What's New in OpenShift 4.1

Principles of design and development
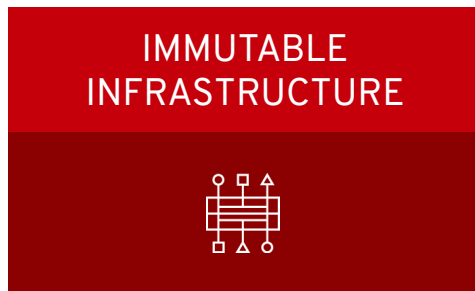
Red Hat

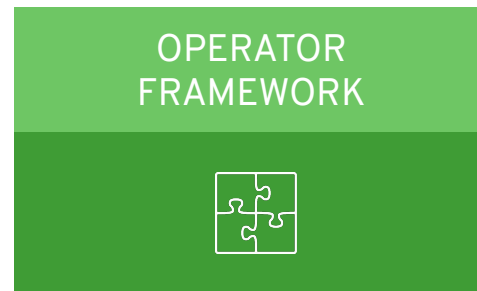# OpenShift 4 Platform

CLUSTER SERVICES	APPLICATION SERVICES	DEVELOPER SERVICES
Metrics, Chargeback, Registry, Logging	Middleware, Service Mesh, Serverless and Functions, ISV	Dev Tools, Automated Builds, CI/CD, IDE

AUTOMATED OPERATIONS

KUBERNETES

Red Hat Enterprise Linux or RHEL CoreOS

Best IT Ops Experience   CaaS ⟷ PaaS ⟷ FaaS   Best Developer Experience
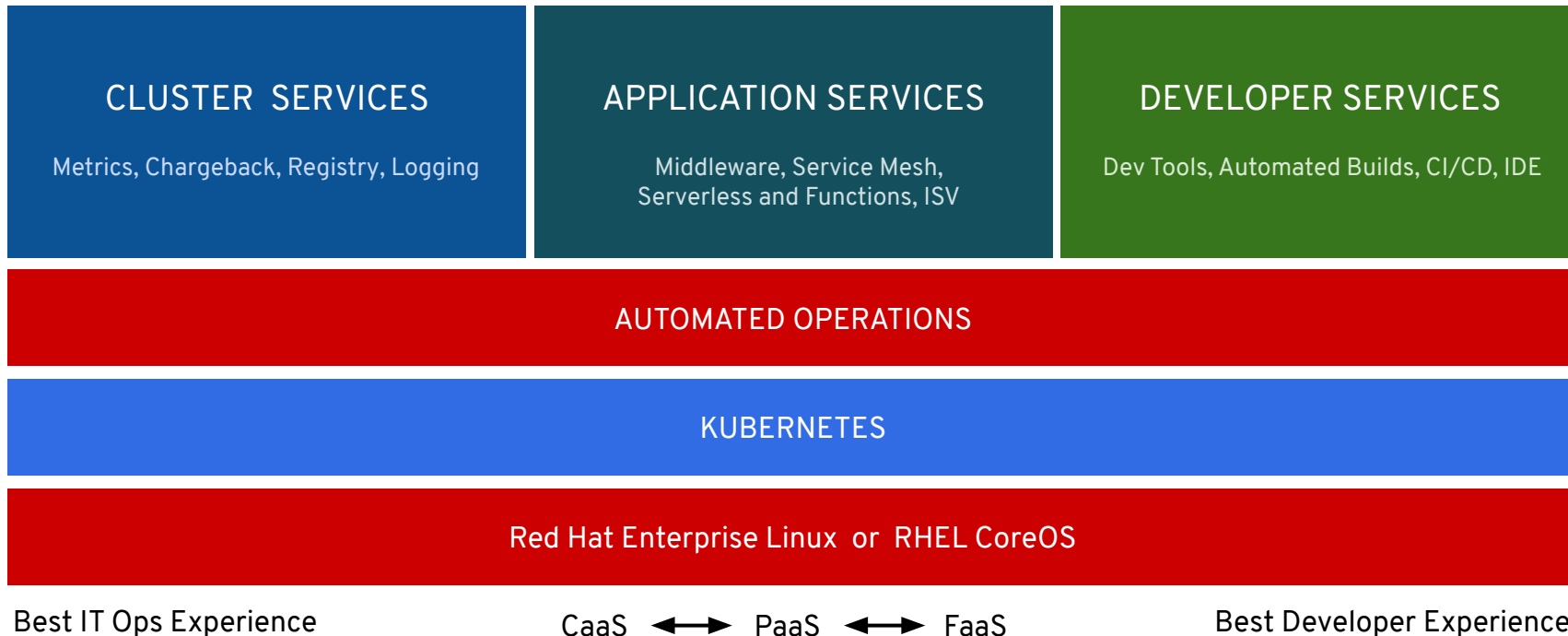
Red Hat

OpenShift 4.1 Workstreams Lifecycle

DAY 2 OPERATIONS	IMMUTABLE INFRASTRUCTURE	OPERATOR FRAMEWORK

Installer + bootstrapping

Autoscale out of the box
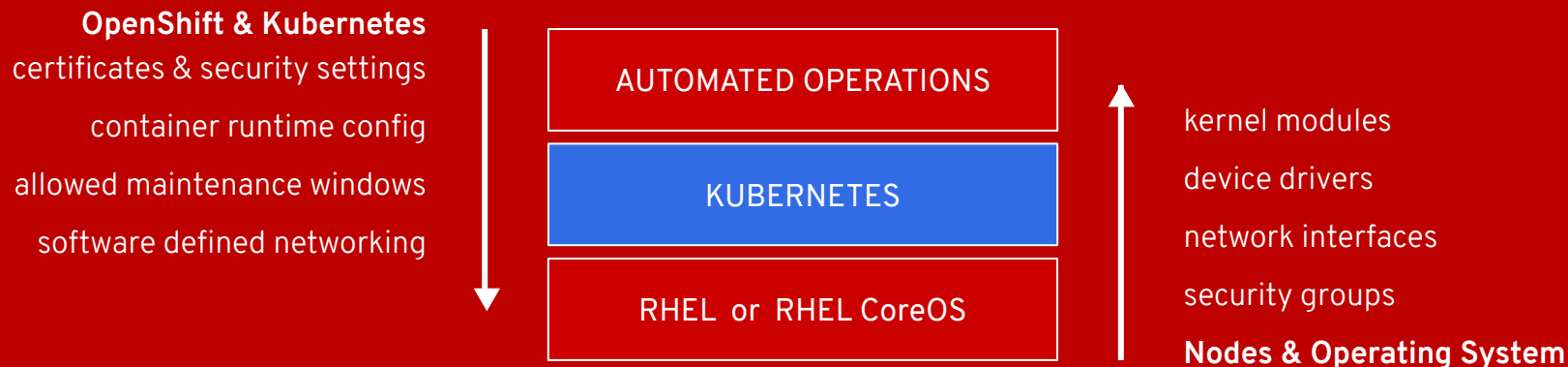
MachineSet node pools

Red Hat Enterprise Linux CoreOS

Discourage SSH/node mutation

Ignition for Machine config

SDK & testing tools

OperatorHub for discovery

OLM delivers upper stack services

Red Hat

The New Platform Boundary

OpenShift 4 is aware of the entire infrastructure and brings the Operating System under management

OpenShift & Kubernetes

certificates & security settings

container runtime config

allowed maintenance windows

software defined networking

AUTOMATED OPERATIONS

KUBERNETES

RHEL or RHEL CoreOS

kernel modules

device drivers

network interfaces

security groups

Nodes & Operating System

2019 Roadmap

Q2 CY2019
OpenShift 4.1

DEV
- OpenShift Serverless (Knative) - DP
- OpenShift Pipelines (Tekton) - DP
- CodeReady Workspaces - GA
- CodeReady Containers - Alpha
- Developer CLI (odo) - Beta

APP
- OperatorHub
- Operator Lifecycle Manager
- Service Mesh (~2 month after)

PLATFORM
- Kubernetes 1.13 with CRI-O runtime
- RHEL CoreOS, RHEL7
- Automated Installer for AWS
- Pre-existing Infra Installer for Bare Metal, VMware, AWS
- Automated, one-click updates
- Multus (Kubernetes multi-network)
- Quay v3

HOSTED
- cloud.redhat.com - Multi-Cluster Mgmt
- OCP Cluster Subscription Management
- Azure Red Hat OpenShift
- OpenShift Dedicated consumption pricing

Q3 CY2019
OpenShift 4.2

DEV
- Developer Console - GA
- OpenShift Serverless (Knative) - TP
- OpenShift Pipelines (Tekton) - TP
- CodeReady Containers - GA
- Developer CLI (odo) - GA

APP
- GPU metering
- OperatorHub Enhancements
- Operator Deployment Field Forms
- Application Binding with Operators
- Application Migration Console

PLATFORM
- Kubernetes 1.14 w/ CRI-O runtime
- Disconnected Install and Update
- Automated Installer for Azure, OSP, GCP
- OVN Tech Preview
- FIPS
- Federation Workload API
- Automated App cert rotation
- OpenShift Container Storage 4.2

HOSTED
- cloud.redhat.com - Multi-Cluster Deployment
- Proactive Support Operator

Q4 CY19/Q1 CY20
OpenShift 4.3

DEV
- OpenShift Serverless (Knative) - GA
- OpenShift Pipelines (Tekton) - GA

APP
- Metering for Services
- Windows Containers

PLATFORM
- Kubernetes 1.15 w/ CRI-O runtime
- Automated Installer for IBM Cloud, Alibaba, RHV, Bare Metal Hardware Appliance
- Pre-existing Infra Installer for Azure, OSP, GCP
- OVN GA w/ Windows Networking Integration

HOSTED
- cloud.redhat.com - Subscription Mgmt Consumption Improvements

6

Installation and deployment

Installation Experiences

OPENSHIFT CONTAINER PLATFORM

HOSTED OPENSHIFT

Full Stack Automated

Simplified opinionated "Best Practices" for cluster provisioning

Fully automated installation and updates including host container OS.

Red Hat
Enterprise Linux
CoreOS

Pre-existing Infrastructure

Customer managed resources & infrastructure provisioning

Plug into existing DNS and security boundaries

Red Hat
Enterprise Linux
CoreOS

Red Hat
Enterprise
Linux

Azure Red Hat OpenShift

Deploy directly from the Azure console. Jointly managed by Red Hat and Microsoft Azure engineers.

OpenShift Dedicated

Get a powerful cluster, fully Managed by Red Hat engineers and support.

Generally Available

Red Hat

4.1 Supported Providers*

Full Stack Automated

Pre-existing Infrastructure

amazon web services

amazon web services

Bare Metal

vmware vSphere

** Requires Internet connectivity; support for cluster-wide proxy
& disconnected installation/updating tentatively planned for 4.2*

Generally Available

Red Hat

Red Hat Enterprise Linux

	RED HAT® ENTERPRISE LINUX®	**RED HAT® ENTERPRISE LINUX CoreOS**
	General Purpose OS	**Immutable container host**
BENEFITS	• 10+ year enterprise life cycle • Industry standard security • High performance on any infrastructure • Customizable and compatible with wide ecosystem of partner solutions	• Self-managing, over-the-air updates • Tightly integrated and versioned with OpenShift • Host isolation is enforced via Containers • Optimized performance on popular infrastructure
WHEN TO USE	When customization and integration with additional solutions is required	When cloud-native, hands-free operations are a top priority

Generally Available

Red Hat

Immutable Operating System

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.
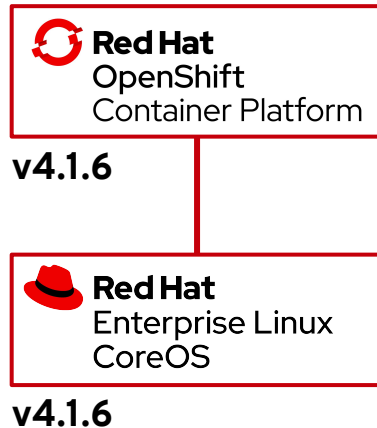
Red Hat Enterprise Linux CoreOS is managed by the cluster

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
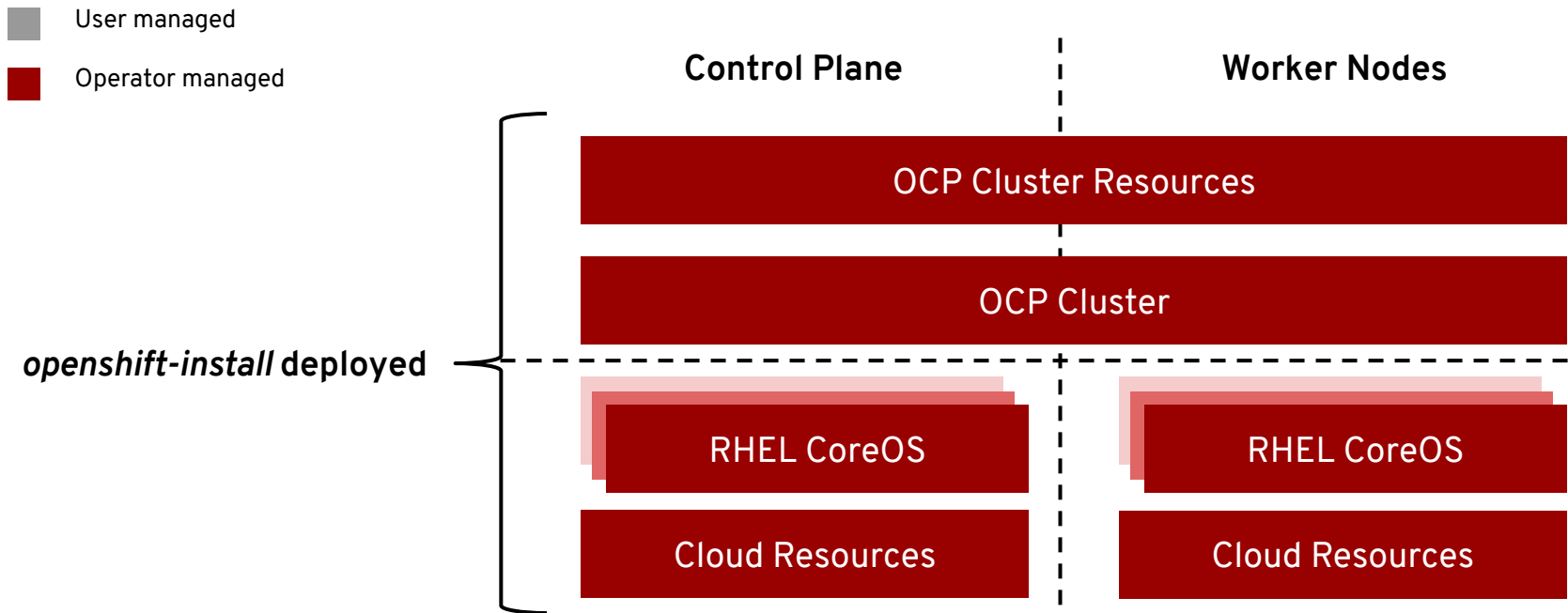- Authorized registries
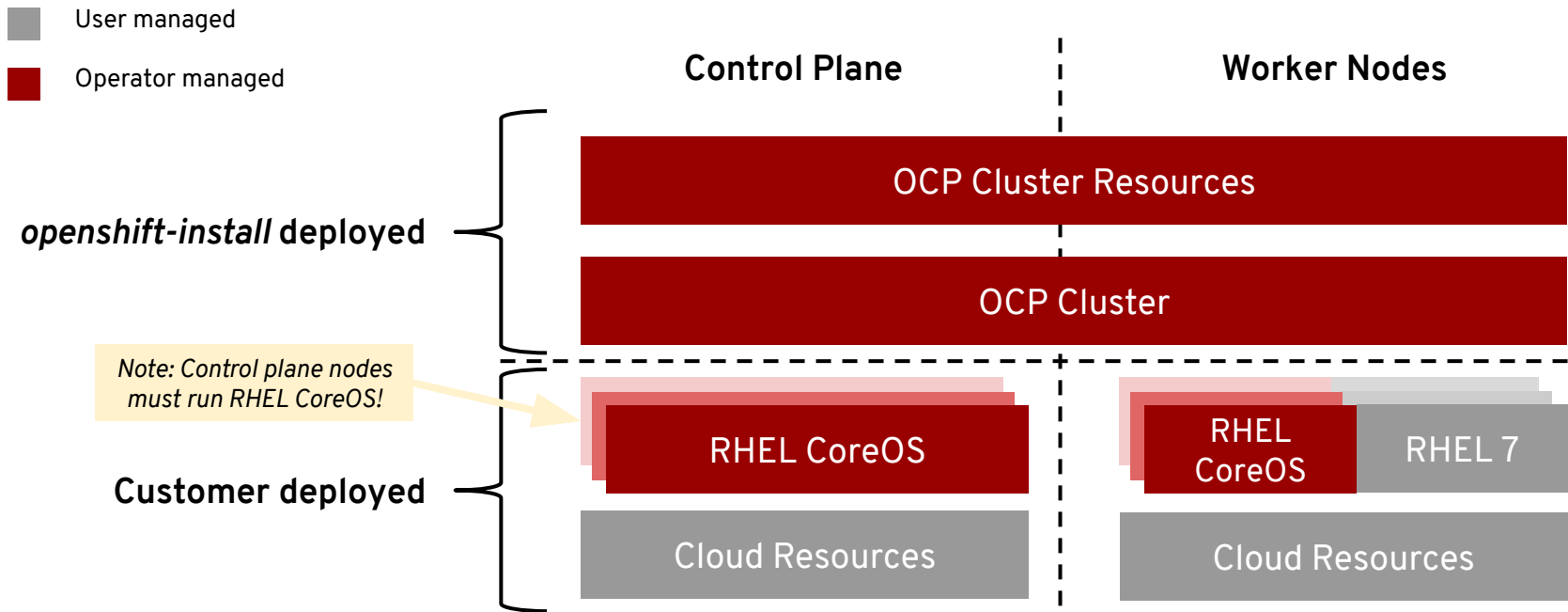- SSH config

RHEL CoreOS admins are responsible for:

Nothing.

Red Hat OpenShift Container Platform

v4.1.6

Red Hat Enterprise Linux CoreOS

v4.1.6

Generally Available

Red Hat

Full Stack Automated Deployments

Day 1: openshift-install - Day 2: Operators

User managed

Operator managed

Control Plane　　　　**Worker Nodes**

OCP Cluster Resources

OCP Cluster

openshift-install **deployed**

RHEL CoreOS　　　　　RHEL CoreOS

Cloud Resources　　　　Cloud Resources

Generally Available

Red Hat

Deploying to Pre-existing Infrastructure

Day 1: openshift-install - Day 2: Operators + admin managed infra & workers

■ User managed

■ Operator managed

Control Plane | **Worker Nodes**

openshift-install **deployed**

OCP Cluster Resources

OCP Cluster

Note: Control plane nodes must run RHEL CoreOS!

Customer deployed

RHEL CoreOS

RHEL CoreOS | RHEL 7

Cloud Resources

Cloud Resources

Generally Available

Red Hat

Deployment Comparison

	Full Stack Automation	Pre-existing Infrastructure
Build Network	Installer	User
Setup Load Balancers	Installer	User
Configure DNS	Installer	User
Hardware/VM Provisioning	Installer	User
OS Installation	Installer	User
Generate Ignition Configs	Installer	Installer
OS Support	RHEL CoreOS	RHEL CoreOS + RHEL 7
Node Provisioning / Autoscaling	Yes	Only for providers with OpenShift Machine API support
Customization & Provider Support	AWS	AWS, Bare Metal, VMware

Generally Available

Red Hat

Management and administration

Cloud-like Simplicity, Everywhere

Full-stack automated operations across any on-premises, cloud, or hybrid infrastructure

cloud.redhat.com

| AWS | VMware | Bare Metal | ... |
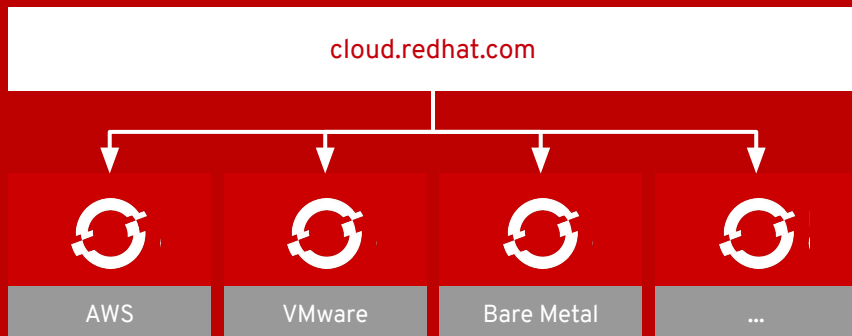
Red Hat

OpenShift Cluster Manager on cloud.redhat.com

Automatic registration of OpenShift clusters

View cluster versions and capacity in one place, no matter what infrastructure you are running on. Integrated with RHSM.
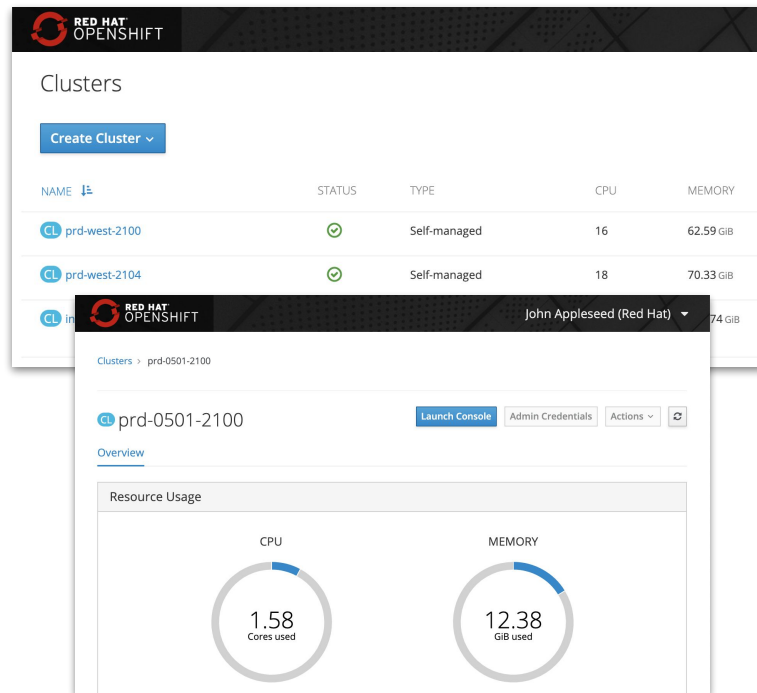
OpenShift Dedicated cluster management

Self-service cluster deployment, scaling, and management for OpenShift Dedicated coming soon.

Azure Red Hat OpenShift

Information about these clusters will be coming at a later date.

Hosted in the United States

Other geographies may come later. You can opt-out too.

Generally Available

Red Hat

OpenShift Subscription Management

Moves from node management to cluster management

Entitle clusters and not nodes. Nodes too dynamic. We do not block on usage. Requires telemeter Opt-In.

Dynamically adds and removes nodes

UHC will dynamically add and remove nodes from your subscription allocations to the cluster in 24 hour intervals. This will move to instantaneous across the next several releases.
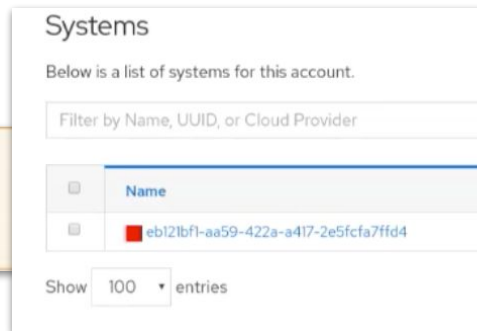
Connected to the same backend as Subscription Portal and Satellite

Allocation numbers you see at cloud.redhat.com for OCP can be also seen on the subscription portal at access.redhat.com

Removes OCP Infrastructure from the count

UHC will figure out which pods are your OCP infra pods and subtract out their usage from your core count so you are not charged.

⚠ **This cluster is overcommitting resources.**

Please check the Red Hat Customer Portal to make sure all clusters are covered by subscriptions and contact sales if required.

Last checked: 5/19/2019, 2:20:00 AM

Systems

Below is a list of systems for this account.

Filter by Name, UUID, or Cloud Provider

☐ | Name
☐ | ■ eb121bf1-aa59-422a-a417-2e5fcfa7ffd4

Show 100 ▾ entries

Red Hat

# Graphical Re-configuration

Global Configuration

You complete most of the cluster configuration and customization after you deploy your OpenShift Container Platform cluster.

Change via Cluster Settings screen

Once you have discovered your desired settings, changes can be made via console or CLI.

Operators apply these updates

One or more Operators are responsible for propagating these settings through the infrastructure

Generally Available
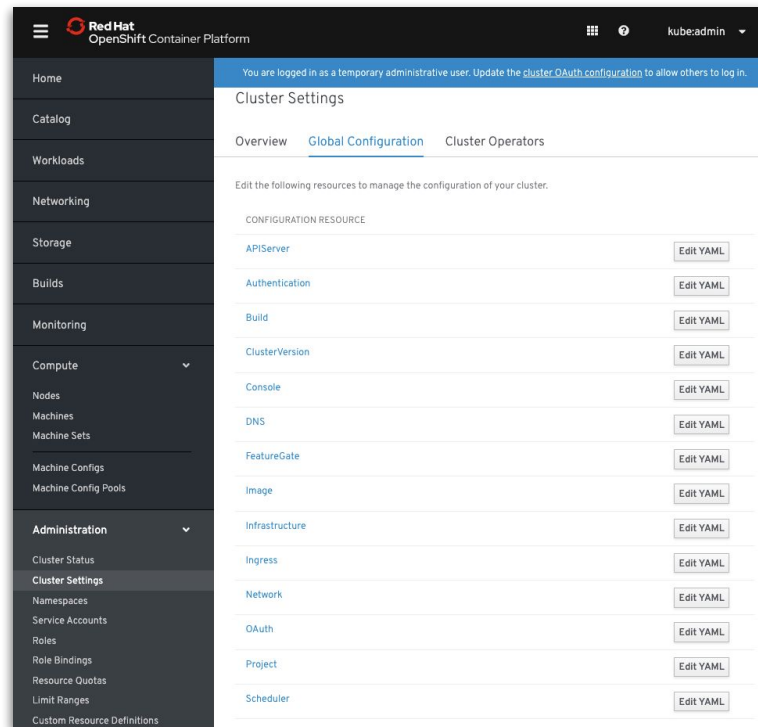
Network Configuration

Example #1: Operator-Assisted Ingress Sharding

In 4.1, the way you create a sharded router is different (API call versus '*oc adm*' command). A simple config (example to right), implemented by the ingress operator, automatically integrates sharding with the external (front-end) DNS/LB configured at install-time.

```
apiVersion: operator.openshift.io/v1
kind: IngressController
metadata:
  namespace: openshift-ingress-operator
  name: internal-apps
spec:
  domain: internal-apps.dmace.devcluster.openshift.com
  routeSelector:
    matchLabels:
      environment: internal
```

Example #2: Create a Second Router

Ingress controller configuration is now a first-class object, meaning additional Ingress controllers can be created by making multiple Ingress objects. This is the preferred method for giving teams their own subdomains, replacing the 'oc adm' method (see right).

```
$ cat <<EOF | oc create -f -
apiVersion: operator.openshift.io/v1
kind: IngressController
metadata:
  namespace: openshift-ingress-operator
  name: finance-apps
spec:
  domain: finance-apps.openshift.example.com
EOF
```

Generally Available

Red Hat

Configuring an Identity Provider

The Cluster Authentication Operator

- Use the *cluster-authentication-operator* to configure an Identity Provider. The configuration is stored in the *oauth/cluster* custom resource object inside the cluster.

- Once that's done, you may choose to remove *kubeadmin* (warning: there's no way to add it back).

- All the identity providers supported in 3.11 are supported in 4.1: LDAP, GitHub, GitHub Enterprise, GitLab, Google; OpenID Connect, HTTP request headers (for SSO), Keystone, Basic authentication.

- For more information:
  Understanding identity provider configuration
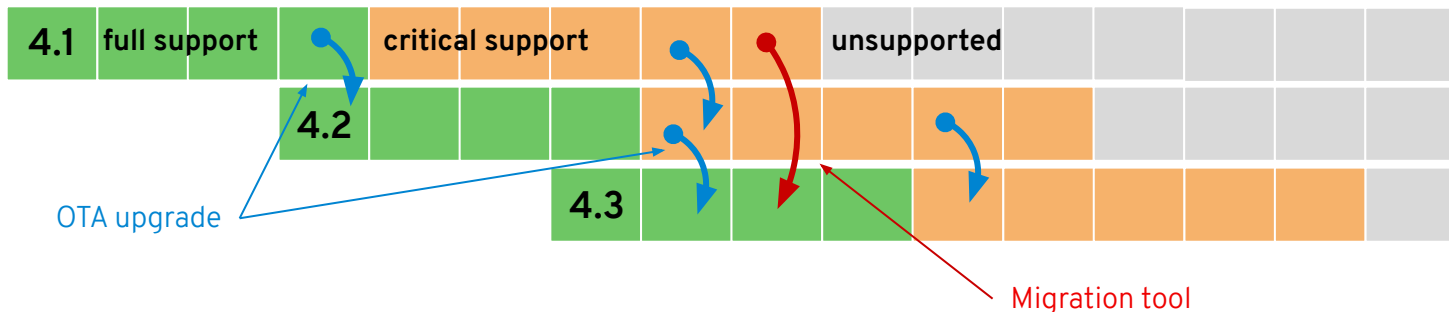 cluster-authentication-operator

Sample identity provider CR

```
apiVersion: config.openshift.io/v1
kind: OAuth
metadata:
  name: cluster
spec:
  identityProviders:
  - name: my_identity_provider    1
    mappingMethod: claim    2
    type: HTPasswd
    htpasswd:
      fileData:
        name: htpass-secret    3
```

1 This provider name is prefixed to provider user names to form an identity name.

2 Controls how mappings are established between this provider's identities and user objects.

3 An existing secret containing a file generated using `htpasswd`.

Generally Available

OpenShift 4 Upgrades

* Hypothetical timeline for discussion purposes

| 4.1 | full support | | | | critical support | | | | | | unsupported | | | | | |

OTA upgrade

4.2

4.3

Migration tool

OTA Upgrades
Works between two minor releases in a serial manner.

Happy path = migrate through each version
On a regular cadence, migrate to the next supported version.

Optional path = migration tooling
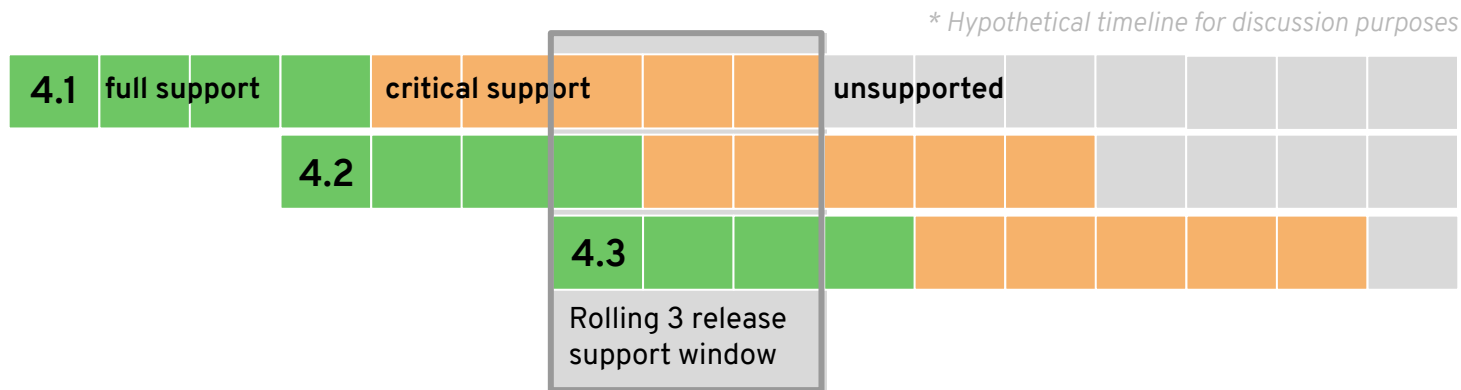If you fall more than two releases behind, you must use the application migration tooling to move to a new cluster.

Current minor release
Full support for all bugs and security issues
1 month full support overlap with next release to aid migrations

Previous minor release
Fixes for critical bugs and security issues for 5 months

Red Hat

OpenShift 4 Lifecycle

* Hypothetical timeline for discussion purposes

| 4.1 | full support | | | critical support | | | unsupported | | | | | | |

| | | 4.2 | | | | | | | | | | | |

| | | | 4.3 | | | | | | | | | | |

Rolling 3 release support window

New model
Release based, not date based. Rolling three release window for support.

The overall 4 series will be supported for at least three years
- Minimum two years full support (likely more)
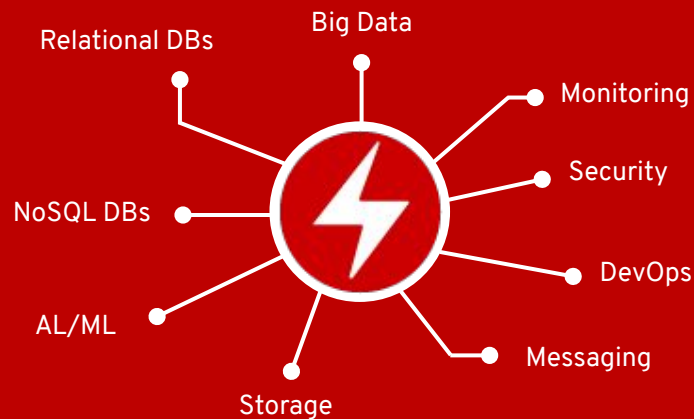- One year maintenance past the end of full support

EUS release planned
Supported for 14 months of critical bug and critical security fixes instead of the normal 5 months. If you stay on the EUS for its entire life, you must use the application migration tooling to move to a new cluster

Red Hat

Deploying applications

A broad ecosystem of workloads

Operator-backed services allow for a
SaaS experience on your own infrastructure

Relational DBs   Big Data   Monitoring   Security   NoSQL DBs   DevOps   AL/ML   Messaging   Storage

Red Hat Certified Operators

DEVOPS — dynatrace

APM — APPDYNAMICS, INSTANA, New Relic, Sysdig

DATA SERVICES — GIGASPACES, hazelcast, PlanetScale

DATABASE — MEMSQL, Couchbase, mongoDB, nuoDB, PingCAP

SECURITY — aqua, anchore, BLACKDUCK BY SYNOPSYS, TREMOLO SECURITY, tufin

STORAGE — ROBIN, STORAGEOS

Generally Available

Red Hat

Red Hat Universal Base Image

STANDARD

MINIMAL

MULTI
SERVICE

Node.js

ALL RED HAT
ENTERPRISE LINUX
PACKAGES

UNIVERSAL
BASE IMAGE
PACKAGES
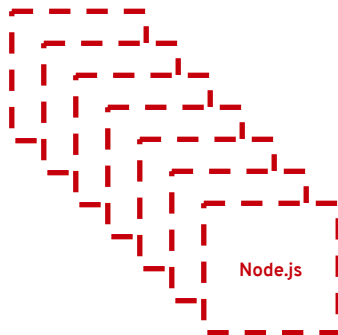
Base
Images

Pre-Built
Language
Images

Package
Subset

Generally Available

Universal Base Image Compatibility and Support

Red Hat Enterprise Linux 7

Red Hat Enterprise Linux 8

Like any community distro

Generally Available
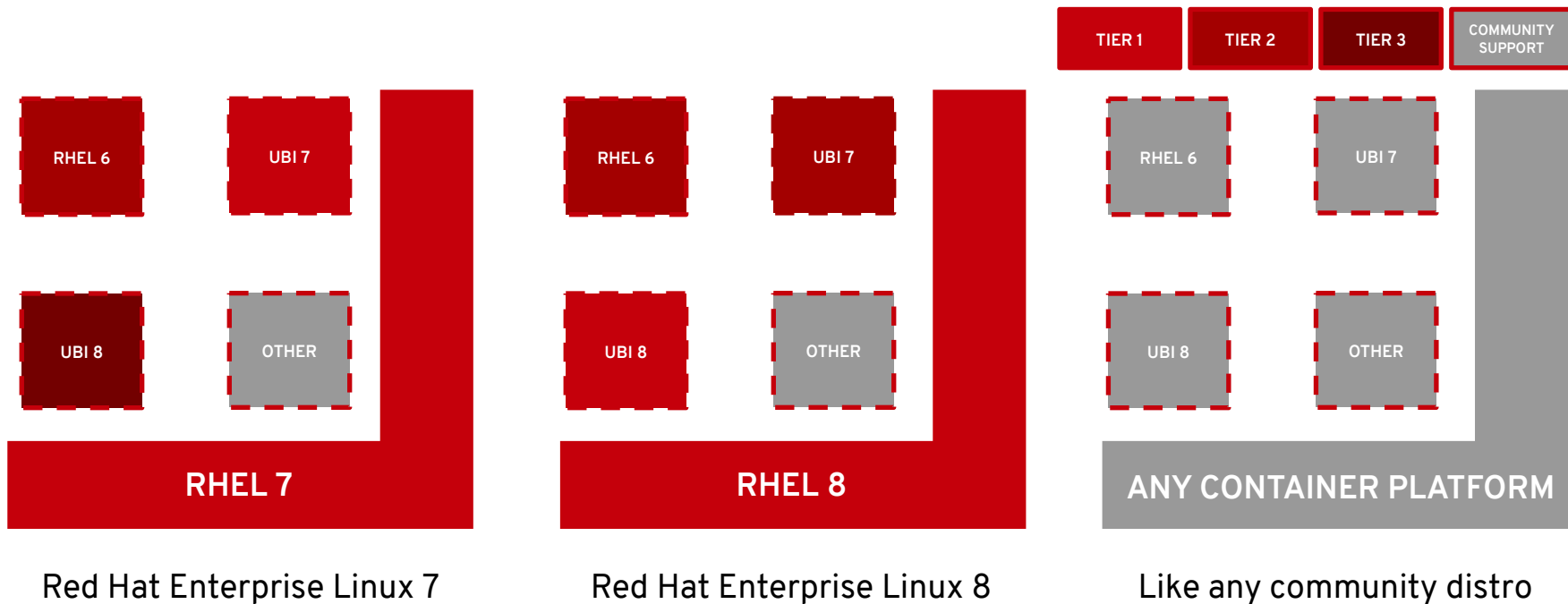
Developer and application tools

Next wave of developer tools*

OpenShift has all of the latest tools to make your devs more productive

Code	**Containers**
Serverless	**Service Mesh**

Red Hat
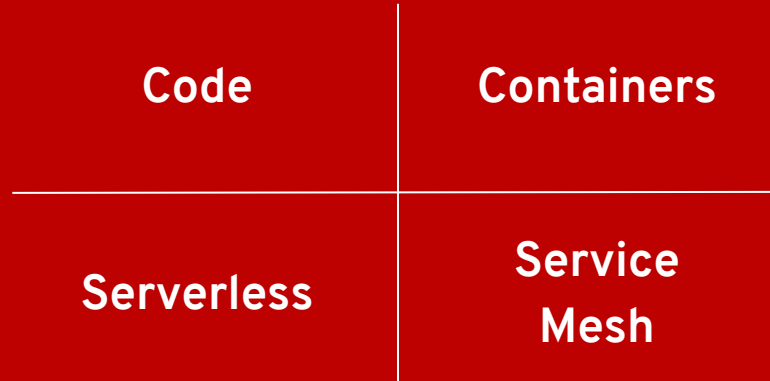
Migrating to OpenShift 4

Tooling and advice for moving from OpenShift 3.x to 4.x
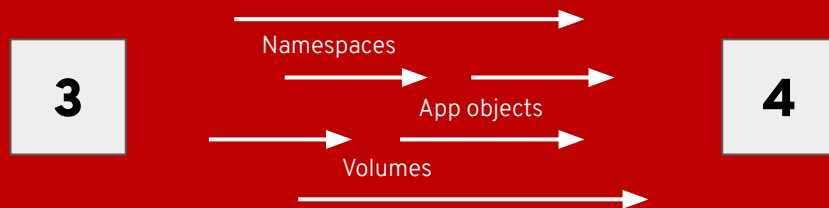
App migration experience

Open source tooling based on Velero

What's moved during a migration

- Namespaces

- Persistent Volumes (move or copy)

- All important resource objects (Deployments, StatefulSets, etc)

Available in OpenShift 4.2

Customers are anxious to get their hands on this, but we want to get it right. We would love to receive sample application workloads to test.

Not Available Yet
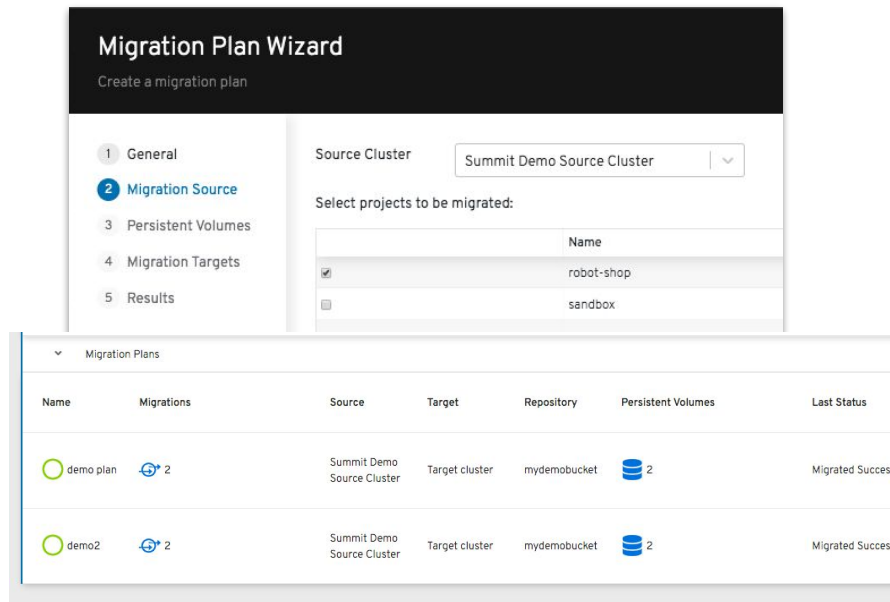
# Why did we choose this migration strategy?

Reducing risk

A ton of innovation went into OpenShift 4, and an in-place upgrade would have risk of failure in which there is no forwards or backwards remediation. It allows you to skip from 3.7/3.9/3.10/3.11 to 4.x.

Useful for 4-to-4 migrations

A general migration tool is frequently requested and a better long term investment. Build a foundation towards making your clusters less fragile.

Allows for staging

Stage a mock migration before doing it live, on a Project by Project basis. Extremely useful for preparing to succeed.
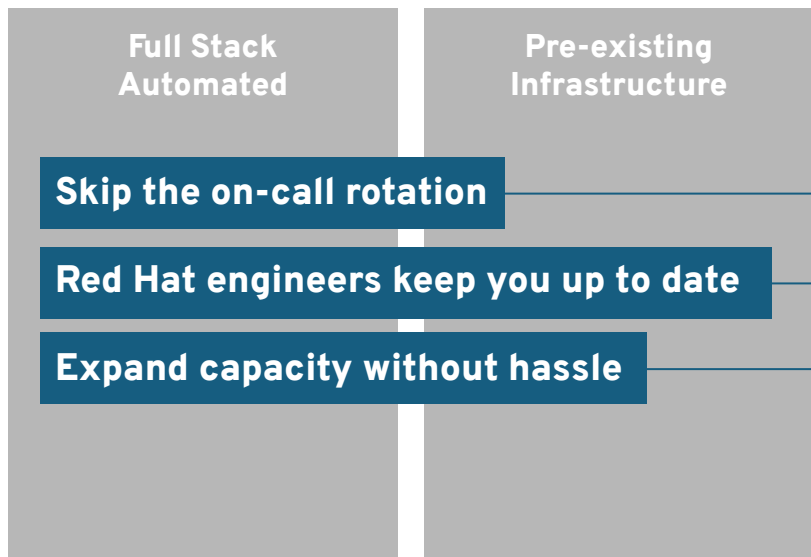
Kube 1.10

Kube 1.9

Kube 1.8

Kube 1.7

Not Available Yet
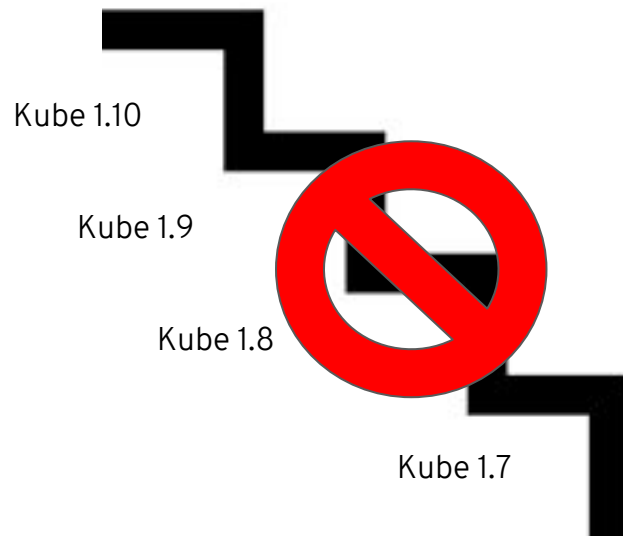
Hosted OpenShift

Get the best of OpenShift without being on call

Hosted OpenShift Benefits

OPENSHIFT CONTAINER PLATFORM

HOSTED OPENSHIFT

Full Stack Automated	Pre-existing Infrastructure	Azure Red Hat OpenShift	OpenShift Dedicated
		Deploy directly from the Azure console	Powerful cluster, no maintenance needed
		Jointly managed by Red Hat and Azure engineers	Managed by Red Hat engineers and support
		Free your team from the distraction of ops	Free your team from the distraction of ops

Skip the on-call rotation

Red Hat engineers keep you up to date

Expand capacity without hassle

Generally Available

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.

in linkedin.com/company/red-hat

▶ youtube.com/user/RedHatVideos

f facebook.com/redhatinc

🐦 twitter.com/RedHat

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