

5th-3rd:
Developer Focus
July 2024

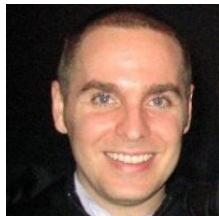
**Modern
Application
Development
Roadshow**

AGENDA

- 10:30am-11:30am. Introductions & Presentation Overview of Key Concepts
- 11:30am-12:00pm. How to Assess & Analyze An App for Modernization
- 12:00pm-12:30pm Break
- 12:30pm-1:15pm. Learn How to Refactor & Deploy A Modernized App on OpenShift
- 1:15pm - 2:15pm. Learn How to Enable Pipeline & GitOps for App on OpenShift
- 2:15pm-2:30pm Break
- 2:30pm-3:30pm. Learn to Build An Event Driven Architecture
- 3:30pm-4:30pm. Accelerate App Development

> whoami

CHRIS DUFFIELD
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chrisd@redhat.com



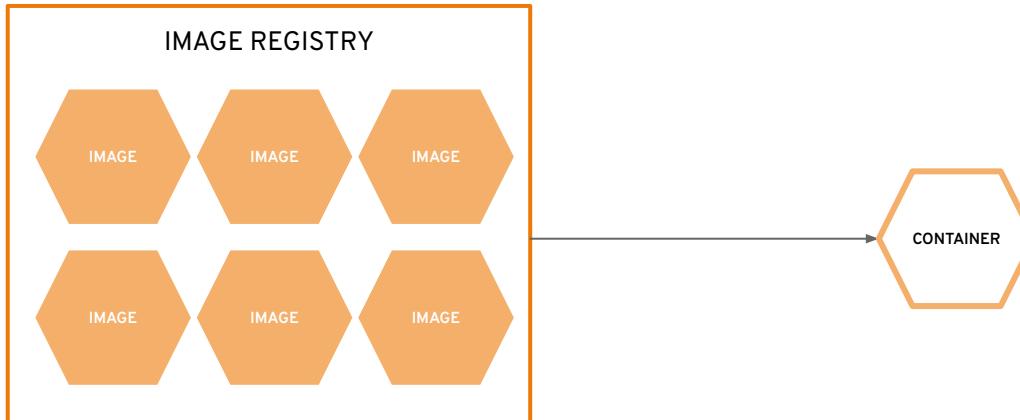
Background:
Electronic Engineering
Self-taught Software Developer



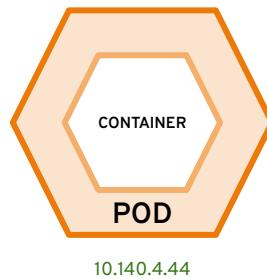
Containers are created from container images



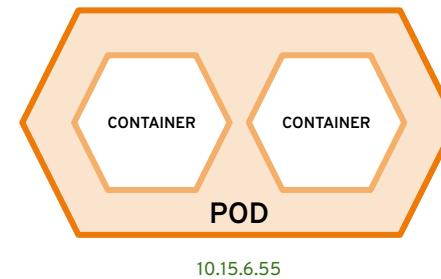
Container images are stored in an image registry



Containers are wrapped in pods which are units of deployment and management



10.140.4.44



10.15.6.55

Container Build Example

```
# Start with a base image that has Java 17 installed.  
FROM eclipse-temurin:17-jdk-jammy  
  
# Set a default directory inside the container to work from.  
WORKDIR /app  
  
# Copy the special Maven files that help us download dependencies.  
COPY .mvn/ .mvn  
  
# Copy only essential Maven files required to download dependencies.  
COPY mvnw pom.xml ./  
  
# Download all the required project dependencies.  
RUN ./mvnw dependency:resolve  
  
# Copy our actual project files (code, resources, etc.) into the container.  
COPY src ./src  
  
# When the container starts, run the Spring Boot app using Maven.  
CMD ["./mvnw", "spring-boot:run"]
```



Red Hat OpenShift

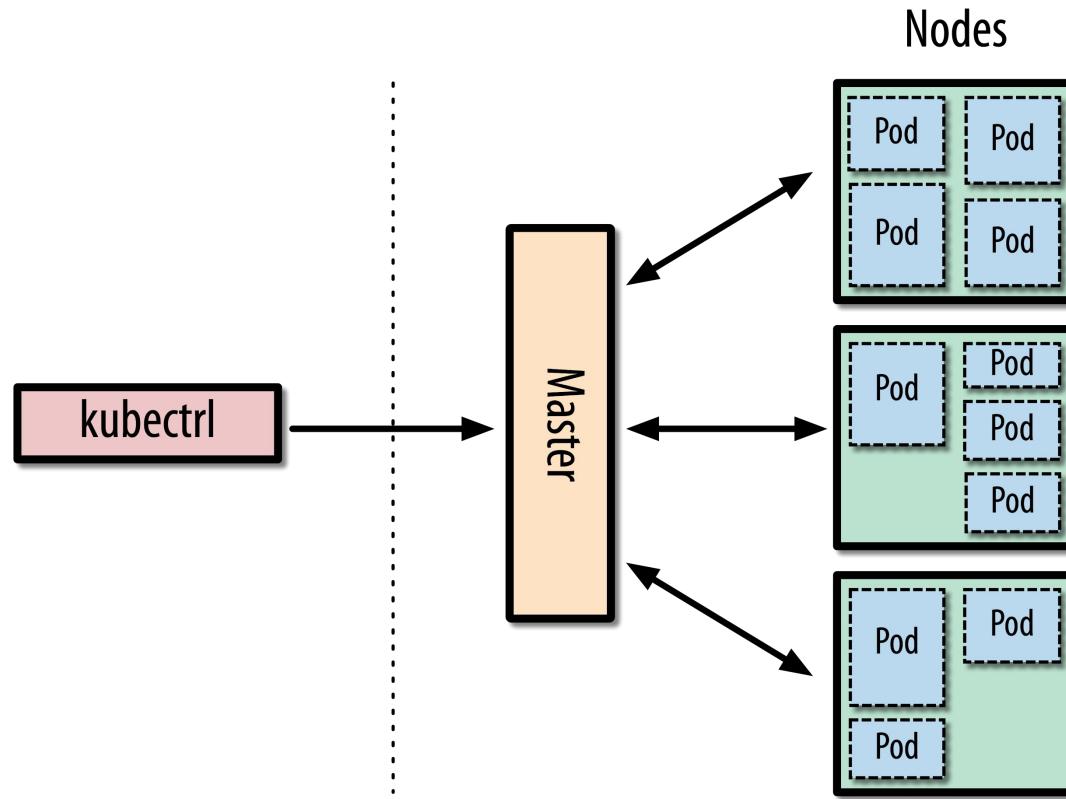


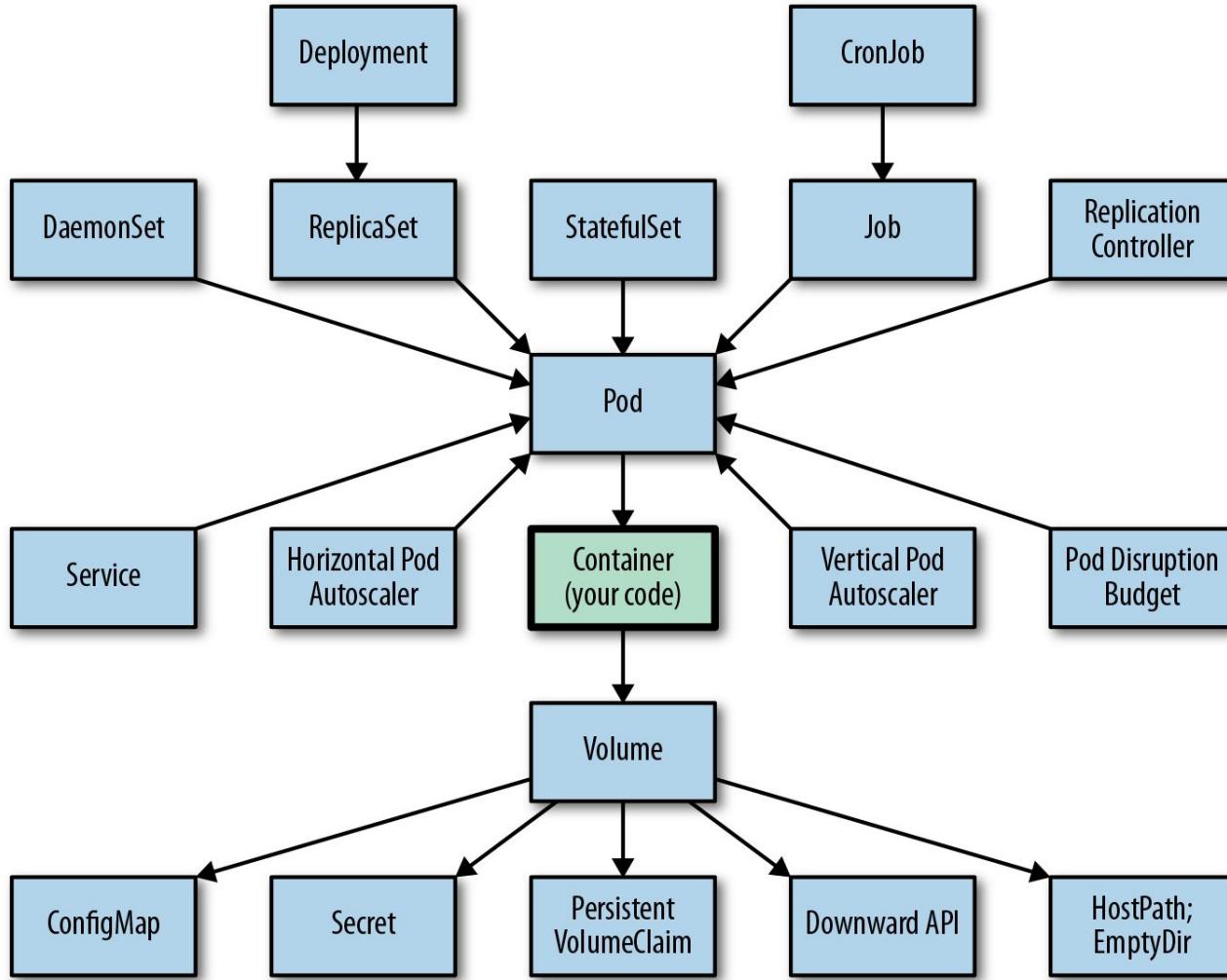
Kubernetes



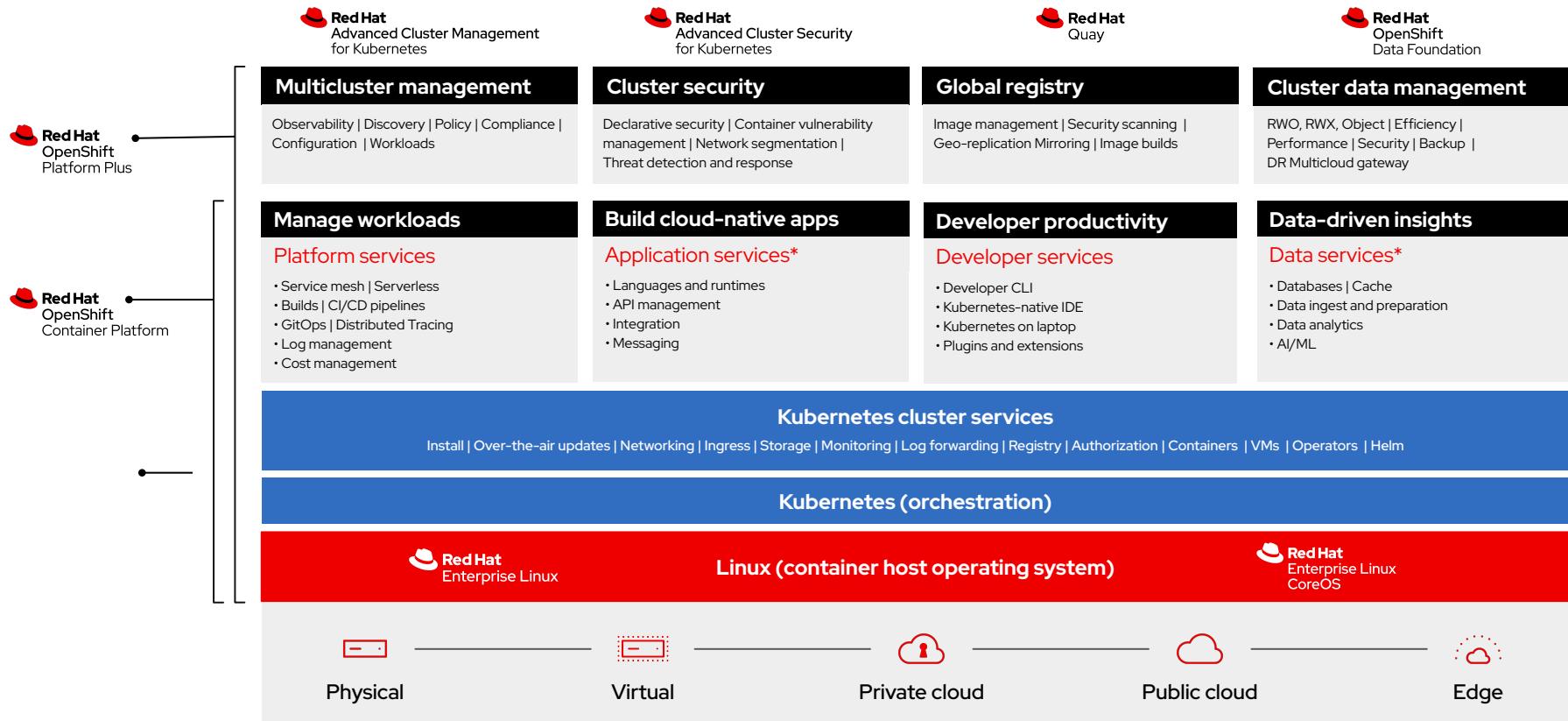
- Open Source container orchestration system started by Google in 2014
 - ※ Scheduling
 - ※ Self-healing
 - ※ Horizontal and vertical scaling
 - ※ Service discovery
 - ※ Rollout and Rollbacks
- Declarative resource-centric REST API

Architecture





Red Hat OpenShift - Overview



* 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

Lab Technologies

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CNCF sandbox project

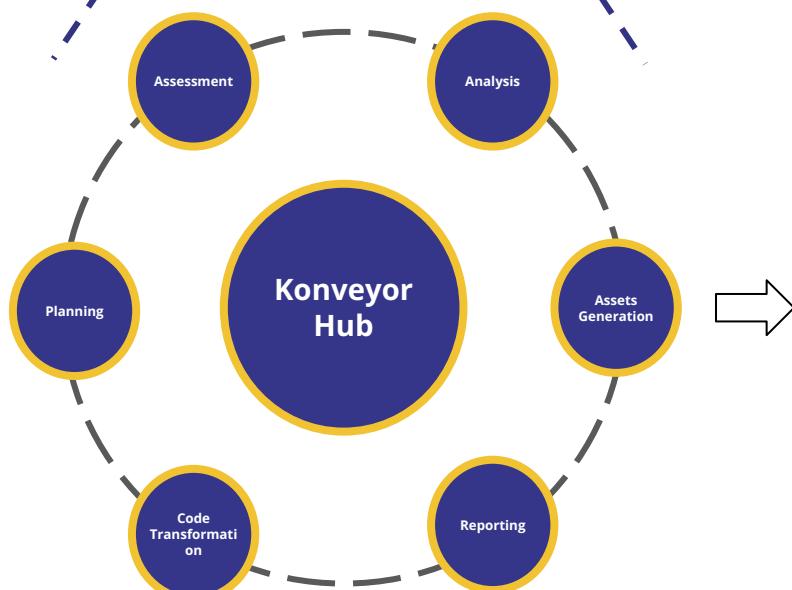


A community of **people** passionate about **helping others modernize** and migrate their **applications** to Kubernetes by **building tools and best practices** on how to **accelerate the journey to Kubernetes**



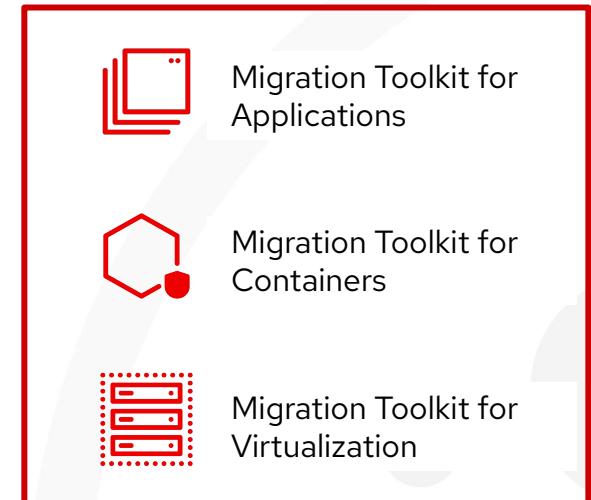
Red Hat Supported Operators

Available for free on OpenShift



Open to
the world

Tech Exchange | 2023





What is Knative ?

Serving

A request-driven model that serves the container with your application and can "scale to zero".

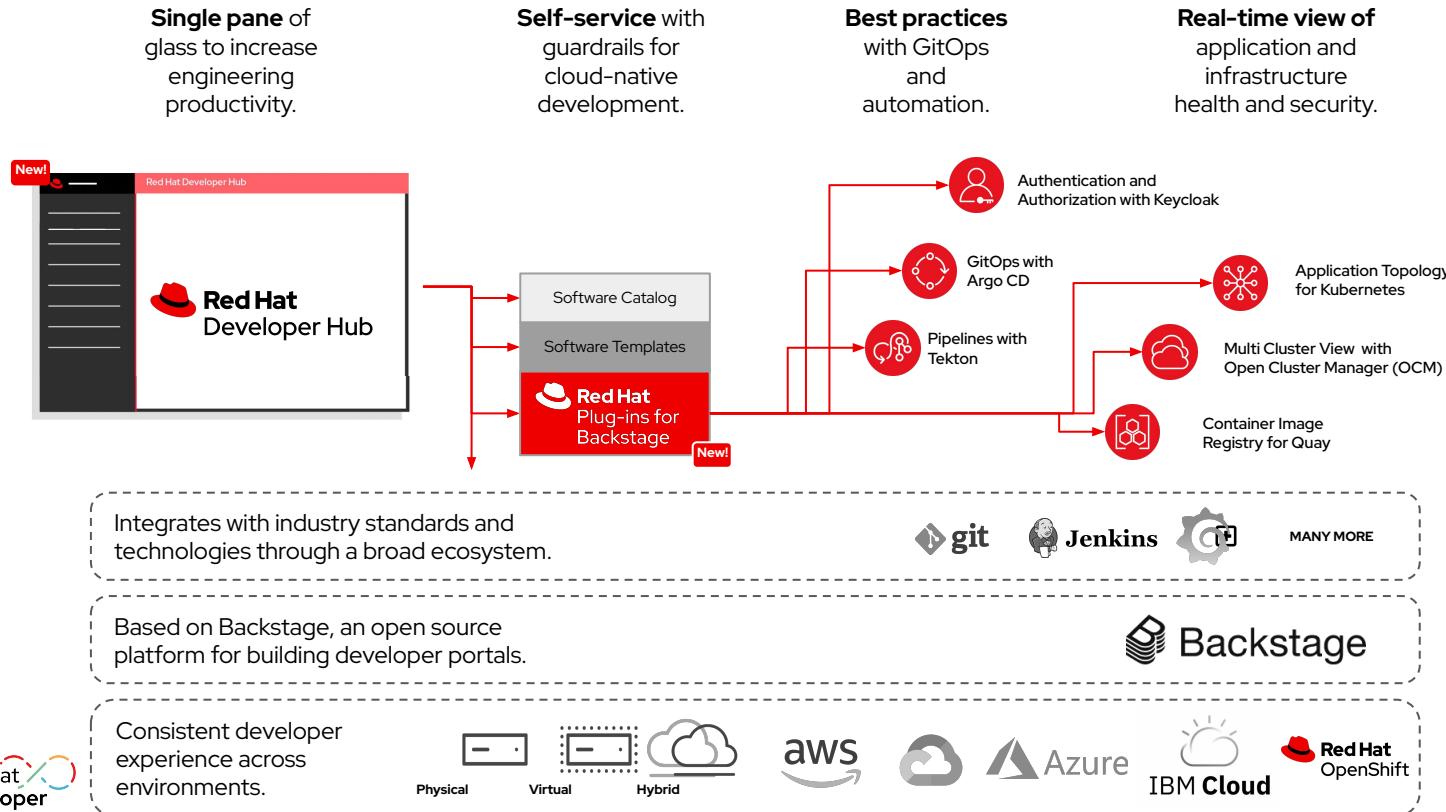
Eventing

Common infrastructure for consuming and producing events that will stimulate applications.



Red Hat Developer Hub & Red Hat Backstage Plug-Ins

Empowering engineering to deliver business value faster.

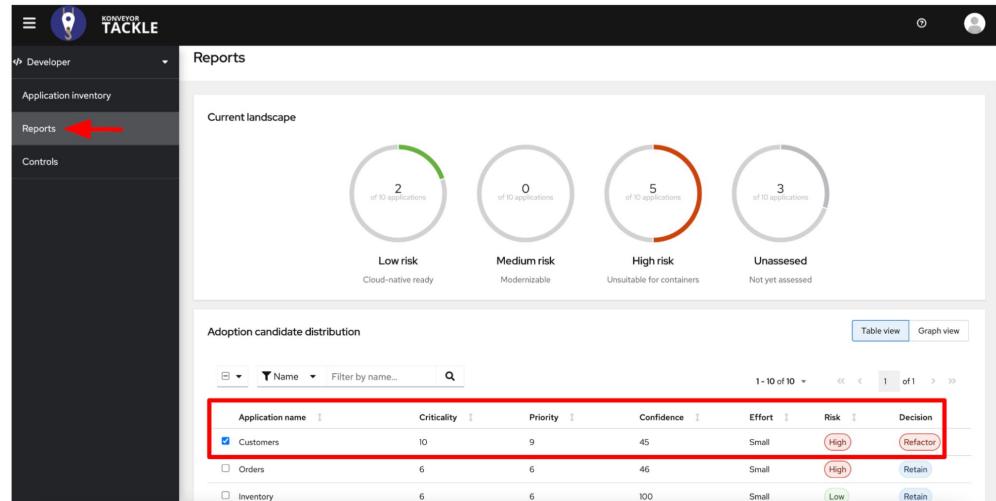


Module 1 - Assessment & Analysis

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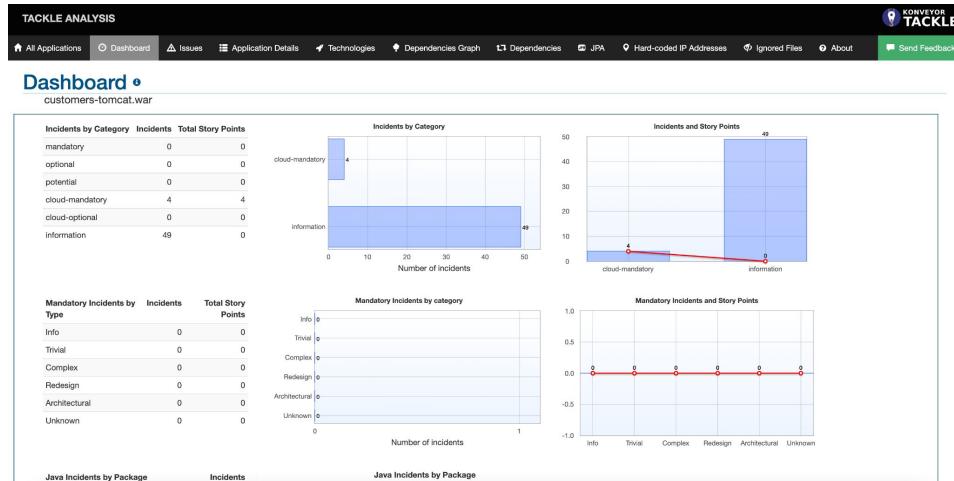
Assessment

- Assess the siloed current application portfolio
- Identify potential issues and risks
- Decide your application modernization journey along with 6Rs' strategy



Application Analysis

- Analyze the siloed application by scanning all source code and properties
- Understand how to get started with the code modification along with the analysis report



<https://get-a-username-dev-guides.apps.cluster-js6qx.sandbox1773.opentlc.com/>

Password = openshift



Account Assignment

Enter your E-Mail Address and password in the form below to request lab access

E-Mail Address

e.g jane@doe.com

Password

e.g labsecret

Submit

Password = openshift



Credentials for cduffiel@redhat.com

Username

user1

Password

openshift

Modules

Module

[Assessment and Analysis](#)

Module

[Refactor and Deployment](#)

Module

[Build Event-driven Architecture](#)

Module

[Accelerating Software Development with Red Hat Developer Hub](#)

Module 2 - Refactor & Deployment

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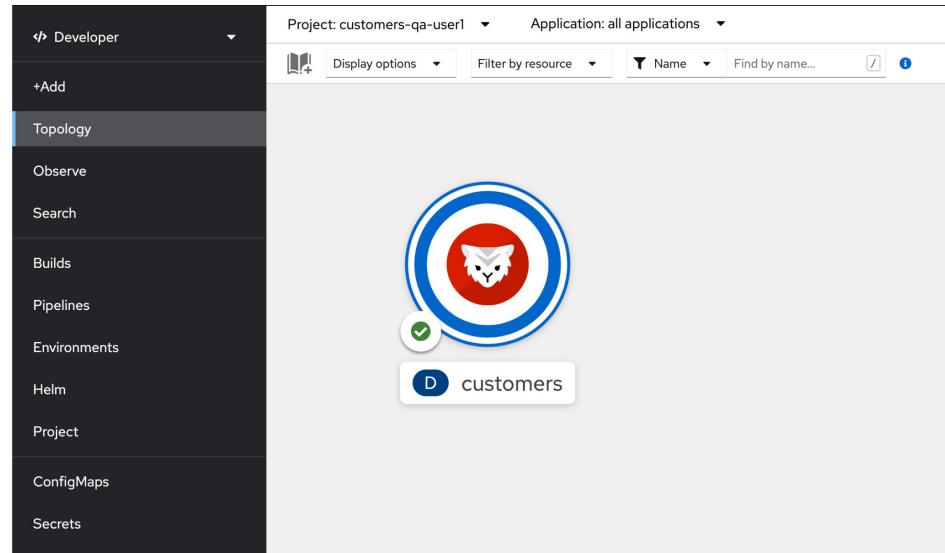
Refactor

- Resolve the migration issues by code modification along with Analysis report
- Use the recommended solutions for the refactoring

```
21  @Configuration
22  @EnableJpaRepositories(basePackages = {
23  |     "io.konveyor.demo.ordermanagement.repository"
24  |})
25  @EnableTransactionManagement
26  @EnableSpringDataWebSupport
27  @PropertySource("classpath:persistence.properties")
28  public class PersistenceConfig {
29
30      @Autowired
31      private Environment env;
32
33      @Bean
34      public LocalContainerEntityManagerFactoryBean entityManagerFactory() {
35          final LocalContainerEntityManagerFactoryBean em = new LocalContainerEntityManagerFactoryBean();
36          em.setDataSource(dataSource());
37          em.setPackagesToScan("io.konveyor.demo.ordermanagement.model");
38          em.setJpaVendorAdapter(new HibernateJpaVendorAdapter());
39          em.setJpaProperties(additionalProperties());
40
41          return em;
42      }
43
44      @Bean
45      public DataSource dataSource() {
46          final DriverManagerDataSource dataSource = new DriverManagerDataSource();
47          dataSource.setDriverClassName(env.getProperty("jdbc.driverClassName"));
48          dataSource.setUrl(env.getProperty("jdbc.url"));
49          dataSource.setUsername(env.getProperty("jdbc.user"));
50          dataSource.setPassword(env.getProperty("jdbc.password"));
51
52          return dataSource;
53      }
54
```

Deploy to Kubernetes

- Build a modernized application using the OpenShift binary build strategy
- Deploy and run the new application on Red Hat JBoss Web Server



Lunch Break

Back at 1 PM

Modern Application Development Roadshow

A red outline icon of a cloud with a single white cube inside it, positioned between the word "Development" and "Roadshow".

Module 3 - Enable Pipeline & GitOps

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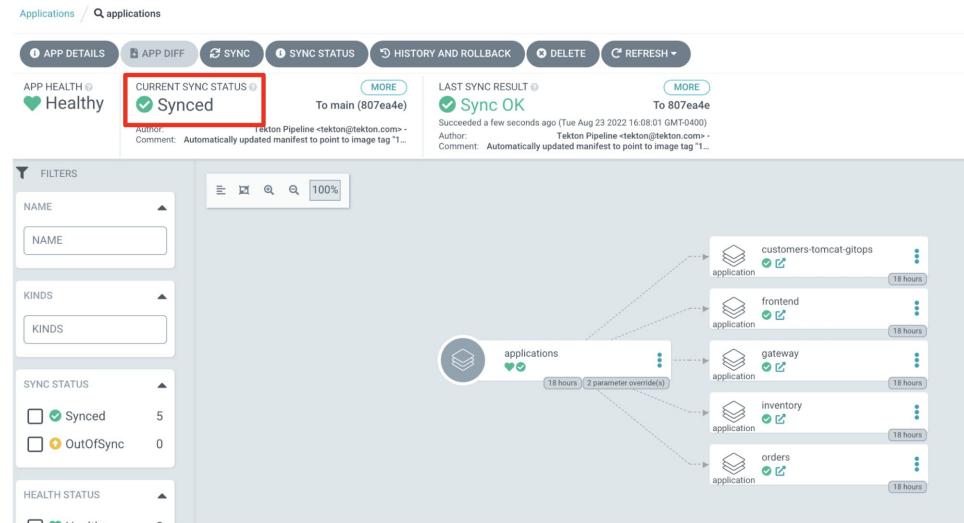
Build CI/CD Pipelines

- Automate build and deployment processes using OpenShift pipeline
- Use Helm charts to externalize the application configurations for the CI/CD pipeline



Integrate OpenShift GitOps

- Synchronize OpenShift pipeline with OpenShift GitOps for advanced deployment practices
- Update the configuration for the frontend service to refer to the new modernized application



Module 4 - Build Event-Driven Architecture

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A stylized white cloud icon with a network of lines connecting various points within it, located to the right of the text.

Event-Driven Architecture

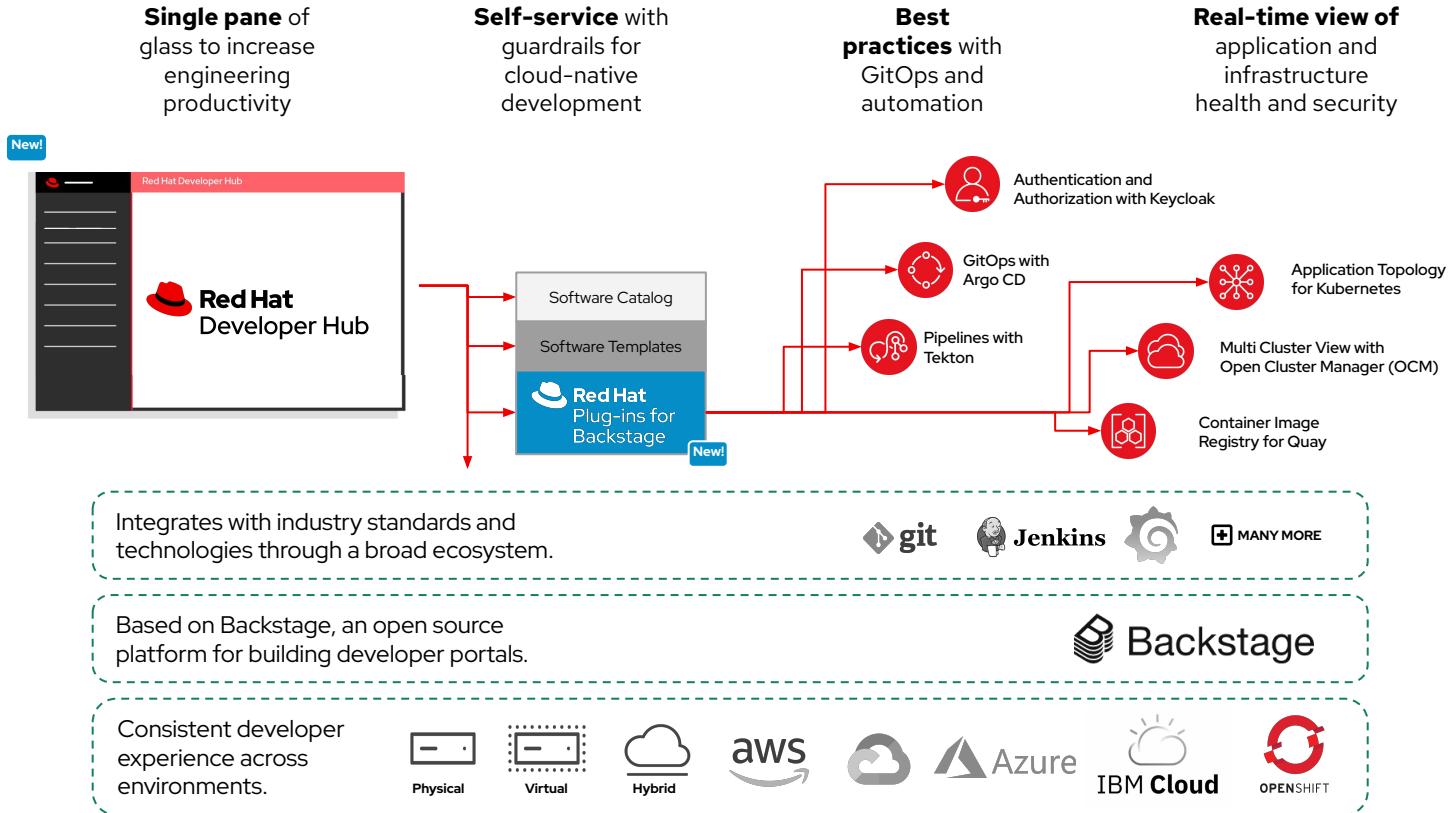
- Build event streaming applications using AMQ Streams (Kafka optimized for OpenShift/Kubernetes)
- Use the Kafka ecosystem to process events at real-time and at scale



Module 5 - Accelerating Software Development

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Empowering engineering to deliver business value faster



Follow Up Questions? Have an App or Solution You'd Like to Discuss?

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513.225.9585

Container Development Cycle

Start



Kube By Example

Start learning Kubernetes today!
<https://kubebvexample.com/>



RH Developer Portal

<https://developers.redhat.com/>



Learn

<https://developers.redhat.com/learn/openshift>



Developer Sandbox

Fastest and least friction way, at zero cost, for a developer to try our OpenShift platform, key developer tools and services, and Red Hat cloud services.
<https://developers.redhat.com/developer-sandbox>



OpenShift Local

Formerly known as "Red Hat CodeReady Containers"
Pre-built development environment, based on OpenShift v4, for quick container-based application development - on developer laptops.
<https://developers.redhat.com/products/openshift-local/overview>

Develop



Podman Desktop

This upstream project enables developers to easily build and share containerized applications, facilitating their transition to Kubernetes.
<https://podman.io>



Docker Desktop extension

Enables deployment of local images to OpenShift directly from Docker Desktop.
<https://github.com/redhat-developer/openshift-dd-ext>



OpenShift Dev Spaces

Centralized, shareable, in-browser Kubernetes-based Integrated Development Environment, focused on OpenShift customers.
https://developers.redhat.com/products/openshift-dev_spaces/overview



OpenShift Toolkit IDE Extension (VSCode, IntelliJ)

Developers can easily create, deploy and live debug container applications running on OpenShift.
<https://marketplace.visualstudio.com/items?itemName=redhat.vscode-openshift-connector>
<https://plugins.jetbrains.com/plugin/12030-openshift-toolkit-by-red-hat>



IDE Extensions (Visual Studio Code, IntelliJ) for Languages (Java, XML, YAML, Apache Camel) and Runtimes (Quarkus, EAP)



CLI tools: odo

OpenShift Developer CLI (command-line interface) that helps developers to build on Kubernetes/OpenShift, hiding Kubernetes complexity and supporting developers to get up and running
<https://developers.redhat.com/products/odo/overview>



Maven/Grade tooling (JKube)

Adds the ability to bring Java applications to Kubernetes by extending native Maven/Gradle packaging tools.



Trusted Supply Chain

Provides trusted open source software packages and dependencies, vulnerability information, and remediations engineered by Red Hat, delivered to developer's IDEs.
<https://developers.redhat.com/products/trusted-software-supply-chain/overview>



Red Hat AMQ

<https://developers.redhat.com/products/amo/overview>

Deploy & Maintain



Plug-ins for CI/CD tools (GitHub Actions, Microsoft Azure DevOps, GitLab Runner, Jenkins)

Provide templates for automated deployment of applications to OpenShift



OpenShift Pipelines, Tekton Hub, Tekton IDE extension

Is a cloud-native CI/CD solution to securely build containerized applications and deploy to OpenShift. Tekton Hub provides a catalog of Tekton task templates. Tekton IDE extension enables developers to create and manage Tekton pipelines from their IDE



IDE Extensions (for Visual Studio Code, IntelliJ, Eclipse) for Deployment (OpenShift Toolkit, Serverless Functions)

Enable developers to push their code to OpenShift without needing to build containers, and to also configure serverless deployments.



OpenShift GitOps

Enables developers to declare and version application and cluster configuration in Git, automate application deployments, configuration drift detection and remediation. kam (Kubernetes application management) enables developers to easily seed GitOps declarative application models in Git.



OpenShift UI tools: OpenShift Dev Console

Provides an end-to-end developer experience in OpenShift, across all cloud platforms, for building, deploying, and managing containerized applications and their related services.



Web Terminal/OC

Runs within the OpenShift Dev Console. It provides a command line interface, pre-loaded with developer-focused CLIs.



Helm

is a package manager for Kubernetes. We provide support for that packaging in OpenShift, and a certified catalog for developers to quickly create applications based on curated Helm charts.



Migrate - Toolkit (Now based on Konveyor)

<https://developers.redhat.com/projekte/github.com/varkrish/rh-devhub-quickstartducts/mta/overview>



Konveyor

The Konveyor community helps modernize applications by providing open source tools to rehost, replatform, and refactor applications to Kubernetes and cloud-native technologies.

<https://www.konveyor.io/>

Thank you

Modern Application Development Roadshow

A red outline icon of a cloud with a single white cube inside it, positioned below the word "Development".