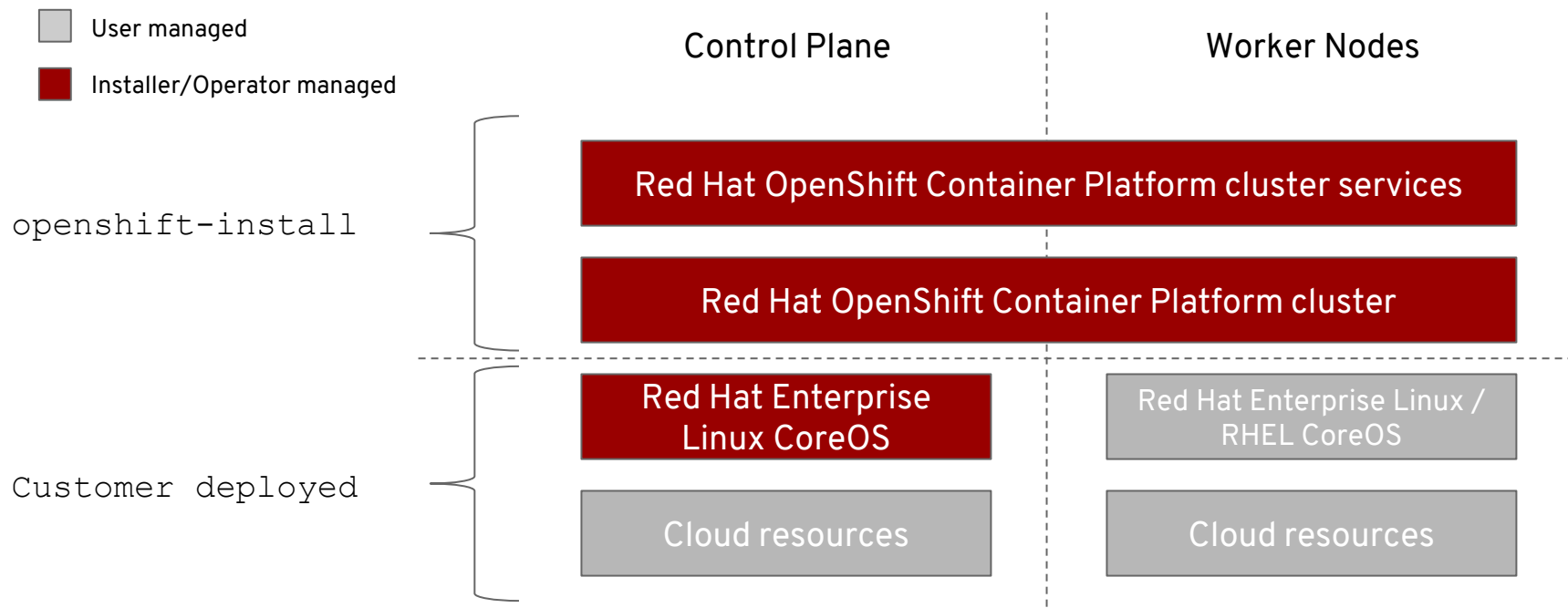
Day 1: OpenShift install - Day 2: Operators





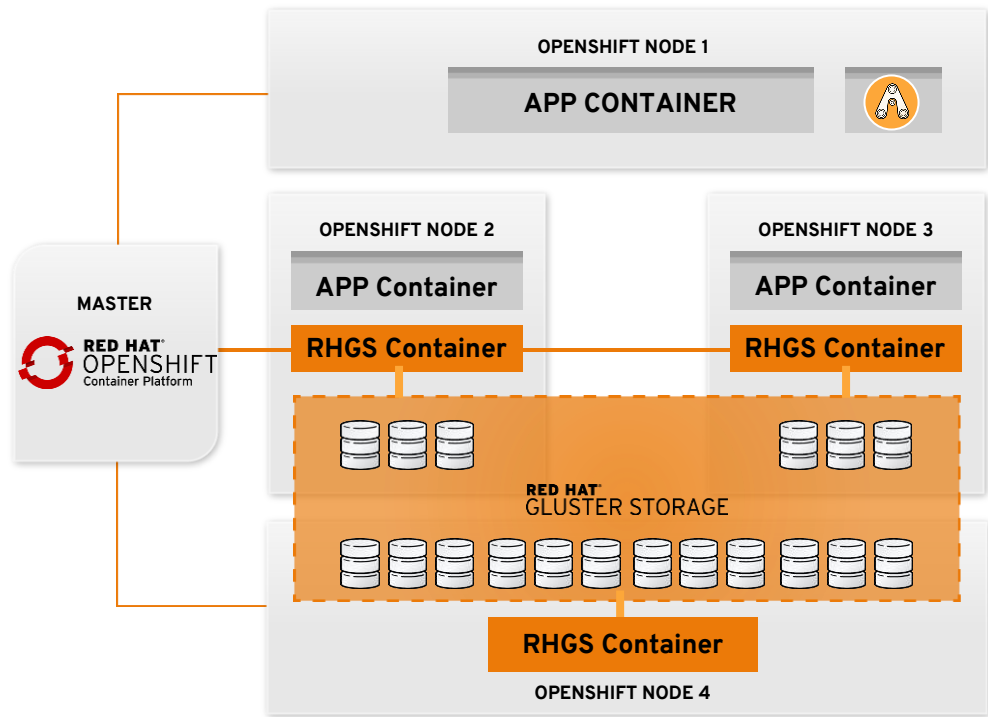
DEPLOY TO PRE-EXISTING INFRASTRUCTURE

Day 1: OpenShift install - Day 2: Operators + Customer Managed Nodes & Infra





CONTAINER-NATIVE STORAGE



Co-Locate Storage and Apps

Dynamic Provisioning

Managed by OpenShift

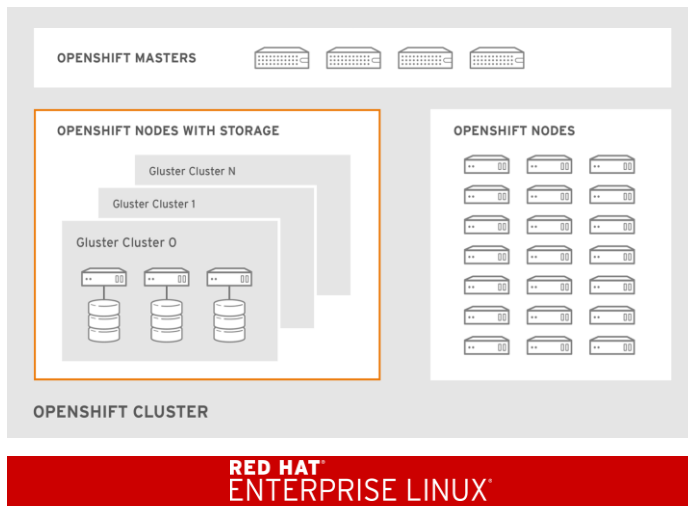
Infrastructure-Agnostic

CNS - SUMMARY



With Container-native Storage

- **Scalable**
(1000+ volumes)
- **Highly-Available**
(across availability zones)



- **Automated**
(Dynamic Provisioning)
- **Integrated**
(installs with / runs on OpenShift)

Persistent, resilient and elastic storage...

... that travels with the platform.