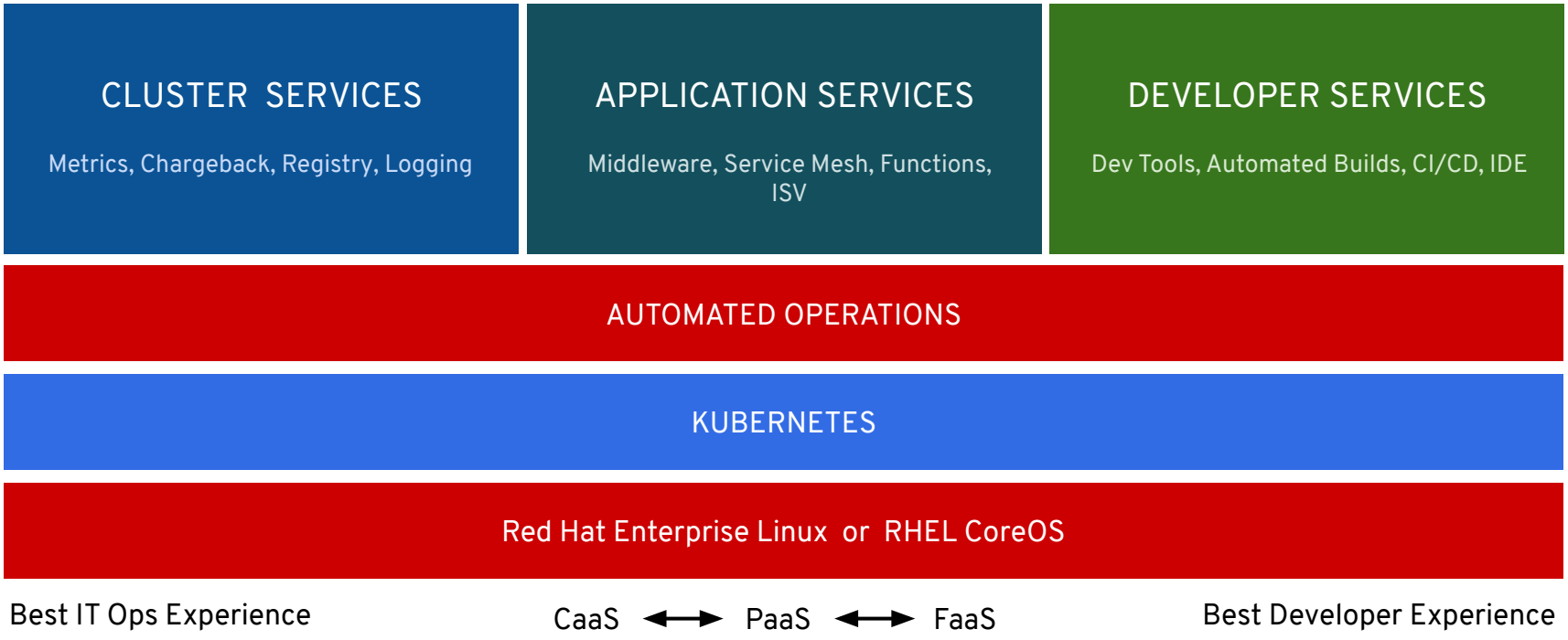
Red Hat OpenShift

What's New in OpenShift 4.x for Sales

Red Hat

OpenShift 4 Platform



Red Hat

OpenShift 4.2

PLATFORM EXPANSION

Disconnected, air-gapped installation

Full-stack Automation for Azure, GCP. OpenStack

Migration tooling

WORKLOAD EXPANSION

Operators for Red Hat Integration, Business Automation, Runtimes

Special resources operator For GPU

DEVELOPER EXPERIENCE

Developer console with application topology

CodeReady Containers

Service Mesh fully supported

Red Hat

The New Platform Boundary

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

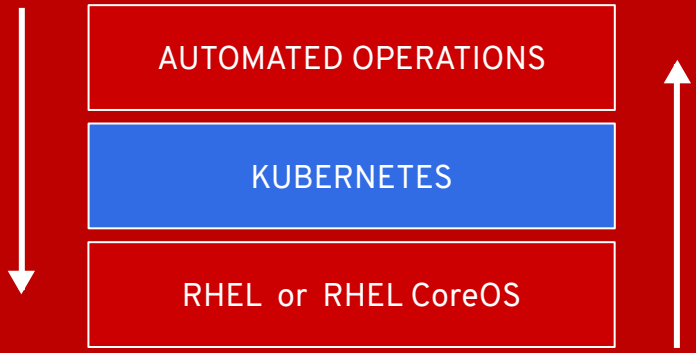
OpenShift & Kubernetes

certificates & security settings

container runtime config

allowed maintenance windows

software defined networking



kernel modules

device drivers

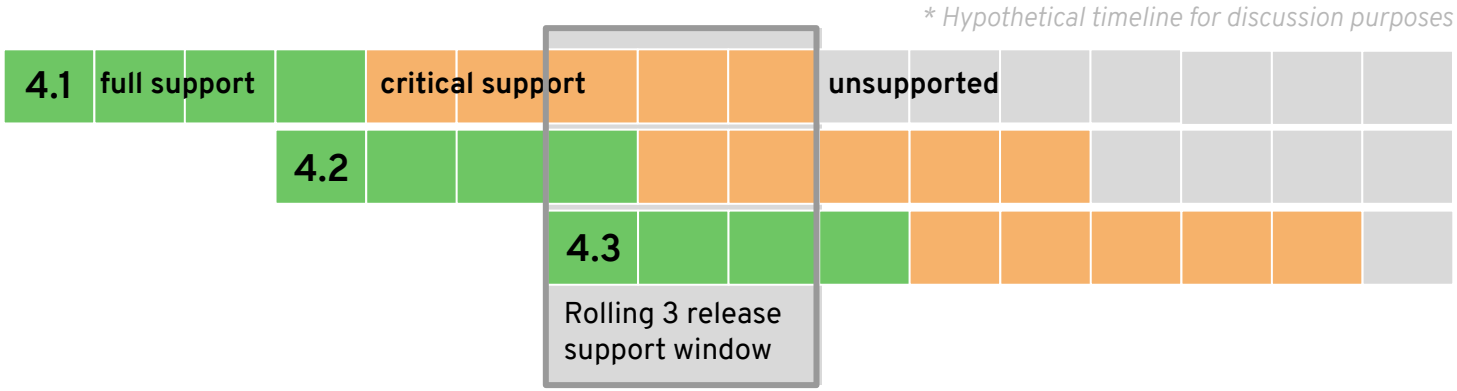
network interfaces

security groups

Nodes & Operating System

Red Hat

OpenShift 4 Lifecycle



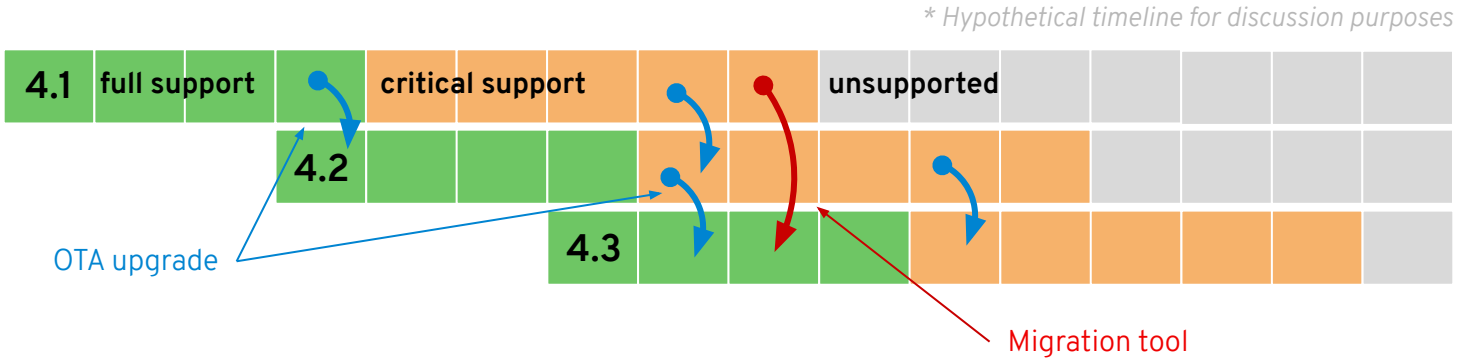
New model
Release based, not date based. Rolling three release window for support.

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

OPENSHIFT 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 OPENSHIFT

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®	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 • Immutable and tightly integrated 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

CRI-O Support in OpenShift

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

CRI-O 1.13	Kubernetes 1.13	OpenShift 4.1
CRI-O 1.14	Kubernetes 1.14	OpenShift 4.2
CRI-O 1.16	Kubernetes 1.16	OpenShift 4.3

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

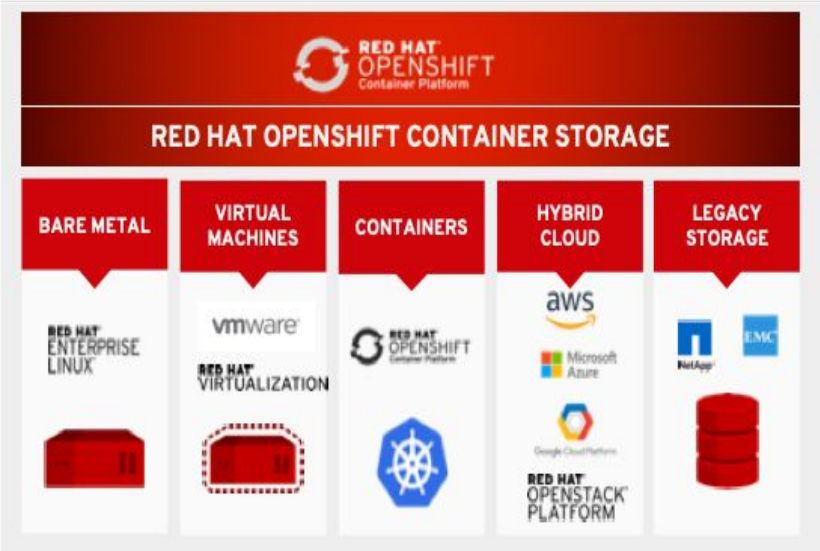
Cipher Suite Configuration

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

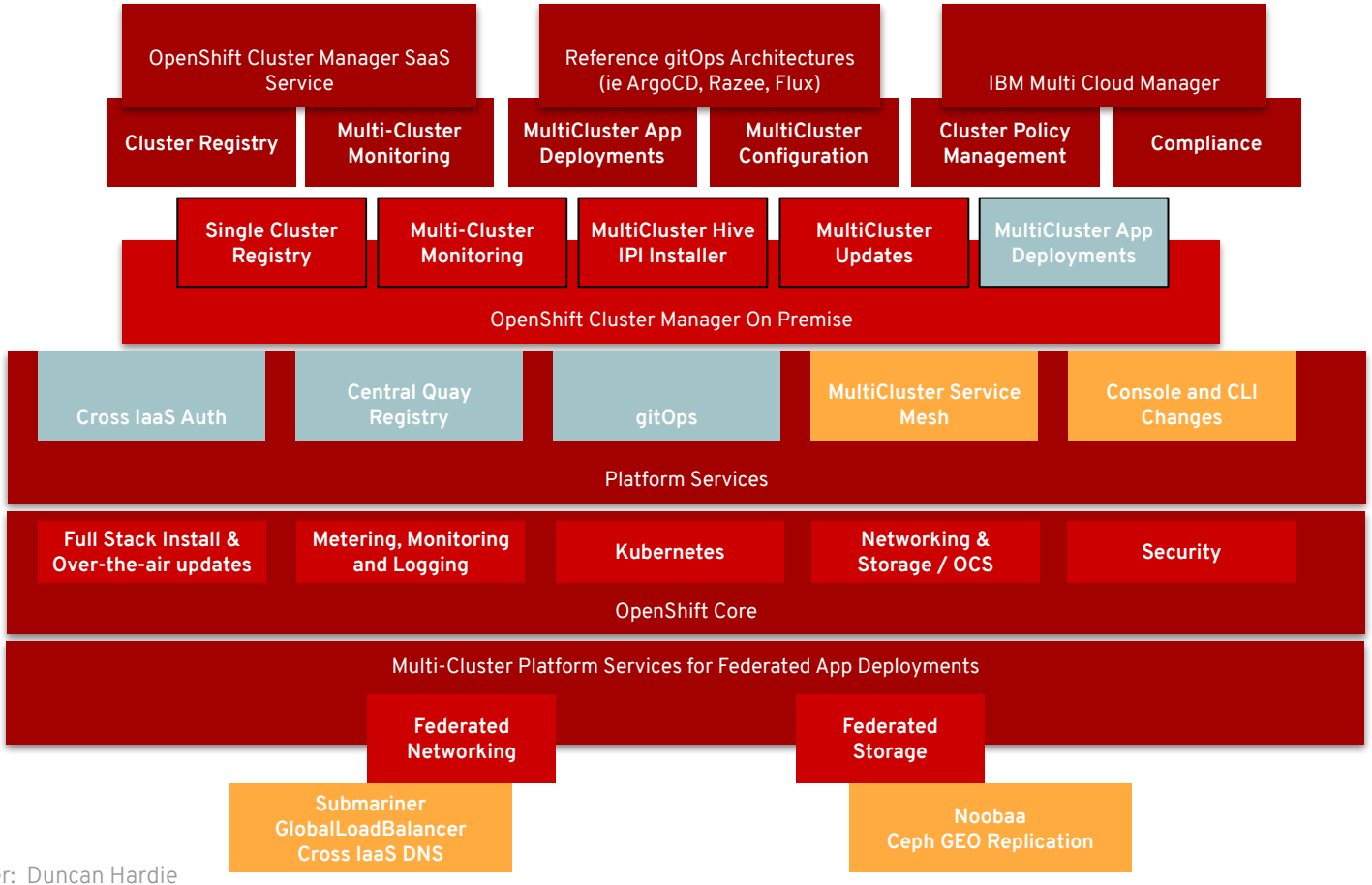
OCS 4.3

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

Red Hat

OPENSHIFT MULTICLUSTER

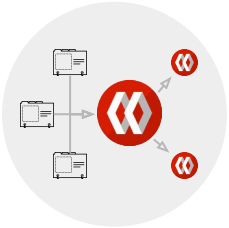
Multi-Cluster Platform Services



Product Manager: Duncan Hardie

Red Hat

Red Hat Quay v3.1 (released)

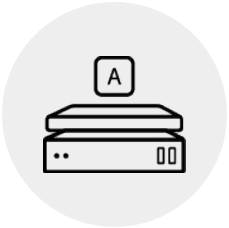


Repository Mirroring[1]

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 Operator [2]

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 / NooBaa[1]

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

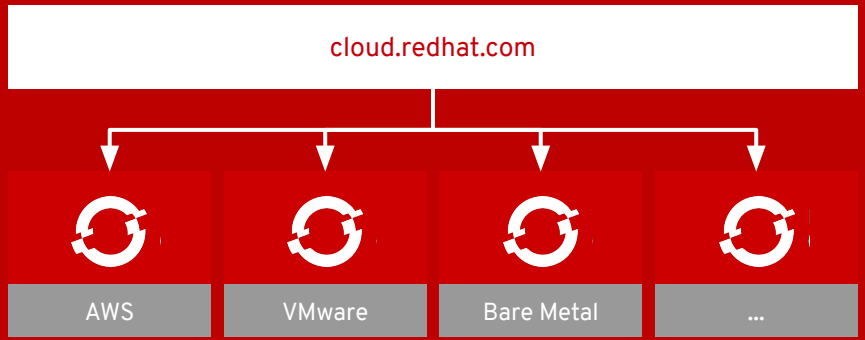
Learn more: https://www.redhat.com/en/blog/red-hat-quay-31-now-even-better-across-distributed-environments

Product Manager: Dirk Herrmann

[1] Tech Preview [2] Dev Preview

Cloud-like Simplicity, Everywhere

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



Red Hat

OpenShift Cluster Manager cloud.redhat.com/openshift

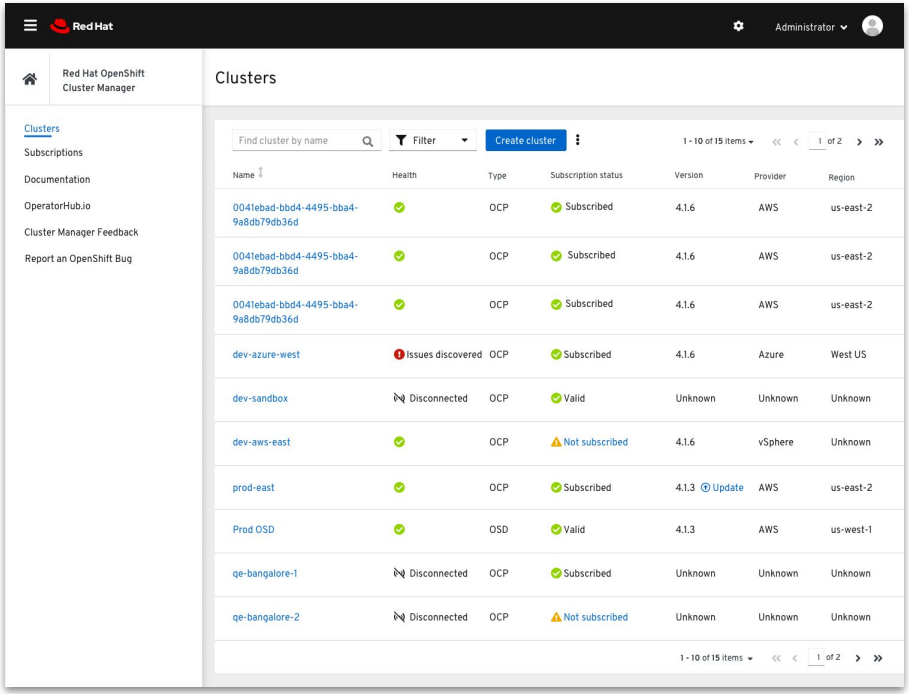
Enhanced OpenShift Web Console Integration
Bi-directional navigation to and from the OpenShift web console for cluster administrators. Deep linking from OCM to the console where relevant.

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.



Product Manager: Jake Lucky

Generally Available

Red Hat

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]

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.

Generally Available

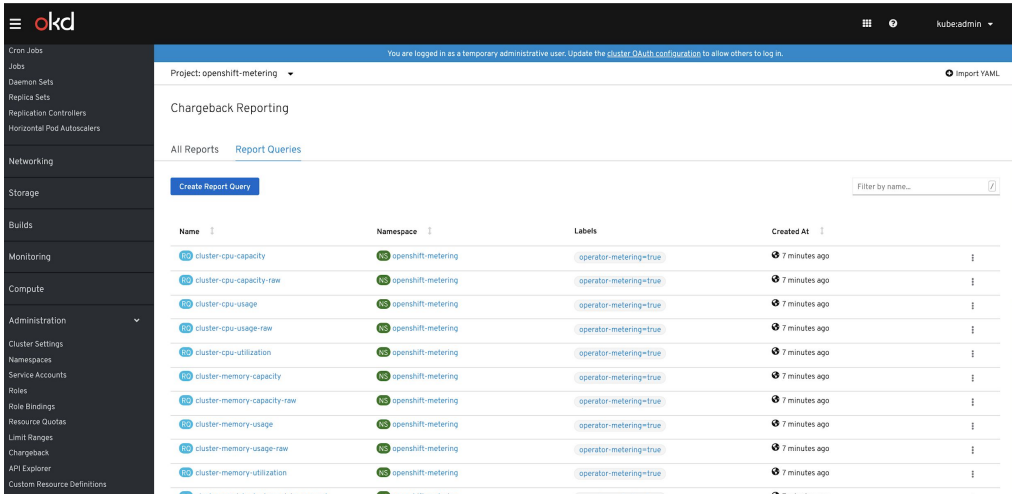
Red Hat

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



CPU
Memory
Storage

✖

Request
Actual Usage
Utilization %

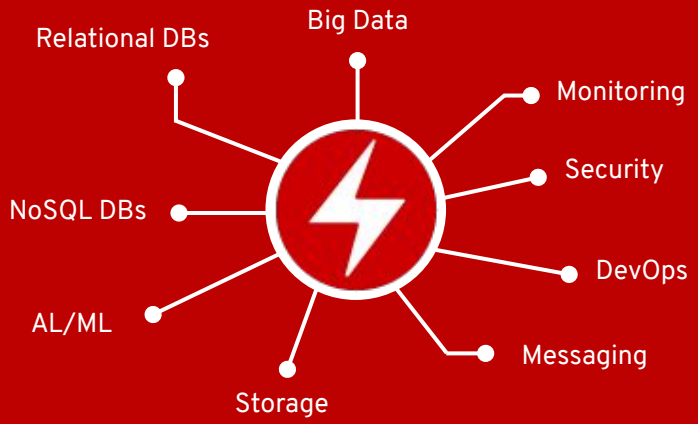
✖

Pod
Namespace
Node
Cluster

Generally Available

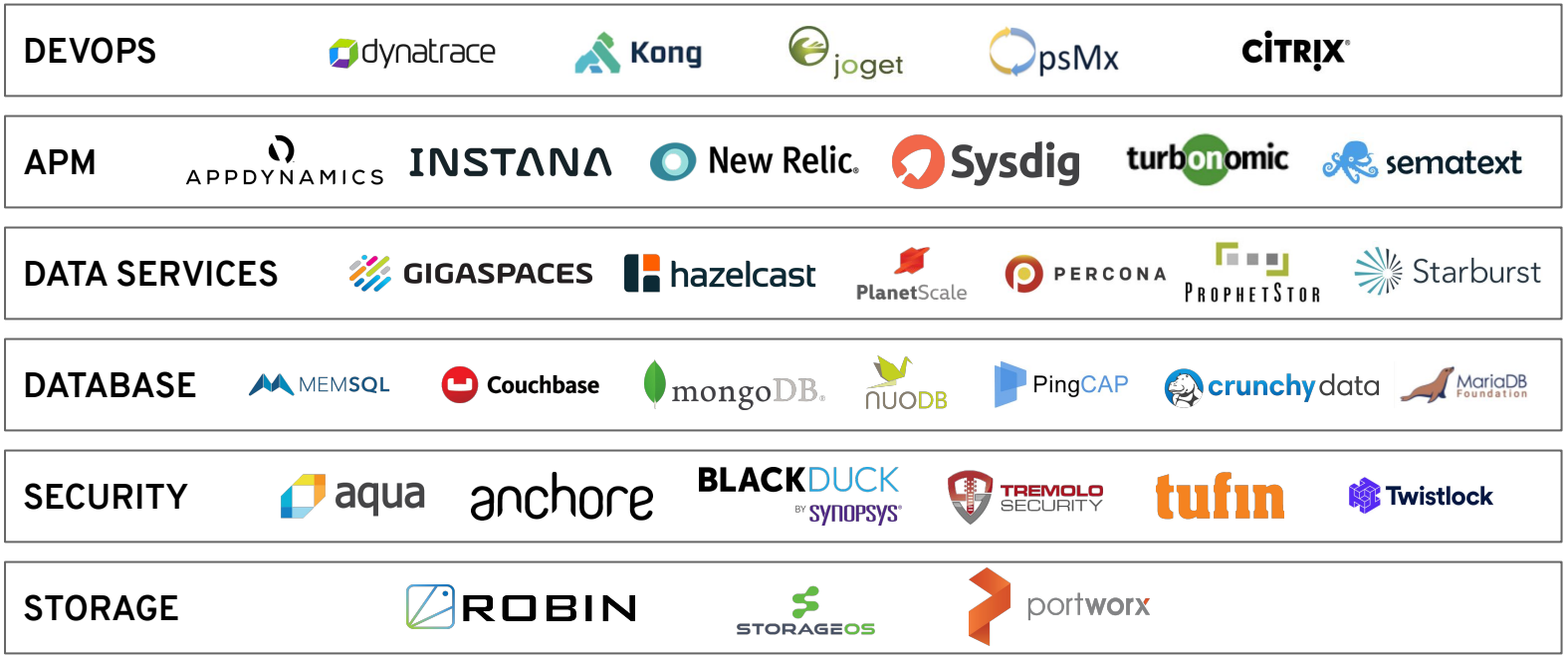
A broad ecosystem of workloads

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

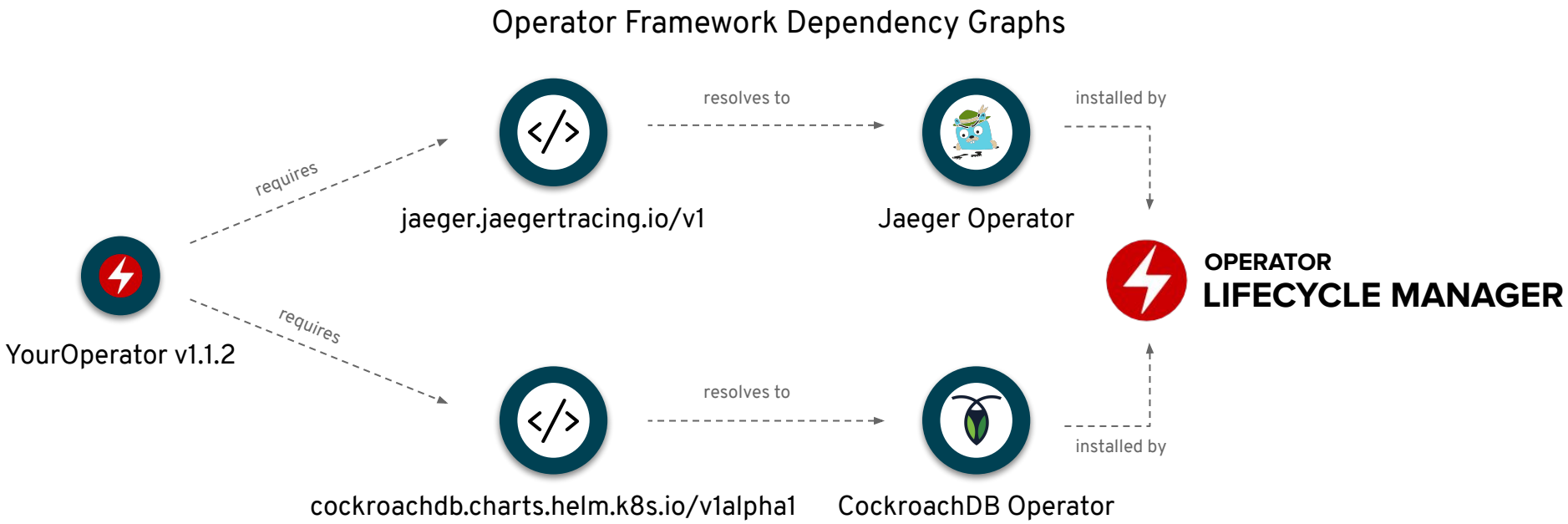


Red Hat

Red Hat Certified Operators

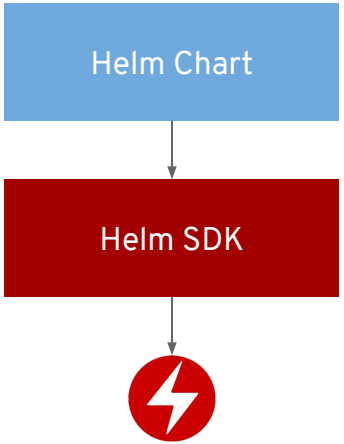


4.2 Automated Dependency Resolution

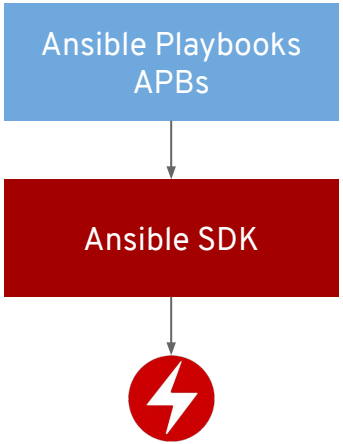


OPERATOR SDK

Build Operators for your apps



Build operators from Helm chart, without any coding



Build operators from Ansible playbooks and APBs

Build advanced operators for full lifecycle management

OpenShift Console

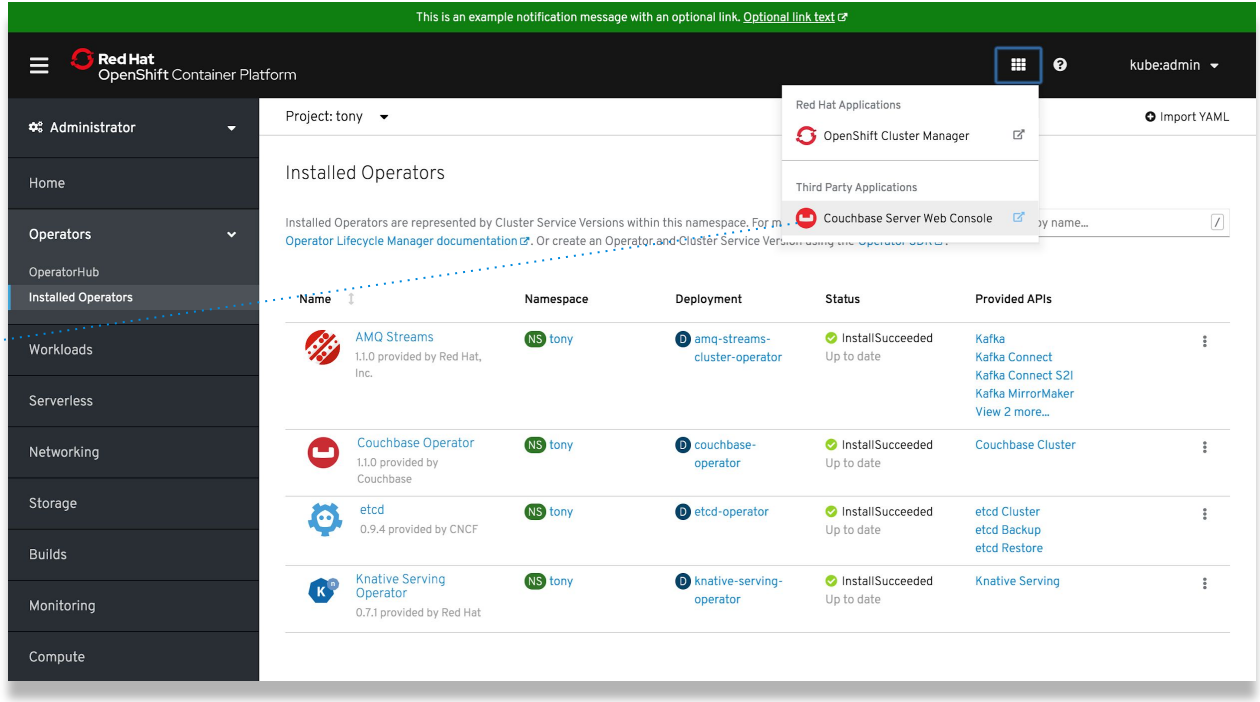
The future is now.

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.

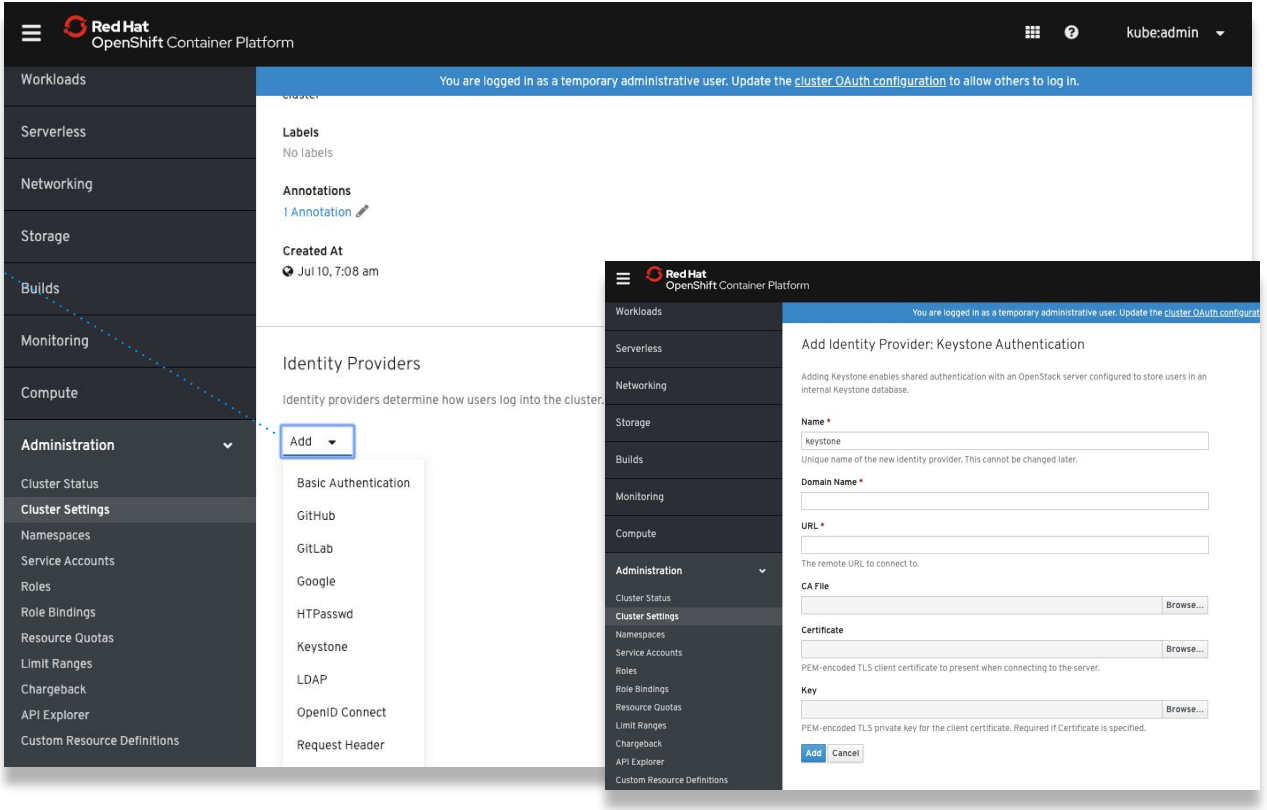


Red Hat

Configuring Authentication for your desired Identity Providers

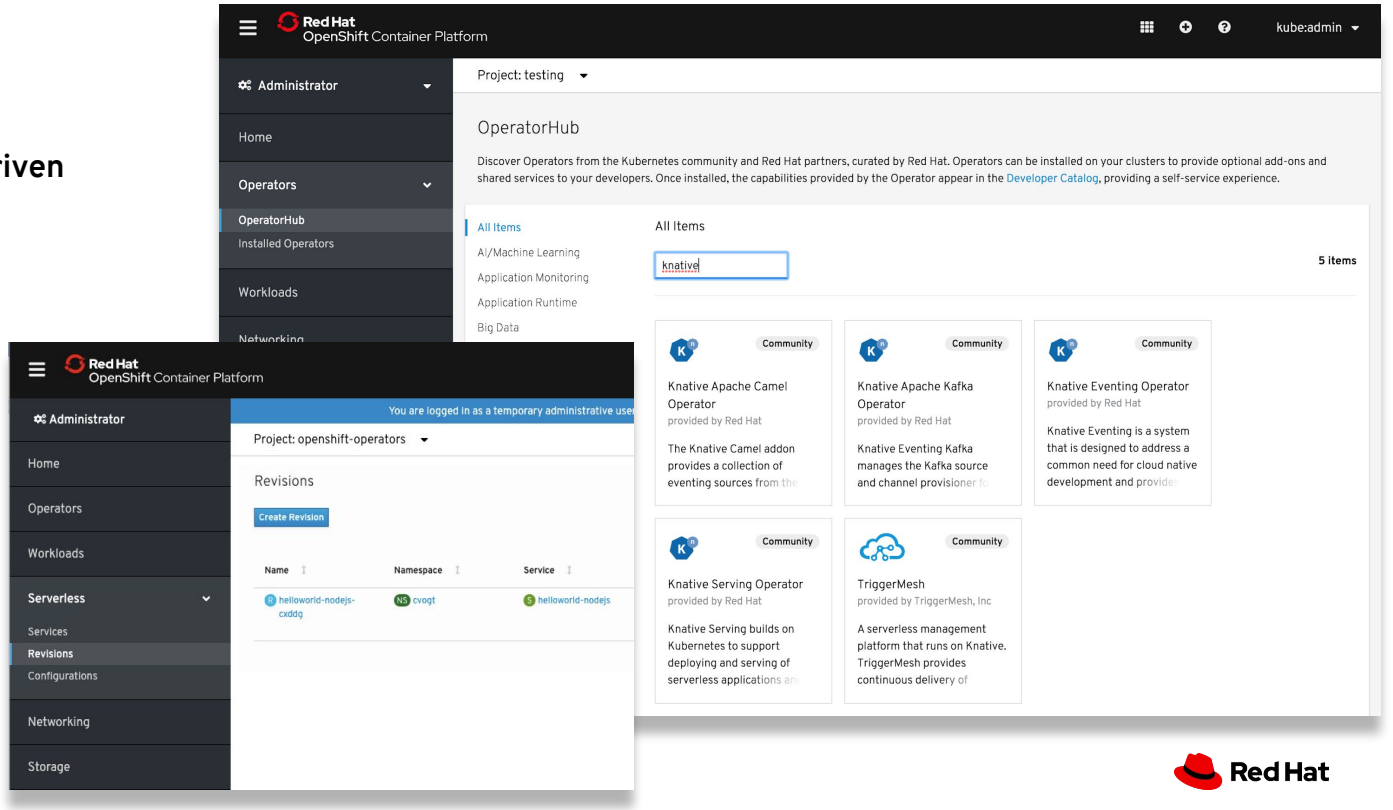
Customize and determine how users log into the cluster

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



Knative on OpenShift Serverless via Knative Operators

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

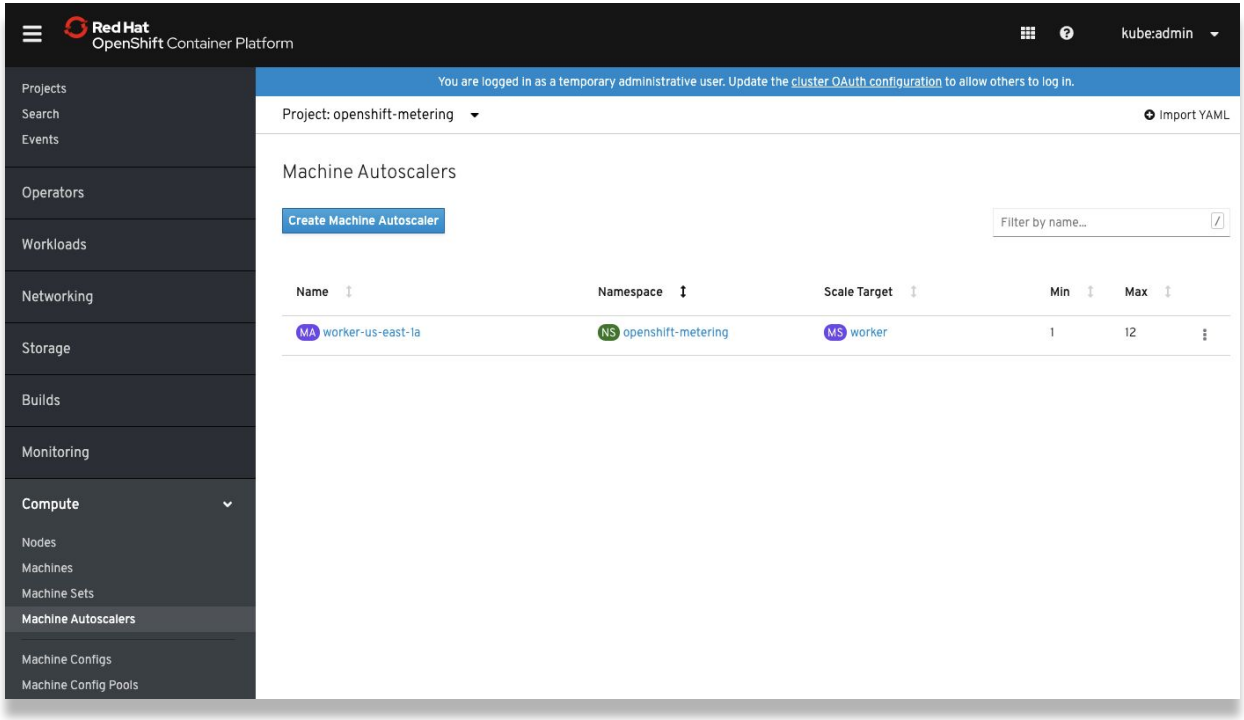


Red Hat

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.

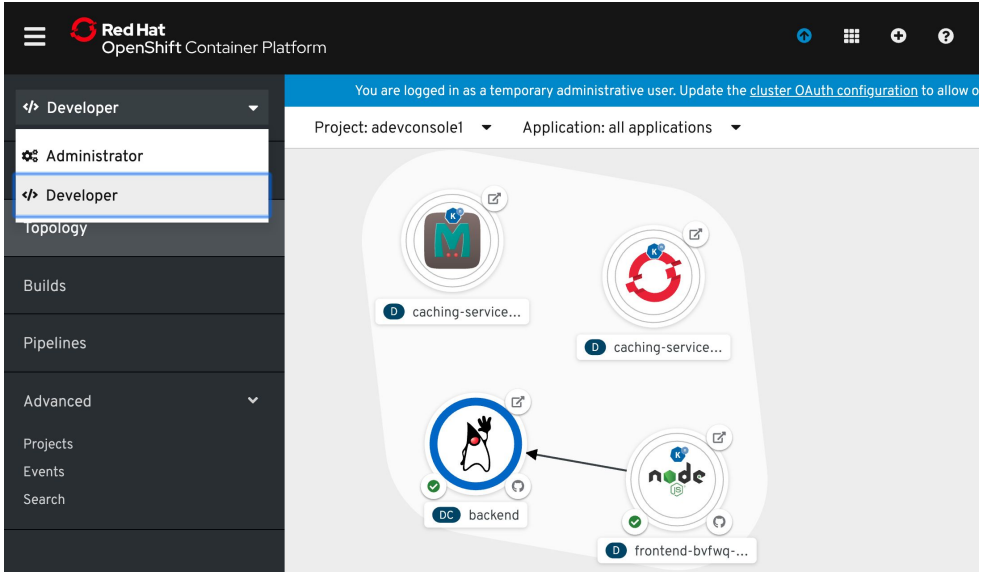


Red Hat

Web Console - Developer Perspective

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

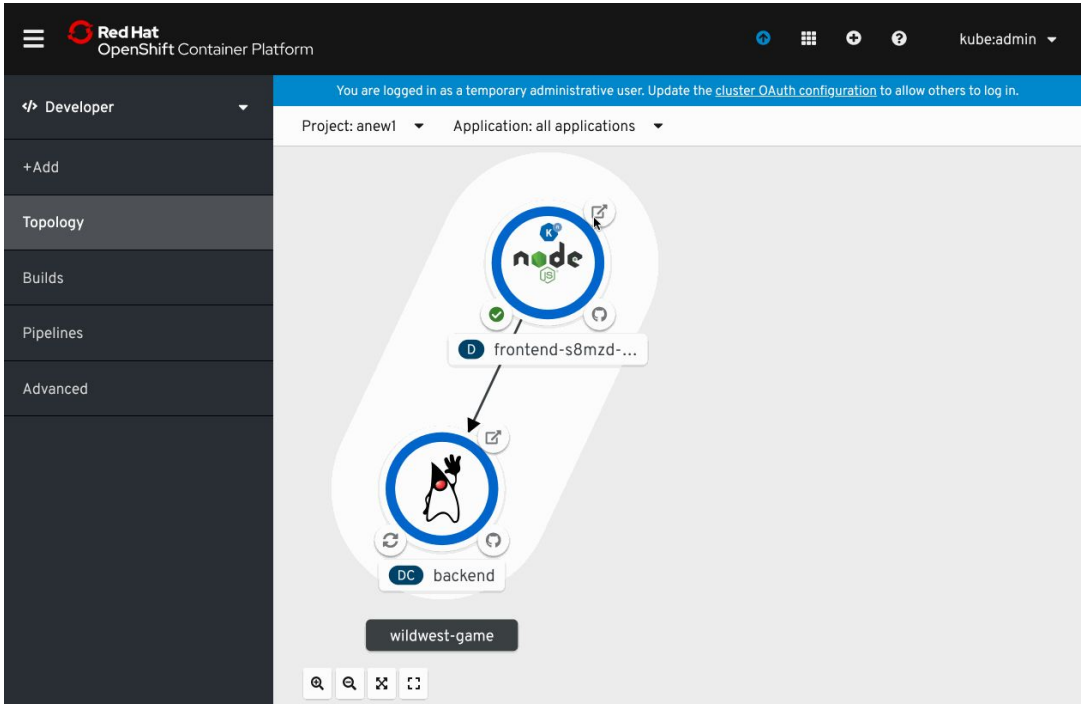
All OpenShift developer tool UIs will be surfaced here...though some (like CodeReady Workspaces) will be links out to unique UIs.



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	**Containers**
Serverless	**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.

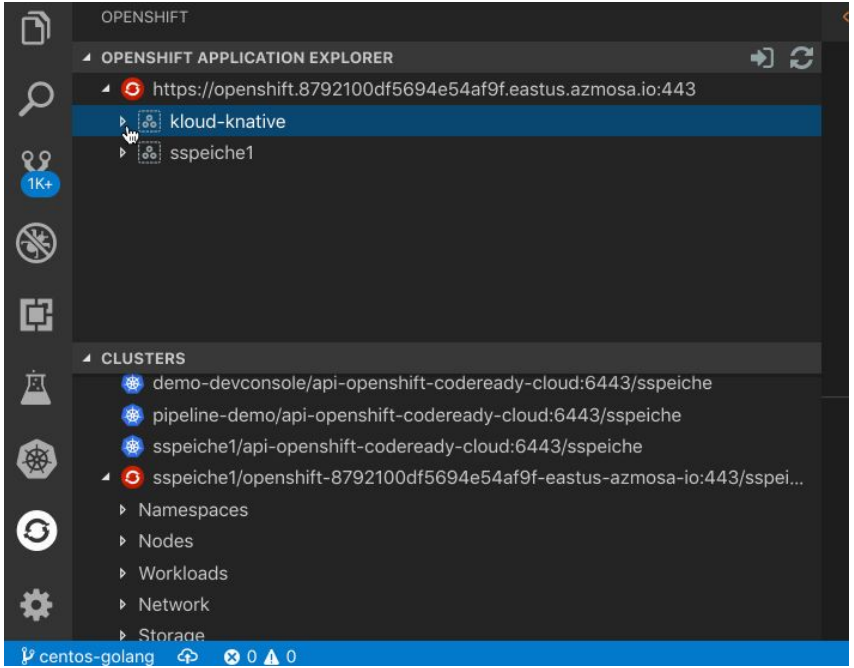
VS Code Kubernetes Extension

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.

Product Manager: Steve Speicher

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

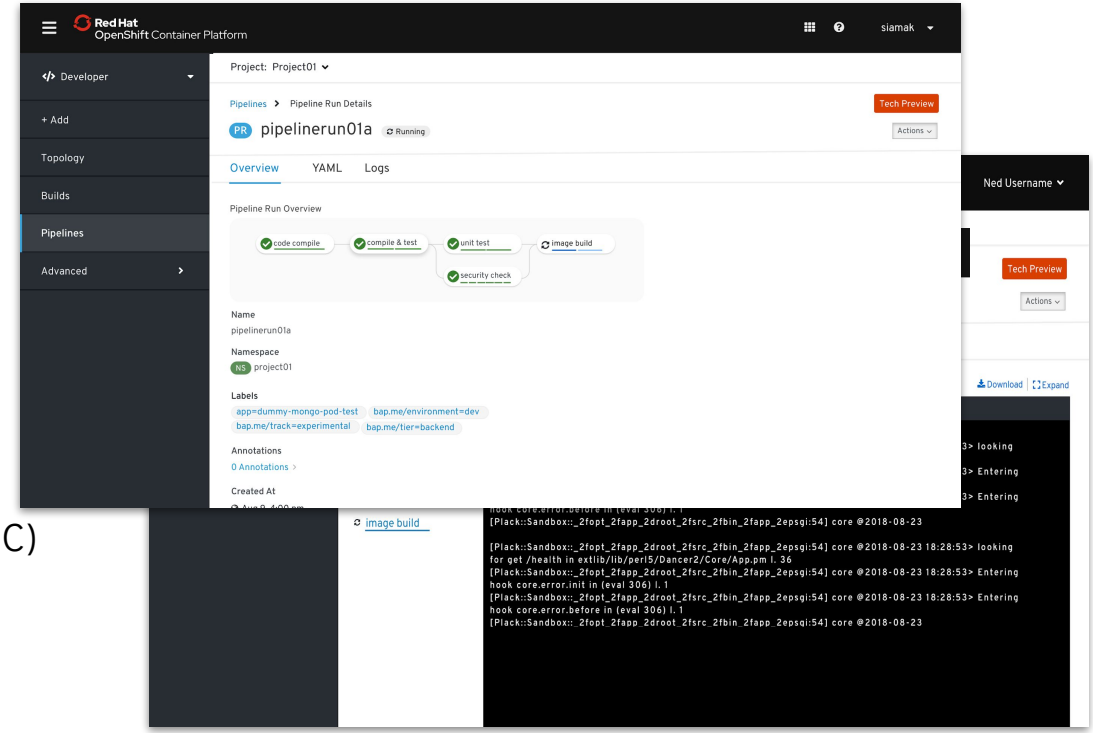
Use It To: Simplify direct-to-OpenShift development on laptops.

Product Manager: Steve Speicher

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

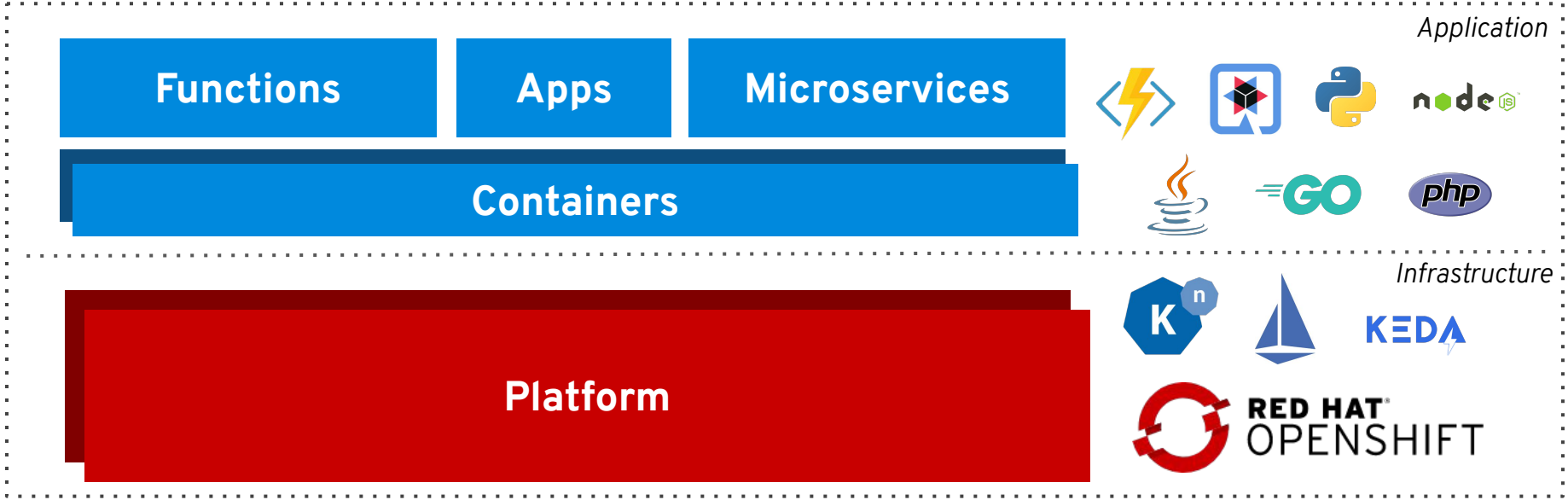


Product Manager: Siamak Sadeghianfar

Red Hat

Tech Preview 4.2

OpenShift Serverless



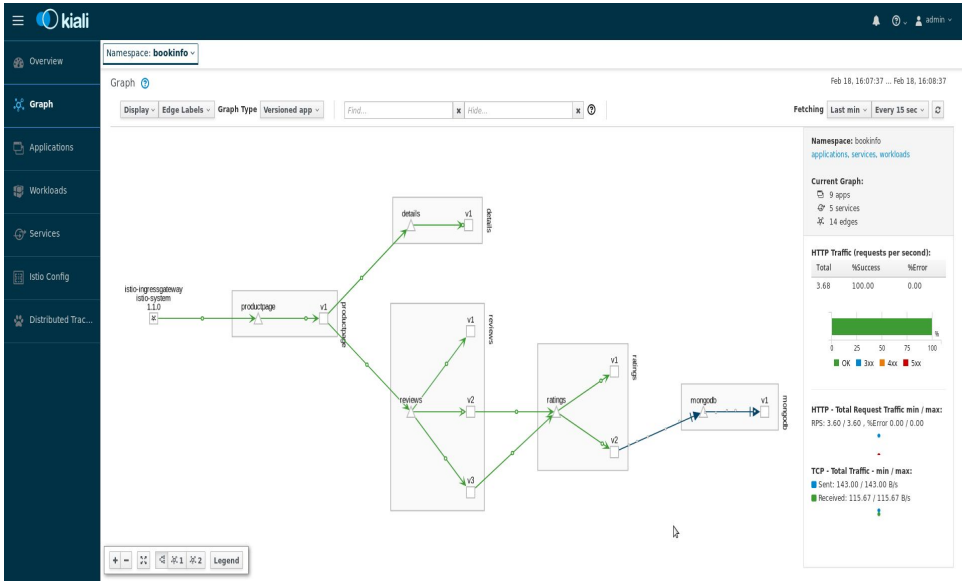
Product Manager: William Markito

Red Hat

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



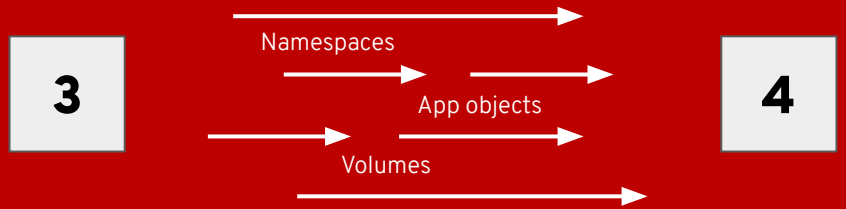
Product Manager: Brian 'redbeard' Harrington

Generally Available

Red Hat

Migrating to OpenShift 4

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



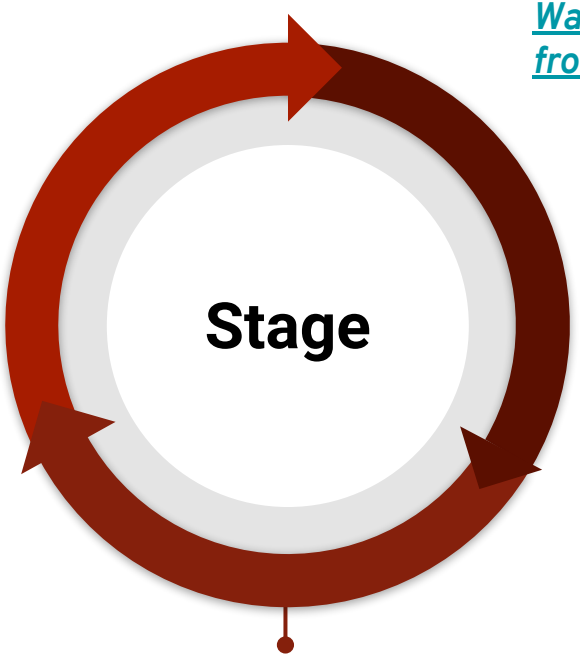
Red Hat

Application Migration: Migration Process

Watch a migration of MS-SQL Server from OCP 3.11 to OCP 4.1!

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

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 <u>are not handled</u>**
  - 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

DEV
- OpenShift Serverless (Knative) - DP
- OpenShift Pipelines (Tekton) DP2
- CodeReady Workspaces
- CodeReady Containers Alpha
- Developer CLI (odo) Beta

APP
- OperatorHub
- Operator Lifecycle Manager
- Service Mesh (~4 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
- OpenShift Dedicated consumption pricing

Q3 CY2019
OpenShift 4.2

DEV
- Developer Console GA
- OpenShift Serverless (Knative) - TP
- OpenShift Pipelines (Tekton) DP3
- CodeReady Containers GA
- Developer CLI (odo) GA

APP
- OperatorHub Enhancements
- Operator Deployment Field Forms
- Application Migration Console

PLATFORM
- Kubernetes 1.14 w/ CRI-O runtime
- Disconnected Install and Update
- Automated Installer for Azure, OSP, GCP
- Pre-existing Infra Installer for GCP
- Cluster-wide Egress Proxy
- OVN Tech Preview
- OpenShift Container Storage 4.2 (1 month after)

HOSTED
- Insights Operator
- Azure Red Hat OpenShift new features (monitoring, logging)

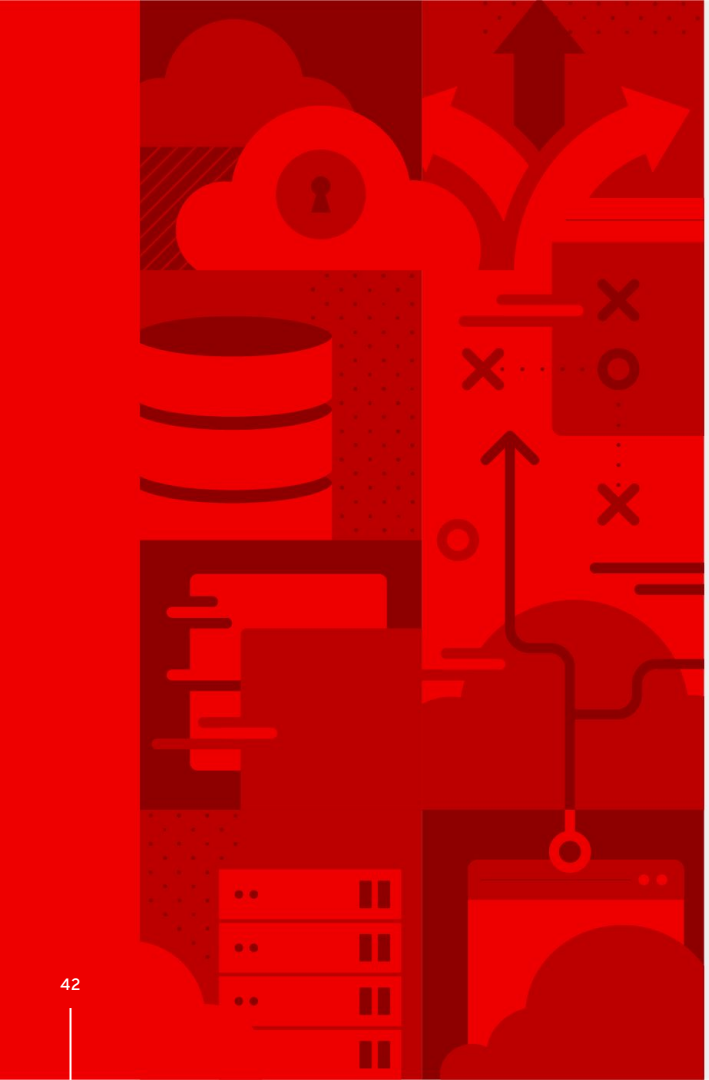
Q4 CY19/Q1 CY20
OpenShift 4.3

DEV
- OpenShift Serverless (Knative) - GA
- OpenShift Pipelines (Tekton) TP
- Helm 3 TP

APP
- Metering for Services
- Windows Containers (Planned)
- GPU Metering
- Application Operator Binding - DP

PLATFORM
- Kubernetes 1.16 w/ CRI-O runtime
- Automated Installer for RHV
- Private/Internal Clusters support from the installer
- Deploy to pre-existing VPC & Subnets
- OVN GA w/ Windows Networking Integration (Planned)
- FIPS
- Pre-existing Infra Installer for OSP
- OpenShift Container Storage 4.3

HOSTED
- cloud.redhat.com - Subscription Mgmt Improvements
- Azure Red Hat OpenShift new features (private clusters)
- Azure Red Hat OpenShift preview of 4.x
- OSD on Google Cloud preview on 4.x



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