Refactoring and modernizing at your pace

Operators: simplifying Kafka (and other deployments)

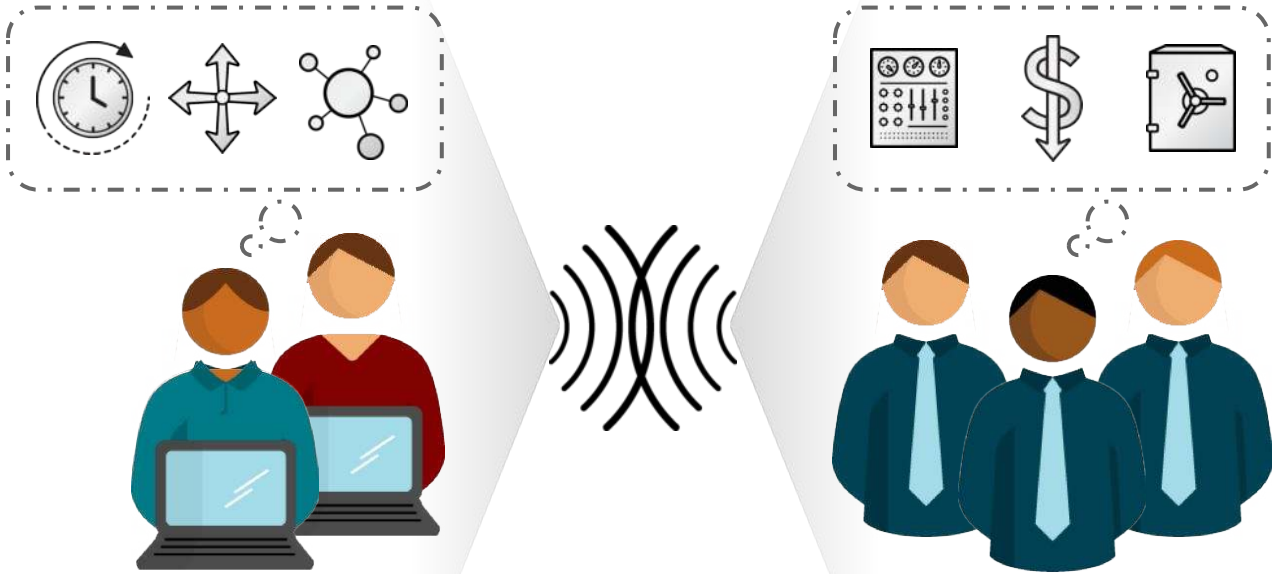
Ludovic Aelbrecht
Open Transformation Lead

Romuald Vandepoel
Open Transformation Lead

The only software worth anything to an organization is in production, the rest is just garbage piling up in a corner.

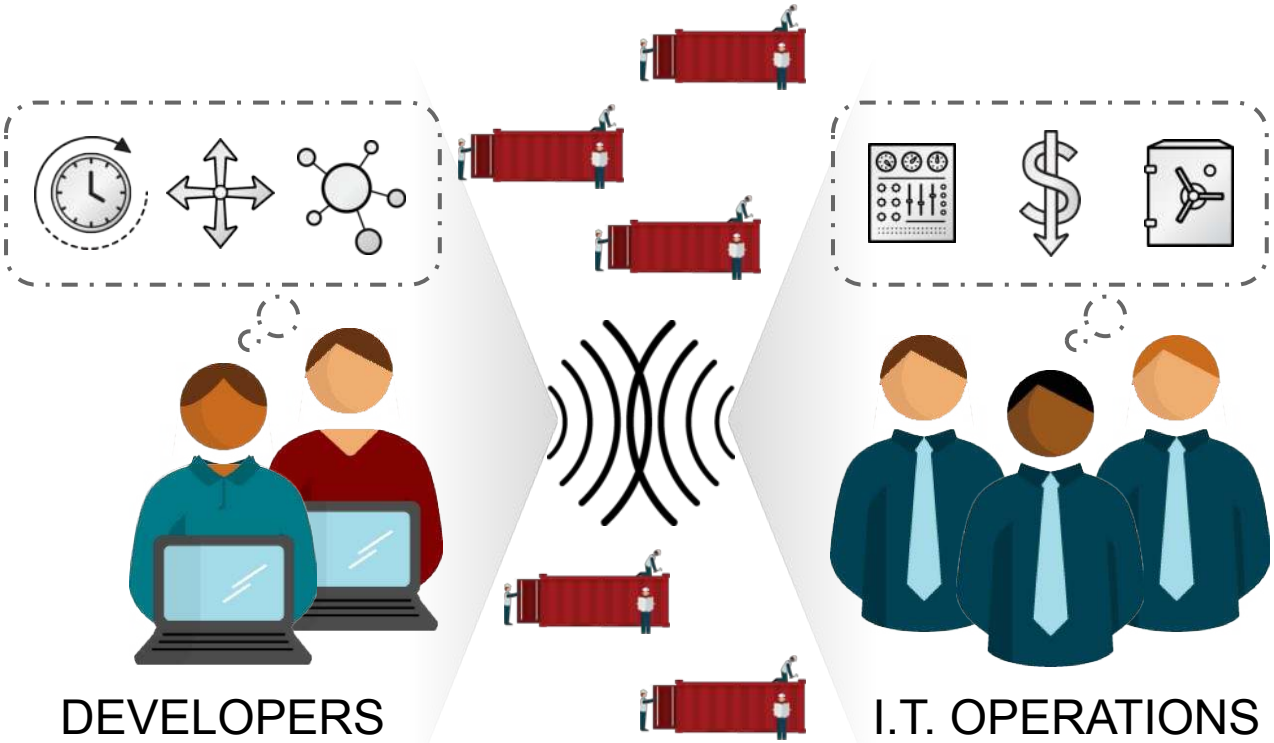
Red Hat

A PROBLEM



Red Hat

A SOLUTION



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Your development & deployment platform needs more than just containers

Scheduling
Decide where to deploy containers

Lifecycle and health
Keep containers running despite failures

Discovery
Find other containers on the network

Monitoring
Visibility into running containers

Security
Control who can do what

Scaling
Scale containers up and down

Persistence
Survive data beyond container lifecycle

Aggregation
Compose apps from multiple containers

Red Hat

Kubernetes is an open-source system for automating deployment, operations, and scaling of containerized applications across multiple hosts

kubernetes

KUBERNETES IS NOT THE END GAME

It’s a building block to build app platforms

Kelsey Hightower

@kelseyhightower

Kubernetes is a platform for building platforms. It's a better place to start; not the endgame.

Source: https://twitter.com/kelseyhightower/status/935252923721793536

Red Hat

CNCF Cloud Native Landscape
2019-07-12T03:51:02Z 024e93b

Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io

Greyed logos are not open source

Database | Streaming & Messaging | Application Definition & Image Build | Continuous Integration & Delivery

App Definition and Development

Scheduling & Orchestration | Coordination & Service Discovery | Remote Procedure Call | Service Proxy | API Gateway | Service Mesh

Orchestration & Management

Cloud-Native Storage | Container Runtime | Cloud-Native Network

Runtime

Automation & Configuration | Container Registry | Security & Compliance | Key Management

Provisioning

Public

Kubernetes Certified Service Provider

Platform

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

PaaS/Container Service

Observability and Analysis

Monitoring

Logging

Tracing

Chaos Engineering

Serverless

Kubernetes Training Partner

Cloud

Special

This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path

l.cncf.io

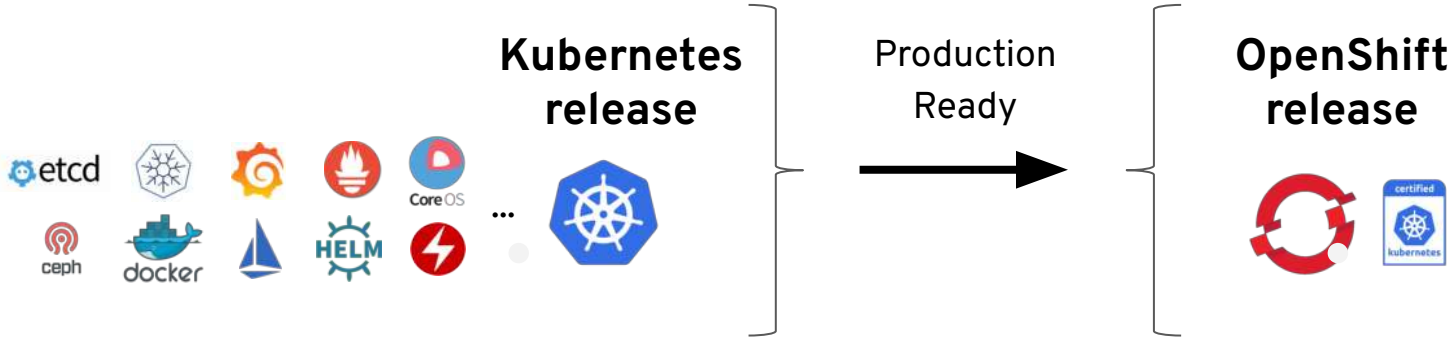
CLOUD NATIVE COMPUTING FOUNDATION

CLOUD NATIVE Landscape

Redpoint Amplify

okd
falco
HELM
CERT MANAGER
CODENVY
Red Hat

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

"[Red Hat] OpenShift is the **most widely deployed** multicloud container platform and boasts **powerful development and unified operations experiences** across many public and on-premises platforms. Red Hat **pioneered the "operator" model** for infrastructure and application management and provides a rich partner ecosystem and popular marketplace."

The Forrester Wave™: Multicloud Container Development Platforms, Q3 2020: The Eight Providers That Matter Most and How They Stack Up
Sep 2020

Source: Forrester, The Forrester Wave™: Multicloud Container Development Platforms, Q32020: The Eight Providers That Matter Most and How They Stack Up. Sep 2020.

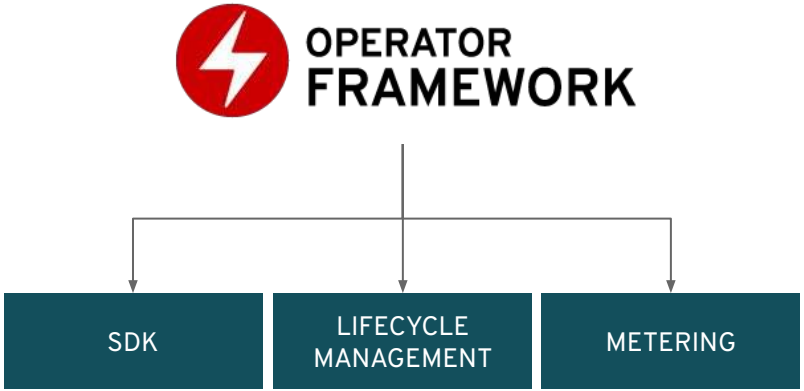
Red Hat

Operator Framework

CNCF Incubating Project

Operators:

- codify operational knowledge & workflows
- to automate lifecycle mgmt
- of containerized applications



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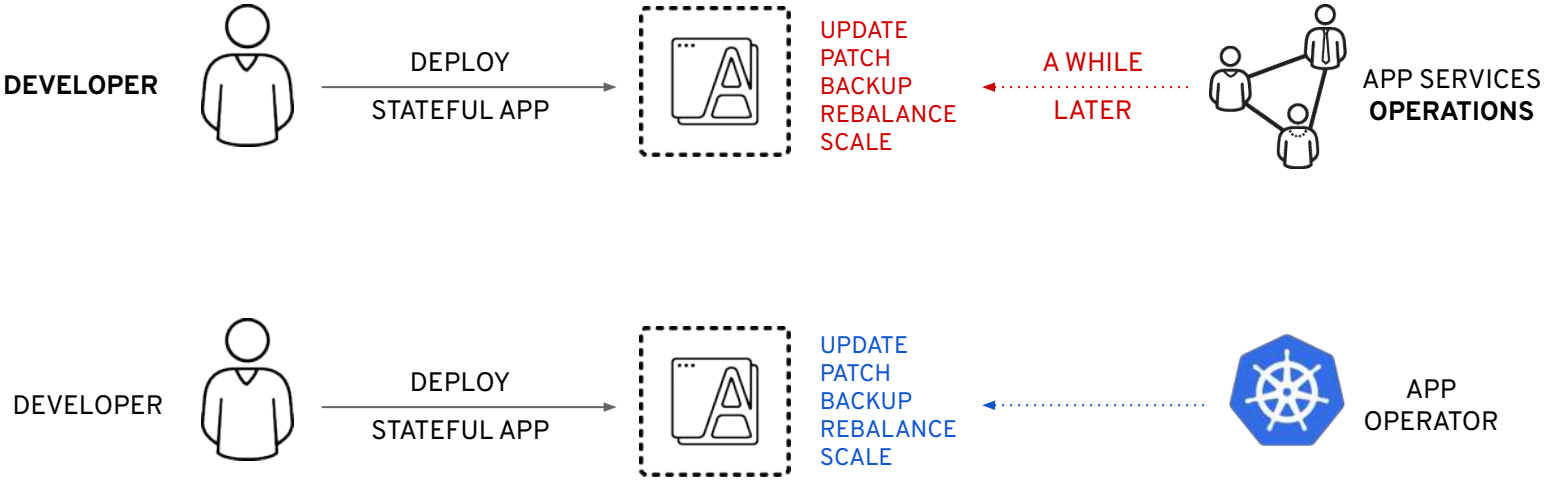
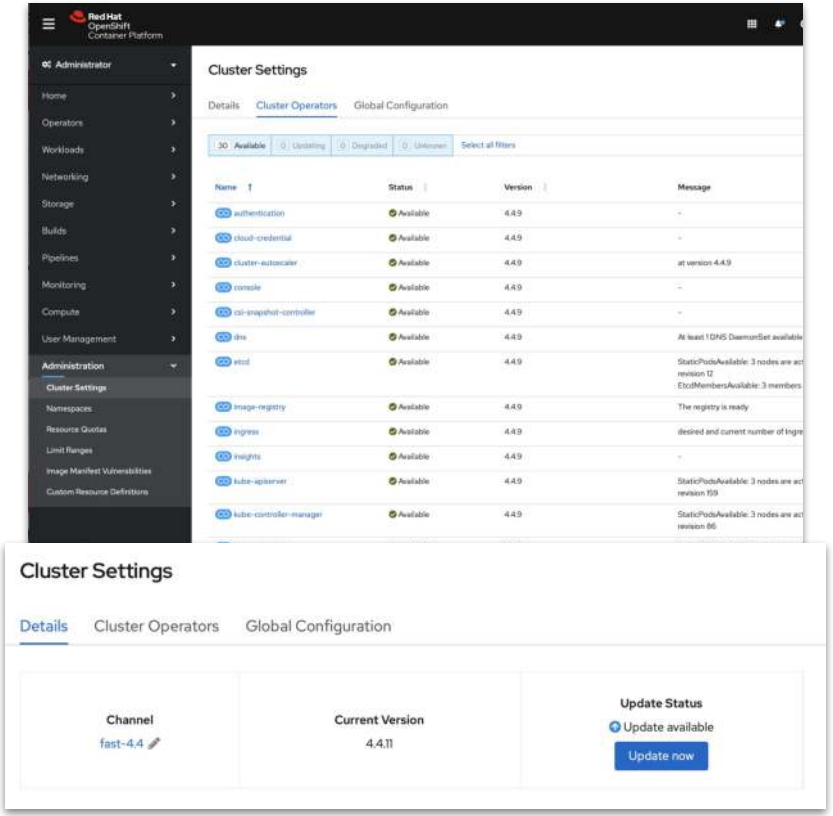
OPERATORS – USE CASE



Red Hat

Each OpenShift release is a collection of Operators

- 100% automated, in-place upgrade process
- 30 Operators run every major part of the platform:
  - Console, Monitoring, Authentication, Machine management, Kubernetes Control Plane, etcd, DNS, and more.
- Operators constantly strive to meet the desired state, merging admin config and Red Hat recommendations
- CI testing is constantly running install, upgrade and stress tests against groups of Operators

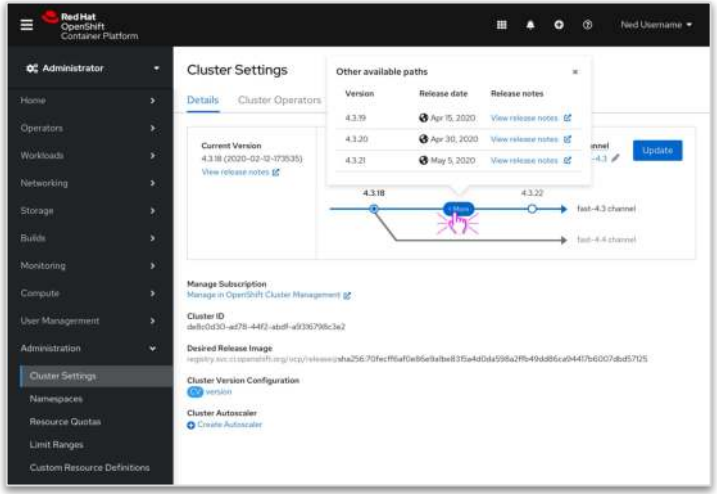


Red Hat

Day 2 Operations Made Easy

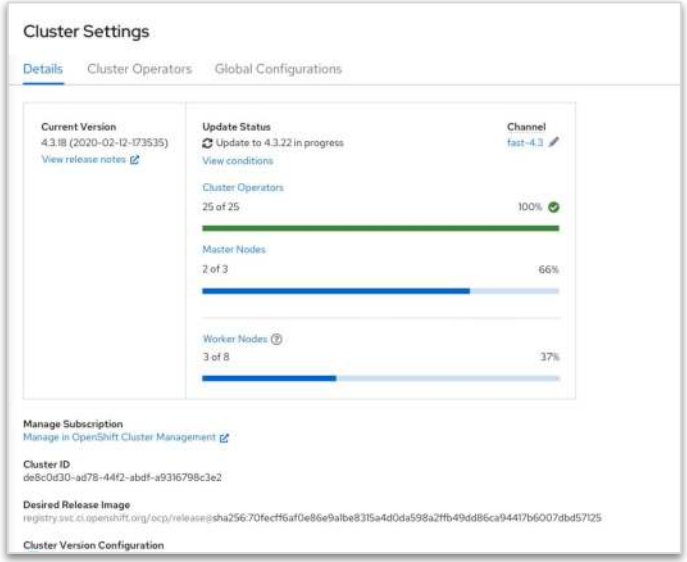
Guide users to recommended update paths and available channels.

- Make it easier to find information on channels and versions
- Provide recommended update paths



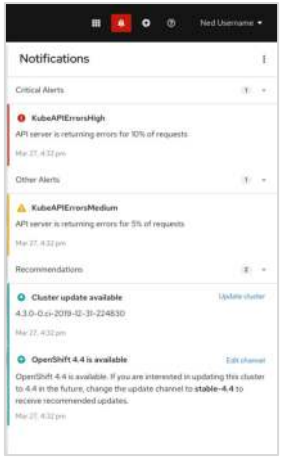
Provide transparency into the update process with an in progress checklist

- Inform on Operator and Node Progress
- Surface conditions



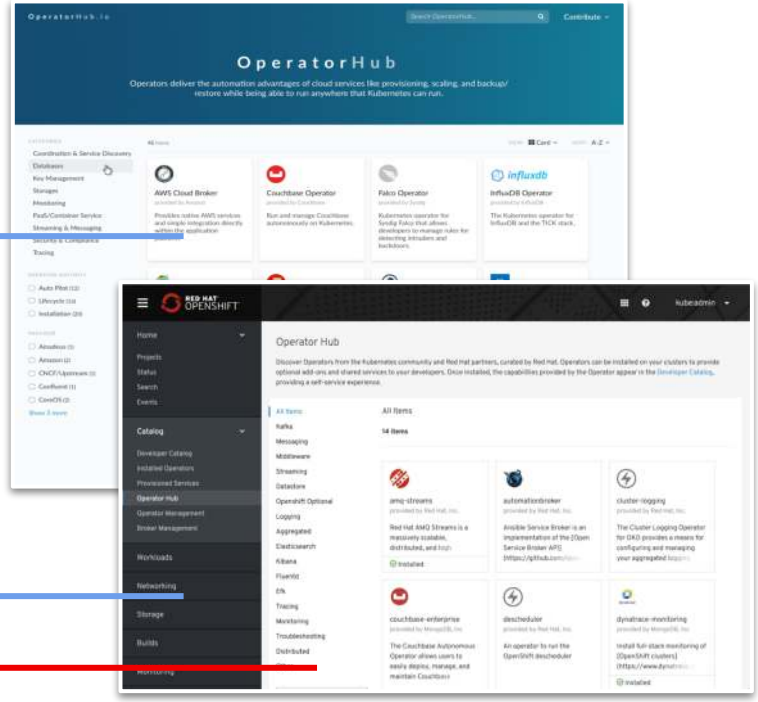
Recommendation Alerts

- Three new recommendation alerts were added to inform users when:
  - a new patch becomes available
  - a new minor release becomes available
  - new channels become



OperatorHub and certified Operators

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



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Red Hat Certified Operators

Red Hat

Red Hat Integration

Data Integration

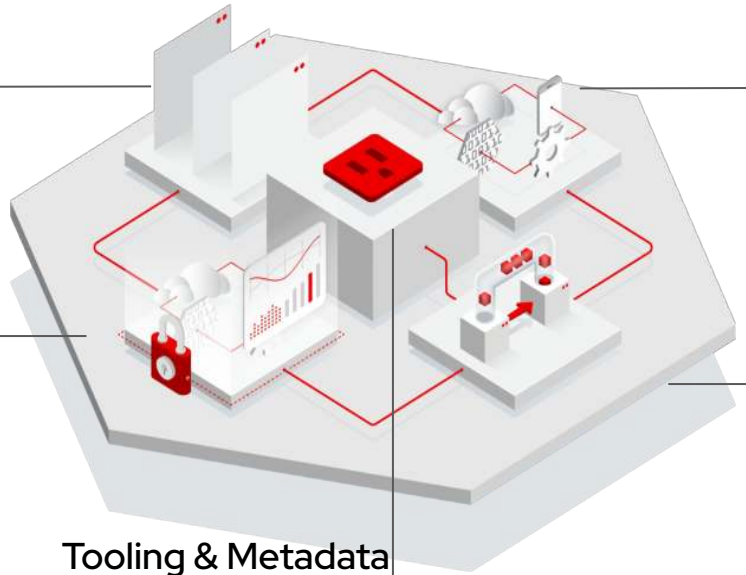
- Change Data Capture

debezium

API Management

- API Manager
- API Gateway
- Istio Service Mesh Adapter

3scale by Red Hat



Tooling & Metadata

- Service Registry
- API Designer
- Integration Operator

APICURIO

APACHE Camel

Enterprise Integration

- Comprehensive connectors
- Microservices orchestration
- Data Transformation
- Low-code iPaaS
- Kubernetes connectivity with Camel K

Events & Messaging

- JMS Message Broker
- Wide Area Routing
- Data Streaming with Apache Kafka

Qpid Dispatch Router

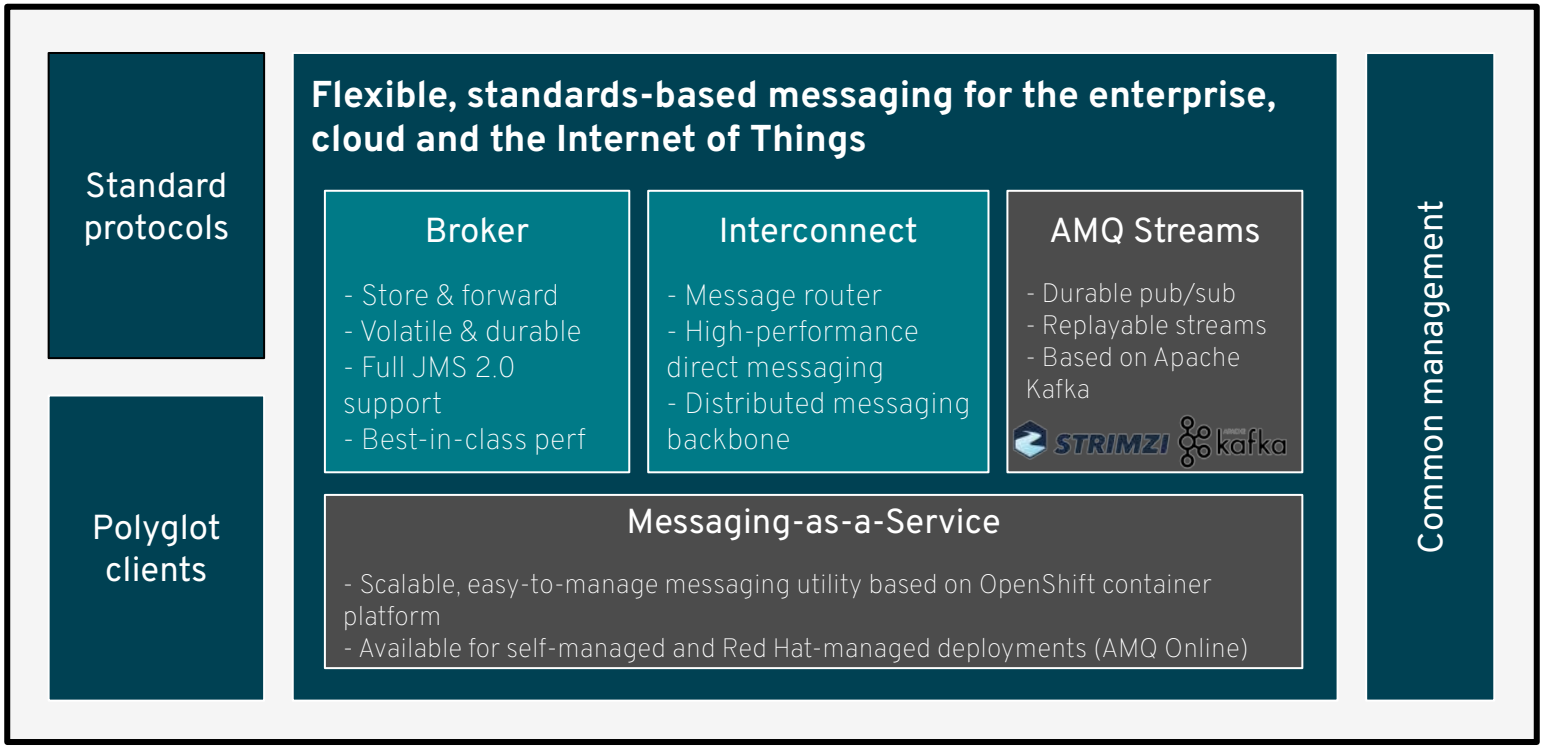
Apache ACTIVEMQ

APACHE kafka

Red Hat

Red Hat AMQ

RED HAT® INTEGRATION



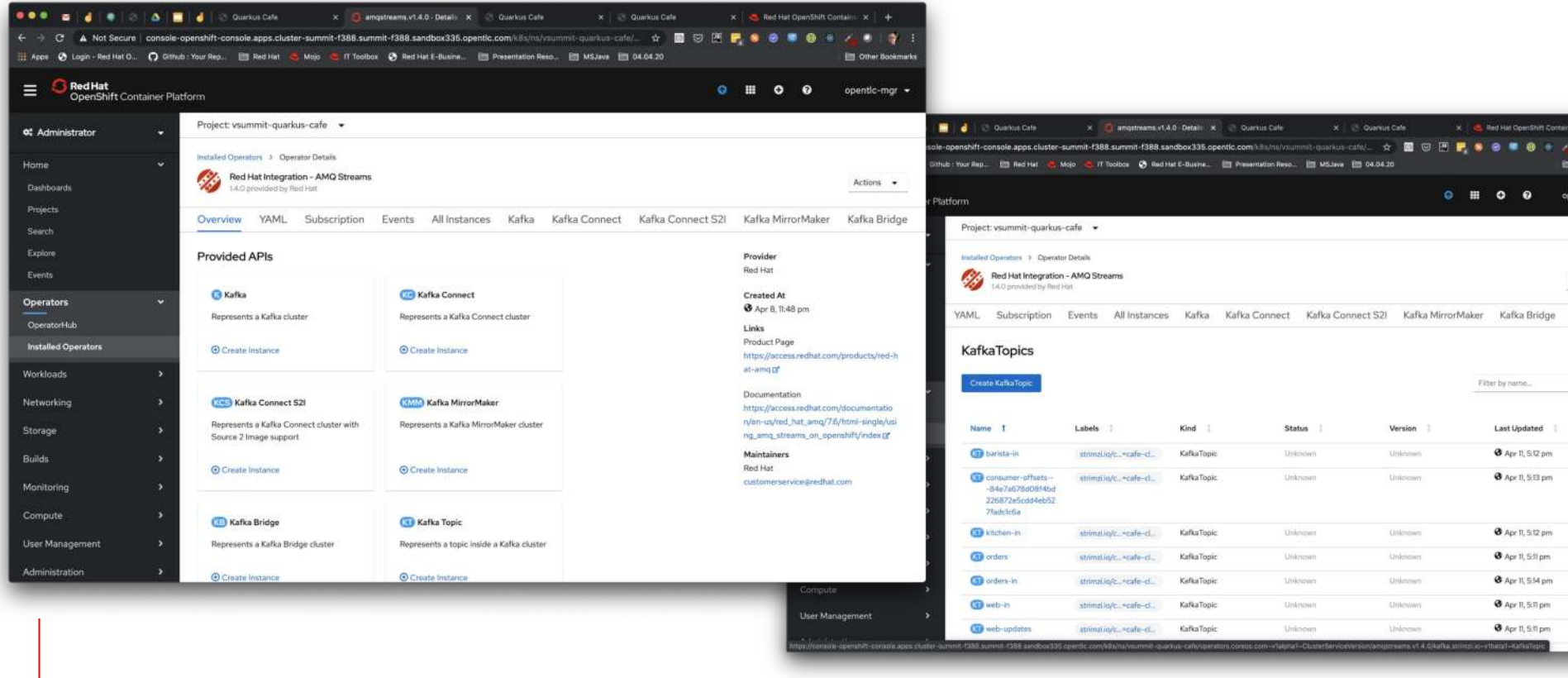
What is Apache Kafka?

- Developed at LinkedIn back in 2010, open sourced in 2011
- Publish-subscribe messaging system
- Receives data from disparate source systems; makes the data available to target systems in real time
- Event streaming platform
- Designed to be fast, scalable, durable and available
- High throughput / low latency
- Ability to handle huge number of consumers

Red Hat AMQ Streams - Apache Kafka

- Red Hat AMQ streams provides:
  - Container images for Apache Kafka, Connect, Zookeeper and MirrorMaker
  - Kubernetes Operators for managing/configuring Apache Kafka clusters, topics and users
  - Kafka Consumer, Producer and Admin clients, Kafka Streams
- Kafka Operator: Strimzi
  - 100% Open source project
  - Part of the Cloud Native Computing Foundation (CNCF)

AMQ Streams (Kafka) on OpenShift



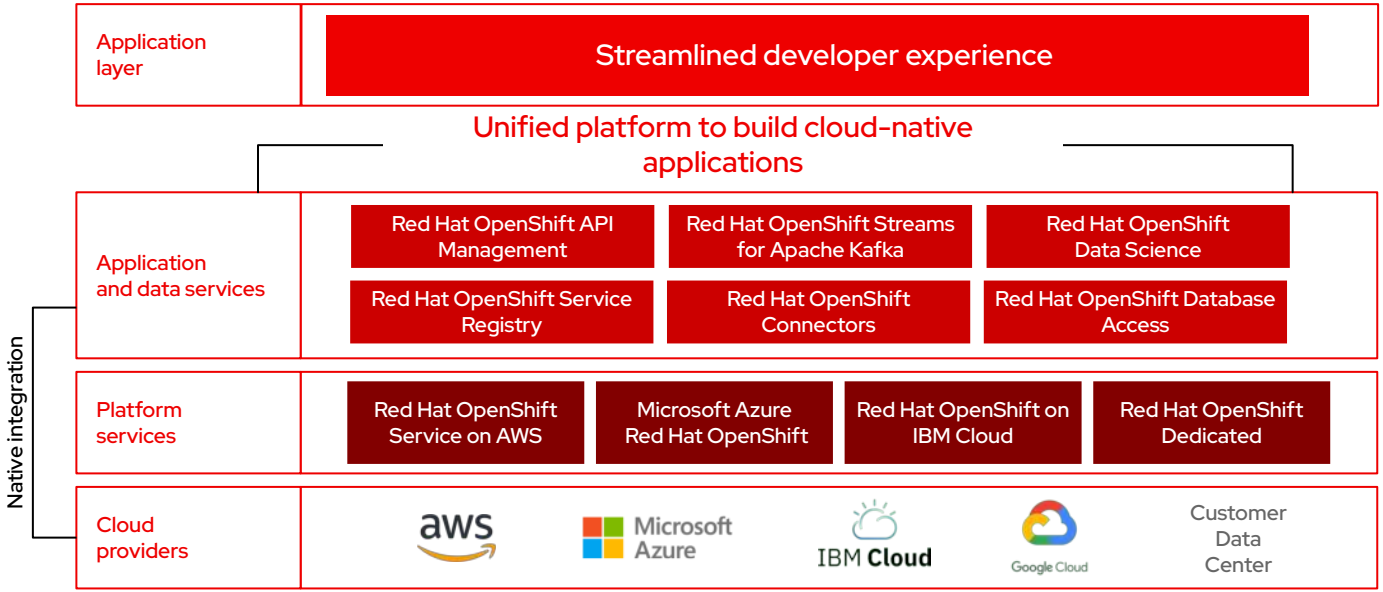
Cloud Services Managed by Red Hat

Managed OpenShift + Application Services + Data Services

Full stack management and unified experience

Maximize full value of Red Hat OpenShift

Hybrid cloud flexibility



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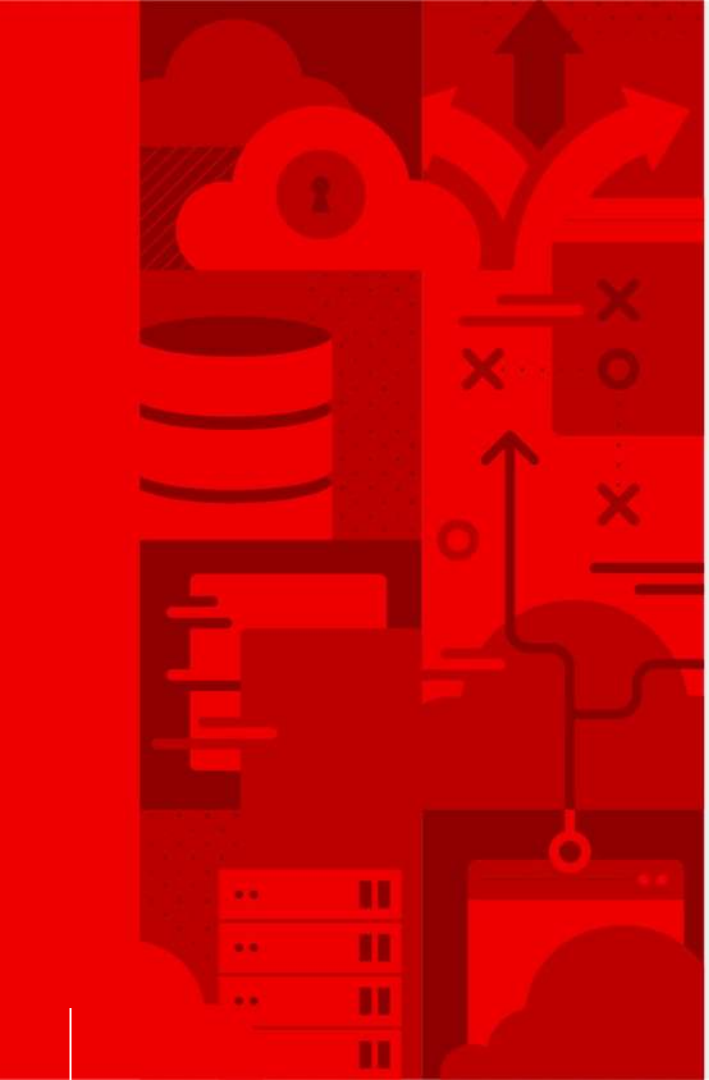

Thank you!

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