Red Hat in the Cloud – OpenShift

Harnessing the Power of Hybrid and Multi-Cloud Deployment

Johnny Yakob

jyakob@redhat.com

Magnus Eklund

meklund@redhat.com

Red Hat in the Cloud – OpenShift

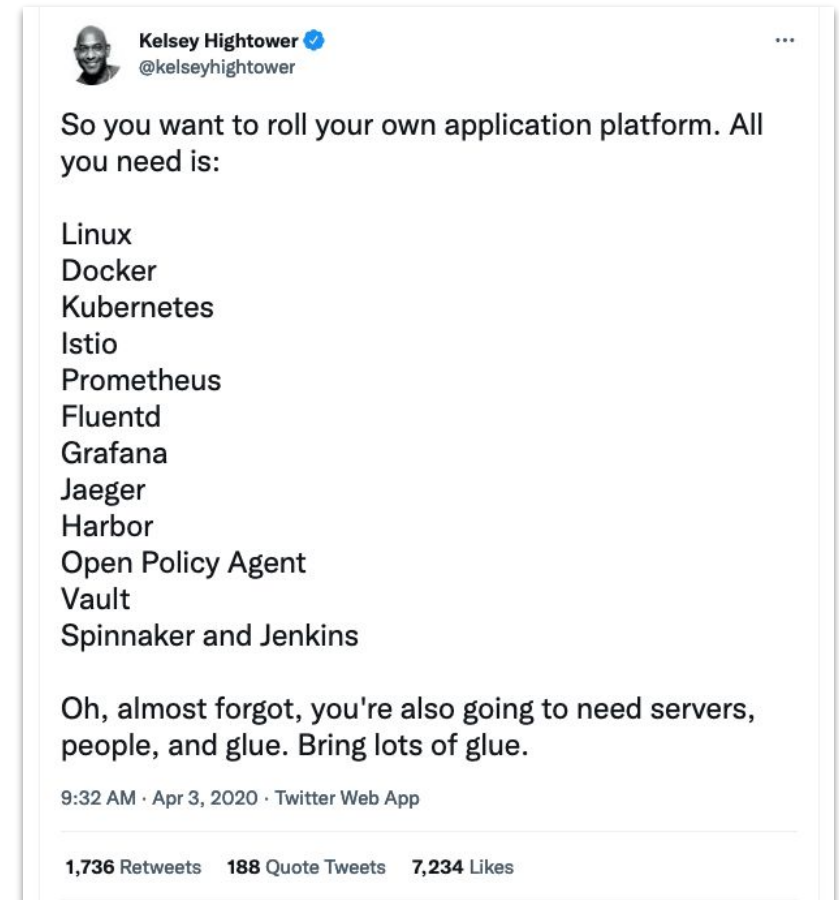Harnessing the Power of Hybrid and Multi–Cloud Deployment

WHO AM I?

- ❏ **Senior Specialist Solution Architect** @ **Red Hat**
- ❏ Over 20 years of experience in the IT industry...
- ❏ Passionate about:
  - ❏ **developer experience**, tooling, people & culture, modernization
  - ❏ **application development** technologies
  - ❏ **CI/CD** as code
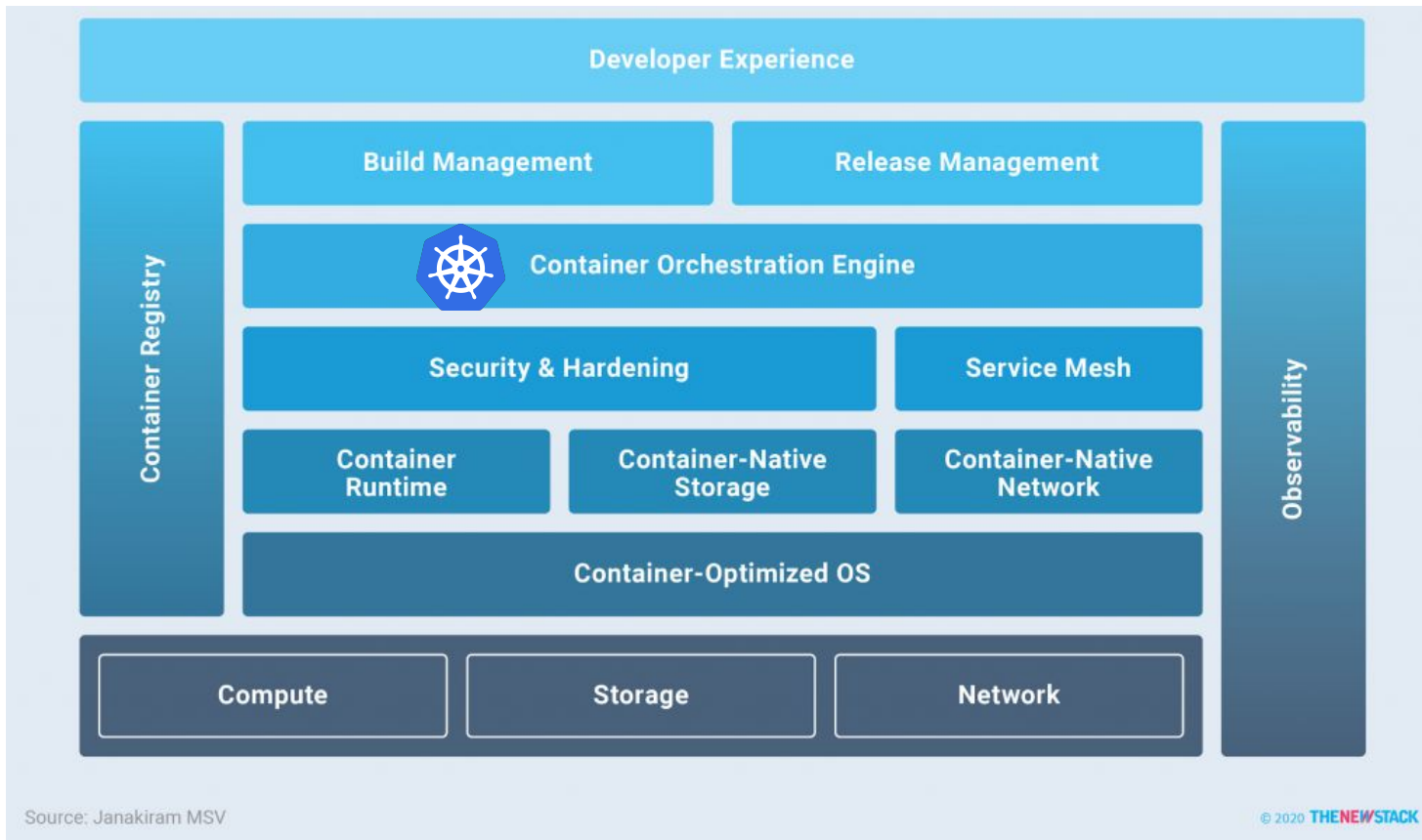 - ❏ **cloud-native** solutions

Positive developer experience is key to building successful and innovative solutions.

 @JOHNNYYAKOB   JYAKOBS

Johnny Yakob

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Kubernetes on its own is not enough

Kelsey Hightower ✔
@kelseyhightower

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

5:04 AM · Nov 28, 2017 · Twitter Web Client

248 Retweets   **43** Quote Tweets   **753** Likes

Kelsey Hightower ✔
@kelseyhightower

So you want to roll your own application platform. All you need is:

Linux
Docker
Kubernetes
Istio
Prometheus
Fluentd
Grafana
Jaeger
Harbor
Open Policy Agent
Vault
Spinnaker and Jenkins

Oh, almost forgot, you're also going to need servers, people, and glue. Bring lots of glue.

9:32 AM · Apr 3, 2020 · Twitter Web App

1,736 Retweets   **188** Quote Tweets   **7,234** Likes

Source:@kelseyhightower (link and link)

You don't want Kubernetes – you want an App Platform

Developer Experience

Build Management

Release Management

Container Orchestration Engine

Security & Hardening

Service Mesh

Container Runtime

Container-Native Storage

Container-Native Network

Container-Optimized OS

Compute

Storage

Network

Container Registry

Observability

Source: Janakiram MSV

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An App Platform is:

▸ An opinionated platform for **building**, **deploying** and **running** applications

▸ Includes all of the following, **fully integrated and supported**, components:
  · Runtimes
  · Build Tools
  · CI/CD
  · Telemetry (including app logging)

▸ **Abstracts away technical details** such as containers and Kubernetes

Supporting developers with tools to

work faster & easier

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What is OpenShift?

OpenShift brings together tested and trusted projects and services to reduce the friction of developing, modernizing, deploying, running, and managing applications.

Built on Kubernetes, it delivers a **consistent experience** across public cloud, on-premise, hybrid cloud, or edge architecture.
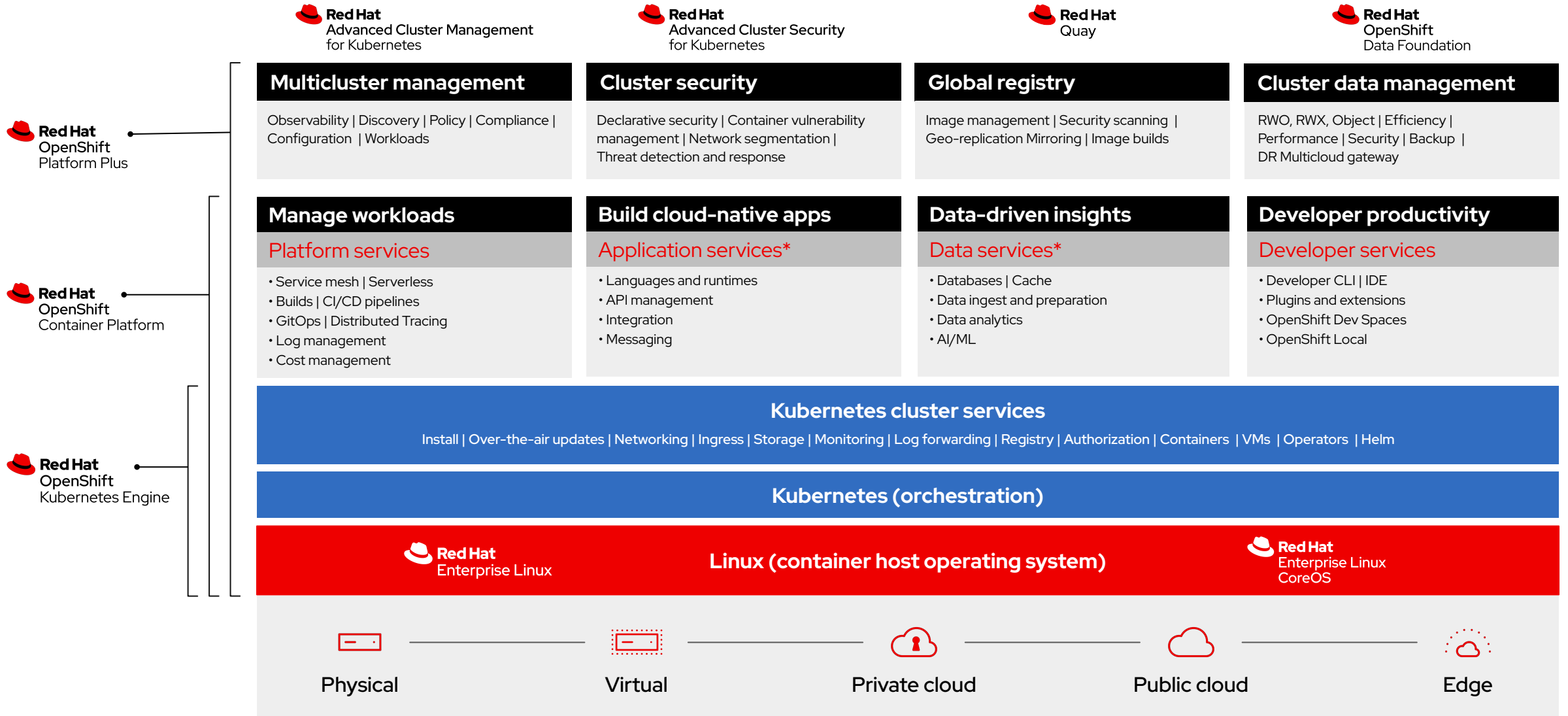
OpenShift offers functionality fully integrated

Dashboard	Kubernetes dashboard
DevOps	Deployment automation
	Build automation
	CI/CD
Orchestration	Container orchestration
Monitoring	Logs/metrics
Infrastructure	RBAC
	Container registry
	Storage
	Networking
	Linux container host

Red Hat OpenShift

Required capabilities fully integrated

Setup and Day 2 operations **simplicity** to deliver "Enterprise Container Platform"

Kubernetes services

Manual integrations

Setup and Day 2 operations **complexity** to deliver "Enterprise Container Platform"

OpenShift Helps Customers Avoid The Cost of Creating & Maintaining an Application Platform

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Red Hat open hybrid cloud platform

Red Hat
Advanced Cluster Management
for Kubernetes

Red Hat
Advanced Cluster Security
for Kubernetes

Red Hat
Quay

Red Hat
OpenShift
Data Foundation

Red Hat
OpenShift
Platform Plus

Multicluster management	Cluster security	Global registry	Cluster data management
Observability | Discovery | Policy | Compliance | Configuration | Workloads	Declarative security | Container vulnerability management | Network segmentation | Threat detection and response	Image management | Security scanning | Geo-replication Mirroring | Image builds	RWO, RWX, Object | Efficiency | Performance | Security | Backup | DR Multicloud gateway

Red Hat
OpenShift
Container Platform

Manage workloads	Build cloud-native apps	Data-driven insights	Developer productivity
Platform services	**Application services***	**Data services***	**Developer services**
• Service mesh | Serverless • Builds | CI/CD pipelines • GitOps | Distributed Tracing • Log management • Cost management	• Languages and runtimes • API management • Integration • Messaging	• Databases | Cache • Data ingest and preparation • Data analytics • AI/ML	• Developer CLI | IDE • Plugins and extensions • OpenShift Dev Spaces • OpenShift Local

Red Hat
OpenShift
Kubernetes Engine

Kubernetes cluster services

Install | Over-the-air updates | Networking | Ingress | Storage | Monitoring | Log forwarding | Registry | Authorization | Containers | VMs | Operators | Helm

Kubernetes (orchestration)

Red Hat
Enterprise Linux

Linux (container host operating system)

Red Hat
Enterprise Linux
CoreOS

Physical — Virtual — Private cloud — Public cloud — Edge

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*   Red Hat OpenShift® includes supported runtimes for popular languages/frameworks/databases. Additional capabilities listed are from the Red Hat Application Services and Red Hat Data Services portfolios.
** Disaster recovery, volume and multicloud encryption, key management service, and support for multiple clusters and off-cluster workloads requires OpenShift Data Foundation Advanced

A consistent platform no matter how or where you run

Developer Efficiency   **Business Productivity**   **Enterprise Ready**

Red Hat OpenShift Everywhere

aws   Azure   IBM **Cloud**   Google Cloud aws   On-premises

| Red Hat OpenShift Service on AWS | Azure Red Hat OpenShift | Red Hat OpenShift on IBM Cloud | Red Hat OpenShift Dedicated | OpenShift Container Platform |

Red Hat with Cloud Provider – Natively integrated

or

OCP Customer Managed

Red Hat Managed

You manage it, for control and flexibility

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Live DEMO 1

What we're going to look at:

▶ Red Hat OpenShift cloud offering

- Using Azure Cloud environment

- How to provision an OpenShift environment using Azure Portal

What we looked at:

▶ Overview of Azure Portal

▶ Provisioning of OpenShift cluster

  • Different options

Live DEMO 2

What we're going to look at:

- Overview of built in console – different perspectives

  - Admin – OperatorHub("App Store") experience, different views

  - Developer – Add functionality, Developer catalogue, different views

- Deployment of microservices demo application originally from Google

  - Deploy manually from terminal based on K8s manifest in GitHub

- Multicloud deployment

  - Deploy same applications to another cloud

  - GitOps with ArgoCD

Microservice demo application
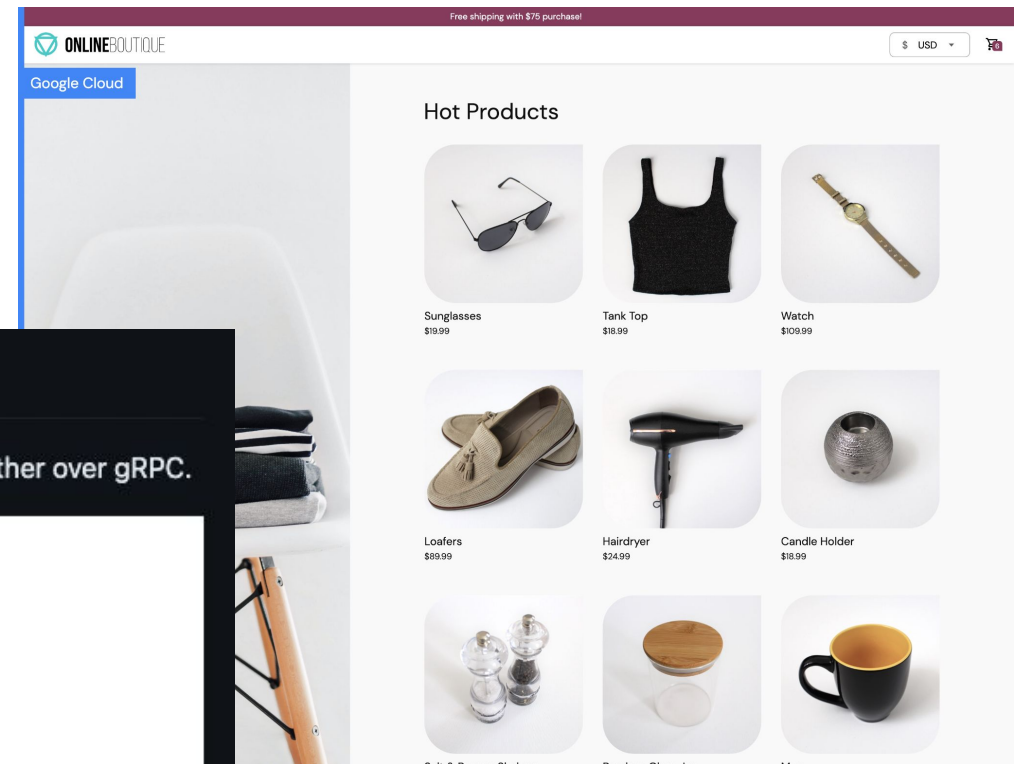
Architecture

Online Boutique is composed of 11 microservices written in different languages that talk to each other over gRPC.
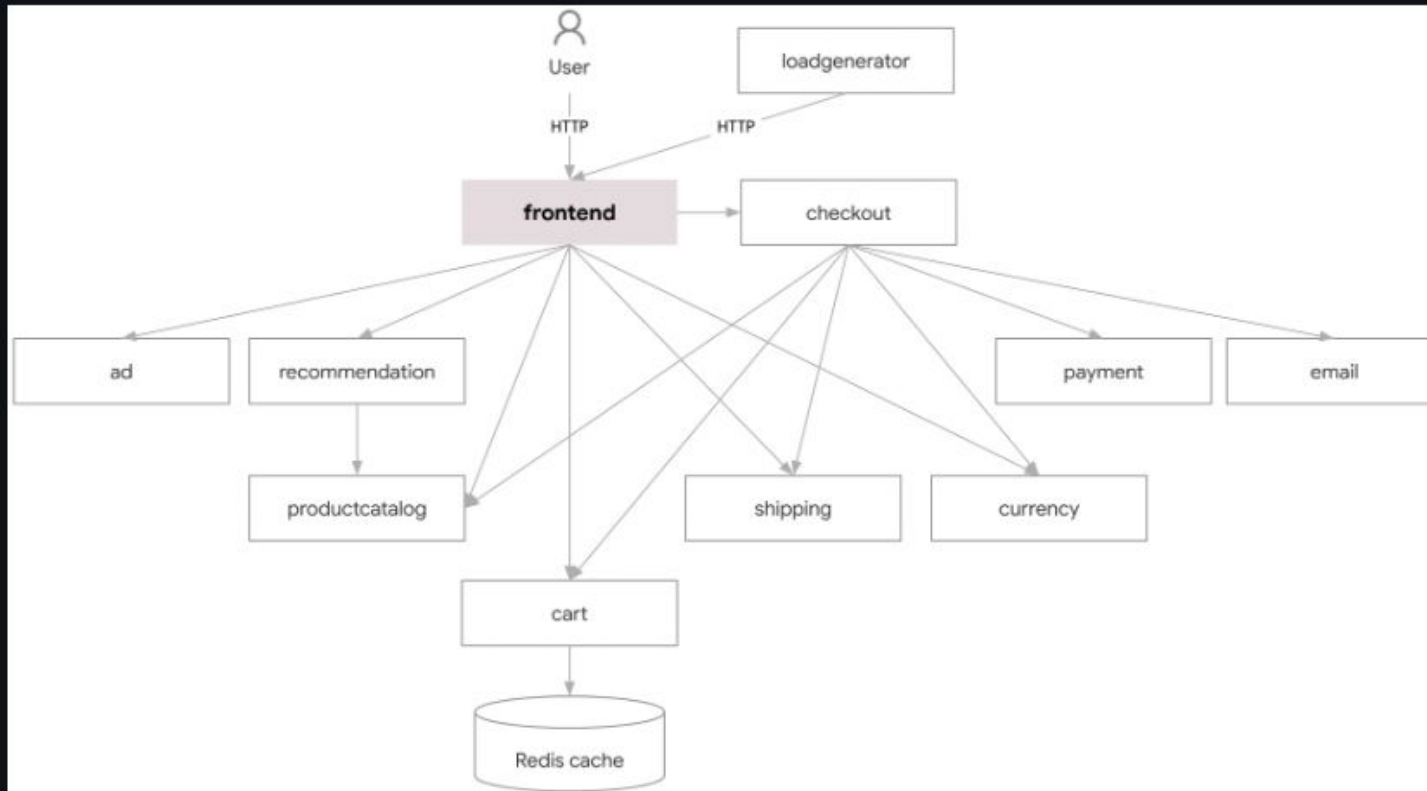
What we looked at:

▸ Overview of built in console – different perspectives

▸ Deployment of microservice architecture

▸ Multicloud deployment with GitOps
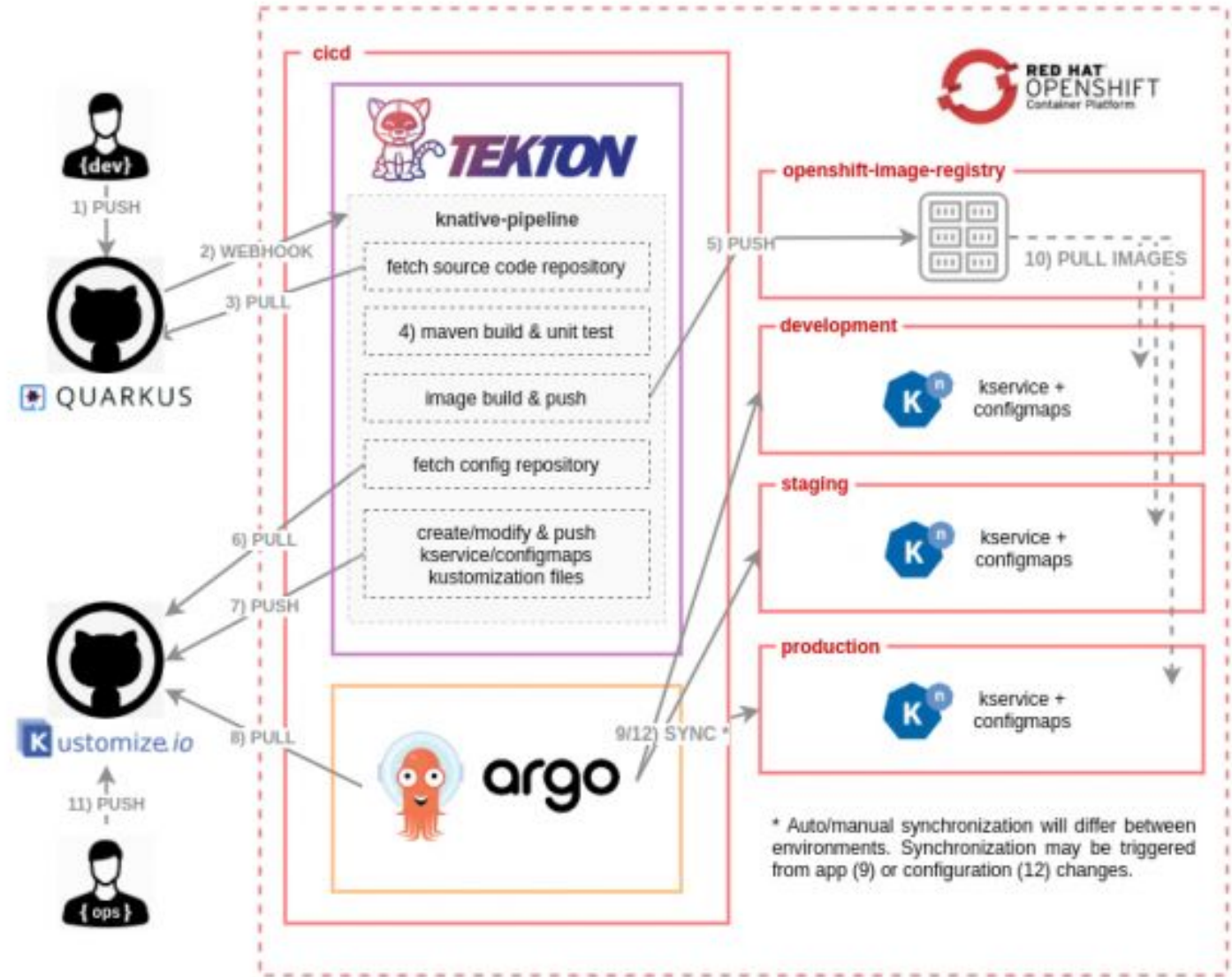
Delivering consistency and flexibility

Traditional apps

Cloud-native apps
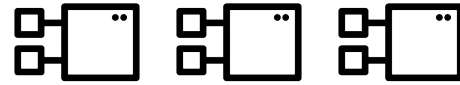
AI/ML, Functions

Communities of Innovation | Ecosystems of Solutions

Red Hat OpenShift

Secure & Automated Infrastructure and Operations

Physical

Virtual

Private cloud

Public cloud

Edge

Developer Productivity in Scope

	Kubernetes	OpenShift
Developer Productivity	Out of scope	✔ <u>Developer Perspective</u> (app-centric topology view, live terminals, logs, and stats), Routes (easy hostname records), Developer Catalog (Operator-backed, Admin configurable)
Inner Loop	Out of scope	✔ CodeReady Workspaces (hosted IDE w/ VScode plugin support), **odo** ("cf push" style code promotion between commits)
Builds, Pipelines	Out of scope	✔ Tekton pipelines, Source-to-Image S2I, Buildah (runs builds on cluster, producing container images that **do not require root privs**)
Container Registry	Out of scope	✔ Quay w/ Clair for static image analysis (on-cluster)
Logging	Out of scope	✔ Prometheus (on-cluster, Developer Perspective dashboard includes PromQL and live data)
Service Mesh	Out of scope	✔ Istio, Kiali, Jaeger (on-cluster)
Serverless	Out of scope	✔ Knative (on-cluster, Developer Perspective dashboard integration)
Advanced Workloads & Marketplace	CRDs (v1.12+ recommended)	✔ Dashboard support for CRDs, Disk storage (volumes and claims), Operator Marketplace (on-cluster), Helm3, KubeVirt (VMs), GPUs

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Live DEMO 3

What we're going to look at:

▸ Red Hat Developer program

  · Upskill with our developer portal

  · Developer content etc

▸ Red Hat Developer Hub

  · https://developers.redhat.com/products/developer-hub/overview

  · Janus and Backstage

  · https://showcase.janus-idp.io/

Project Janus / Backstage

https://showcase.janus-idp.io/

Project Janus / Backstage

OPENSHIFT MEETUP
27/SEP at 17.30

SPOTIFY HQ - STOCKHOLM

https://showcase.janus-idp.io/

Developer Hub Helps Enterprises

## Streamline Development and Accelerate Innovation
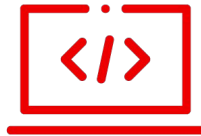
Consistent Developer Experience

Avoid tool sprawl. The Developer Hub offers a single pane of glass, allowing you to view all available & approved developer tools and resources in one place, increasing productivity and reducing confusion.

Self-Service Capabilities and Guardrails

Embrace cloud-native application development while complying with enterprise-wide best practices. The Developer Hub empowers you with self-service capabilities while ensuring proper security and governance across the entire organization.
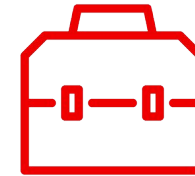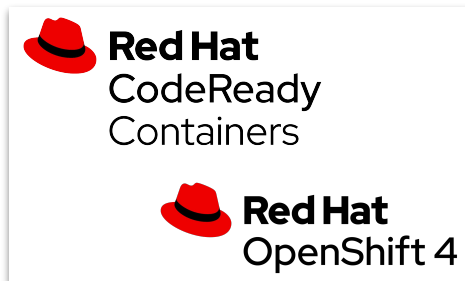
Curated Tools and Resources

The Developer Hub exposes your set of approved tools, languages, and resources. Experience choice without choice paralysis, accelerating application velocity and code quality without sacrificing innovation.

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What we looked at:

▶ Red Hat developer program
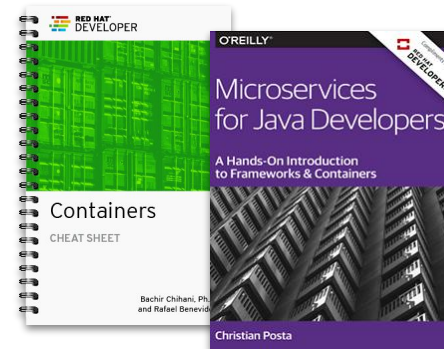
▶ Red Hat Developer Hub

Free Products

Free access to downloadable and SaaS software for use in development and pre-production environments.
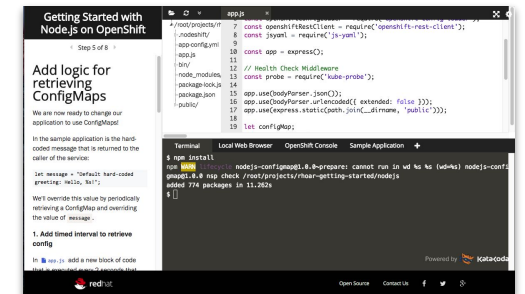
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