Application Modernisation with Transformation Advisor

Meetup Sydney: Application Modernisation - tools and techniques

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Agenda

Containers – Overview and Benefits

Transformation Advisor

Example Results

Example Migration

What is so good about containers anyway?

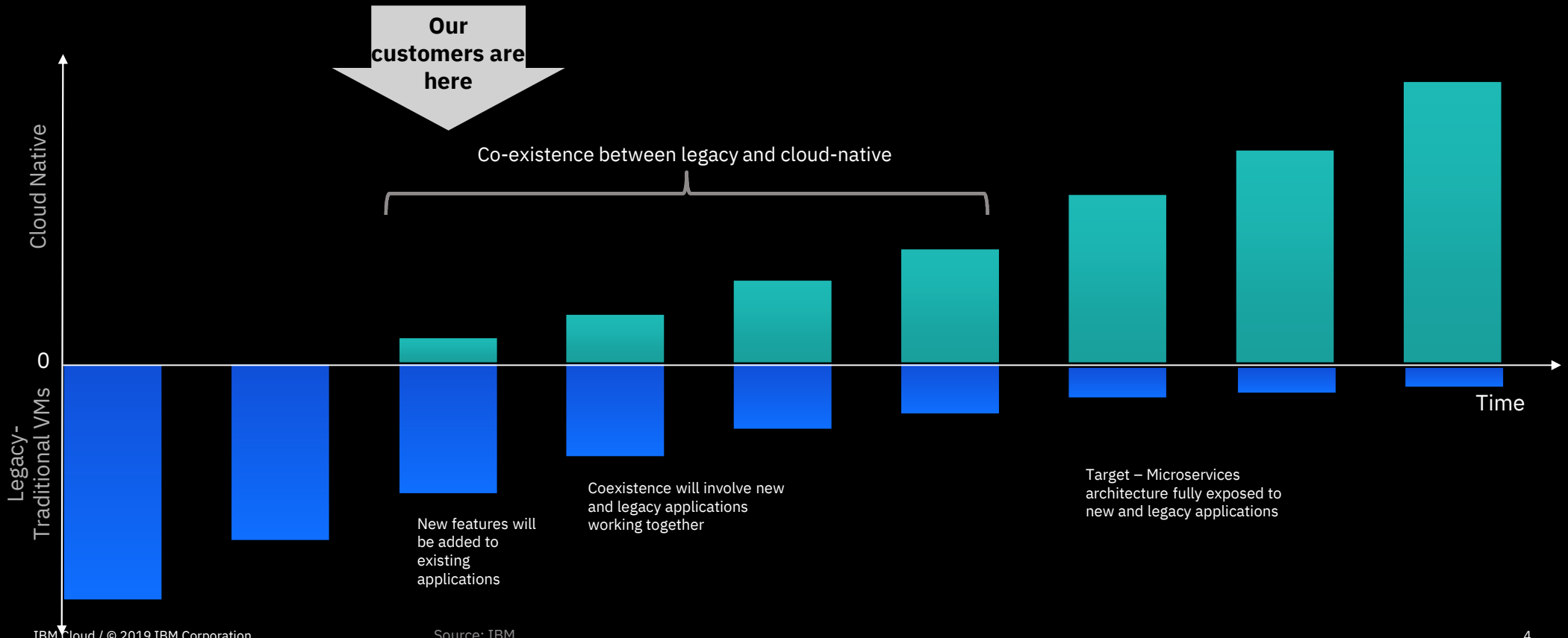
Traditional Virtualisation provides hardware abstraction, allowing multiple instances of Operating System on a single hardware.

Compared to virtual machines, Container-based-virtualisation provide lightweight solutions by abstracting Operating System, where multiple workloads share the kernel host operating system.

Benefits of Containers:

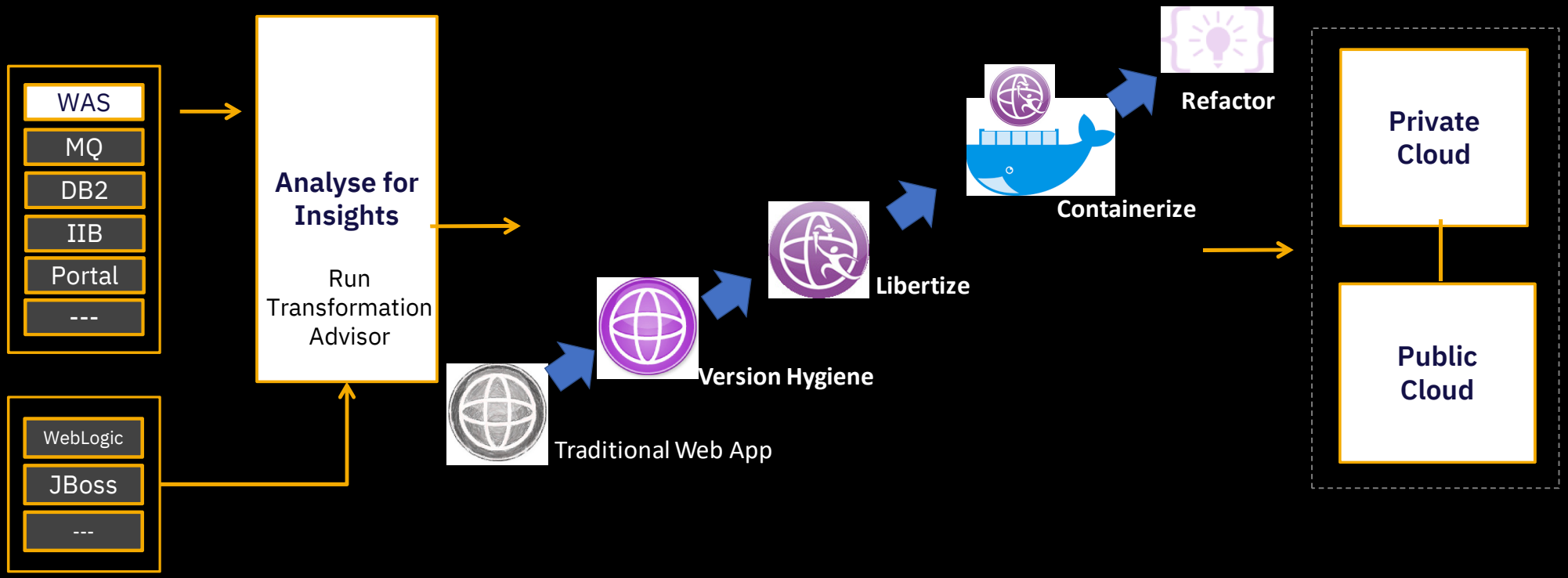
1. Agility and Productivity
2. Fine-grained resiliency
3. Scalability and Infrastructure optimisation
4. Operational Consistency
5. Component Portability

Cloud native & legacy apps will co-exist for the next 10+ years

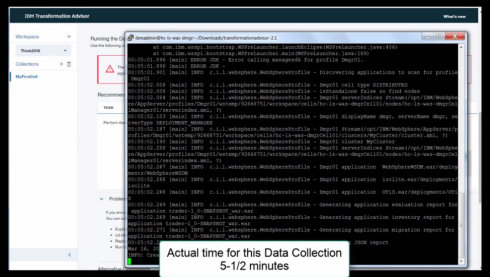


Source: IBM

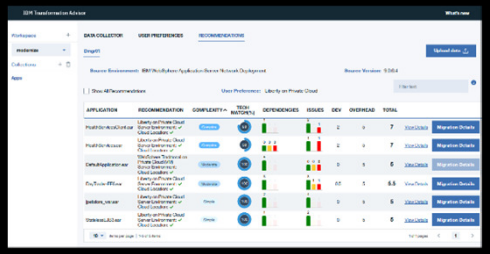
Modernise Apps – Overall process



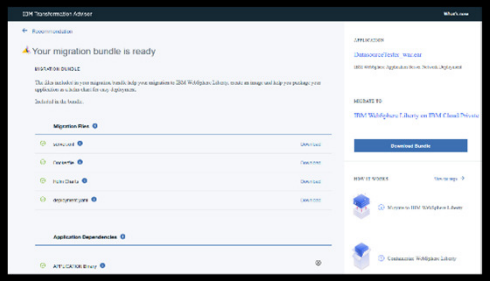
How it works.



1. **Run Data Collector** against existing system and application environment to gather information about how the Java applications are deployed



2. **Provides recommendations** and insights by utilising binary scanners and migration config tools



3. For WebSphere 7 and above - **Generates customized deployment artifacts** for faster migrations to containers.

IBM Cloud Transformation Advisor

Quickly evaluate on-premises Java EE apps for deployment to the cloud

Deployed on Docker + Kubernetes environments.

Introspects WebSphere, WebLogic and JBoss deployments

Provides recommendations and automation for App Modernisation

Analysis Report

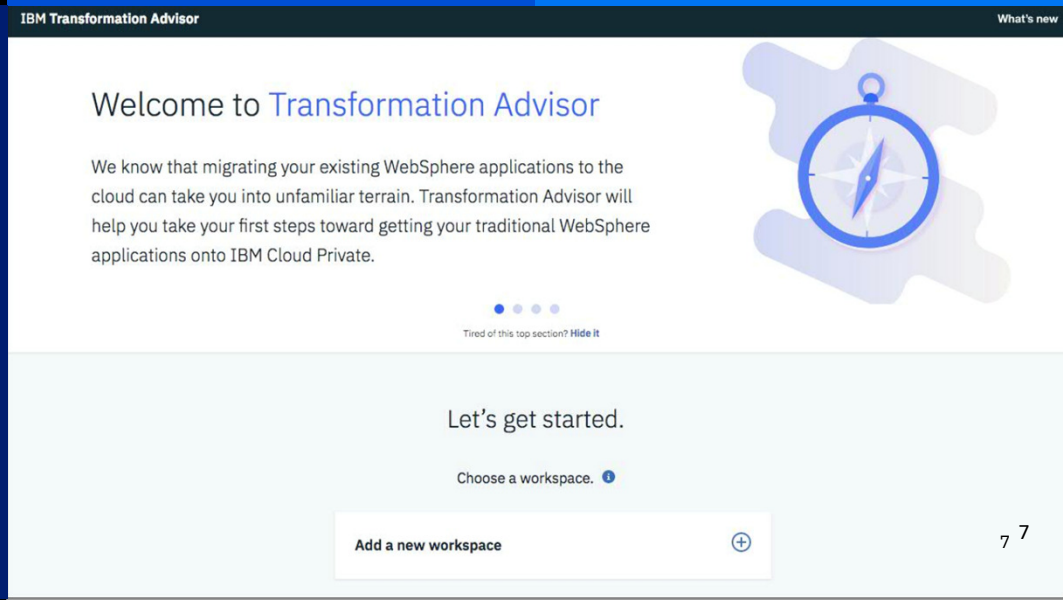
Potential issues, severity & possible solutions

Technology Report

Details on IBM platform support for technologies used in the app

Inventory Report

High-level inventory of application content and structure



Transformation Advisor: Re-platform to Liberty

Deep analysis moving to WebSphere Liberty from these application servers

WebSphere traditional

Application

- Java EE differences (6, 7, 8)
- Deprecated Java EE technologies not available
- WebSphere traditional APIs not available
- Third-party APIs not available
- Behavior changes between WebSphere traditional and Liberty
- Bindings and extension differences
- MBean differences

Configuration

- Liberty server.xml, Dockerfile, Helm Charts, yaml and Jenkins file

Java SE – applies to all app servers

Application

IBM/Oracle Java differences (Java 5, 6, 7 to Java 8)

- Behavior differences
- Interface changes
- New exceptions

WebLogic

Application

- WebLogic APIs
- WebLogic deployment descriptors
- WebLogic JDBC properties
- WebLogic JPA differences
- WebLogic login modules
- WebLogic MBeans
- WebLogic servlet differences
- WebLogic-specific JNDI property values
- T3 protocol
- WebLogic-specific SSL protocols
- WebLogic startup and shutdown classes
- WebLogic transaction differences
- BEA Beehive
- EJB implementation differences
- JSP file considerations
- Framework considerations
- Logging differences

Configuration

- Liberty server.xml, Dockerfile, Helm Charts, yaml and Jenkins file

JBoss

Application

- JBoss APIs
- JBoss deployment descriptors
- JBoss JNDI property values
- JBoss login modules
- JBoss manifest class path
- JBoss MBeans
- JBoss naming lookup strings
- JBoss startup/shutdown logic
- JSP file considerations
- Framework considerations

Configuration

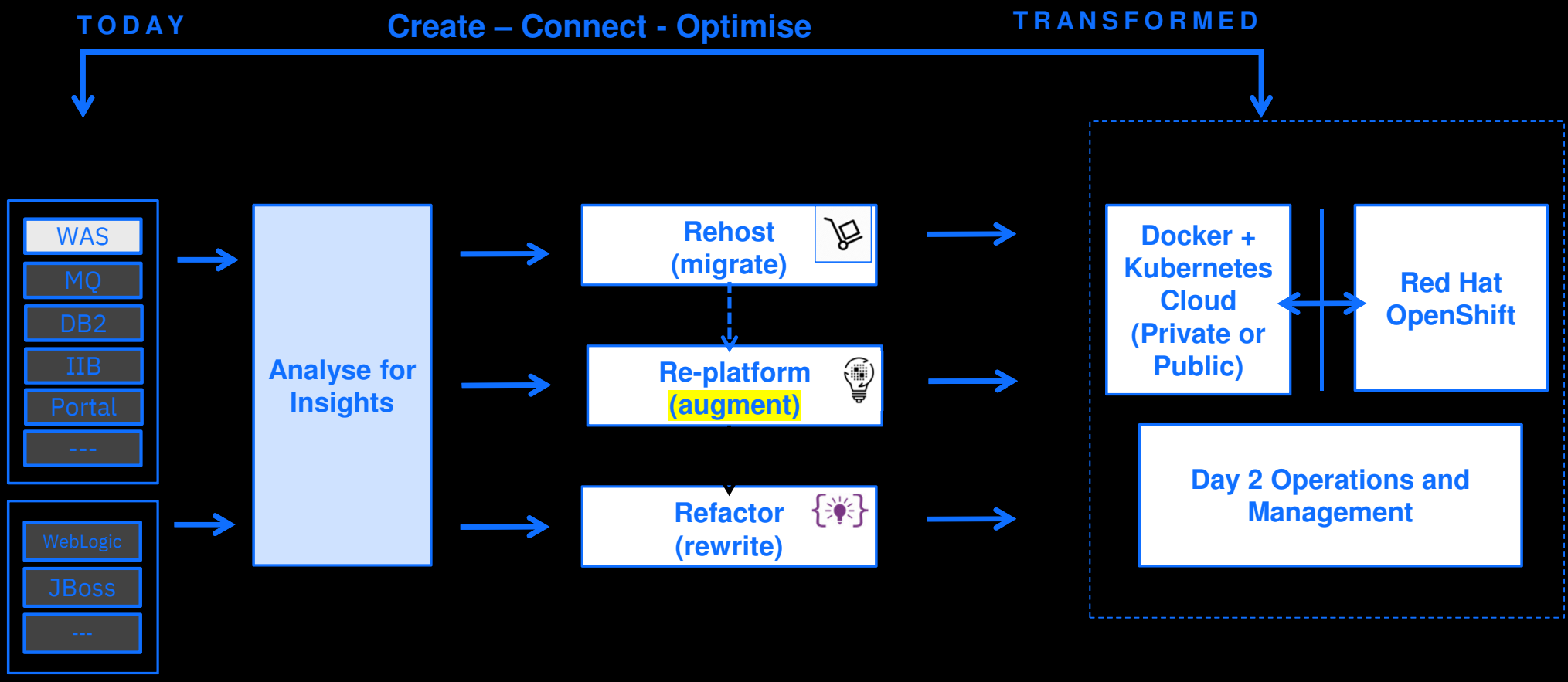
- Liberty server.xml, Dockerfile, Helm Charts, yaml, and Jenkins file

Cloud – applies to all app servers

Application

- Connectivity considerations for remote data or services
- Considerations for an ephemeral runtime
- File system considerations in Docker

IBM TA is part of our Application Modernisation Framework



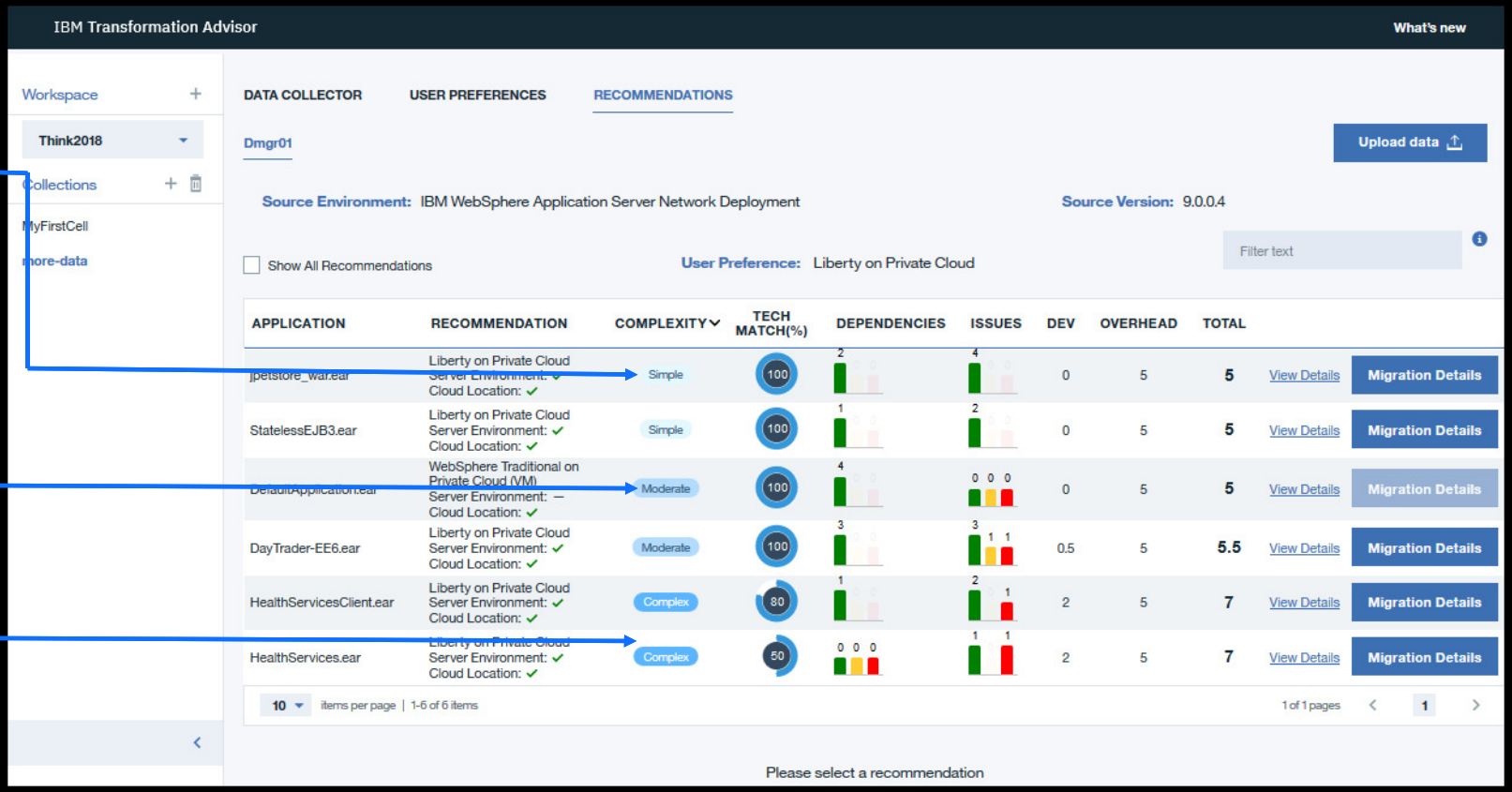
IBM Transformation Advisor – Interpreting results

Creates application inventory, estimates modernisation effort and provides insights and guidance …

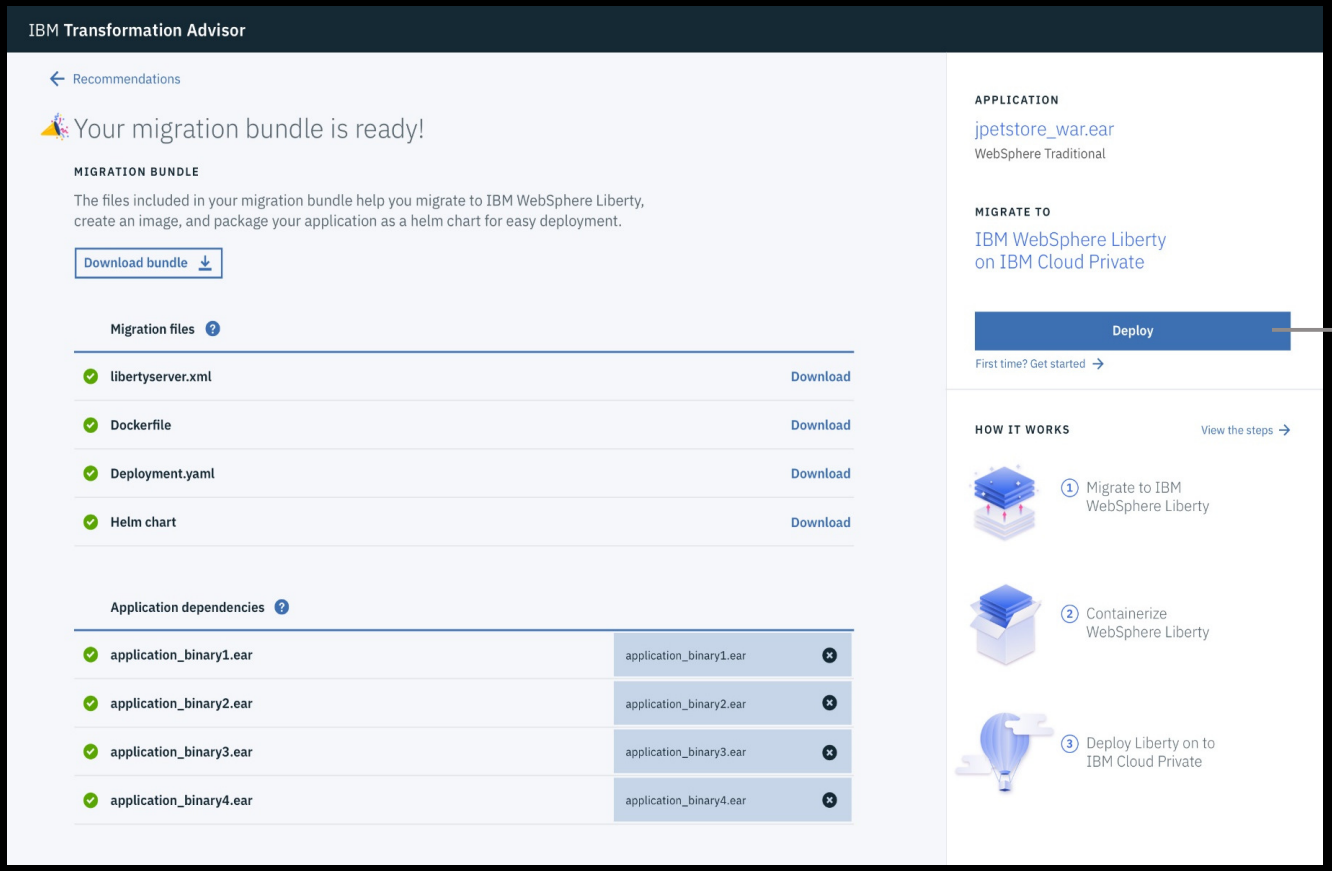
Simple:
No code changes

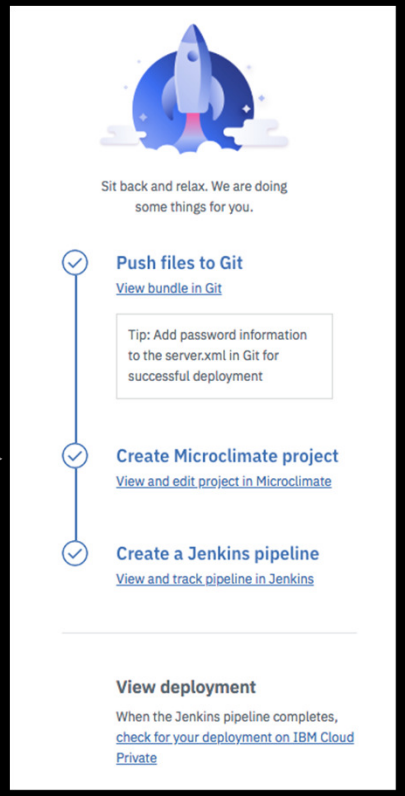
Moderate:
Some refactoring needed

Complex:
May decide to run in WAS in VMs before re-engineering or run in tWAS containers as a temporary measure.



Automate Simple Migrations





Steps that occur behind the scenes to move the app over to containers

Containerisation – Efforts - Orders of Magnitude

Low

These applications should require little or no application code changes to run on Cloud Private (Kubernetes) in a WebSphere Liberty Runtime.

Medium

These applications require some application code changes and upgrading to newer technologies, but overall effort to run on Cloud Private (Kubernetes) in a WebSphere Liberty runtime is low-medium.

High

These applications require an IBM Cloud Garage-led workshop to determine how to address their significant use of old third-party and IBM-provided technologies that are not available on a WebSphere Liberty runtime.

1-5 PDs per App

5-10 PDs per App

~15+ PDs per App

What doesn’t Transformation Advisor tell me?

- Stateful applications
- Shared Libraries/Classpath
- External Cache/DynaCache
- Extreme Scale
- Work Managers/Timers
- Java 2 Security
- HTTP Server Configuration/Static Content

IBM Transformation Advisor – putting it all together

Transformation Advisor created all the artifacts, we created a repo in github:

https://github.com/cmejia2/my-appmod-resorts

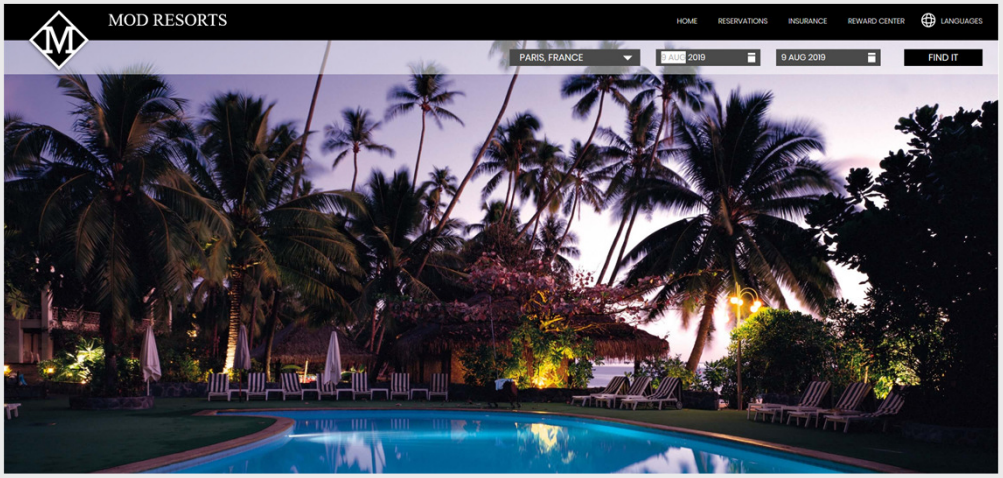
And then built and run the container:

```
# docker build --no-cache -t demotransadv:latest .
# docker images | grep demo
demotransadv                                latest              af8ac6ef6574        About a minute ago   615MB

# docker run -d -p 9080:9080 demotransadv:latest
# docker ps | grep demo
fee9a78bd29b        demotransadv:latest     "/opt/ibm/helpers/ru..."   23 seconds ago      Up 22 seconds       0.0.0.0:9080->9080/tcp, 9443/tcp   vigilant_swanson
# docker exec -it fee9a78bd29b /bin/bash

$ hostname
fee9a78bd29b
$ ls -al opt/ibm/wlp/usr/servers/defaultServer/apps
-rw-rwxr-- 1 default root 8544389 Aug  9 01:42 modresorts.war
$ exit
```

http://mycluster.icp:9080/resorts/



Other deployment options:

- Helm Charts => Kubernetes
- Microclimate + Jenkins
- CodeWin + Red Hat OpenShift
- Traditional (tWAS) vs Liberty

Thank You !!!

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