

Application Modernization and Migration

with Konveyor



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Increased Kubernetes Adoption Reveals a Need for an Open-source Solution



CNCF Survey 2021

“96% of organizations are either using or evaluating Kubernetes”



CLOUD NATIVE
COMPUTING FOUNDATION



[Link](#)



Forecast Analysis: Container Management (Software and Services), Worldwide

“By 2022, more than 75% of global organizations will be running containerized applications in production, up from less than 30% today”



[Link](#)

**Kubernetes is becoming the default platform for
application deployment**

Application Modernization Market Size And Forecast

“Global Application Modernization Market was valued at USD \$7.74 Billion in 2018 and is projected to reach USD \$30.59 Billion by 2026, growing at a CAGR of 18.7 % from 2019 to 2026”



[Link](#)

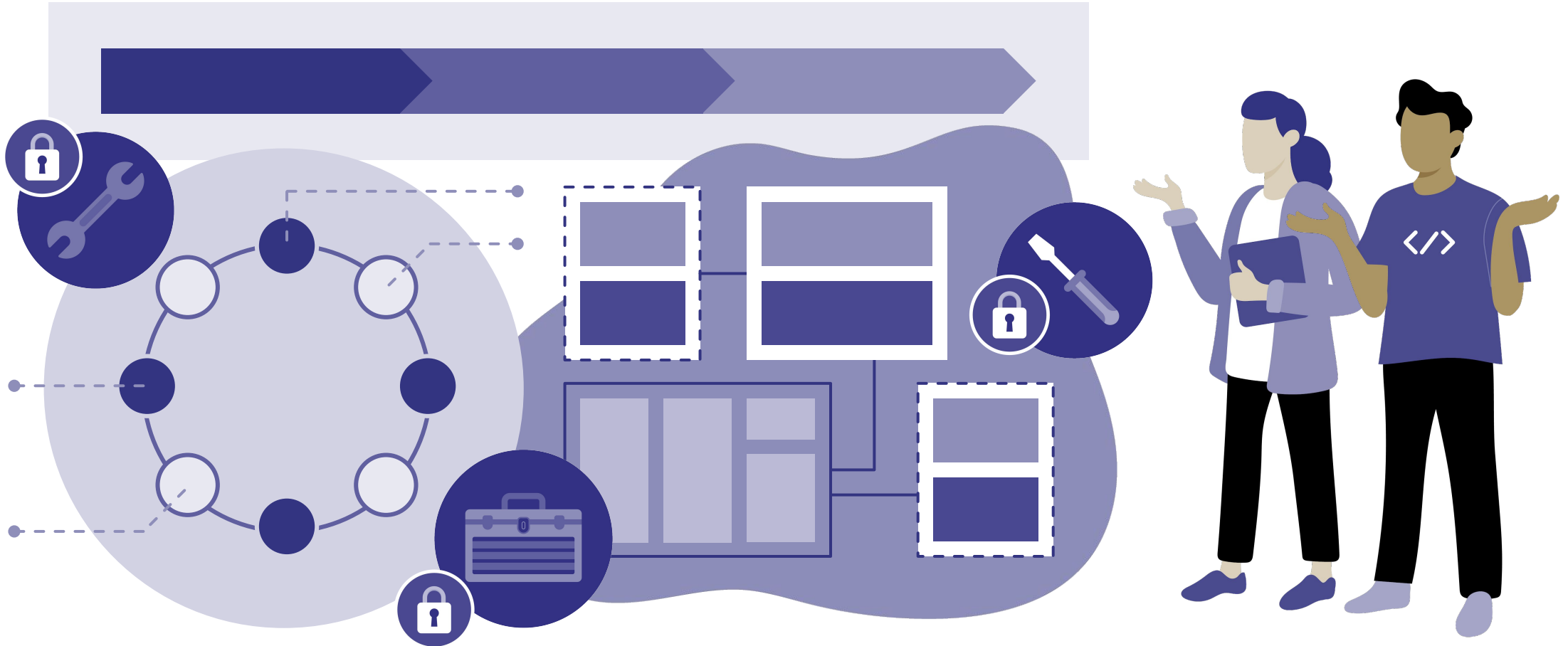
Forecast Analysis: Container Management (Software and Services), Worldwide

*“Gartner expects that up to 15% of enterprise applications will run in a container environment by 2024: **The bottleneck will be the speed at which applications can be refactored and/or replaced**”*



[Link](#)

A myriad of methodologies and proprietary tools



Modernizing & Migrating With Konveyor



Konveyor Community



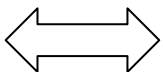
Explore becoming CNCF sandbox projects over time



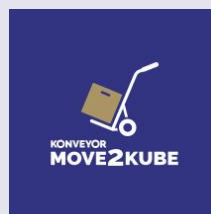
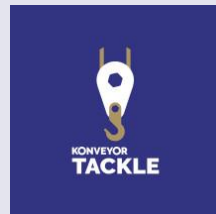
A community of **people** passionate about **helping others modernize** and migrate their **applications** to Kubernetes by **building tools and best practices** on how to **accelerate the journey to Kubernetes**



Additional community contributors being recruited



Projects



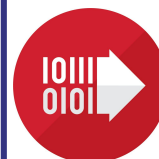
Meetups



How I strangled a monolith

How I containerized my java app

How I created an operator



Migration Toolkit for:

- Applications (MTA)
- Containers (MTC)
- Virtualization (MTV)



IBM GBS Modernization & Migration Tool Kit

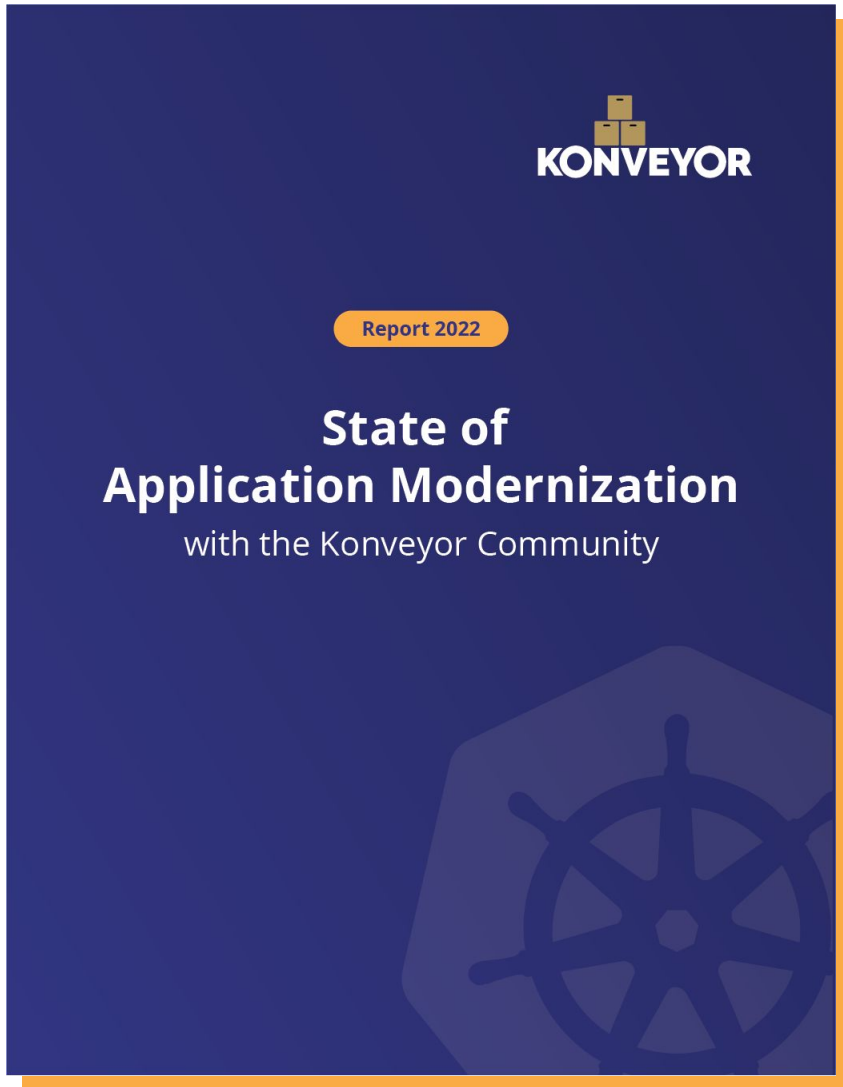


IBM Cloud and Cognitive Software Product (WHE)



IBM Mainframe Application Modernization Tools





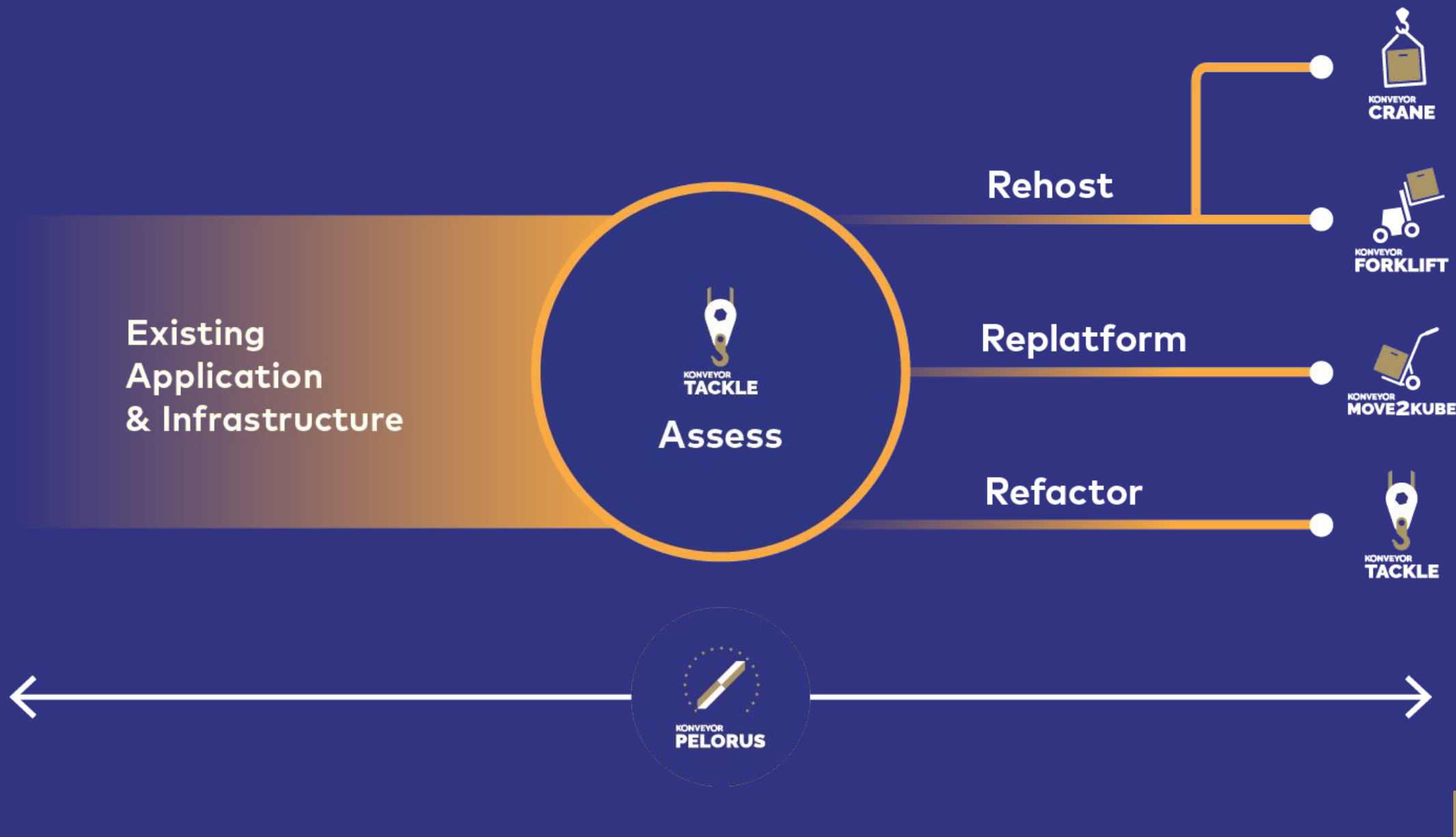
The State of Application Modernization Report 2022

Learn why enterprises plan to modernize more than half of their existing applications to run on Kubernetes within the next year. And see how these 600 companies will approach the move, along with other key insights, to inform your modernization strategy.

View the report

konveyor.io/modernization-report





Application Portfolio Modernization and Migration with Tackle



The ultimate Open Source toolkit to help organizations safely migrate and modernize their application portfolio to leverage Kubernetes, providing differential value on each stage of the adoption process

The ultimate Open Source toolkit to help organizations **safely** migrate and modernize their application portfolio to leverage Kubernetes, providing differential value on each stage of the adoption process

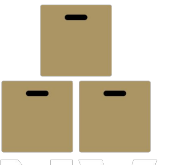
An overview of Tackle 2.0



Tackle Operator

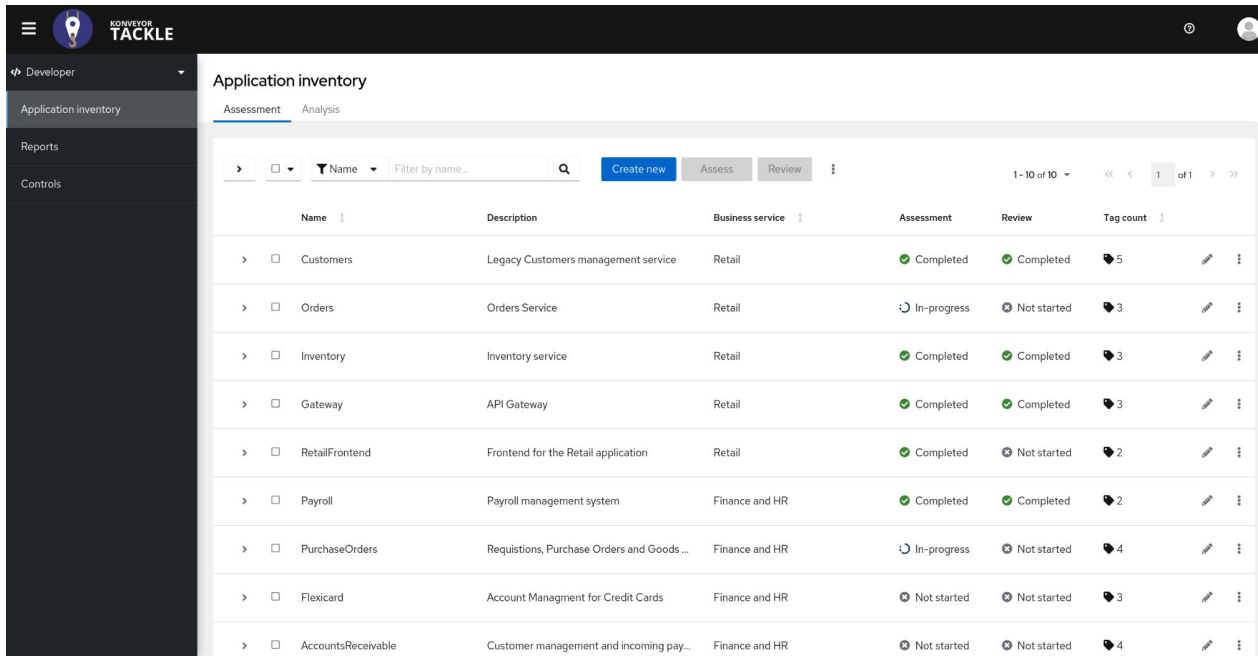
Install Tackle in your Kubernetes cluster with almost no effort

- ▶ Can be installed in all Kubernetes distributions
- ▶ Available in operatorhub.io and OpenShift
- ▶ Requires Operator Lifecycle Manager on upstream Kubernetes distributions
- ▶ Provides a tackle CRD to provision all components
- ▶ Capability Level II



Application Inventory

Manage your Application Portfolio



Name	Description	Business service	Assessment	Review	Tag count
Customers	Legacy Customers management service	Retail	Completed	Completed	5
Orders	Orders Service	Retail	In-progress	Not started	3
Inventory	Inventory service	Retail	Completed	Completed	3
Gateway	API Gateway	Retail	Completed	Completed	3
RetailFrontend	Frontend for the Retail application	Retail	Completed	Not started	2
Payroll	Payroll management system	Finance and HR	Completed	Completed	2
PurchaseOrders	Requisitions, Purchase Orders and Goods ...	Finance and HR	In-progress	Not started	4
Flexicard	Account Management for Credit Cards	Finance and HR	Not started	Not started	3
AccountsReceivable	Customer management and incoming pay...	Finance and HR	Not started	Not started	4

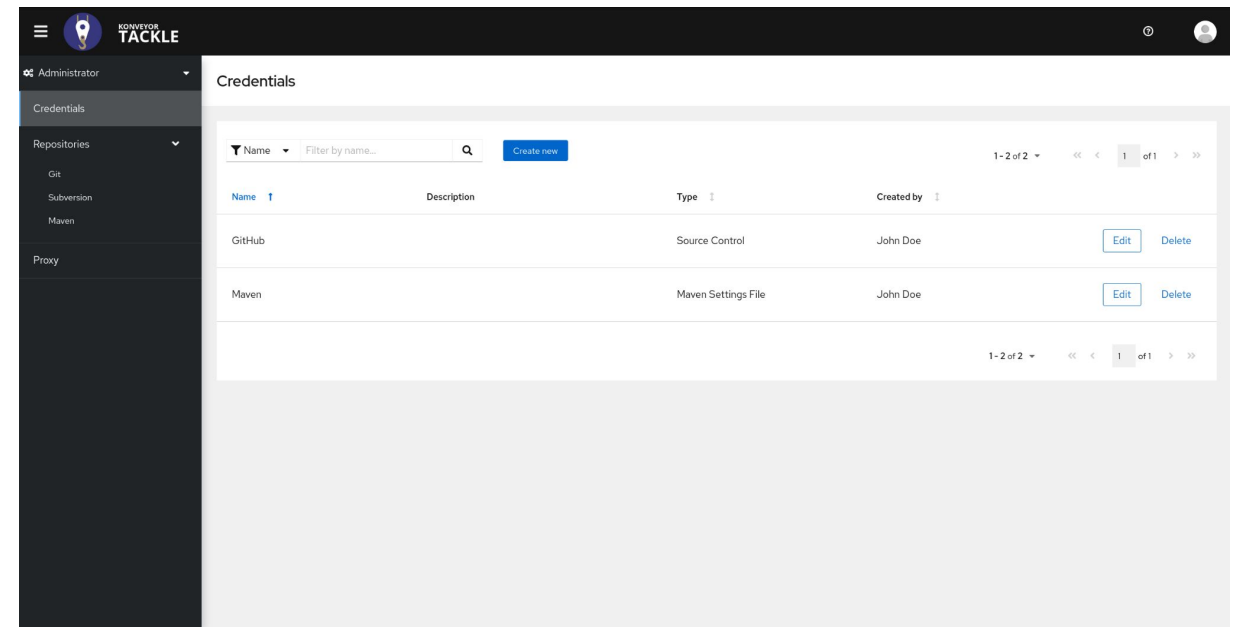
- ▶ Used to maintain a portfolio of applications
- ▶ It is the hub, and natural integration point for all Tackle projects in the future
- ▶ Applications can be linked to the business services that they support
- ▶ Application interdependencies can be defined and managed
- ▶ Through the use of tags extensible metadata can be added to describe and categorize the applications in multiple dimensions



Application Inventory

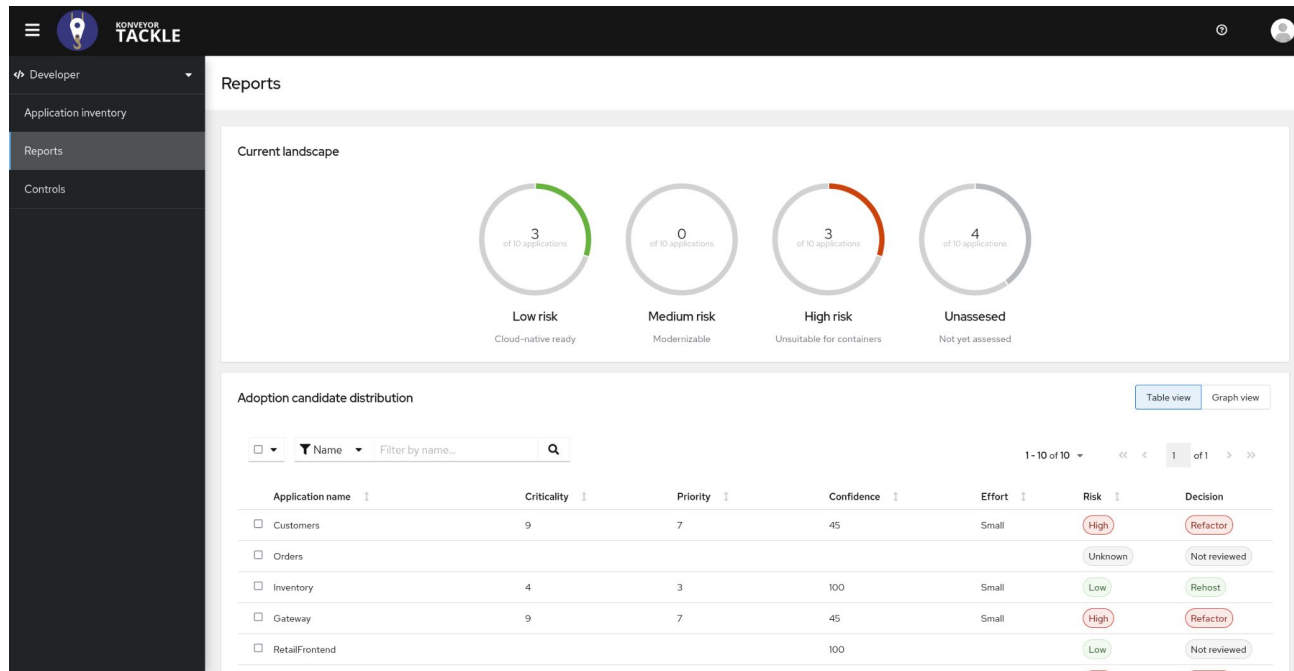
Integration with repositories

- ▶ Integration with source code and binaries repositories:
 - Git
 - Subversion
 - Maven Artifact repositories
- ▶ Secure store for multiple credential types:
 - Source control
 - Maven settings files
 - Proxy
- ▶ Credentials are managed by administrators and assigned by architects to applications.



Application Assessment

Assess your Application Portfolio for containerization suitability



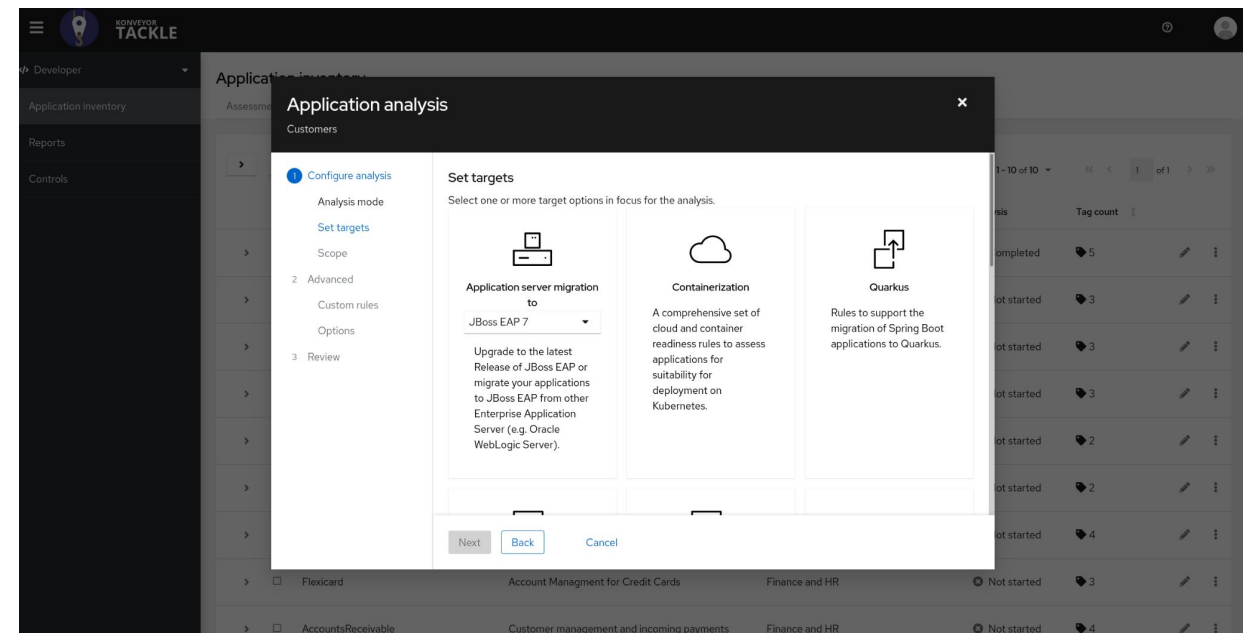
- ▶ A questionnaire based tool that assesses the suitability of applications for deployment in containers within an enterprise Kubernetes platform
- ▶ The reports provide information about the suitability of the applications for containerization, highlighting risks and producing an adoption plan informed by effort, priority and dependencies



Application Analysis

Get precise data about your Application Portfolio and estimate migration cost


- ▶ Analyzes application source code and binaries and helps estimating the migration effort for different targets or paths
- ▶ Decompiles and analyzes Java applications executing an extensible set of rules to identify issues
- ▶ Support numerous migration paths and creates a rich set of reports



Application Analysis

Issue identification

TACKLE ANALYSIS



[All Applications](#) [Dashboard](#) [Issues](#) [Application Details](#) [Technologies](#) [Dependencies](#) [JPA](#) [Hard-coded IP Addresses](#) [About](#) [Send Feedback](#)

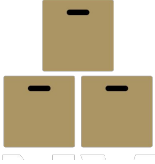
Issues

source

Cloud Mandatory				
Issue by Category	Incidents Found	Story Points per Incident	Level of Effort	Total Story Points
Legacy configuration with io.konveyor.demo.config.ApplicationConfiguration	2	1	Trivial change or 1-1 library swap	2
Hard-coded IP address	1	1	Trivial change or 1-1 library swap	1

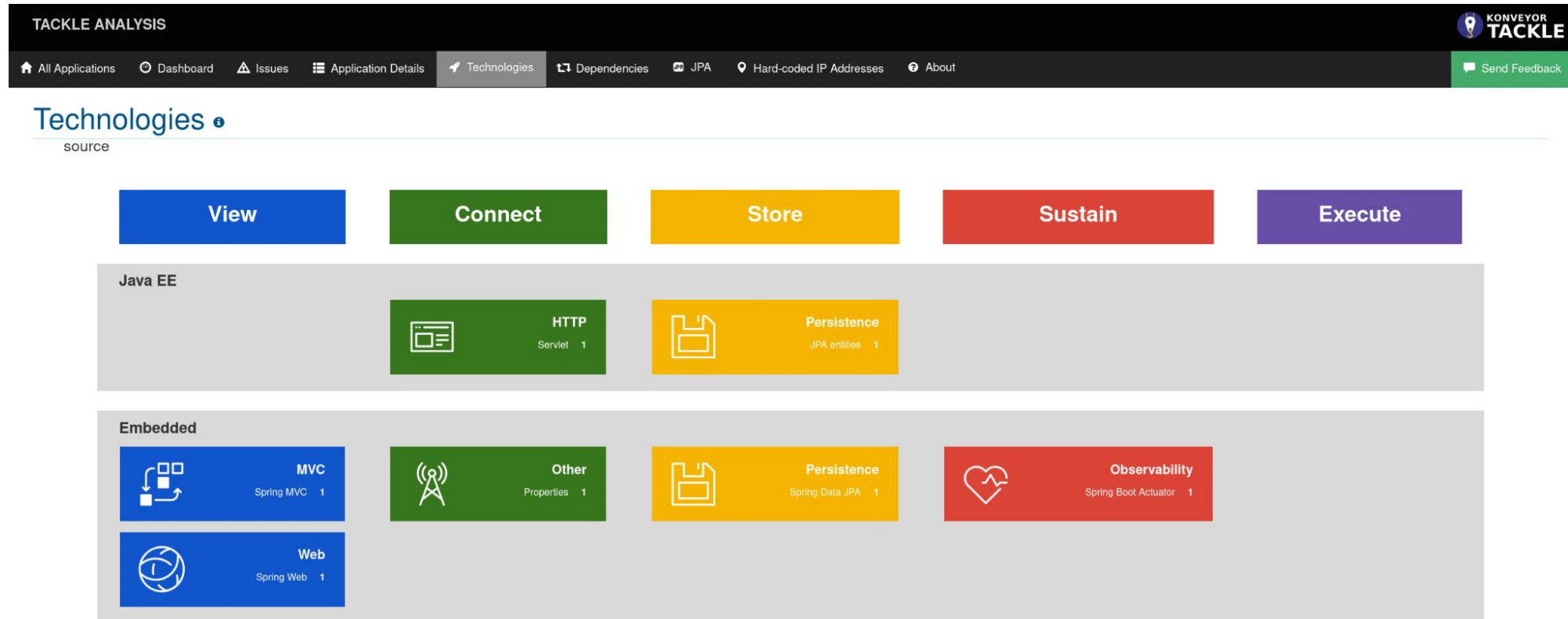
File	Incidents Found	Hint
src/main/resources/persistence.properties	1	<div>Issue Detail: Hard-coded IP address</div> <div>Hard-coded IP: 10.19.2.93</div> <div>When migrating environments, hard-coded IP addresses may need to be modified or eliminated.</div>
3		3

Information				
Issue by Category	Incidents Found	Story Points per Incident	Level of Effort	Total Story Points
Maven POM (pom.xml)	1	0	Info	0
Embedded framework - Spring Web	1	0	Info	0
Embedded library - Spring MVC	1	0	Info	0
Embedded library - Spring Boot Actuator	1	0	Info	0
Embedded Spring Data JPA	1	0	Info	0
Java Servlet	1	0	Info	0
6		0		



Application Analysis


Technologies report



Application Analysis

Dependencies identification

TACKLE ANALYSIS

 KONVEYOR
TACKLE

[All Applications](#) [Dashboard](#) [Issues](#) [Application Details](#) [Technologies](#) [Dependencies Graph](#) [Dependencies](#) [JPA](#) [Hard-coded IP Addresses](#) [Ignored Files](#) [About](#) [Send Feedback](#)

Dependencies

customers-tomcat-0.0.1-SNAPSHOT.war

log4j-api-2.14.1.jar

Maven coordinates: [org.apache.logging.log4j:log4j-api:2.14.1](#)

SHA1 hash: cd8858fbbde69f46bce8db1152c18a43328aae78

Version: 2.14.1

Organization: Apache

Found at path: customers-tomcat-0.0.1-SNAPSHOT.war/WEB-INF/lib/log4j-api-2.14.1.jar

log4j-to-slf4j-2.14.1.jar

Maven coordinates: [org.apache.logging.log4j:log4j-to-slf4j:2.14.1](#)

SHA1 hash: ce8a86a3f50a4304749828ce68e7478cafbcb8039

Version: 2.14.1

Organization: Apache

Found at path: customers-tomcat-0.0.1-SNAPSHOT.war/WEB-INF/lib/log4j-to-slf4j-2.14.1.jar

tomcat-juli-9.0.46.jar

SHA1 hash: 409b519751e104eab51b4347a0d27b186a413bb1

Version: 9.0.46

Organization: Apache Software Foundation

Found at path: customers-tomcat-0.0.1-SNAPSHOT.war/WEB-INF/lib/tomcat-juli-9.0.46.jar

tomcat-jdbc-9.0.46.jar

SHA1 hash: 385cb6cb1f6b26c881cd5c1c6ade5f180712fddc

Organization: Apache Software Foundation

Found at path: customers-tomcat-0.0.1-SNAPSHOT.war/WEB-INF/lib/tomcat-jdbc-9.0.46.jar

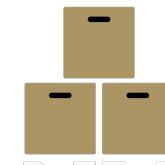
aspectjrt-1.9.6.jar



Application Analysis

Migration paths out of the box

Source Platform	Targets							
	Migration to JBoss EAP 7	Cloud Readiness	OpenJDK 8 & 11	Jakarta EE 9	Camel 3	Spring Boot in Red Hat Runtimes	Quarkus	Open Liberty
Oracle WebLogic Server	✓	✓	✓	-	-	-	-	-
IBM WebSphere Application Server	✓	✓	✓	-	-	-	-	✓
JBoss EAP 4	✗ [1]	✓	✓	-	-	-	-	-
JBoss EAP 5	✓	✓	✓	-	-	-	-	-
JBoss EAP 6	✓	✓	✓	-	-	-	-	-
JBoss EAP 7	✓	✓	✓	-	-	-	-	-
Thorntail	✓ [2]	-	-	-	-	-	-	-
Oracle JDK	-	✓	✓	-	-	-	-	-
Camel 2	-	✓	✓	-	✓	-	-	-
Spring Boot	-	✓	✓	✓	-	✓	✓	-
Any Java application	-	✓	✓	-	-	-	-	-
Any Java EE application	-	-	-	✓	-	-	-	-

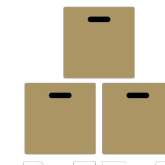


Application Analysis

Custom rules development

- ▶ For your own Frameworks
 - “If you encounter this - here is how you migrate”
- ▶ Also great for large engagements, once you have built your “cookbook”
- ▶ Provide internal guidance and link directly to your documentation

```
<rule id="cookbook-eap7-02000" xmlns="http://windup.jboss.org/schema/jboss-ruleset">
  <when>
    <javaclass references="weblogic.utils.StringUtils.{*}" />
  </when>
  <perform>
    <hint category-id="mandatory" effort="1" title="WebLogic StringUtils usage">
      <message>Replace with the `StringUtils` class from Apache Commons.</message>
      <link href="https://commons.apache.org/proper/commons-lang/" title="Apache Commons Lang"/>
      <message>Also, check the wiki for an example in conjunction with our XYZ-SUPERFRAMEWORK</message>
      <link href="https://our.internal.wiki/migration/StringUtils/" title="StringUtils usage and"/>
      <tag>weblogic</tag>
    </hint>
  </perform>
</rule>
```



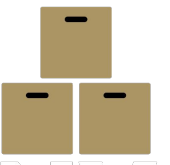
Building Tackle together



Tackle Initiatives

Different projects under the Tackle umbrella

- ▶ Tackle Hub - Red Hat
- ▶ Pathfinder - Red Hat
- ▶ Windup - Red Hat
- ▶ Containerization Assessment - IBM Research
- ▶ Automated Configuration Discovery (ACD) - IBM Research
- ▶ Data Intensive Validity Advisor (DiVA) - IBM Research
- ▶ Test-driven Modernization - IBM Research



Tackle Roadmap



Tackle Roadmap

Tackle Analysis Integration



Tackle 2 beta is out now!!

Demo Tomorrow 16:15

Red Hat Booth Demo

Theater



Questions?



Thank you!

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Senior Product Manager
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Migration Solutions
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