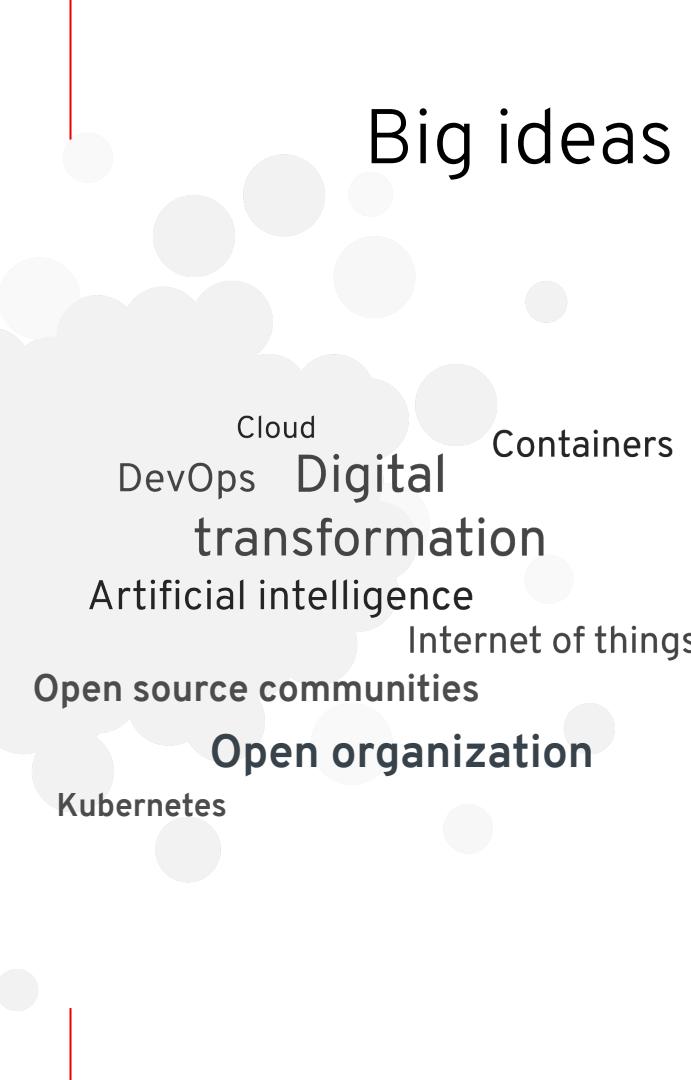




The Kubernetes platform
for big ideas

Big ideas drive business innovation



Cloud
DevOps **Digital transformation** Containers

Artificial intelligence
Internet of things

Open source communities

Open organization

Kubernetes

Business innovation is all around us.

Every organization in every geography and in every industry can innovate and create more customer value and differentiation with open source technologies and an open culture.

Creating value depends on your ability to deliver applications faster

Cloud-native
applications



AI & machine
learning



Analytics



Internet of
Things

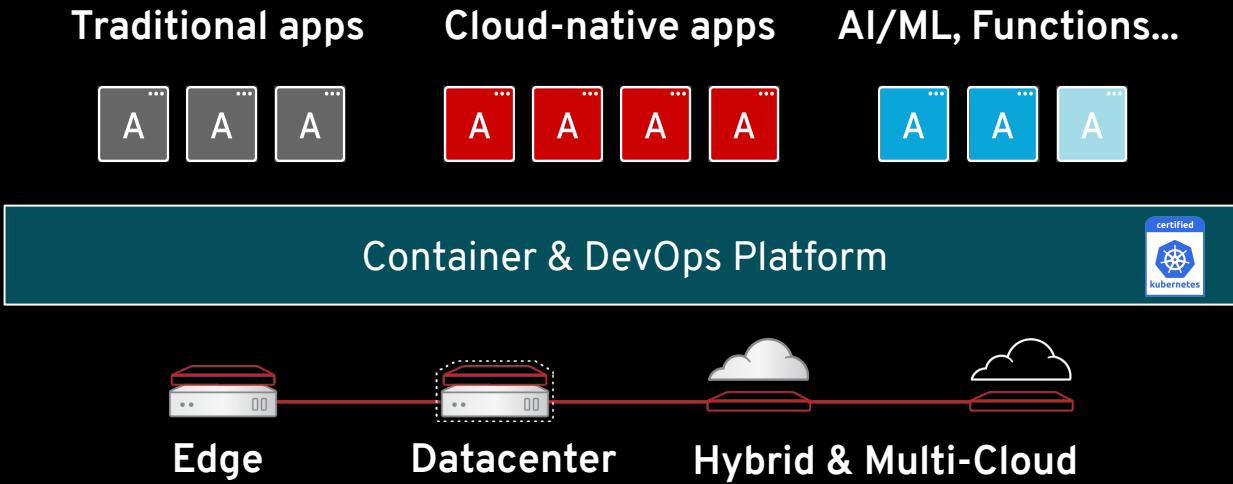


Innovation
culture



Containers, Kubernetes, and hybrid cloud are key ingredients.
OpenShift is the best platform to deliver container-based applications.

With OpenShift you can deliver all your applications in a whole new way



“”

We provide a 5-hour head start in treating sepsis. And in the hands of clinicians, 5 hours saves lives.

—
Dr. Edmund Jackson
VP & Chief Data
Scientist
HCA Healthcare



HCA Healthcare
Using data insights to save lives

More than 1,000 Red Hat OpenShift customers



MODERNIZE APPS



BBVA KOHLS



AMADEUS



Schiphol
Amsterdam Airport

Deutsche Bank

MULTI-CLOUD



Hilton Emirates NBD

MOBILE

HCA Healthcare bp
T...Systems...

ExxonMobil



BIG DATA | ANALYTICS

AI | ML

SMARTBOW

BMW GROUP VORWERK

IOT



Why customers choose Red Hat OpenShift

The diagram consists of four main sections, each enclosed in a dashed border:

- Trusted enterprise Kubernetes**: Contains an icon of a server with a gear inside, representing a containerized environment.
- Cloud-like experience everywhere**: Contains the OpenShift logo (a red circular arrow) above two clouds, one containing a network icon and the other a shield icon.
- Empowering developers to innovate**: Contains icons for Spring (green leaf), Node.js (green hexagon with 'node'), Docker (yellow blob), a smartphone displaying various app icons, Kafka (blue hexagon with nodes), and Kubernetes (blue hexagon with 'K' and 'n').
- Open source innovation**: Contains icons for Helm (blue hexagon with steering wheel), OpenShift (blue sailboat), Rook (red flame), CoreOS (red lightning bolt), Ceph (blue hexagon with red 'd'), etcd (blue hexagon with gear), and Kubernetes (blue hexagon with white snowflake).

CONTAINER CHALLENGES

Container security

Image scanning, patching, and compliance

Day 2 management

Installations, upgrades, and maintenance
Integration of existing enterprise technology

Application delivery

Monitoring, metering, and management
Integration of existing developer tools



Trusted enterprise Kubernetes

Continuous security, world-class support and services, and deep expertise to confidently run any application

A cloud-like experience, everywhere

Full-stack automated operations on a consistent foundation across on-premises or hybrid cloud infrastructure

Empowerment for developers to innovate

Ability to get applications to production sooner with a wide range of technologies and streamlined workflows

Trusted enterprise Kubernetes



Red Hat
OpenShift

Trusted host, content,
platform

Full-stack automated
installation

Seamless updates

Kubernetes done right is hard

INSTALL

- Templating
- Validation
- OS setup

DEPLOY

- Identity & security access
- App monitoring & alerts
- Storage & persistence
- Egress, ingress, & integration
- Host container images
- Build/Deploy methodology

HARDEN

- Platform monitoring & alerts
- Metering & chargeback
- Platform security hardening
- Image hardening
- Security certifications
- Network policy
- Disaster recovery
- Resource segmentation

OPERATE

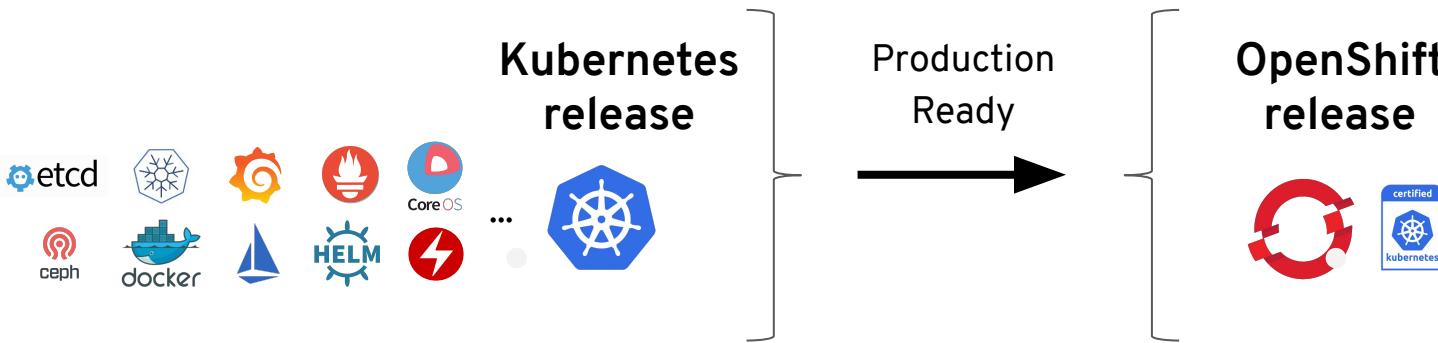
- OS upgrade & patch
- Platform upgrade & patch
- Image upgrade & patch
- App upgrade & patch
- Security patches
- Continuous security scanning
- Multi-environment rollout
- Enterprise container registry
- Cluster & app elasticity
- Monitor, alert, remediate
- Log aggregation



75%
of enterprise users identify
complexity of implementation and
operations as the top blocker to adoption

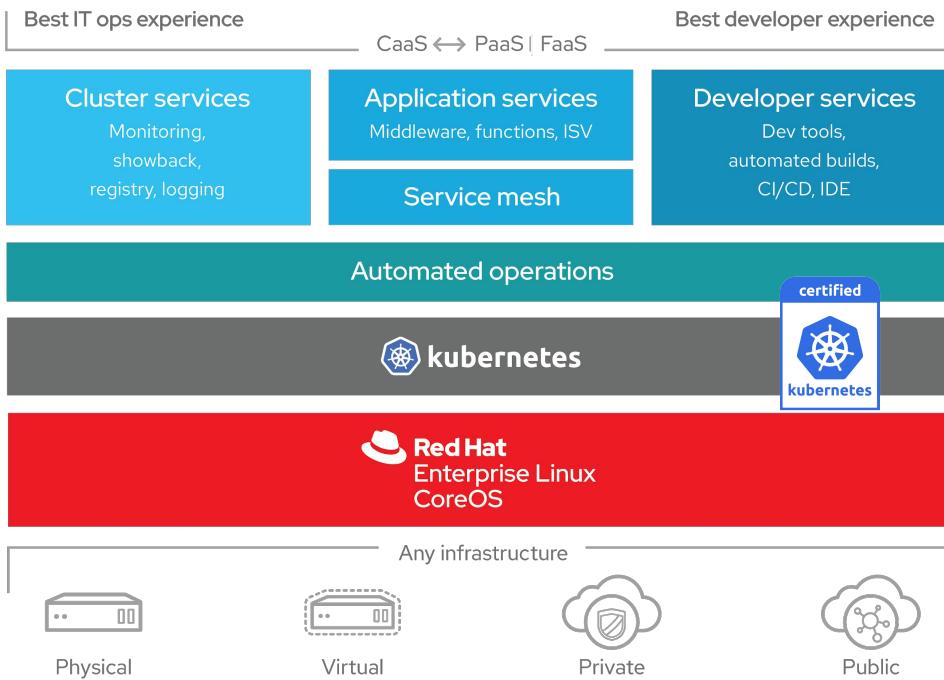
Source: The New Stack. *The State of the Kubernetes Ecosystem*, August 2017.

OpenShift is trusted enterprise Kubernetes



- Hundreds of defect and performance fixes
- 200+ validated integrations
- Certified container ecosystem
- 9-year enterprise life-cycle management
- Red Hat is a leading Kubernetes contributor since day 1

OpenShift 4 - A smarter Kubernetes platform



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

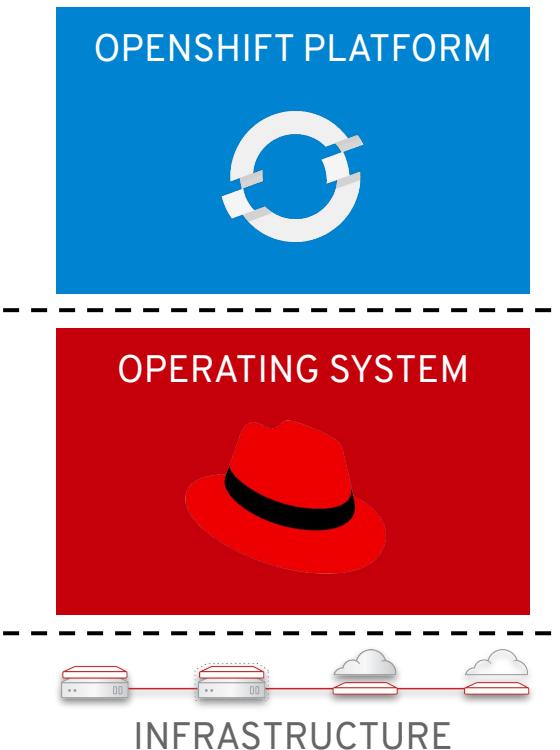
Seamless Kubernetes deployment to any cloud or on-premises environment

Autoscaling of cloud resources

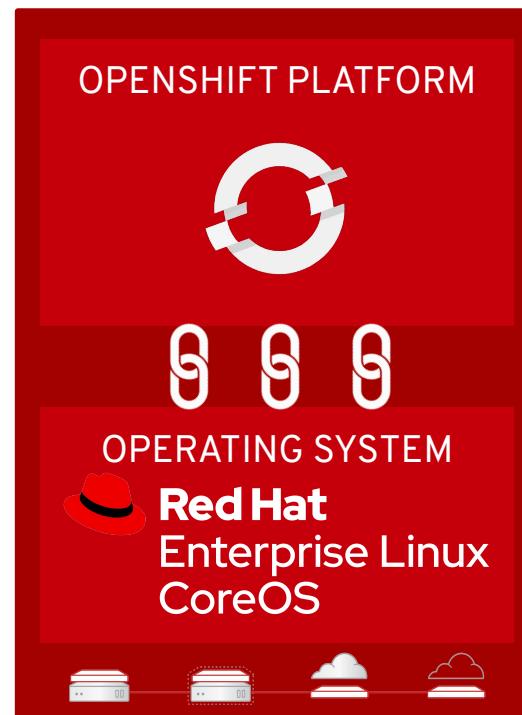
One-click updates for platform, services, and applications

Full-stack automated install

OPENSHIFT 3 & 4



OPENSHIFT 4 (only)



Over the Air (OTA) Updates

- OpenShift retrieves the list of available updates
- Admin selects the target version
- OpenShift is updated over the air
- Auto-update support

The screenshot shows the 'Cluster Settings' page in the Red Hat OpenShift web interface. The left sidebar has a 'Administration' section with 'Cluster Settings' selected. The main content area displays cluster information:

CHANNEL	UPDATE STATUS	CURRENT VERSION
fast	4.1.0-0.2	4.0.0-0.2

Below the table, it says 'CURRENT PAYLOAD' followed by a minus sign. Under 'CLUSTER AUTOSCALER', there is a link to 'Create Autoscaler' and a blue 'Update' button.

Comprehensive container security



CONTROL

Application
security

Container content

CI/CD pipeline

Container registry

Deployment policies



DEFEND

Infrastructure

Container platform

Container host multi-tenancy

Network isolation

Storage

Audit & logging

API management



EXTEND

Security ecosystem

“”

We can localize clusters in different markets if we need to and therefore serve our customers on a worldwide scale.

Dr. Alexander Lenk
Lead Architect Connected
Vehicle, Digital Backend,
Big Data, Blockchain
BMW Group

BMW
Connected Drive



A cloud-like experience, everywhere



Operator Framework
Operator Hub &
ISV ecosystem
Multicloud
management

A consistent container application platform

FROM YOUR DATACENTER TO THE CLOUD



Automated
operations



Multi-tenant



Secure by
default



Network
traffic control



Over-the-air
updates



Monitoring
& chargeback



Pluggable
architecture



Bare metal, VMware vSphere, Red Hat Virtualization, Red Hat OpenStack Platform,
Amazon Web Services, Microsoft Azure, Google

Kubernetes adoption phases

1. Stateless apps

ReplicaSets

Deployments

2. Stateful apps

StatefulSets

Storage/CSI

3. Distributed systems

Data rebalancing

Autoscaling

Seamless upgrades

Automated container operations

FULLY AUTOMATED DAY-1 AND DAY-2 OPERATIONS

INSTALL

DEPLOY

HARDEN

OPERATE

AUTOMATED OPERATIONS

Infra provisioning

Full-stack deployment

Secure defaults

Multicloud aware

Embedded OS

On-premises and cloud

Network isolation

Monitoring and alerts

Unified experience

Audit and logs

Full-stack patch & upgrade

Signing and policies

Zero-downtime upgrades

Vulnerability scanning

Kubernetes-native day 2 management



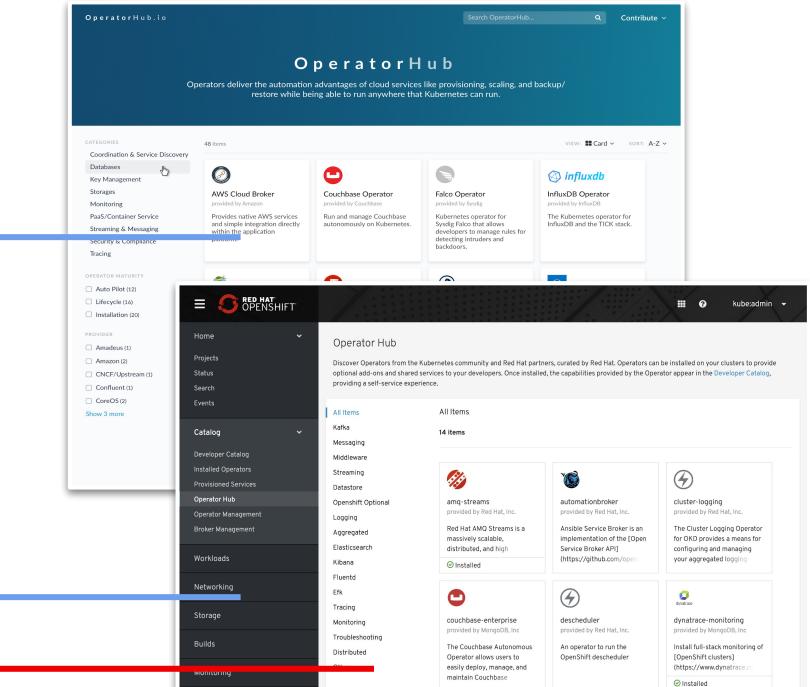
 A white icon consisting of four arrows pointing outwards from a central point, forming a cross shape.	Flexible app architectures	 A white icon containing mathematical symbols: a pi symbol, a square root symbol with 'x+y', the number '42', an equals sign with 'e=mc²', and a percent sign with a infinity symbol.	No reinvention of core concepts
 A white icon showing a sequence of three boxes: a top box with a square arrow, a middle box with a checkmark, and a bottom box with a square arrow.	Uniform deploy and debug	 A white icon showing two overlapping circles, one solid and one dashed, representing a hybrid model.	Truly hybrid

Operators codify operational knowledge and workflows to automate life-cycle management of containerized applications with Kubernetes

OperatorHub and certified Operators

- OperatorHub.io launched by Red Hat, AWS, Microsoft and Google
- OpenShift Operator Certification
- OperatorHub integrated into OpenShift 4

COMMUNITY OPERATORS
OPENSHIFT CERTIFIED OPERATORS



Full control for administrators

The screenshot shows the Red Hat OpenShift Container Platform interface. On the left, the navigation sidebar includes sections for Home, Catalog (with OperatorHub selected), Workloads, and other cluster management tools. The main content area displays the OperatorHub, listing various operators such as AMQ Streams, AppDynamics Cluster, Automation Broker Operator, and Camel-K Operator. A modal window titled "Create Operator Subscription" is open on the right, prompting the user to select an installation mode (All namespaces on the cluster or a specific namespace), an update channel (preview), and an approval strategy (Automatic or Manual). The "Subscribe" button is at the bottom of the modal.

Project: all projects ▾

OperatorHub

All Items 40 items

Category	Operator Name	Description	Status
AI/Machine Learning	AMQ Streams	Red Hat AMQ Streams is a massively scalable, distributed, and high	Installed
Application Monitoring	AppDynamics Cluster	End to end monitoring of applications on Kubernetes and OpenShift clusters by AppDynamics.	Community
Big Data	Automation Broker Operator	provided by The Apache Software Foundation	Community
Database	Camel-K Operator	provided by Red Hat, Inc.	Community
Developer Tools			
Integration & Delivery			
Logging & Tracing			
Monitoring			
Networking			
OpenShift Optional			
Security			
Storage			
Streaming & Messaging			
Other			

Create Operator Subscription

Keep your service up to date by selecting a channel and approval

Installation Mode *

All namespaces on the cluster (default)
Operator will be available in all namespaces.

A specific namespace on the cluster
Operator will be available in a single namespace only.

Update Channel *

preview

Approval Strategy *

Automatic

Manual

Subscribe **Cancel**

Self-service for developers

The screenshot shows the Red Hat OpenShift web interface. On the left, the navigation sidebar includes sections for Home, Projects, Status, Search, Events, Catalog (with sub-options like Developer Catalog, Installed Operators, OperatorHub, and Operator Management), and Workloads (with sub-options like Pods, Deployments, Deployment Configs, Stateful Sets, Secrets, Config Maps, Cron Jobs, Jobs, Daemon Sets, and Replica Sets). The Catalog section is currently active.

In the main content area, the user is viewing the 'production-api-backend' project. They are in the 'Kafka Details' section of the 'amqstreams.v1.0' topic. Below this, there are tabs for Overview, YAML, and Resources. The Resources tab is selected, showing a table with the following data:

NAME ↑	TYPE	STATUS
production-api-kafka-clients-ca	Secret	Created
production-api-kafka-clients-ca-cert	Secret	Created
production-api-kafka-cluster-ca	Secret	Created
production-api-kafka-cluster-ca-cert	Secret	Created
production-api-kafka-cluster-operator-certs	Secret	Created
production-api-kafka-entity-operator	Deployment	Created
production-api-kafka-entity-operator-6d499d47db	ReplicaSet	Created
production-api-kafka-entity-operator-6d499d47db-82xll	Pod	Running

A tooltip for the 'MongoDB Replica Set' operator is open. It shows the following details:

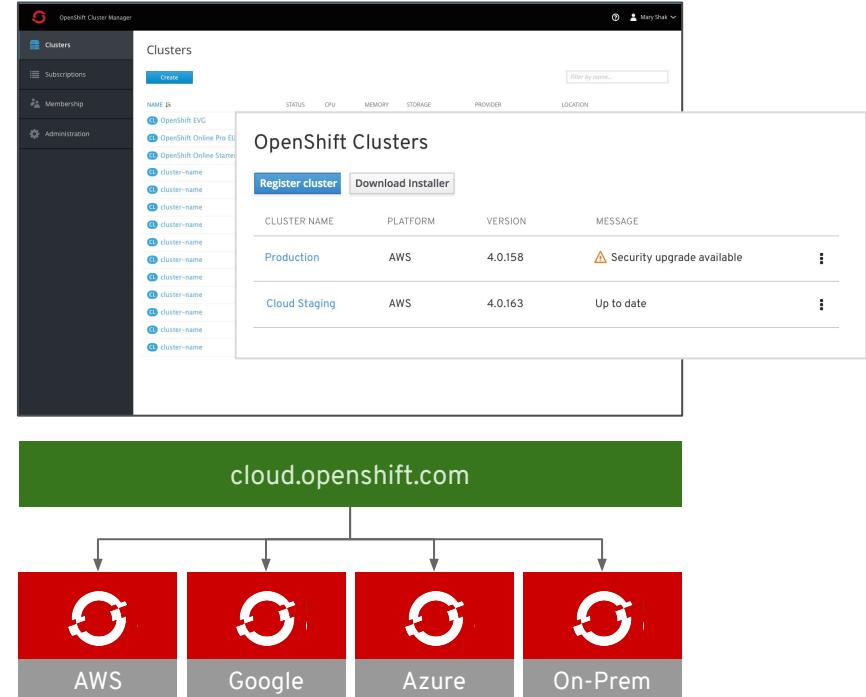
- MongoDB Replica Set** (Provided by MongoDB, Inc)
- Create** (button)
- PROVIDER**: MongoDB, Inc
- CREATED AT**: Apr 29, 2:50 pm
- Description**: This resource is provided by MongoDB, a Kubernetes Operator enable
- Documentation**: <https://docs.opsmanager.mongodb.com/current/tutorial/install-k8s->

Below the tooltip, a large black box displays the YAML configuration for the MongoDB Replica Set:

```
apiVersion: mongodb.com/v1
kind: MongoDBReplicaSet
metadata:
  name: example
  namespace: production
spec:
  members: 3
  version: 4.0.2
  persistent: false
  project: example
  credentials: my-secret
```

Unified Hybrid Cloud

- Cloud-based multicluster management
 - New clusters on AWS, Azure, Google, vSphere, OpenStack, and bare metal
 - Register existing clusters
 - Including OpenShift Dedicated
- Management operations
 - Install new clusters
 - View all registered clusters
 - Update clusters

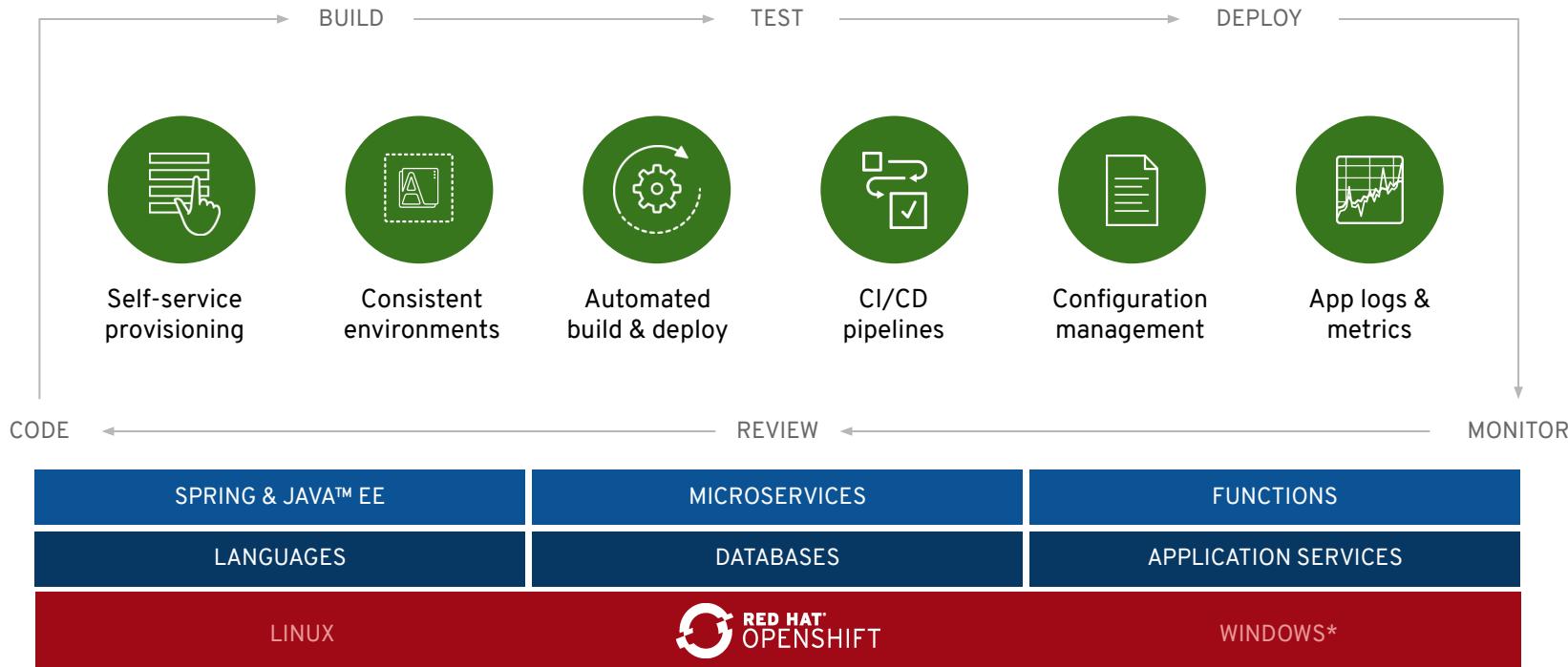


Empowering developers to innovate



Service mesh
Serverless
Red Hat CodeReady
Workspaces &
developer tooling

OpenShift enables developer productivity



* coming soon



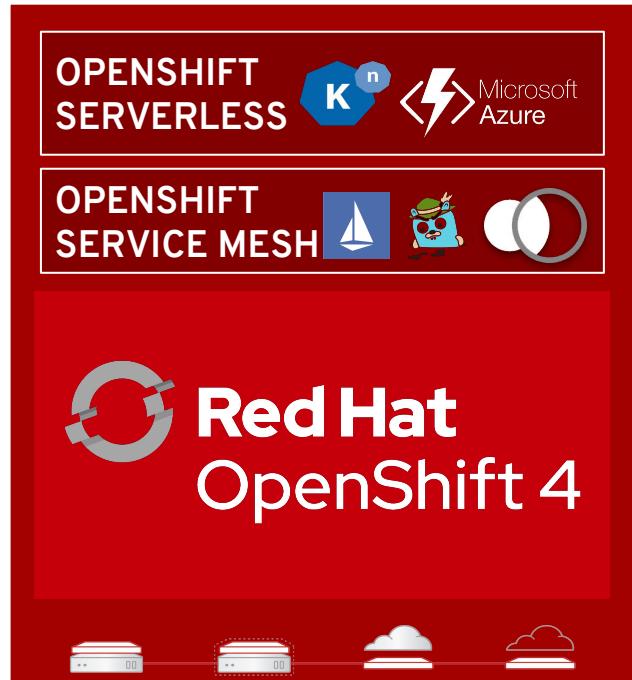
Building next-gen applications

OpenShift Service Mesh

- Integrated Service Mesh for enhanced security and network segmentation of microservices applications. Combines Istio, Kiali (UI), and Jaeger (Tracing) projects.

OpenShift Serverless

- Integrated serverless, enabling scale-to-zero FaaS services and event sources - built on the Knative framework.
- Support for Azure Functions
- Integrated with Camel-k for rich set of initial event sources: HTTP, Kafka, AMQP



Enabling greater developer productivity

CodeReady Workspaces

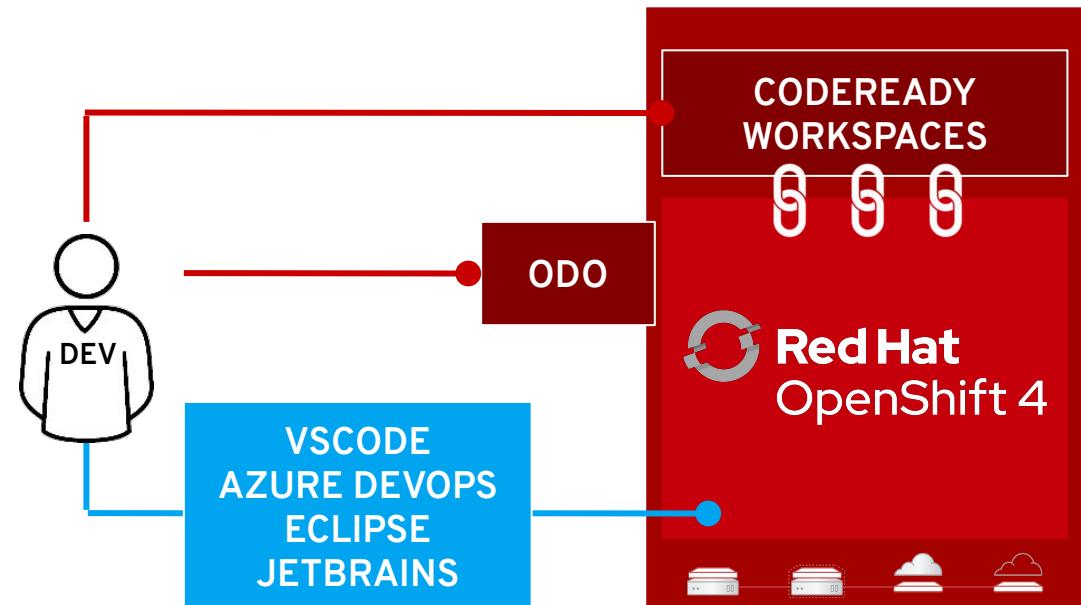
Web-Based IDE (Eclipse Che),
Collaborative Development,
integrated with CI/CD.

OpenShift ODO

Advanced developer CLI

OpenShift Plugins

Integration plugins - VScode, Azure DevOps, Eclipse IDE, JetBrains



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 soon)

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



Lufthansa Technik

The Kubernetes platform for your business

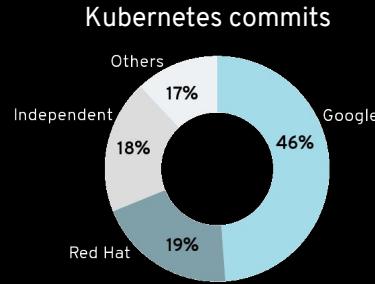
“The moment we have an idea, we can start building the product.”

Tobias Mohr, Head of Technology and Infrastructure, Lufthansa Technik

Why is Red Hat the best choice?

THE 4 C's

CODE



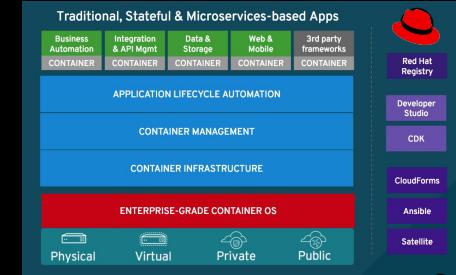
CUSTOMERS



CLOUD



COMPREHENSIVE



Red Hat is a leading Kubernetes developer & contributor with Google¹.

We make container development easy, reliable, & more secure.

1,000+ customers²

We have years of experience running OpenShift Online & OpenShift Dedicated services.

We have strong partnerships with cloud providers, ISVs, & CCSPs.

We have an extensive container catalog of certified partner images.

Our comprehensive portfolio of container products and services includes developer tools, security, application services, storage, & management.

Source: [1] Stackalytics, [Contribution by Companies](#). (Release: All, Project type: Kubernetes, Module: kubernetes, Metric: Commits)

Retrieved: March 2, 2018. [2] [More Than 1,000 Enterprises Across the Globe Adopt Red Hat OpenShift Container Platform to Power Business Applications](#)



Red Hat
OpenShift 4

Trusted enterprise Kubernetes

- Trusted host, content, platform
- Full-stack automated install
- Seamless updates & day 2 management

A cloud-like experience, everywhere

- Operator Framework
- Operator Hub & certified ISVs
- Hybrid, multicloud management

Empowering developers to innovate

- OpenShift service mesh / Istio
- OpenShift serverless / Knative
- CodeReady Workspaces / Che

Thank You



[linkedin.com/company/red-hat](https://www.linkedin.com/company/red-hat)



[youtube.com/user/RedHatVideos](https://www.youtube.com/user/RedHatVideos)



[facebook.com/redhatinc](https://www.facebook.com/redhatinc)



twitter.com/RedHat

Appendix: What's new with OpenShift 4.2?



Trusted enterprise Kubernetes

- Trusted Host, Content, Platform
- Full Stack Automated Install
- Over the Air Updates & Day 2 Mgt

A cloud-like experience, everywhere

- Hybrid, Multi-Cluster Management
- Operator Framework
- Operator Hub & Certified ISVs

Empowering developers to innovate

- CodeReady Workspaces (Che)
- OpenShift Developer Console
- OpenShift Service Mesh (Istio)



Red Hat OpenShift 4.2



Trusted enterprise Kubernetes

- Rebase to Kubernetes 1.14
- Disconnected installation and cluster-wide proxy enablement
- RHCOS, RHEL 7.6/7.7 support

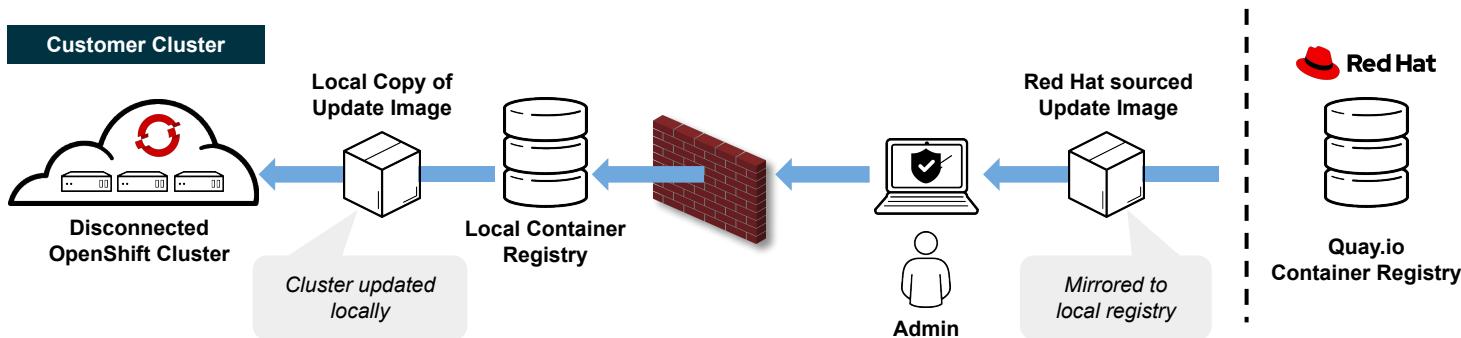
A cloud-like experience, everywhere

- Full stack automated installs on Azure, OpenStack and GCP
- OCP 3 → OCP 4 Migration tooling

Empowering developers to innovate

- New application topology
- OpenShift ServiceMesh GA
- OpenShift Serverless TechPreview
- CodeReady Containers

Disconnected “Air-gapped” Installation & Upgrading



Platforms Supported With 4.2

Full Stack Automation (IPI)



Microsoft Azure



Red Hat
OpenStack
Platform

Pre-existing Infrastructure (UPI)



Bare Metal



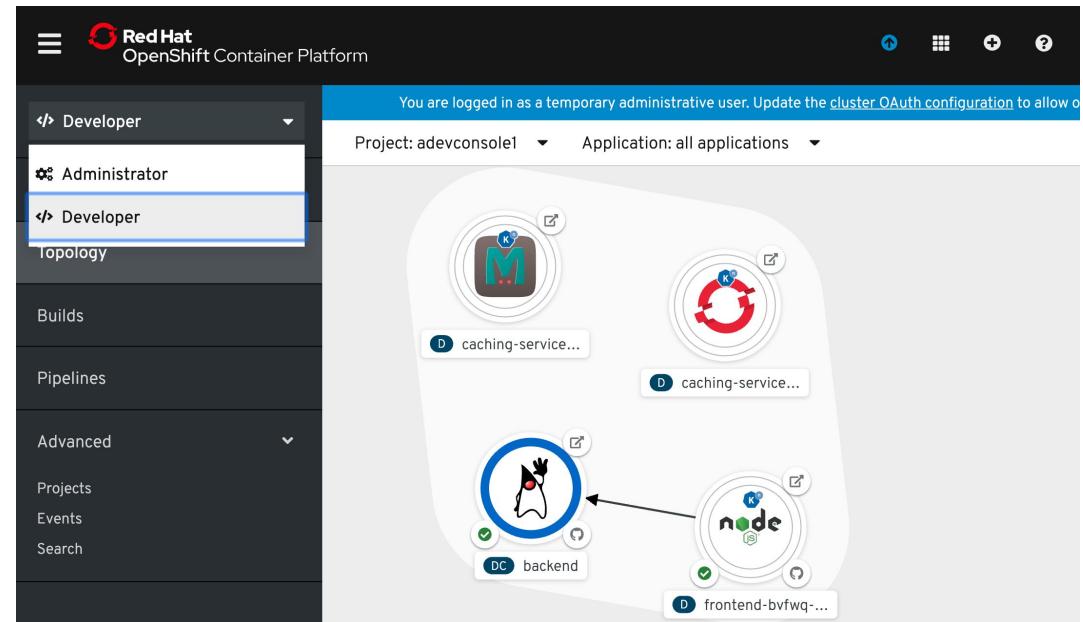
IPI: The installer provisions infrastructure for installation.

UPI: The user must provision infrastructure for installation.

OpenShift Developer Console

An developer-specific 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.



Developer Console: Create Applications

Key Features

- Import source from Git
- View existing container image
- Edit YAML definition
- Build from Dockerfile
- Explore services catalog
- Deploy database from catalog

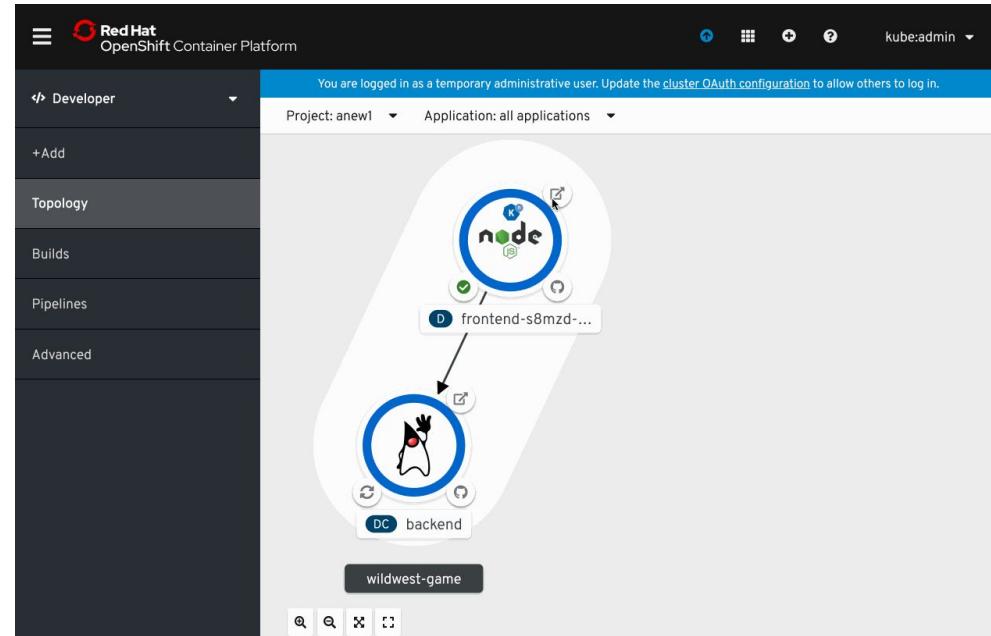
The screenshot shows the Red Hat OpenShift Container Platform Developer Console interface. The top navigation bar includes the Red Hat logo and the text "Red Hat OpenShift Container Platform". The left sidebar has a "Developer" tab selected, with options like "+Add", "Topology", "Builds", "Pipelines", and "Advanced". The main content area is titled "Select a way to create an application, component or service from one of the options." It displays six creation methods arranged in a 2x3 grid:

Icon	Name	Description
	From Git	Import code from your git repository to be built and deployed
	Container Image	Deploy an existing image from an image registry or image stream tag
	From Catalog	Browse the catalog to discover, deploy and connect to services
	From Dockerfile	Import your Dockerfile from your git repo to be built & deployed
	YAML	Create or replace resources from their YAML or JSON definitions.
	Database	Browse the catalog to discover database services to add to your application

Developer Console: 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



CodeReady Containers

Environment to simplify local direct-to-OpenShift application development.

Available for:

- Linux (KVM)
- Windows (Virtualbox)
- MacOS (Virtualbox)

```
$ 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
```

ODO - A DEVELOPER-FRIENDLY 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
```

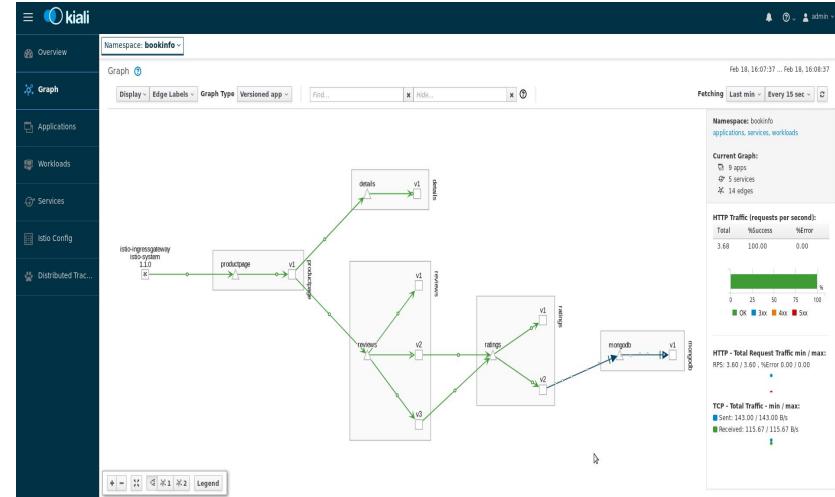
OpenShift Service Mesh

Key Features

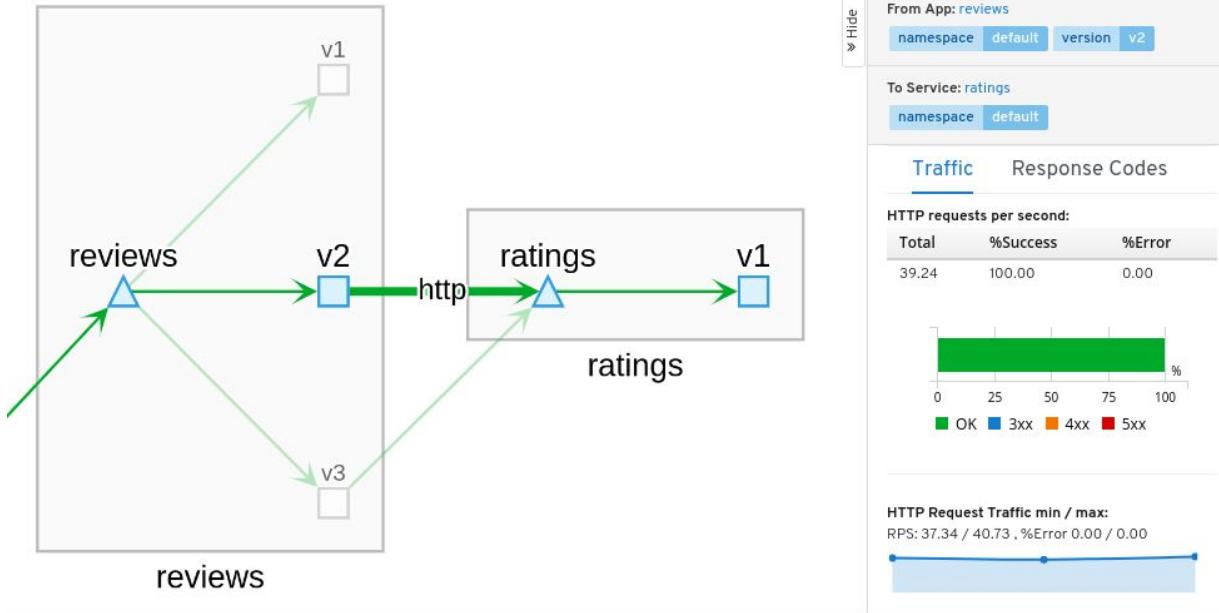
- A dedicated network for service to service communications
- Policy-driven security
- Routing rules & chaos engineering
- Powerful visualization & monitoring
- Available via OperatorHub

Benefits

- Complete service mesh, including tracing and visualization capabilities, packaged for ease of use
- Built with key open source integrations
- Extend security into the API layer with with 3scale API management integration



Protocol-Specific Tracing And Analysis (Kiali)





OpenShift Serverless

Key Features

- Familiar to Kubernetes users. Native.
- Scale to 0 and autoscale to N based on demand
- Applications and functions. Any container workload.
- Powerful eventing model with multiple event sources.
- Operator available via OperatorHub
- Knative v0.7.1 (v1beta1 APIs)
- No vendor lock in

Learn more

<https://openshift.com/learn/topics/serverless>

<https://redhat-developer-demos.github.io/knative-tutorial>

The screenshot shows the Red Hat OpenShift Container Platform interface. On the left, the navigation sidebar includes options like Home, Dashboards, Projects, Search, Explore, Events, Operators (selected), Workloads, Serverless, Services, Revisions, Routes, and Networking. The main content area displays the "Installed Operators" section under "Operators". A card for the "Serverless Operator" is shown, indicating it is version 1.0.0 provided by Red Hat. Below this, the "spring-petclinic-bchpw-deployment" is selected in the "Project: markito-rhte" dropdown. The deployment overview shows a scaling status of "4 scaling to 10". The deployment details table includes columns for Name, Update Strategy, Namespace, Max Unavailable, Labels, Max Surge, Progress Deadline, and Min Ready Seconds. The deployment is currently in a RollingUpdate state, with 25% of 10 pods unavailable. The labels include app=spring-petclinic-bchpw, app.kubernetes.io..., serving.knative.dev/configurable..., serving.knative.dev/...=spring-bchpw..., serving.knative.dev/configurable..., serving.knative.dev/b8d3ed9f4cb..., serving.knative.dev/...=spring-bchpw..., serving.knative.dev/...=spring-bchpw..., and serving.knative.dev/...=spring-bchpw... . The progress deadline is set for 2m 0s, and the min ready seconds is not configured.

Name	Update Strategy
spring-petclinic-bchpw-deployment	RollingUpdate

Namespace	Max Unavailable
markito-rhte	25% of 10 pods

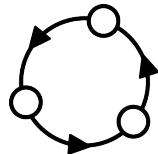
Labels	Max Surge
app=spring-petclinic-bchpw, app.kubernetes.io..., serving.knative.dev/configurable..., serving.knative.dev/...=spring-bchpw..., serving.knative.dev/configurable..., serving.knative.dev/b8d3ed9f4cb..., serving.knative.dev/...=spring-bchpw..., serving.knative.dev/...=spring-bchpw..., serving.knative.dev/...=spring-bchpw...	25% greater than 10 pods

Progress Deadline	Min Ready Seconds
2m 0s	Not Configured

Appendix: OpenShift vs. “Vanilla” Kubernetes Myths

THE VANILLA KUBERNETES MYTHS

Why IT shops swoon over “Vanilla” Kubernetes and its perceived value



Ultimate portability across Kubernetes Clusters



No “vendor lock-in”



Always on latest version

THE VANILLA KUBERNETES REALITY

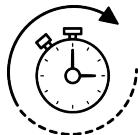
“Vanilla” Kubernetes is not really vanilla at all



Every vendor configures their Kubernetes distribution differently



Every vendor operates Kubernetes differently; this matters



No vendor is in lockstep with the latest upstream

* <https://medium.com/@jzelinskie/youre-not-running-vanilla-kubernetes-2f2359666bf9>

KUBERNETES CONFORMANCE

Interoperability at the API



“The new Certified Kubernetes Conformance Program gives enterprise organizations the confidence that workloads that run on any Certified Kubernetes Distribution or Platform will work correctly on any other version,” said Dan Kohn, Executive Director, Cloud Native Computing Foundation. **“The interoperability that this program ensures is essential to Kubernetes meeting its promise of offering a single open source software project supported by many vendors that can deploy on any public, private or hybrid cloud.”**

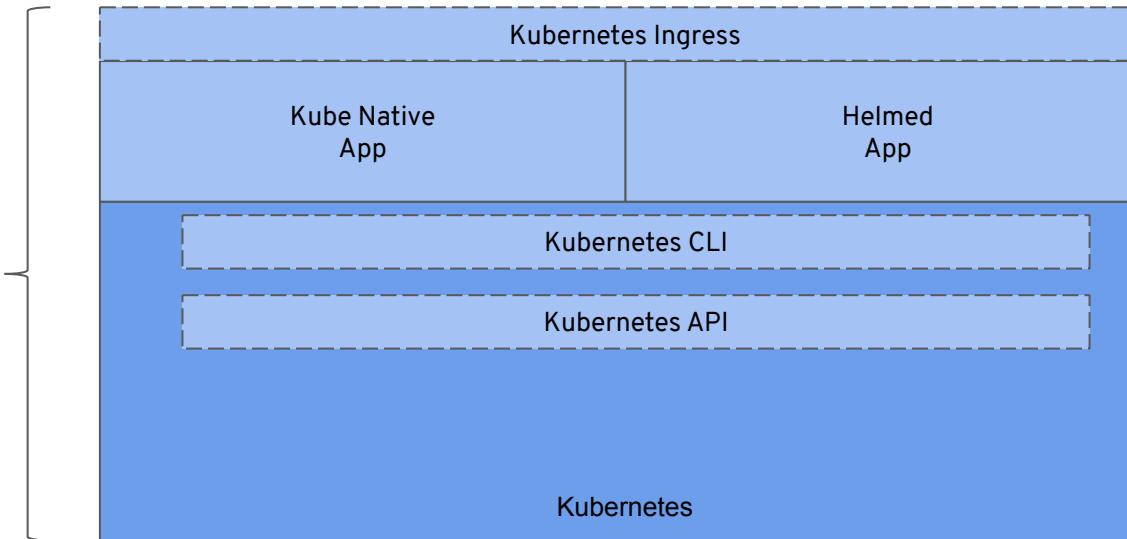
One of the goals of the project has always been **consistency** and **portability**. Kubernetes sits on top of the infrastructure and enables you to **describe your workload in a common format**. Kubernetes **makes it easy to move workloads from one place to another**, or combine disjointed environments with a shared control plane.

This **program gives end users the confidence** that when they use a **Certified Kubernetes** product they **can rely on a high level of common functionality**. It gives Independent Software Vendors (ISVs) **confidence that if their customer is using a Certified Kubernetes platform that their software will behave as expected**.

* <https://github.com/cncf/k8s-conformance>

UPSTREAM KUBERNETES

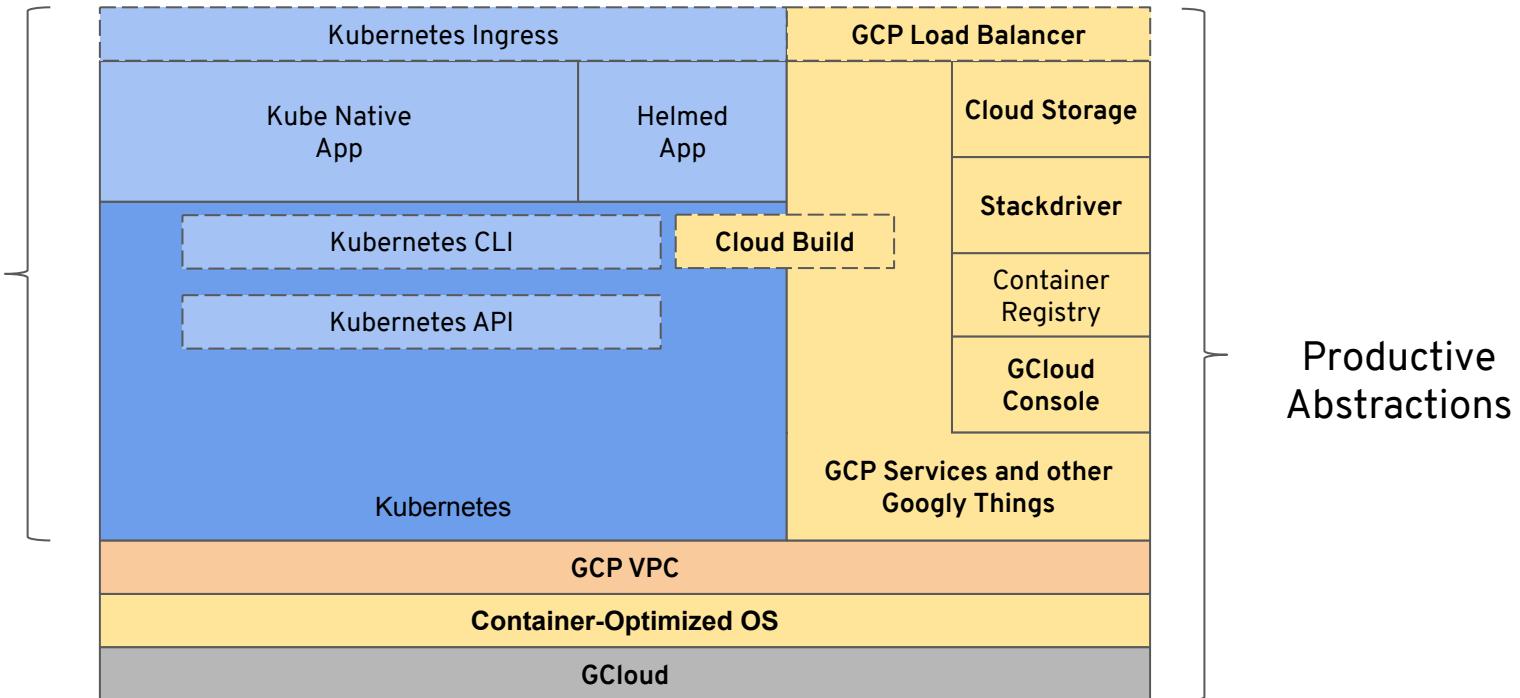
Upstream is closest to “Vanilla”



* Not comprehensive. Not even close.

GKE

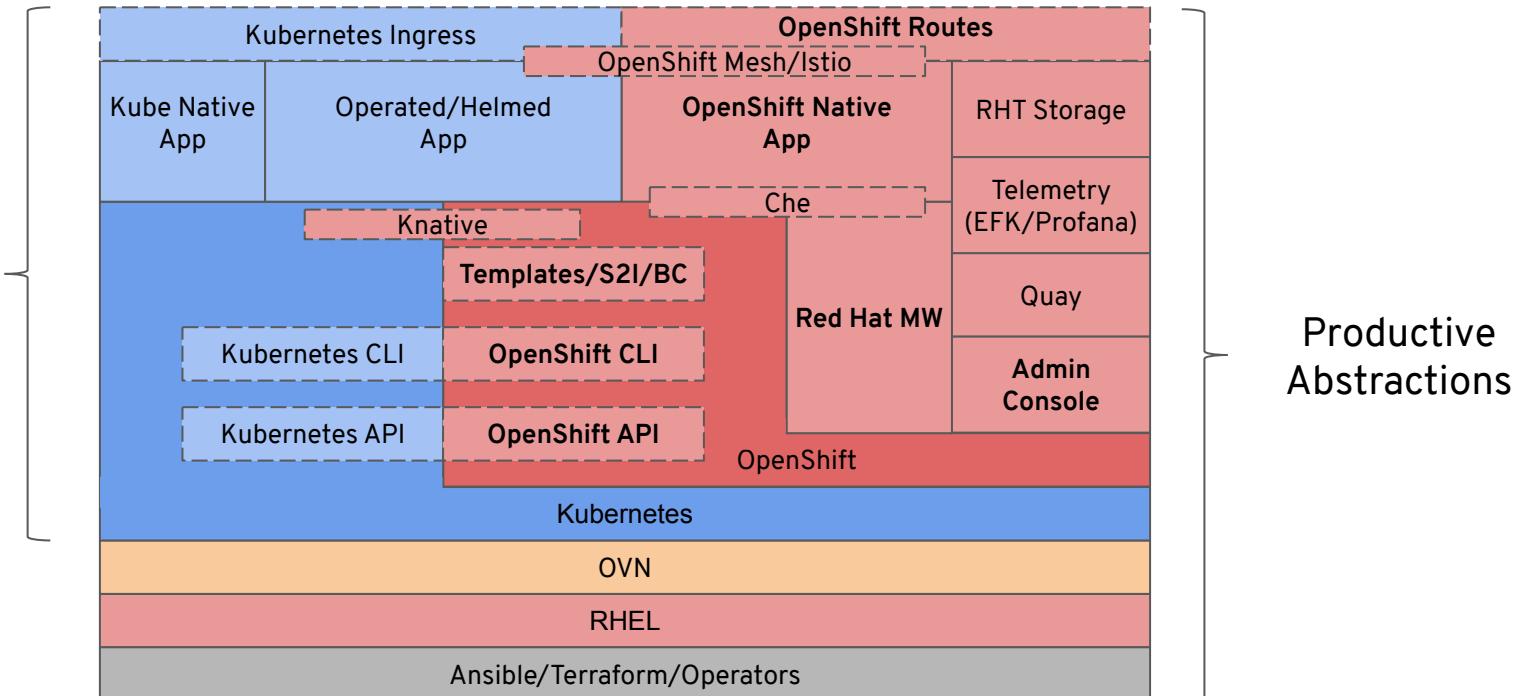
Even one of the Kube founders is not “Vanilla”



* Not comprehensive. Not even close. GCP only APIs in **bold**.

OPENSIFT

Certified “Pure” Kubernetes and productive abstractions



* Not comprehensive. Not even close. Red Hat or OpenShift only APIs in **bold**.

KUBERNETES CONFORMANCE

OpenShift is 100% Kubernetes

Branch: master ▾ k8s-conformance / v1.11 / openshift /

Create new file Upload files Find file History

smarterclayton and taylorwaggoner OpenShift v1.11 conformance results (#385) Latest commit 7615279 on Nov 28, 2018

..

PRODUCT.yaml OpenShift v1.11 conformance results (#385) 3 months ago

README.md OpenShift v1.11 conformance results (#385) 3 months ago

e2e.log OpenShift v1.11 conformance results (#385) 3 months ago

junit_01.xml OpenShift v1.11 conformance results (#385) 3 months ago

version.txt OpenShift v1.11 conformance results (#385) 3 months ago

README.md

This conformance report is generated by the OpenShift CI infrastructure. The canonical source location for this test script is located at <https://github.com/openshift/origin/blob/master/test/extended/conformance-k8s.sh>

This file was generated by:

Commit 17bd01127a26f49de8b5a9f420e465de7c32dea8 Tag v3.11.0-63-g17bd011

To recreate these results

1. Install an [OpenShift cluster](#)
2. Retrieve a `.kubeconfig` file with administrator credentials on that cluster and set the environment variable `KUBECONFIG`

```
export KUBECONFIG=PATH_TO_KUBECONFIG
```



GCS Storage Browser

Builds

Build ID	Date	Duration
2	2018-11-27 23:31 EST	took 2h0m
1	2018-11-27 23:15 EST	took 2h49m

[View earlier builds...](#)

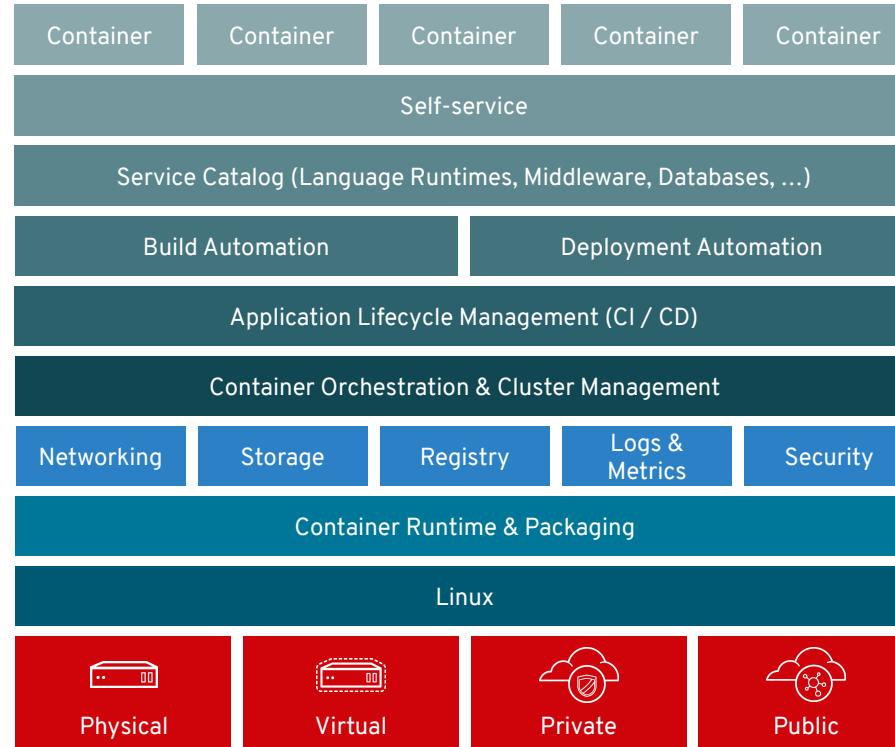
* Don't believe me? Check out and repeat the conformance test on your own OpenShift install at <https://github.com/cncf/k8s-conformance/tree/master/v1.11/openshift>

Appendix: Community projects vs enterprise software products

DIY CONTAINER STACK CHALLENGES

Bring your own middleware, data & other services. Build out a service catalog / interface to enable self-service deployment.

Pull Kubernetes or other orchestration (Mesos, Swarm) from rapidly moving upstream & support / maintain yourself. Do all the work required to integrate it into your enterprise IT environment (networking, storage, registry, security, logging, metrics, etc.)



Take existing application build/CI & deployment tools and evolve to add container image build & mgt., continuous deployment, etc.

Pull Docker container runtime from rapidly moving upstream and support, secure and maintain it yourself.

Support and manage your own Linux community distro or build on existing RHEL or 3rd party commercial Linux offerings.

CONTAINER INFRASTRUCTURE AND MANAGEMENT

	Kubernetes	OKD*	OpenShift
Multi-host container scheduling	✓	✓	✓
Self-service provisioning	✓	✓	✓
Service discovery	✓	✓	✓
Enterprise Linux operating system			✓
Image registry		✓	✓
Validated storage plugins		✓	✓
Networking and validated networking plugins		✓	✓
Log aggregation and monitoring		✓	✓
Multi-tenancy		✓	✓
Metering and chargeback			✓

* OKD is the open source project [formerly known as OpenShift Origin](#)

DEVELOPER EXPERIENCE

	Kubernetes	OKD*	OpenShift
Automated image builds	No developer or application services	✓	✓
CI/CD workflows and pipelines		✓	✓
Certified application services			✓
Certified middleware			✓
Certified databases			✓
200+ certified ISV solutions			✓

* OKD is the open source project [formerly known as OpenShift Origin](#)

ENTERPRISE SUPPORT AND COMMUNITY

	Kubernetes	OKD	OpenShift
Community forums and resources	✓	✓	✓
Zero downtime patching and upgrades			✓
Enterprise 24/7 support			✓
9 year support lifecycle			✓
Security response team			✓

External review: [10 most important differences between OpenShift and Kubernetes](#)

Appendix: Docker Support in OpenShift 4

IS DOCKER THE BEST AVAILABLE CONTAINER ENGINE?

Potential limitations surrounding Docker

- Build requires a “big fat” daemon on every host
- Regression for integration with container platforms
Kubernetes/OpenShift
- Build has secret handling issues
- Root/privileged concerns at runtime
- Root/privileged concerns with daemon
- Build requires a running container



- Docker, Red Hat et al. June 2015
- Two specifications
 - Image format
 - How to package an OCI Image with sufficient information to launch the application on the target platform
 - Runtime
 - How to launch a “filesystem bundle” that is unpacked on disk
- Version 1.0 of each released July 19th 2017
- Distribution spec started in April, 2018.

CONTAINER INNOVATION CONTINUES

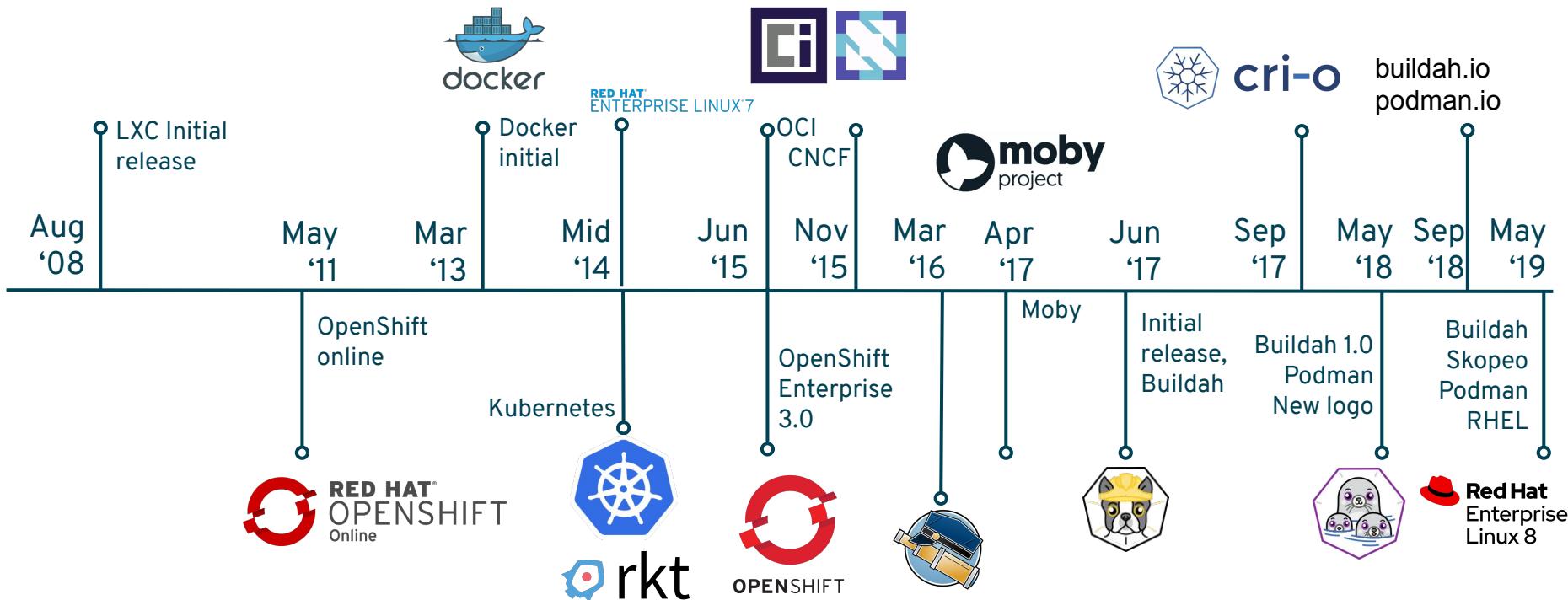
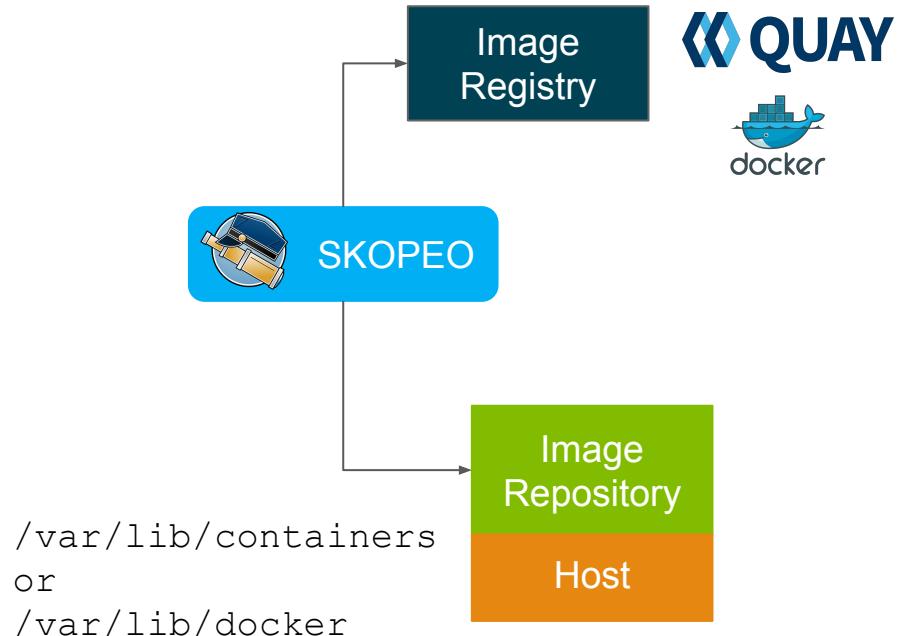


IMAGE COPY WITH SKOPEO



- Built for interfacing with Docker registry
- CLI for images and image registries
- Rejected by upstream Docker `＼(ツ)／`
- Allows remote inspection of image meta-data - no downloading
- Can copy from one storage to another

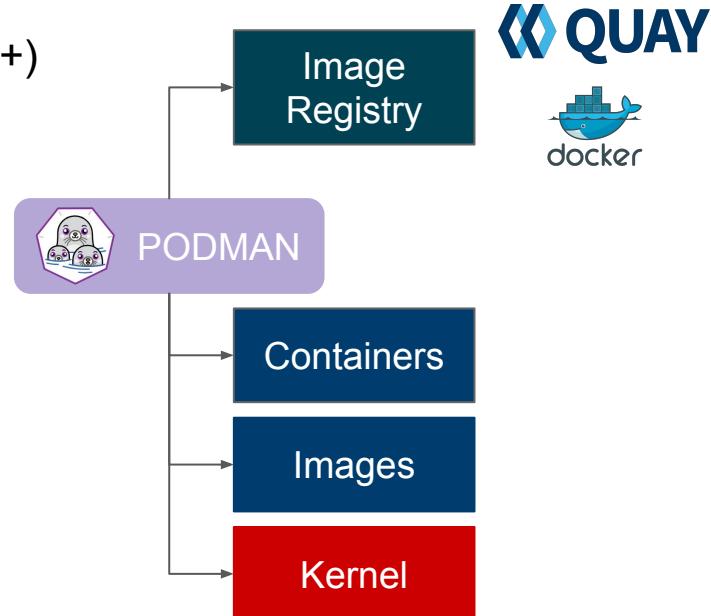


The new container CLI



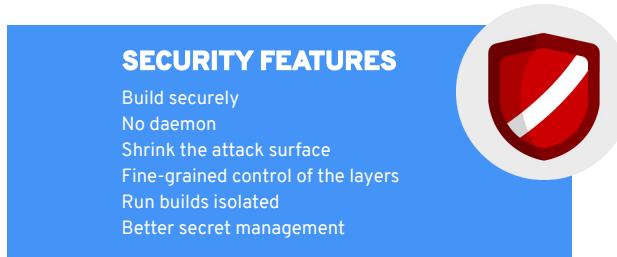
podman

- @ podman.io
- Client only tool, based on the Docker CLI. (same+)
- No daemon!
- Storage for
 - Images - containers/image
 - Containers - containers/storage
- Runtime - runc
- Shares state with CRI-O and with Buildah!

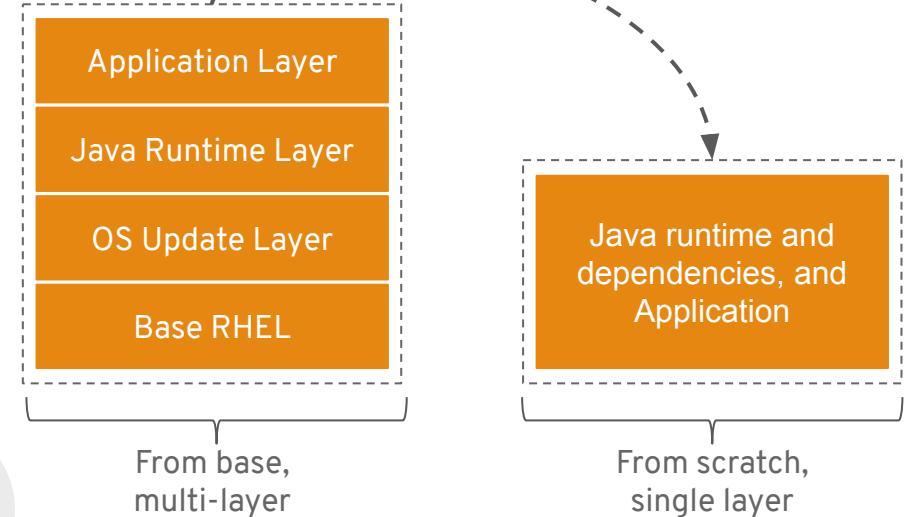


Why use Buildah?

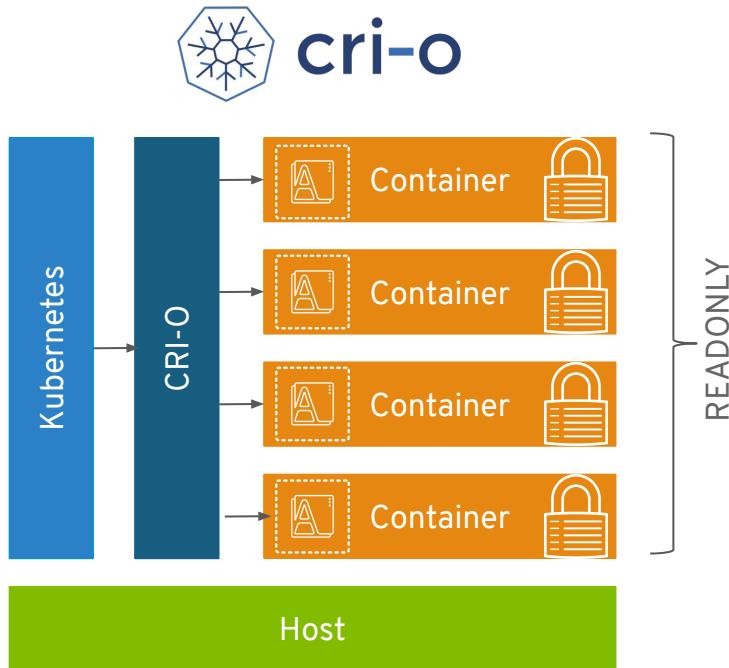
- Now buildah.io
- Builds OCI compliant images
- No daemon - no “docker socket”
- Does not require a running container
- Can use the host’s user’s secrets.
- Single layer, from scratch images are made easy and it ensures limited manifest.
- If needed you can still maintain Dockerfile based workflow



buildah



OCI AND CRI-O



- A Kubernetes thing
- Now part of CNCF! (April 8th)
- OCI daemon
- Implements Kubelet Container Runtime Interface (CRI)



SECURITY FEATURES

- Run securely in a production cluster
- No daemon
- Read-only containers
- Enable fewer capabilities
- User namespaces
- FIPS mode support

Appendix: Getting started with Red Hat OpenShift

LEARN.OPENSHIFT.COM

Foundations of
OpenShift

START COURSE

Building
Applications On
OpenShift

START COURSE

Subsystems,
Components, and
Internals

START COURSE

OpenShift
Playgrounds

START COURSE

Service Mesh
workshop with Istio

START COURSE

Serverless scenarios
with OpenShift
Cloud Functions

START COURSE

Interactive Learning Scenarios provide you with a pre-configured OpenShift instance, accessible from your browser without any downloads or configuration.

Appendix: Industry analyst comparisons

THE FORRESTER NEW WAVE™

Enterprise Container Platform Software Suites

Q4 2018



Red Hat named a Leader in The Forrester New Wave™ Enterprise Container Platform Software Suites, Q4 2018 report

- Leads the pack with excellent user experience and integration capabilities
- Popular with Red Hat customers who prefer strong ecosystem synergy

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Thank You



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