



What's New in OpenShift 4.x for Sales

OpenShift 4 Platform

CLUSTER SERVICES

Metrics, Chargeback, Registry, Logging

APPLICATION SERVICES

Middleware, Service Mesh, Functions,
ISV

DEVELOPER SERVICES

Dev Tools, Automated Builds, CI/CD, IDE

AUTOMATED OPERATIONS

KUBERNETES

Red Hat Enterprise Linux or RHEL CoreOS

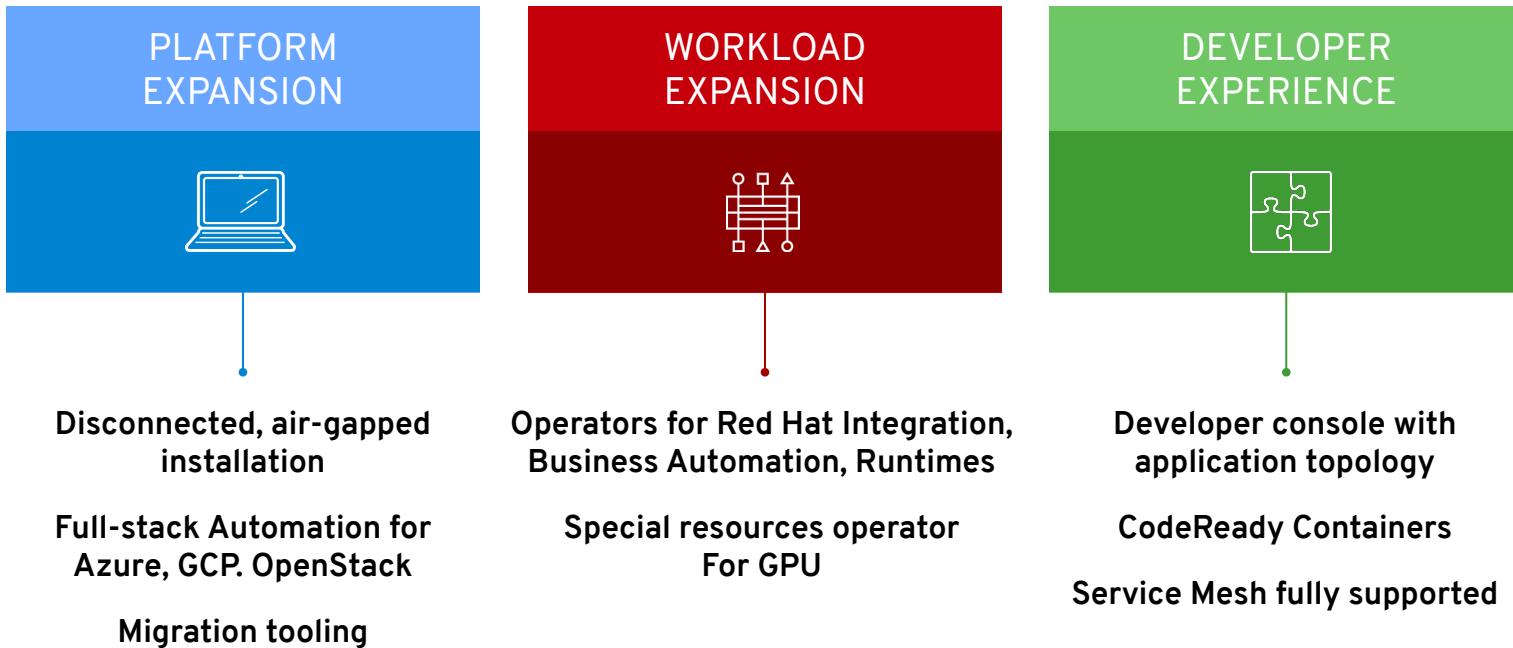
Best IT Ops Experience

CaaS \longleftrightarrow PaaS \longleftrightarrow FaaS

Best Developer Experience



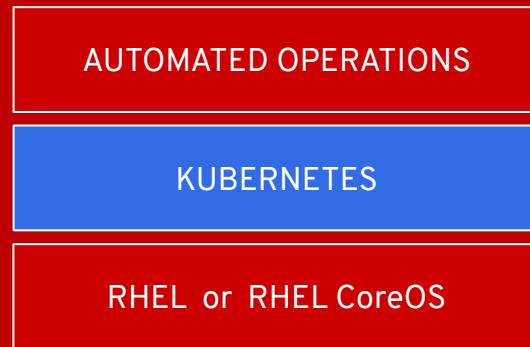
OpenShift 4.2



The New Platform Boundary

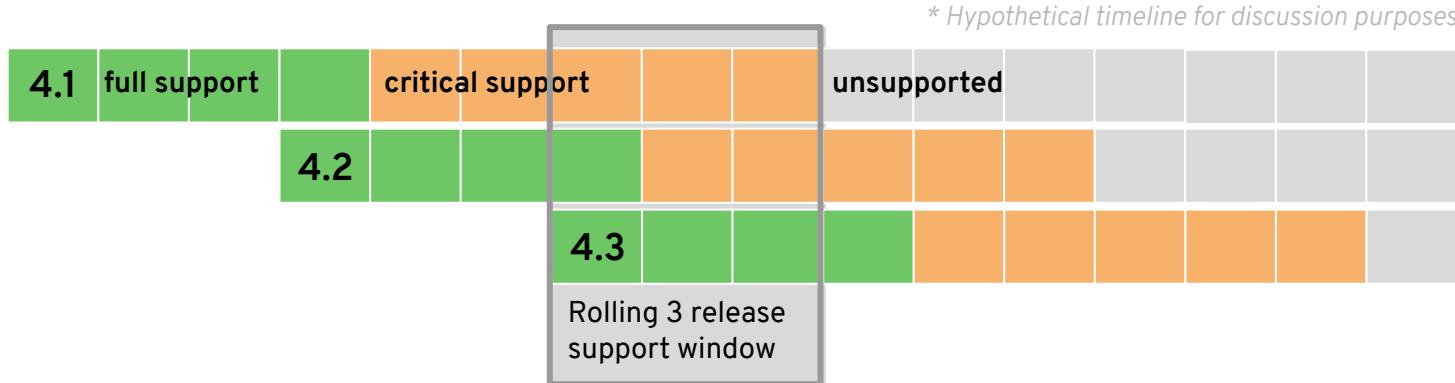
OpenShift 4 is aware of the entire infrastructure and
brings the Operating System under management

OpenShift & Kubernetes
certificates & security settings
container runtime config
allowed maintenance windows
software defined networking



kernel modules
device drivers
network interfaces
security groups
Nodes & Operating System

OpenShift 4 Lifecycle



New model

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

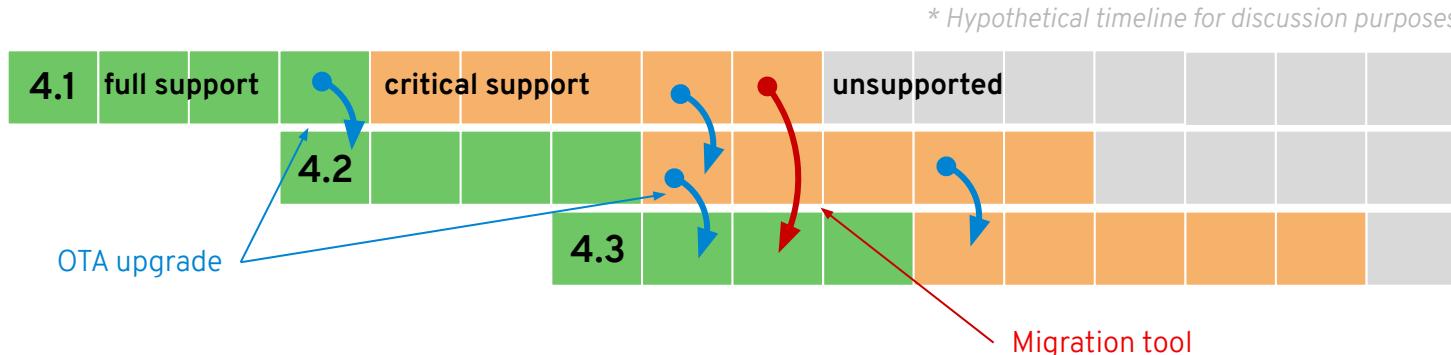
The overall 4 series will be supported for at least three years

- 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

OpenShift 4 Upgrades



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

Installation Experiences

OPENSIFT CONTAINER PLATFORM

Full Stack Automation

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

HOSTED OPENSIFT

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.

4.2 Supported Providers

Full Stack Automation (IPI)



Pre-existing Infrastructure (UPI)



* Support for full stack automated installs to pre-existing VPC & subnets and deploying as private/internal clusters is planned for 4.3.

Red Hat Enterprise Linux

RED HAT® ENTERPRISE LINUX	
BENEFITS	General Purpose OS
	<ul style="list-style-type: none">• 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 CoreOS	
	<ul style="list-style-type: none">• Self-managing, over-the-air updates• Immutable and tightly integrated with OpenShift• Host isolation is enforced via Containers• Optimized performance on popular infrastructure
WHEN TO USE	When cloud-native, hands-free operations are a top priority

CRI-O Support in OpenShift

CRI-O tracks and versions identical to Kubernetes, simplifying support permutations



Security Themes



Control Application Security

Connect workload identity to Cloud provider authorization
Application certificate lifecycle management



Defend the Infrastructure

Encrypt etcd datastore
Enhanced certificate management
RHEL CoreOS disk encryption
VPN / VPC support
Consume group membership from Identity Provider
External Keycloak integration



Automate Compliance

Disconnected / air-gapped install
FIPS compliance
Cipher Suite Configuration
Compliance Operator

OpenShift Container Storage 4.2

Persistent data services for OCP Hybrid Cloud

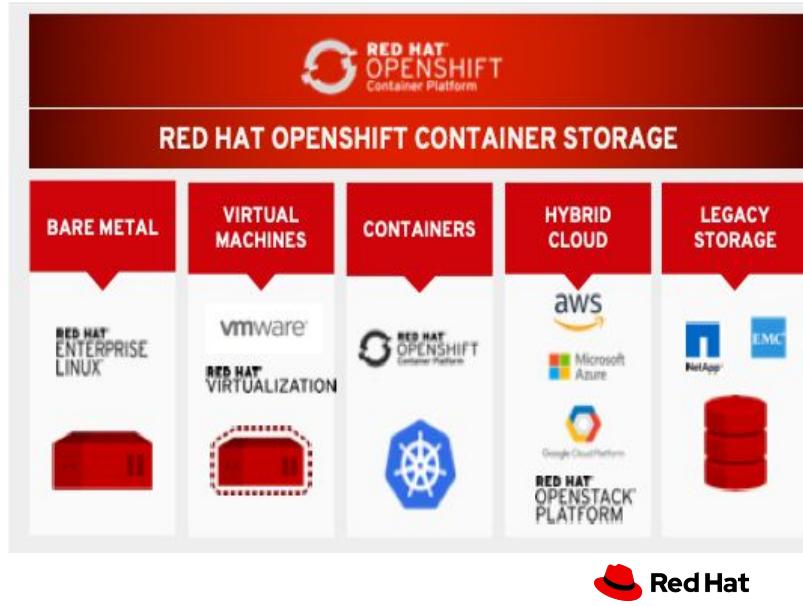
- Complete Data Services: RWO, RWX & **S3(new)** (block, file & object)
- Persistent storage for all OCP Infra and Applications
- Build and deploy anywhere -Consistent Storage Consumption, management, and operations

OCS 4.2 support with OCP 4.2

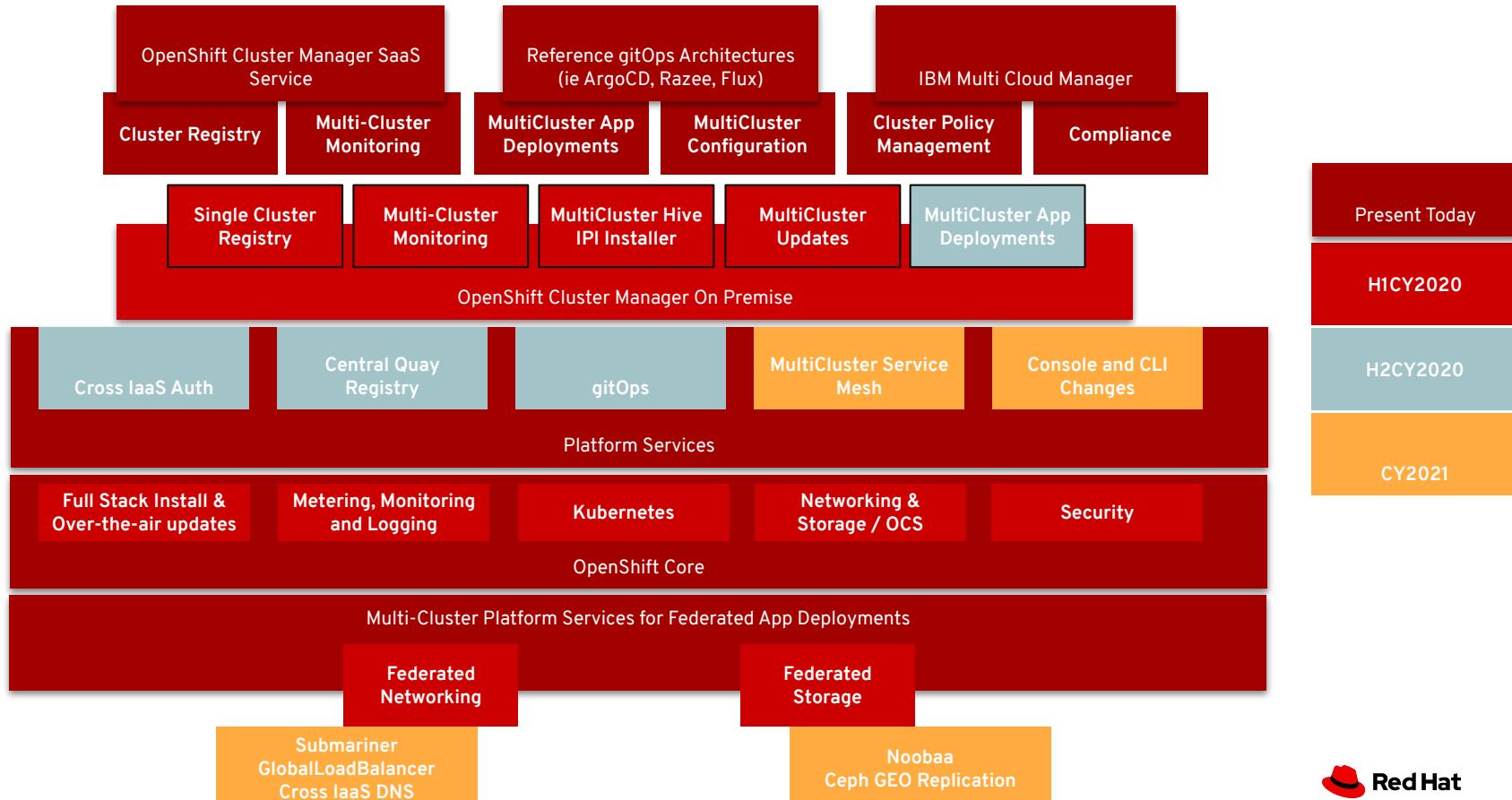
- Platform support: AWS and VMware
- Converged Mode support : Run as a service on OCP Cluster
- Consistent S3 across hybrid cloud

OCS 4.3

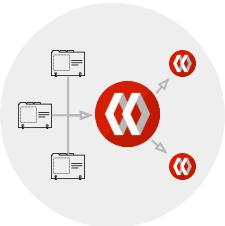
- Additional Platform: Bare Metal, Azure Cloud
- Independent Mode : Run OCS outside of OCP Cluster
- Hybrid and Multi-cloud S3



Multi-Cluster Platform Services



Red Hat Quay v3.1 (released)



Repository Mirroring¹

Allows to continually synchronize image repositories are a subset of those from external source registries into Quay (content ingress point / content whitelists)



Read-Only Repositories

To prevent undesirable content changes temporarily or forever (binary archives, (temporarily) frozen repositories)
Users can switch repository states via UI



Quay Setup Operator²

Automates the initial deployment of Quay and Clair and simplifies updates & day 2 ops
Configures all relevant OpenShift objects (routes, secrets, etc.)



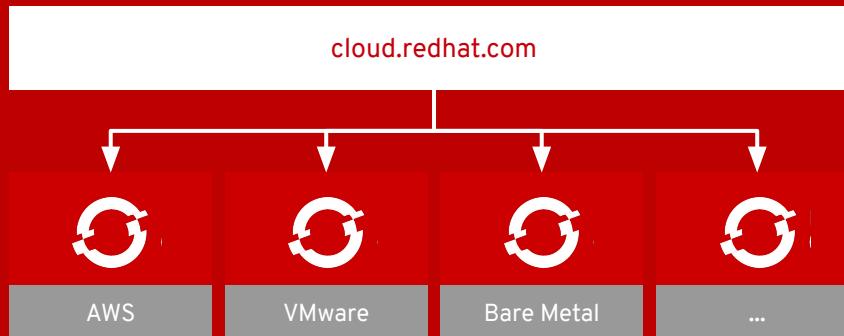
Support for RHOCS3 / NooBaa¹

Allows to continually synchronize image repositories are a subset of those from external source registries into Quay (content ingress point / content whitelists)

Learn more: <https://www.redhat.com/en/blog/red-hat-quay-31-now-even-better-across-distributed-environments>

Cloud-like Simplicity, Everywhere

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



OpenShift Cluster Manager cloud.redhat.com/openshift

Enhanced OpenShift Web Console Integration

Bi-directional navigation to and from the OpenShift web console for cluster administrators. Deep linking from OCM to the console where relevant.

OpenShift Dedicated cluster management

Self-service cluster provisioning, scaling, and basic management for OpenShift Dedicated customers (4.1+).

Cluster Monitoring

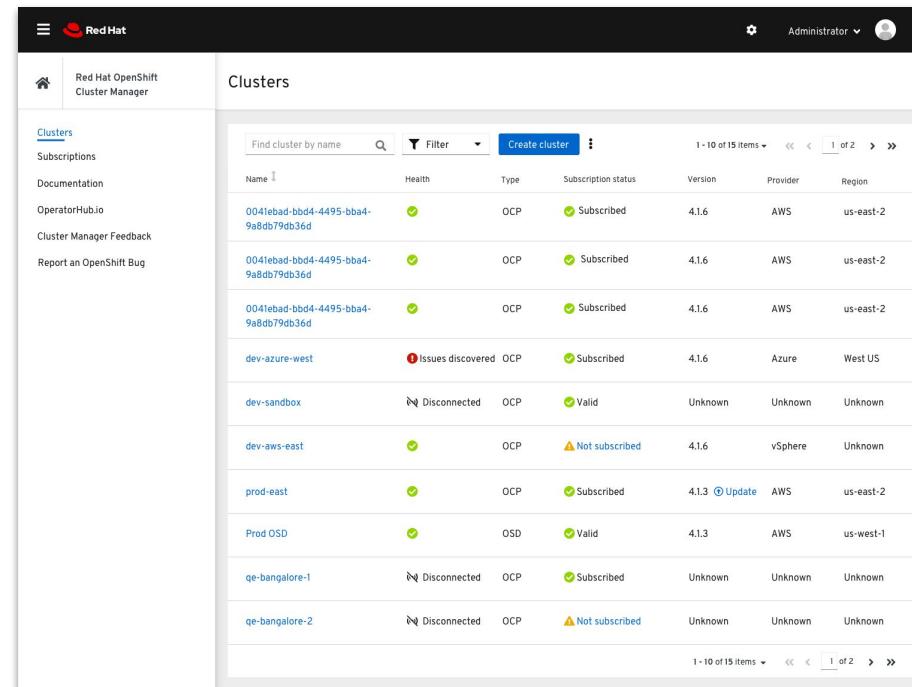
New tab available on all cluster detail pages helps cluster administrators discover critical issues impacting their clusters.

Cluster Updates & New Metrics

OCM provides a link to your cluster's settings page when updates are available for your cluster. Infrastructure provider and region are now captured and displayed for all clusters, where available.

More OpenShift Install Options

New infrastructure providers, including CodeReady Containers, are now listed as install options.



The screenshot shows the Red Hat OpenShift Cluster Manager web interface. The top navigation bar includes the Red Hat logo and the title "Red Hat OpenShift Cluster Manager". On the left, there is a sidebar with links for "Clusters", "Subscriptions", "Documentation", "OperatorHub.io", "Cluster Manager Feedback", and "Report an OpenShift Bug". The main content area is titled "Clusters" and displays a table of 15 items. The columns in the table are: Name, Health, Type, Subscription status, Version, Provider, and Region. The data in the table is as follows:

Name	Health	Type	Subscription status	Version	Provider	Region
0041ebad-bbd4-4495-bba4-9a8db79db36d	✓	OCP	✓ Subscribed	4.1.6	AWS	us-east-2
0041ebad-bbd4-4495-bba4-9a8db79db36d	✓	OCP	✓ Subscribed	4.1.6	AWS	us-east-2
0041ebad-bbd4-4495-bba4-9a8db79db36d	✓	OCP	✓ Subscribed	4.1.6	AWS	us-east-2
dev-azure-west	⚠ Issues discovered	OCP	✓ Subscribed	4.1.6	Azure	West US
dev-sandbox	⚠ Disconnected	OCP	✓ Valid	Unknown	Unknown	Unknown
dev-aws-east	✓	OCP	⚠ Not subscribed	4.1.6	vSphere	Unknown
prod-east	✓	OCP	✓ Subscribed	4.1.3	Update	AWS
Prod OSD	✓	OSD	✓ Valid	4.1.3	AWS	us-west-1
qe-bangalore-1	⚠ Disconnected	OCP	✓ Subscribed	Unknown	Unknown	Unknown
qe-bangalore-2	⚠ Disconnected	OCP	⚠ Not subscribed	Unknown	Unknown	Unknown

Subscription Management cloud.redhat.com/openshift

Disconnected Cluster Registration

Register your disconnected clusters with Red Hat to receive support and updates using the online process.

Subscription Compliance Summary

View subscription compliance status across all of your clusters at a glance.

Public Documentation

Outlining the OpenShift 4 subscription management process, added to the public OCP 4.X docs.

OCP 4 Subscription Management

Product Manager: Jake Lucky

Generally Available

Improved Metrics Collection

RHEL workers, entitled via RHSM, are automatically excluded from remaining entitlement required for your cluster.

Infrastructure Node Labeling

Nodes labeled with the infra node role will be excluded from entitlement required for your cluster.

Subscriptions

Entitlement status

Properly entitled

Subscription amount required

45 vCPU

Support level

Premium

Subscription manager ID

de278845-2ed3-4a60-b4b5-a7ba6c47c615

Operating system

Red Hat Enterprise Linux CoreOS

[Manage subscriptions](#)

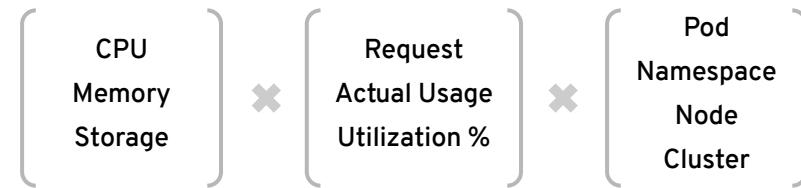


Metering

ShowBack/ChargeBack Reports available from OperatorHub

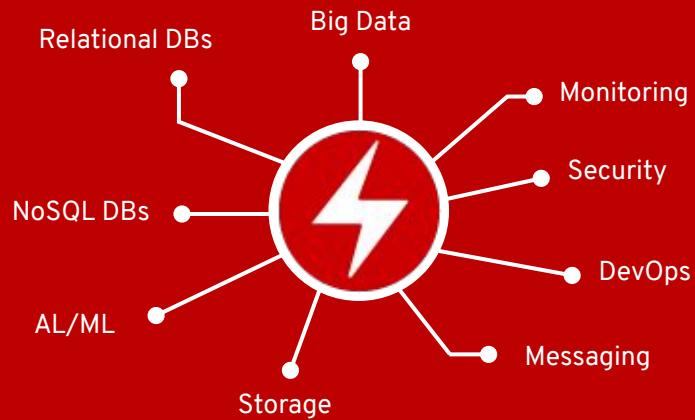
- Base functionality on all providers
- Tie into cloud providers for \$\$
- Included reports for 80% use-case
- Customers can write custom reports and time periods
- Offer basic UI reporting but main use is to plug into customer's BI tool of choice

Name	Namespace	Labels	Created At
cluster-cpu-capacity	openshift-metering	operator-metering=true	7 minutes ago
cluster-cpu-capacity-raw	openshift-metering	operator-metering=true	7 minutes ago
cluster-cpu-usage	openshift-metering	operator-metering=true	7 minutes ago
cluster-cpu-usage-raw	openshift-metering	operator-metering=true	7 minutes ago
cluster-cpu-utilization	openshift-metering	operator-metering=true	7 minutes ago
cluster-memory-capacity	openshift-metering	operator-metering=true	7 minutes ago
cluster-memory-capacity-raw	openshift-metering	operator-metering=true	7 minutes ago
cluster-memory-usage	openshift-metering	operator-metering=true	7 minutes ago
cluster-memory-usage-raw	openshift-metering	operator-metering=true	7 minutes ago
cluster-memory-utilization	openshift-metering	operator-metering=true	7 minutes ago



A broad ecosystem of workloads

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



Red Hat Certified Operators

DEVOPS



APM



DATA SERVICES



DATABASE



SECURITY

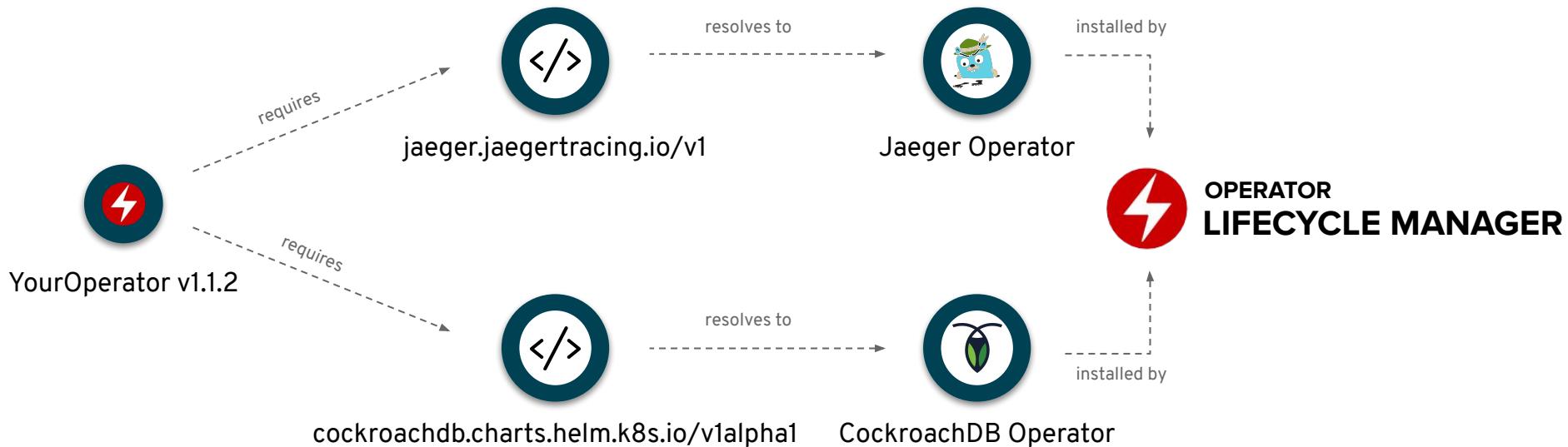


STORAGE

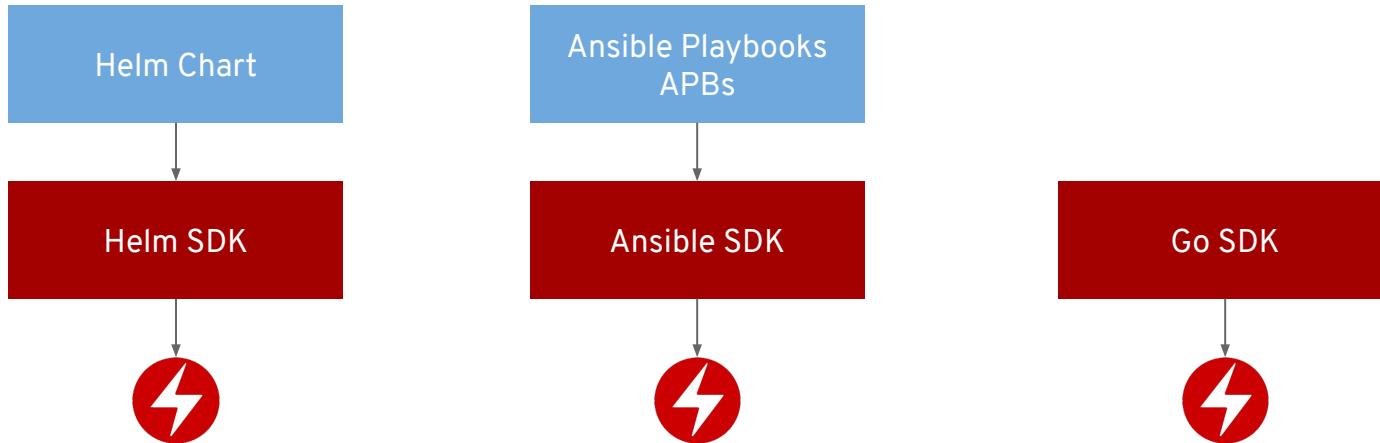


4.2 Automated Dependency Resolution

Operator Framework Dependency Graphs



Build Operators for your apps



OpenShift Console

The future is now.

Extending the
Console

Improve
Observability

Administration
made easy

Scaling your
Cluster

Expose Third Party App Console for Operator-backed Services

Expose Operator-backed service Console through console CRD

Easily integrate/onboard third-party user interfaces in order to develop, administer, and configure Operator-backed services.

This is an example notification message with an optional link. [Optional link text](#)

Red Hat Applications

OpenShift Cluster Manager

Third Party Applications

Couchbase Server Web Console

Import YAML

Project: tony

Installed Operators

Installed Operators are represented by Cluster Service Versions within this namespace. For more information, see the [Operator Lifecycle Manager documentation](#). Or create an Operator and Cluster Service Version using the [Operator SDK](#).

Name	Namespace	Deployment	Status	Provided APIs
AMQ Streams	NS tony	amq-streams-cluster-operator	InstallSucceeded Up to date	Kafka Kafka Connect Kafka Connect S2I Kafka MirrorMaker View 2 more...
Couchbase Operator	NS tony	couchbase-operator	InstallSucceeded Up to date	Couchbase Cluster
etcd	NS tony	etcd-operator	InstallSucceeded Up to date	etcd Cluster etcd Backup etcd Restore
Knative Serving Operator	NS tony	knative-serving-operator	InstallSucceeded Up to date	Knative Serving

Configuring Authentication for your desired Identity Providers

Customize and determine how users log into the cluster

- Basic Authentication
- GitHub
- GitLab
- Google
- HTPasswd
- Keystone
- LDAP
- OpenID Connect
- Request Header

The screenshot shows the Red Hat OpenShift Container Platform web interface. On the left, a sidebar menu lists various cluster components: Workloads, Serverless, Networking, Storage, Builds, Monitoring, Compute, and Administration. Under Administration, Cluster Settings is selected. A dropdown menu titled 'Add' is open, listing the available identity providers: Basic Authentication, GitHub, GitLab, Google, HTPasswd, Keystone, LDAP, OpenID Connect, and Request Header. The main content area displays the 'Identity Providers' configuration page. It includes sections for Labels (No labels), Annotations (1 Annotation), and Created At (Jul 10, 7:08 am). Below this, a sub-section titled 'Identity Providers' provides a brief description: 'Identity providers determine how users log into the cluster.' A form for adding a new identity provider is shown, specifically for 'Keystone Authentication'. The form fields include: Name * (keystone), Domain Name * (optional), URL * (remote URL), CA File (Browse...), Certificate (Browse...), and Key (Browse...). Buttons for 'Add' and 'Cancel' are at the bottom of the form.

Knative on OpenShift Serverless via Knative Operators

Build and deploy Serverless applications using an event-driven infrastructure on OpenShift

The image displays two screenshots of the Red Hat OpenShift Container Platform web interface.

Top Screenshot (OperatorHub):

- Left Sidebar:** Shows navigation links for Administrator, Home, Operators (selected), OperatorHub (selected), Installed Operators, Workloads, Networking, and NetworkPolicy.
- Header:** Red Hat logo and "OpenShift Container Platform".
- Project:** testing
- OperatorHub Section:** Title "OperatorHub". Subtext: "Discover Operators from the Kubernetes community and Red Hat partners, curated by Red Hat. Operators can be installed on your clusters to provide optional add-ons and shared services to your developers. Once installed, the capabilities provided by the Operator appear in the [Developer Catalog](#), providing a self-service experience." Filter bar shows "knative" selected. Result count: 5 items.
- Bottom Categories:** All Items, AI/Machine Learning, Application Monitoring, Application Runtime, Big Data.

Bottom Screenshot (Serverless):

- Left Sidebar:** Shows navigation links for Administrator, Home, Operators, Workloads, Serverless (selected), Services, Revisions (selected), Configurations, Networking, and Storage.
- Header:** Red Hat logo and "OpenShift Container Platform".
- Project:** openshift-operators
- Revisions Section:** Title "Revisions", "Create Revision" button, table with columns Name, Namespace, and Service. One row is shown: helloworld-nodejs-cxdqg, NAMESPACE cvogt, SERVICE helloworld-nodejs.
- Community Operators:** A grid of four cards:
 - Knative Apache Camel Operator** (Community, provided by Red Hat): Knative Camel addon provides a collection of eventing sources from the...
 - Knative Apache Kafka Operator** (Community, provided by Red Hat): Knative Eventing Kafka manages the Kafka source and channel provisioner to...
 - Knative Serving Operator** (Community, provided by Red Hat): Knative Serving builds on Kubernetes to support deploying and serving of serverless applications and...
 - TriggerMesh** (Community, provided by TriggerMesh, Inc.): A serverless management platform that runs on Knative. TriggerMesh provides continuous delivery of...

Scaling Your Cluster with the Machine Autoscaler

Machine Autoscaler adjusts the number of Machines in the MachineSets being deployed in your cluster.

- Increase Machines when the cluster runs out of resources to support more deployments.
- Any changes such as the minimum or maximum number of instances, are immediately applied to the MachineSet that MachineAutoscalers target.

The screenshot shows the Red Hat OpenShift Container Platform web interface. The left sidebar has a dark theme with the following navigation items:

- Projects
- Search
- Events
- Operators
- Workloads
- Networking
- Storage
- Builds
- Monitoring
- Compute
 - Nodes
 - Machines
 - Machine Sets
 - Machine Autoscalers** (highlighted)
 - Machine Configs
 - Machine Config Pools

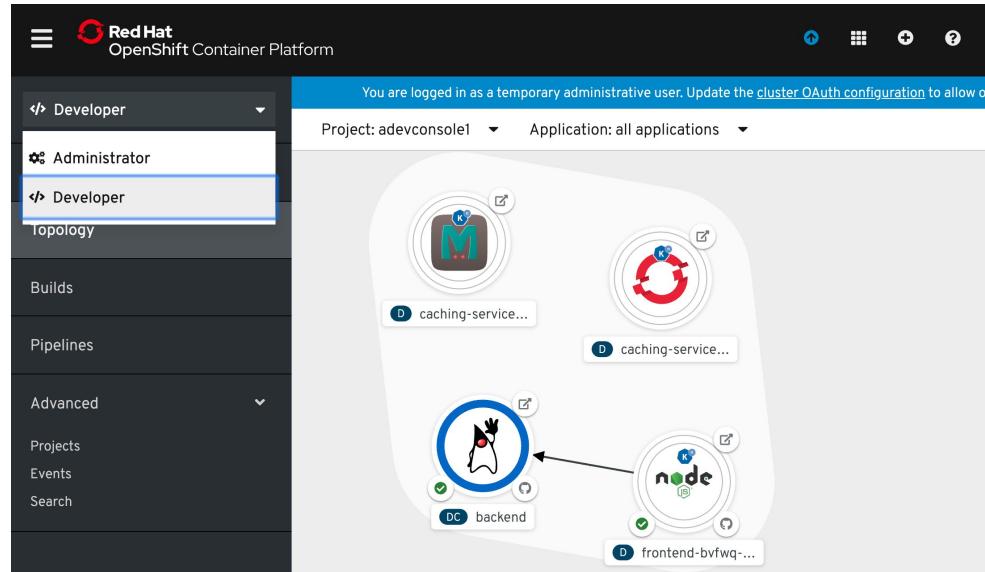
The main content area has a header bar with the Red Hat logo and "Red Hat OpenShift Container Platform". It displays a message: "You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in." Below this is a dropdown for "Project: openshift-metering" and a "Import YAML" button. The main section is titled "Machine Autoscalers" and contains a "Create Machine Autoscaler" button. A search bar labeled "Filter by name..." is also present. A table lists one existing machine autoscaler:

Name	Namespace	Scale Target	Min	Max
MA worker-us-east-1a	NS openshift-metering	MS worker	1	12

Web Console - Developer Perspective

An alternative perspective in the OpenShift UI that will sit beside the admin console and focus on developer use cases.

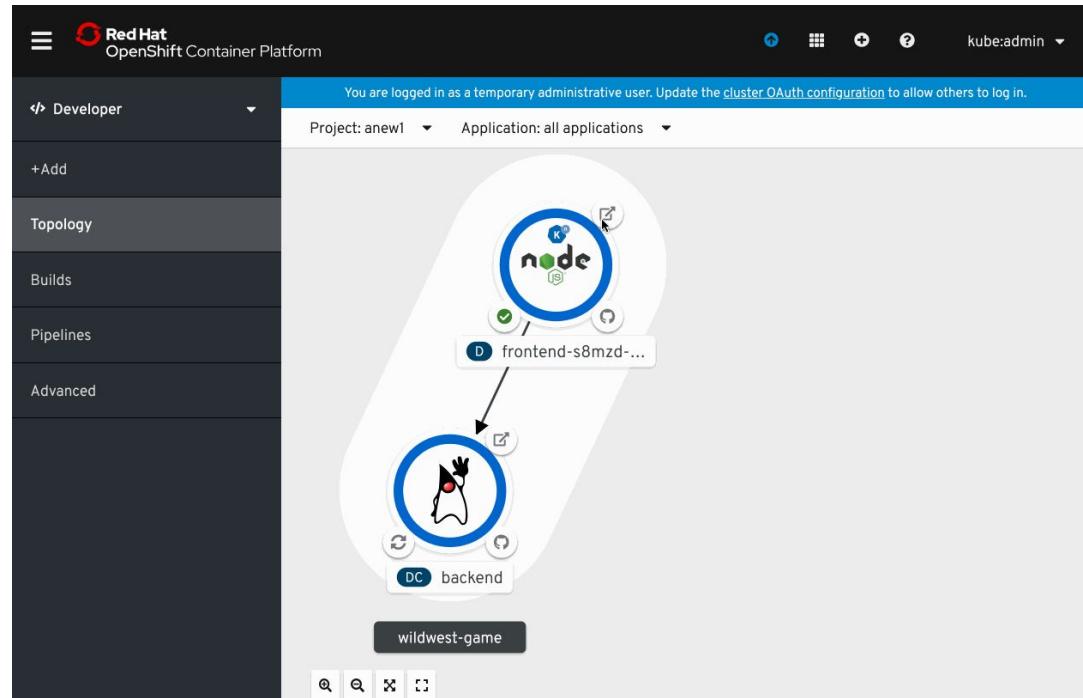
All OpenShift developer tool UIs will be surfaced here...though some (like CodeReady Workspaces) will be links out to unique UIs.



Application Topology

Key Features

- View structure and status of app components
- Drill into specific workloads
- Quickly navigate to pod logs
- Manually scale
- Pod donut!
- Access route/URL
- Linked build and source



Next wave of developer tools

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

Code
Serverless

Containers
Service Mesh

CodeReady Workspaces

The collaborative OpenShift-Native IDE. Free for any customer of OpenShift Dedicated or OpenShift Container Platform.

Container Workspaces



Workspace replicas to end “works on my machine” and enable team collaboration.

DevOps Integrations



Reference developer workspaces from any issue, failed build, or git notification.

Protect Source Code

Full access to source code without any of it landing on hard-to-secure laptops.

Based on the open Eclipse Che project

Red Hat Linux and Application Infrastructure

Plugin model for extensibility

Serverless support (coming later)

Use It To: Replace VDI for devs, and enable true container-based DevOps.

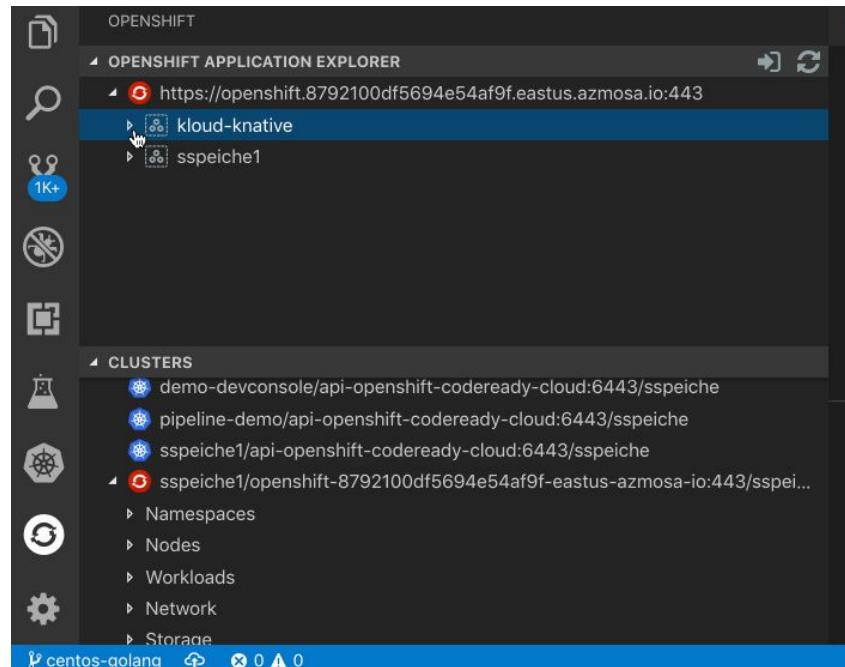
VS Code Kubernetes Extension

Kubernetes Extension Improvements

- Collaboration spearheaded by Red Hat and OpenShift needs
- Many improvements around:
 - Non-cluster-admin use cases
 - Auto-hide Helm features when no Tiller installed
 - Add nodes to navigator

OpenShift Improvements

- OpenShift logo on OpenShift clusters
- Add: Routes, DeploymentConfig, Projects, ImageStreams
- Ability to set Project context



odo - OpenShift's Dev-Focused CLI

Developer-focused CLI
for rapid development
iterations on OpenShift

Simplifies building of
microservices
applications on
OpenShift.

```
$ odo create wildfly backend
Component 'backend' was created.

$ odo push
Pushing changes to component: backend

$ odo create php frontend
Component 'frontend' was created.
To push source code to the component run 'odo push'

$ odo push
Pushing changes to component: frontend

$ odo url create
frontend - http://frontend-myapp.192.168.99.100.nip.io

$ odo watch
Waiting for something to change in /dev/frontend
```

Use It To: Enable the 'git push' flow developers love, but with OpenShift Kubernetes.

CodeReady Containers: OpenShift on your Laptop

Provides a pre-built development environment based on **Red Hat Enterprise Linux** and **OpenShift** for quick container-based application development. Use with OpenShift on-premises or cloud.

```
$ crc setup
Prepare your machine for running OpenShift

$ crc start -b
crc-hyperkit-4.2.0.crcbundle
Start with the Hyperkit 4.2 bundle

$ crc status
Get the status of the cluster
```

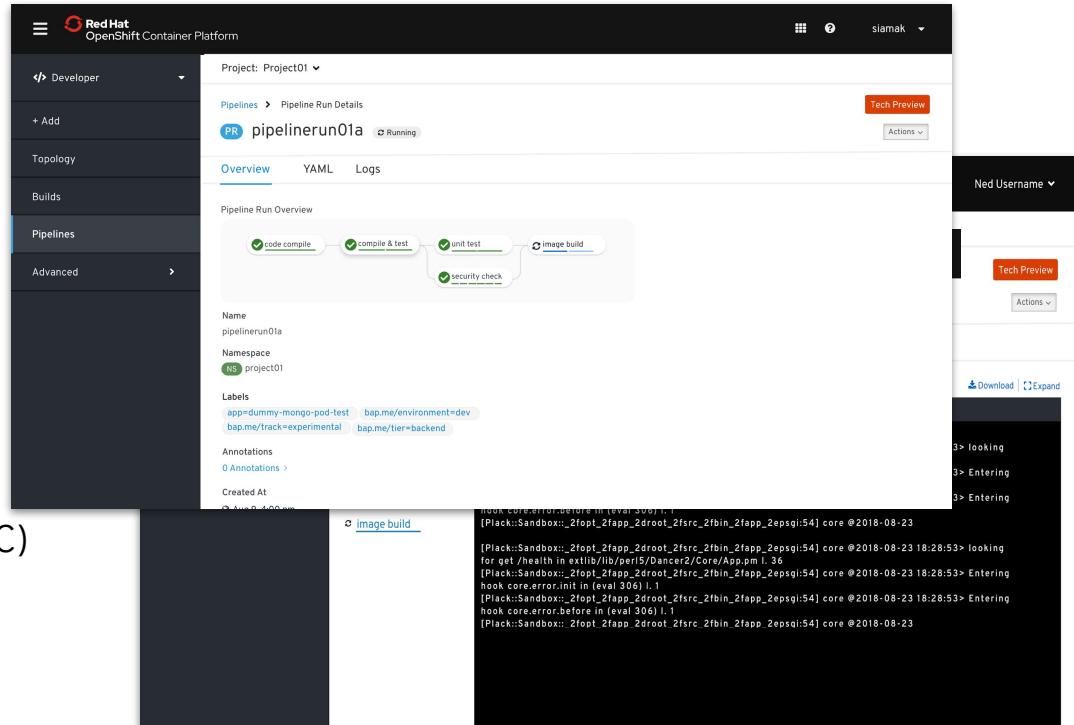
- Based on OpenShift 4.x
- Linux (libvirt)
- Windows (Hyper-V)
- MacOS (Virtualbox)
- External beta available
- Replaces the 3.x experiences around:
 - Minishift
 - CDK
 - oc cluster up

Use It To: Simplify direct-to-OpenShift development on laptops.

NEXT WAVE OF DEVELOPER TOOLS

Cloud-native CI/CD with OpenShift Pipelines

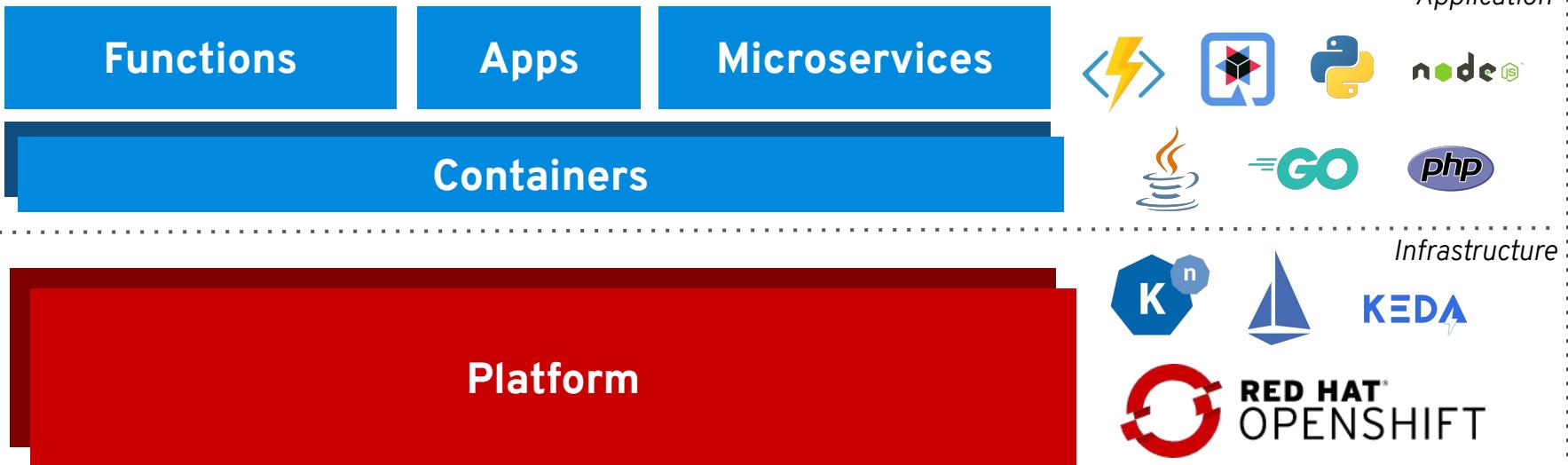
- Based on Tekton Pipelines
- Runs serverless (no babysitting!)
- Containers as building blocks
- Deploy to multiple platforms
- Standard CRDs
- Build images with Kubernetes tools
(s2i, buildah, kaniko, jib, buildpack, etc)
- Pipelines portable to any Kubernetes
- Available in OperatorHub



NEXT WAVE OF DEVELOPER TOOLS



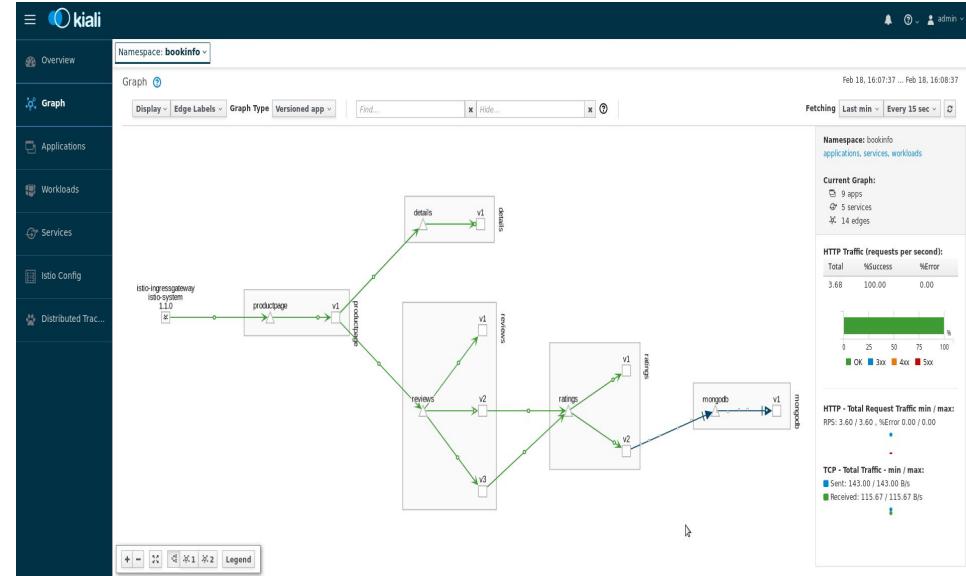
OpenShift Serverless



Red Hat Service Mesh

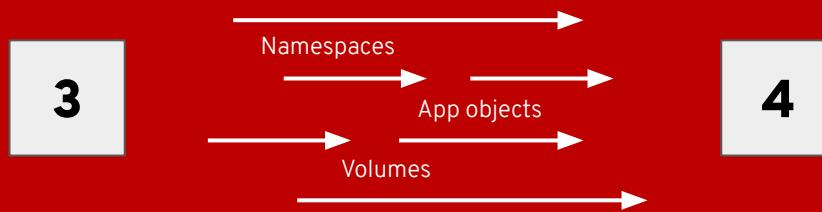
Key Features

- A dedicated network for service to service communications
- Observability and distributed tracing
- Policy-driven security
- Routing rules & chaos engineering
- Powerful visualization & monitoring
- Will be available via OperatorHub



Migrating to OpenShift 4

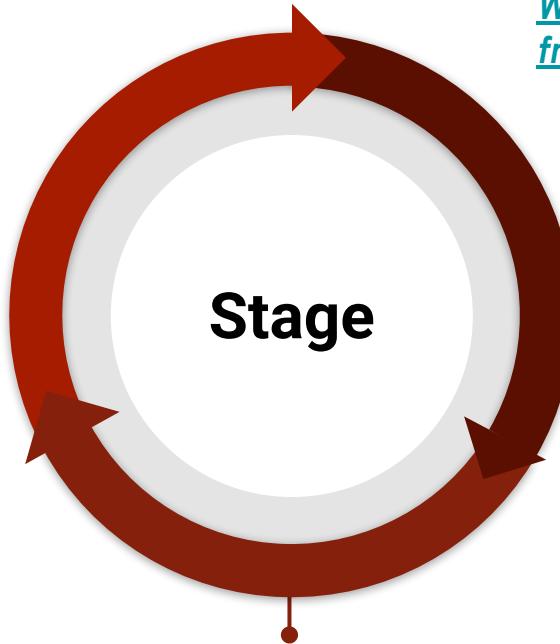
Tooling and advice for moving from OpenShift 3.x to 4.x



Application Migration: Migration Process

Plan

1. Select Source Cluster
2. Select Namespaces
3. Choose Copy or Move for each PV
4. Specify Destination



Stages the data from Source to Destination.

May be run multiple times.
Applications are running
no Downtime during step

[Watch a migration of MS-SQL Server from OCP 3.11 to OCP 4.1!](#)

Migrate

Quiesce Application

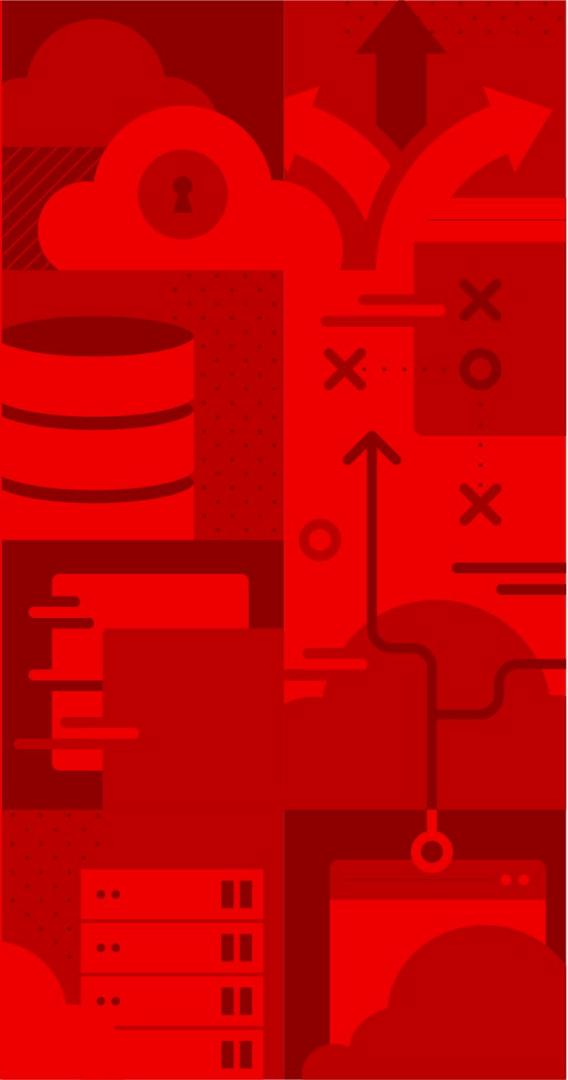
Migrate any delta bits not captured in stage.

Granularity of Namespace(s) & ‘cluster-admin’ required

- **Migration is at scope of a Namespace.**
 - *Future will allow selecting resources inside of a Namespace*
- **Cluster Scoped Resources are not handled**
 - Cluster Role Bindings, SCCs, etc are not handled with migration.
 - Expectation is that cluster admin handles cluster scoped resources ahead of running a Migration.
- **‘cluster-admin’ required for initial release targeting OCP 4.2**
 - Future plans to allow end user to migrate what they own post OCP 4.2+

2019 Roadmap

Q2 CY2019 OpenShift 4.1		Q3 CY2019 OpenShift 4.2		Q4 CY19/Q1 CY20 OpenShift 4.3	
HOSTED	PLATFORM	HOSTED	PLATFORM	HOSTED	PLATFORM
HOSTED	PLATFORM	HOSTED	PLATFORM	HOSTED	PLATFORM
	DEV		DEV		DEV
	APP		APP		APP
	HOSTED		HOSTED		HOSTED
<ul style="list-style-type: none">OpenShift Serverless (Knative) - DPOpenShift Pipelines (Tekton) DP2CodeReady WorkspacesCodeReady Containers AlphaDeveloper CLI (odo) Beta		<ul style="list-style-type: none">Developer Console GAOpenShift Serverless (Knative) - TPOpenShift Pipelines (Tekton) DP3CodeReady Containers GADeveloper CLI (odo) GA	<ul style="list-style-type: none">OperatorHub EnhancementsOperator Deployment Field FormsApplication Migration Console	<ul style="list-style-type: none">OpenShift Serverless (Knative) - GAOpenShift Pipelines (Tekton) TPHelm 3 TP	<ul style="list-style-type: none">Metering for ServicesWindows Containers (Planned)GPU MeteringApplication Operator Binding - DP
<ul style="list-style-type: none">Kubernetes 1.13 with CRI-O runtimeRHEL CoreOS, RHEL7Automated Installer for AWSPre-existing Infra Installer for Bare Metal, VMware, AWSAutomated, one-click updatesMultus (Kubernetes multi-network)Quay v3		<ul style="list-style-type: none">Kubernetes 1.14 w/ CRI-O runtimeDisconnected Install and UpdateAutomated Installer for Azure, OSP, GCPPre-existing Infra Installer for GCPCluster-wide Egress ProxyOVN Tech PreviewOpenShift Container Storage 4.2 (1 month after)	<ul style="list-style-type: none">Insights OperatorAzure Red Hat OpenShift new features (monitoring, logging)	<ul style="list-style-type: none">Kubernetes 1.16 w/ CRI-O runtimeAutomated Installer for RHVPrivate/Internal Clusters support from the installerDeploy to pre-existing VPC & SubnetsOVN GA w/ Windows Networking Integration (Planned)FIPSPre-existing Infra Installer for OSPOpenShift Container Storage 4.3	<ul style="list-style-type: none">cloud.redhat.com - Multi-Cluster MgmtOCP Cluster Subscription ManagementOpenShift Dedicated consumption pricing



Questions?

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