



# IBM Cloud Private Practical Workshop

## Application Modernization



# Cloud accelerates business transformation

- Innovate with the latest technology from any source
- Access more types of data, analytics & AI, anywhere
- Improve return on existing investments



Yet less than 20% of enterprise workloads have moved to date. Why?

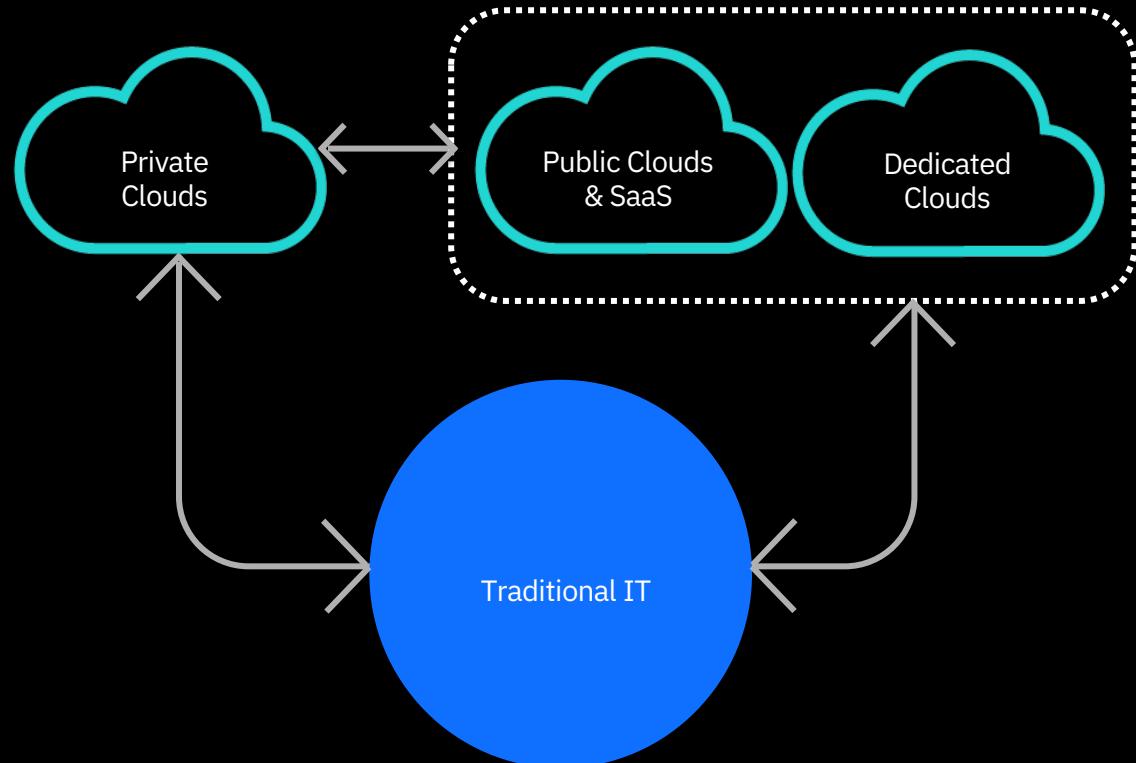
Source: McKinsey research

# What's preventing rapid modernization of the remaining 80%?

**Unique workload needs** – compliance, security, location - requires more choice

**Multiple clouds & vendors** – hard to connect / manage across clouds and IT

**Lack of necessary skills** – how do you prioritize and deliver modernization



## Cloud

90,000 experts  
100,000 migrations  
38 global studios

## Security

60 Billion security events managed per day

## Data

20,000 data scientists, developers, and consultants

## Industry

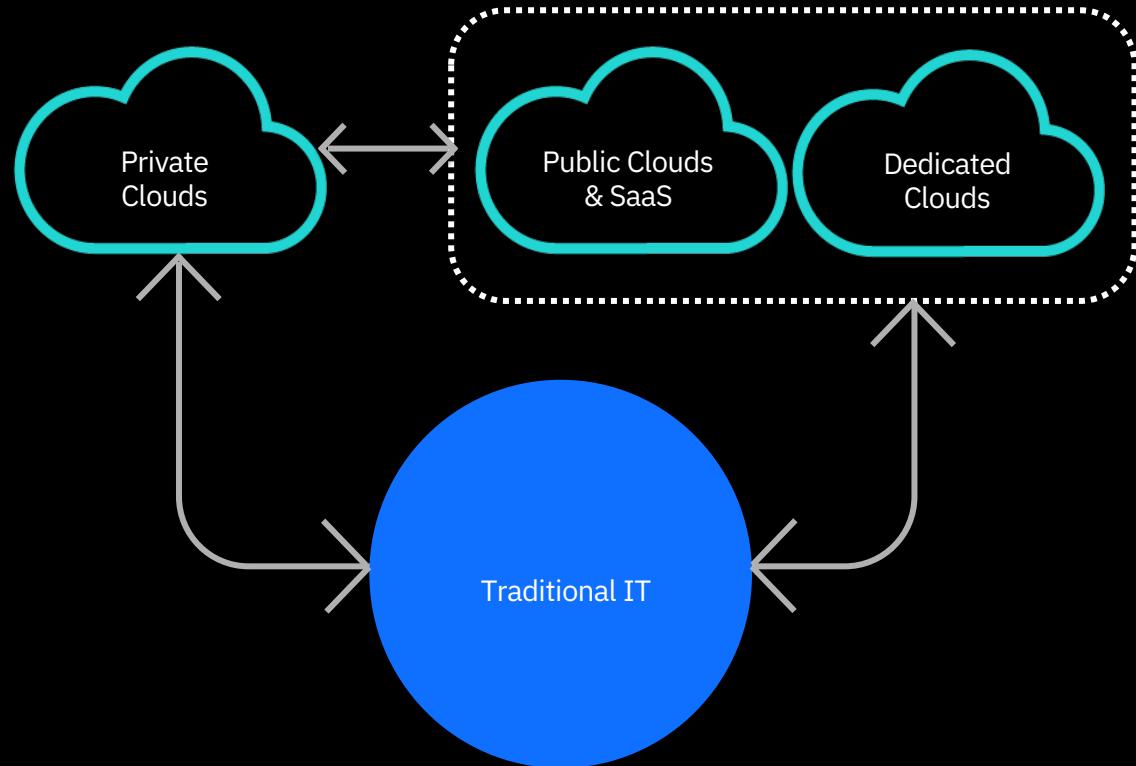
Depth in 20 industries  
\$6 billion in R&D;  
Patent Leader 25 yrs

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# The 6R's in Cloud Migrations

## Retain

Not Moving  
Continuing to operate in the current environment

## Retire

Decommissioning  
Getting rid of applications / resources no longer needed

## Rehost

Lift & Shift  
Fast, predictable, repeatable, and economical.  
Minimal changes to operate in the cloud

## Replatform

Changing the platform only  
Some changes to applications may be needed

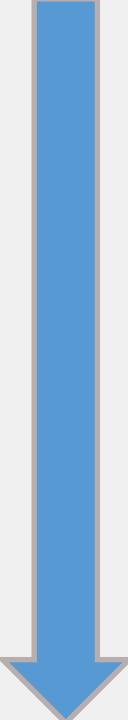
## Refactor

Architecting as cloud native applications  
Major or Minor changes to application design & code

## Repurchase

Replacing with better alternatives  
Choosing SaaS or Cloud friendly licensing

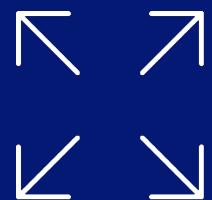
# Comparing Cloud Migration Strategies



Migration Complexity	Time	Cost to Migrate	Cost to Operate	Agility
Low				
Retain	+	+	++++	
Retire	++	+		
Rehost	++	++	+++	++
Replatform	+++	+++	++	+++
Repurchase	+++	+++	++	+++
Refactor	++++	++++	+	++++
High				

# Application modernization accelerates *Digital Transformation*

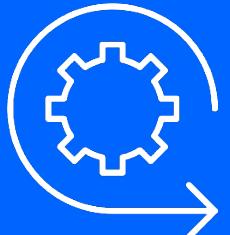
Flexibility



Agility



Adaptive  
Automation



Digital  
Transformation

# Application modernization

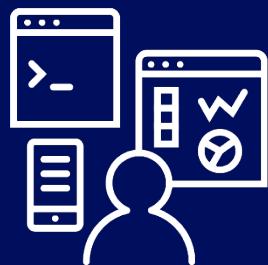
- ✓ Improves developer productivity
- ✓ Increases operational efficiency
- ✓ Reduces cost to build new capabilities
- ✓ Expands capacity delivered in a short time



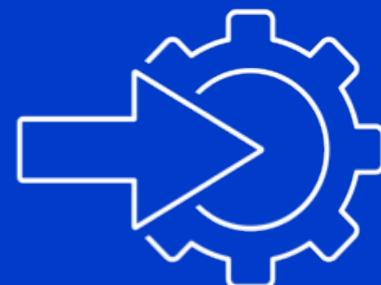
# Choosing what apps to move to cloud

## *Assess and Plan*

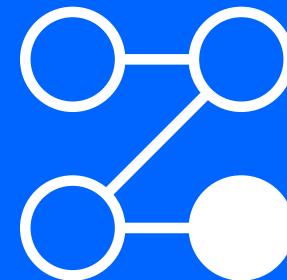
What applications  
do I have on  
premise?



Will they be easy  
or problematic to  
move?



Which ones should  
I move first?

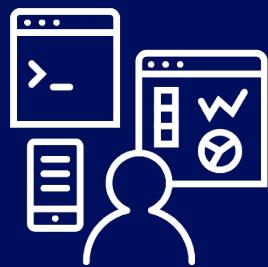


What resources  
and time will I  
need to invest?

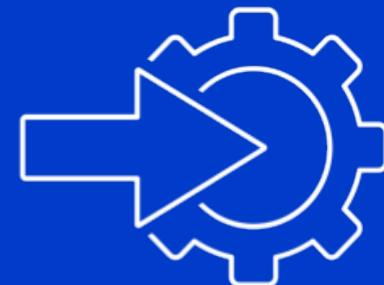


# IBM Cloud Advisory Services

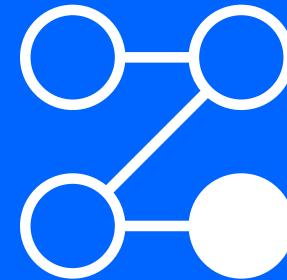
Gather information  
on existing apps &  
supportive  
environment



Determine  
adoption  
readiness



Provides and  
actionable  
roadmap



Make the best  
decisions based  
on best practices



# Public Cloud

Backup & archive

Front office/desktop

ERP

Big data & analytics

Disaster recovery

# Private Cloud

Workloads needing low latency to back ends

Existing database workloads

Applications with sensitive data

# Maintain & Evolve

Applications with complex processes and transactions

Highly customized applications

Not yet virtualized applications

Data sovereignty / residency

Regulation-intensive applications

Information-intensive applications

Batch processing

# Choosing your cloud platform: matching the right workload to the right cloud

Enterprise transformation required for cloud adoption

DevOps | Governance | Integration  
Security | Architecture | Culture

Web applications/ e-commerce

Digital experience solutions

Customer service

Enterprise social solutions

Third-party applications

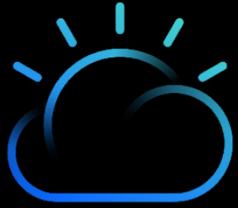
Mobile applications

Non-core business processes

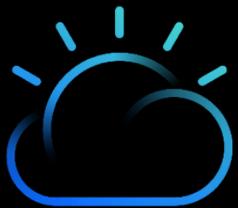
Development and test workloads

\* IBM Institute for Business Value study,  
"Tailoring Hybrid Cloud" August 2016

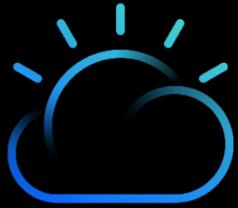
# Finding Where Your Workloads Thrive



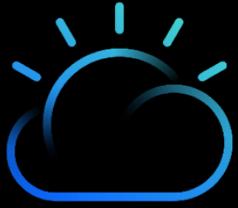
**Public**



**Dedicated**



**Bare Metal**



**Private**



**On-Prem**



## *Common workloads*

*e.g. Systems of Engagement: Web, Mobile, IoT, AI, Video*

*e.g. Security sensitive, regulated, federal*

*e.g. Lift & shift: VMware, SAP, WAS; high perf. computing*

*e.g. Systems of record, security sensitive, regulated*

*e.g. Complex monolithic, mainframe, legacy*

Modernize  
and Extend

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Migrate

Cloud Native

**Hybrid**  
is the path

**Cloud**  
is the destination



# IBM capabilities for application modernization

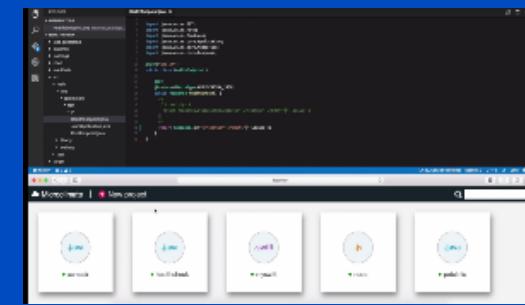


## Assess & Plan

Cloud Transformation  
Advisor

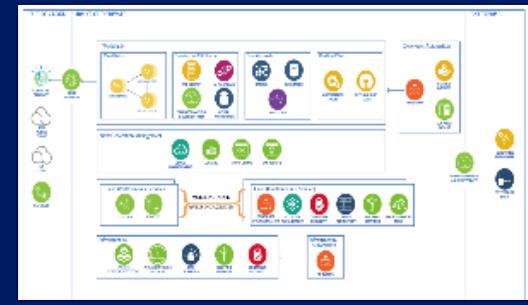


**Enterprise-grade services catalog**  
IBM certified software  
for Kubernetes



## DevOps

Microclimate,  
UrbanCode and Testing



## Best Practices

Garage Method &  
Services

# IBM Cloud Product Insights Transformation Advisor

*quickly evaluate on-premises Java EE & MQ apps for deployment to the cloud*

Provides recommendations and artifacts for Application Modernization

## Analysis Report

Potential issues, severity & possible solutions

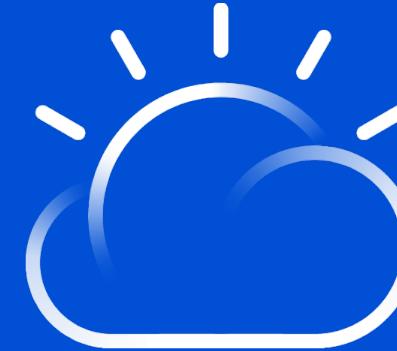
## Technology Report

Details on IBM platform support for technologies used in the app

## Inventory Report

High-level inventory of application content and structure

Included and deployed on IBM Cloud Private



Introspects WebSphere deployments



IBM Transformation Advisor

Source Environment: IBM WebSphere Application Server Network Deployment      Source Version: 9.0.0.4

Show All Recommendations      User Preference: Liberty on Private Cloud

Filter text

APPLICATION	RECOMMENDATION	COMPLEXITY	TECH MATCH(%)	DEPENDENCIES	ISSUES	DEV	OVERHEAD	TOTAL	View Details	Migration Details
sampleMDB.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Simple	100	2	0 0 0	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
StatelessEJB3.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Simple	100	1	2	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
StatefulEJB3.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Simple	100	2	2	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
pbw-ear.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Simple	100	3	0 0 0	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
DayTrader-EE6.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Moderate	100	3	1 1 0	0.5	5	5.5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
itcamdemo.ear	WebSphere Traditional on Private Cloud (VM) Server Environment: -- Cloud Location: ✓	Moderate	100	9	4	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
DefaultApplication.ear	WebSphere Traditional on Private Cloud (VM) Server Environment: -- Cloud Location: ✓	Moderate	100	4	0 0 0	0	5	5	<a href="#">View Details</a>	<a href="#">Migration Details</a>
NewDatabaseEARProject.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Complex	50	2	1	2	5	7	<a href="#">View Details</a>	<a href="#">Migration Details</a>
POS-EAR.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Complex	66	3	1	2	5	7	<a href="#">View Details</a>	<a href="#">Migration Details</a>
LegacyEARProject.ear	Liberty on Private Cloud Server Environment: ✓ Cloud Location: ✓	Complex	50	2	1	2	5	7	<a href="#">View Details</a>	<a href="#">Migration Details</a>

10 items per page | 1-10 of 17 Items

1 of 2 pages

# Classify Existing Apps Based on Migration Complexity

Migration Complexity

Simple:  
No code  
changes

Moderate:  
Code changes;  
moving to VMs

Complex:  
Incompatible  
technologies;  
external  
dependencies

Data collector		Recommendations																																																						
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Dmgr01	Liberty on Private Cloud	IBM WebSphere Application Server Network Deployment			9.0.0.4																																																			
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<p>Items per page: 10   1-6 of 6 items</p>																																																								
<p>1 of 1 pages &lt; 1 &gt;</p>																																																								

# IBM Cloud Transformation Advisor for MQ

**Simple:**  
DNS  
reconfiguration  
required

**Complex:**  
Porting Binaries  
required and/or  
Complex Security  
Reconfiguration  
required

**Moderate:**  
Cluster  
reconfiguration  
required

IBM Cloud Transformation Advisor

Recommendations

Source environment: IBM MQ | Installation: Install-01 | Preferred migration: MQ on Private Cloud

Search items

Queue Manager	Issues	Total effort in days	
Apples	Simple	None	1
Bananas	Simple	3	0.5
Grapes	Complex	1   1   3	8
Kiwis	Moderate	2   1   1	5.5
Starfruit	Moderate	2   1	3
Strawberries	Simple	2   1	3

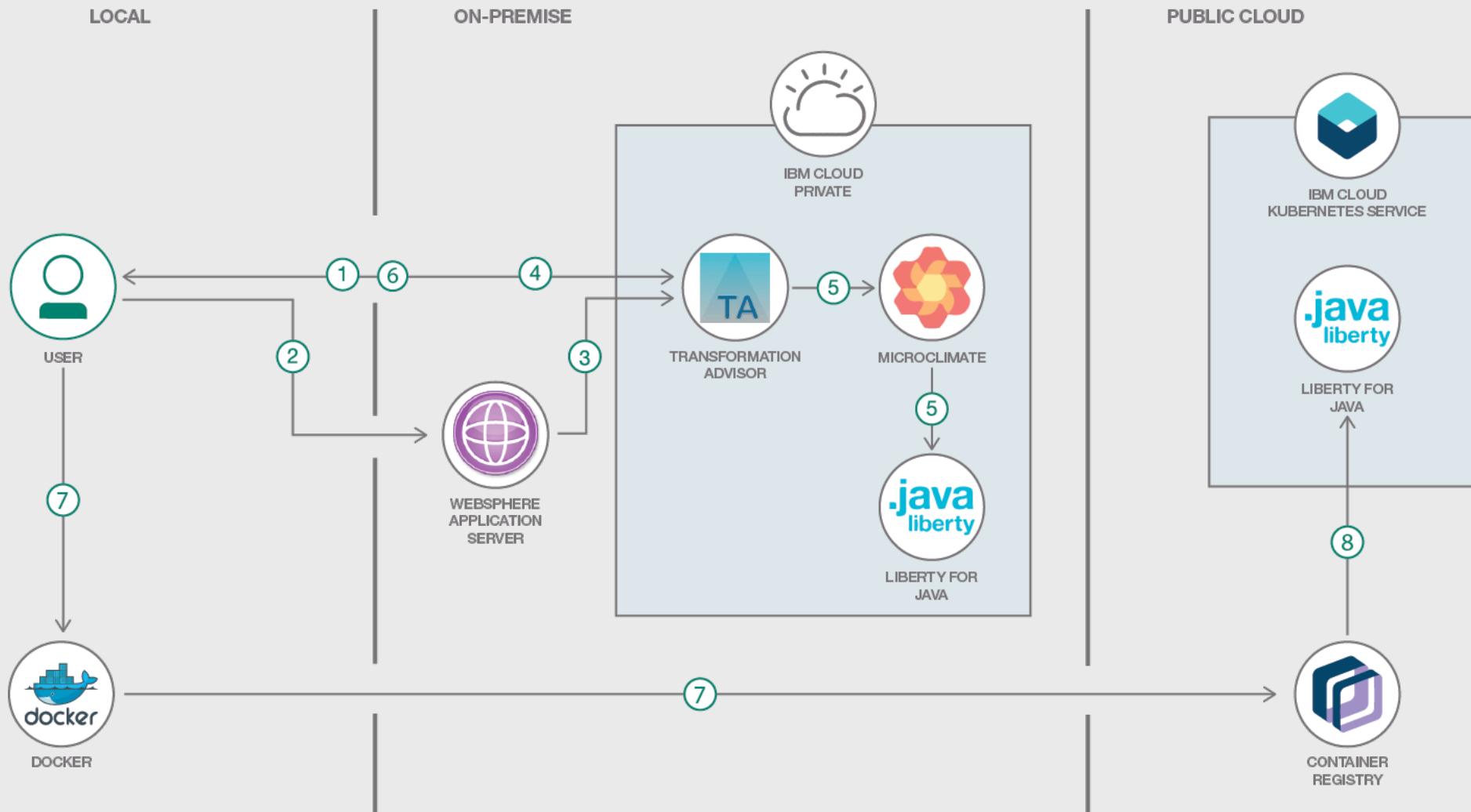
Items per page: 10 | 1 - 6 of 6 items

Export | Upload options

What's new | Join us on Slack

The screenshot shows the IBM Cloud Transformation Advisor interface. On the left, there's a sidebar with 'Workspace' (modernize), 'Collections' (mq data, mq data 02), and links for 'What's new' and 'Join us on Slack'. The main area is titled 'Recommendations' and displays information about a source environment (IBM MQ), installation (Install-01, Version 7.0.0.0), and preferred migration (MQ on Private Cloud). It lists six queue managers: Apples, Bananas, Grapes, Kiwis, Starfruit, and Strawberries. Each entry shows its status (Simple, Complex, or Moderate), issue count (represented by colored dots: green for simple, yellow for moderate, red for complex), and total effort in days. A search bar and export/upload options are at the top right.

# App Modernization using Transformation Advisor and Microclimate



## IBM Transformation Advisor

# Welcome to Transformation Advisor

We know that migrating your existing WebSphere applications to the cloud can take you into unfamiliar terrain. Transformation Advisor will help you take your first steps toward getting your traditional WebSphere applications onto IBM Cloud Private.



• • • •

Tired of this top section? Hide it

Let's get started.

Choose a workspace. i

Add a new workspace



Most recently accessed. (1 total)

AppResorts

3 hours



# Ilmarinen accelerates innovation with IBM Cloud Private



## Business Needs

- Speed time to market
- Refactor monolithic applications that were hard to maintain and required a lot of resources

## Benefits

- Faster time to market through improved DevOps practices in a secure, on-premises environment
- Greater efficiency and reduced costs through containerized approach

“Ilmarinen is excited about the capabilities in IBM Cloud Private as a flexible, compliant cloud-native platform that it can deploy and manage behind our firewall for creating new applications and modernizing traditional workloads,” said Jani Itkonen, Production Manager, Ilmarinen.



DevOps tools &  
techniques  
accelerates  
app modernization

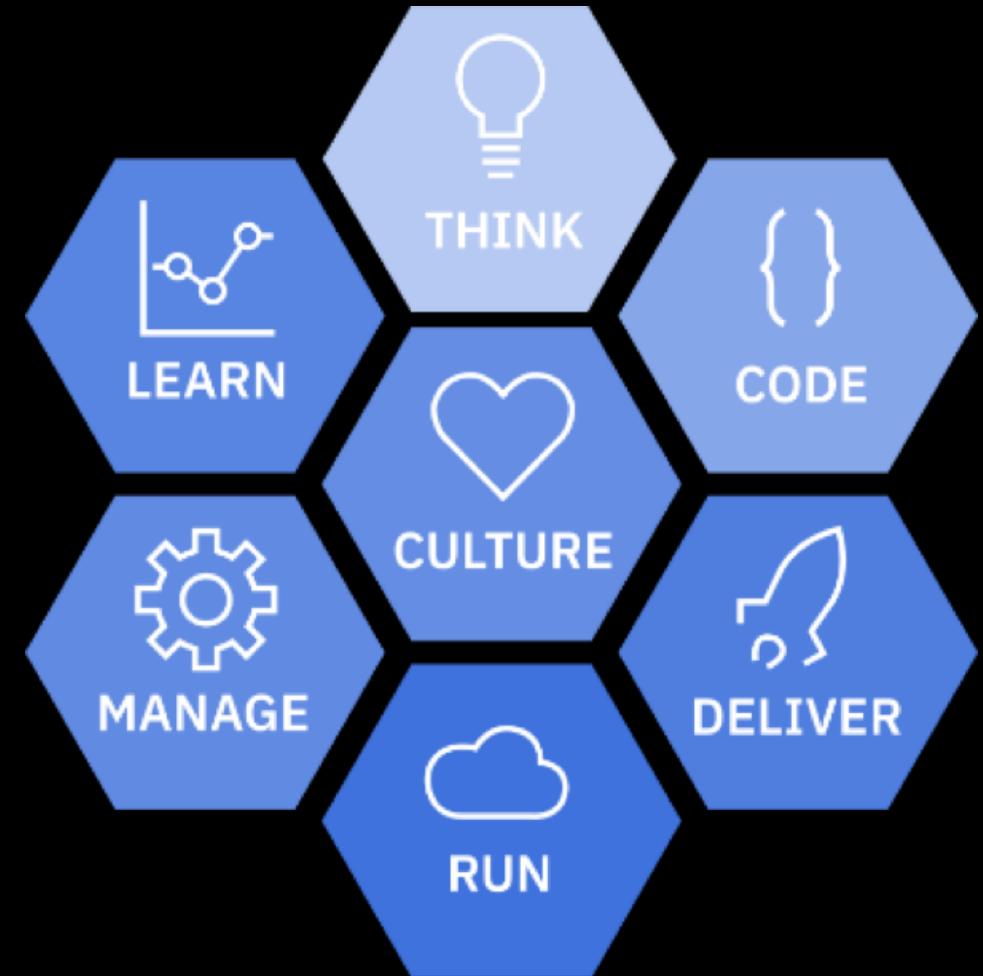
# DevOps

*Provision and Deploy anywhere - regardless of cloud vendor*

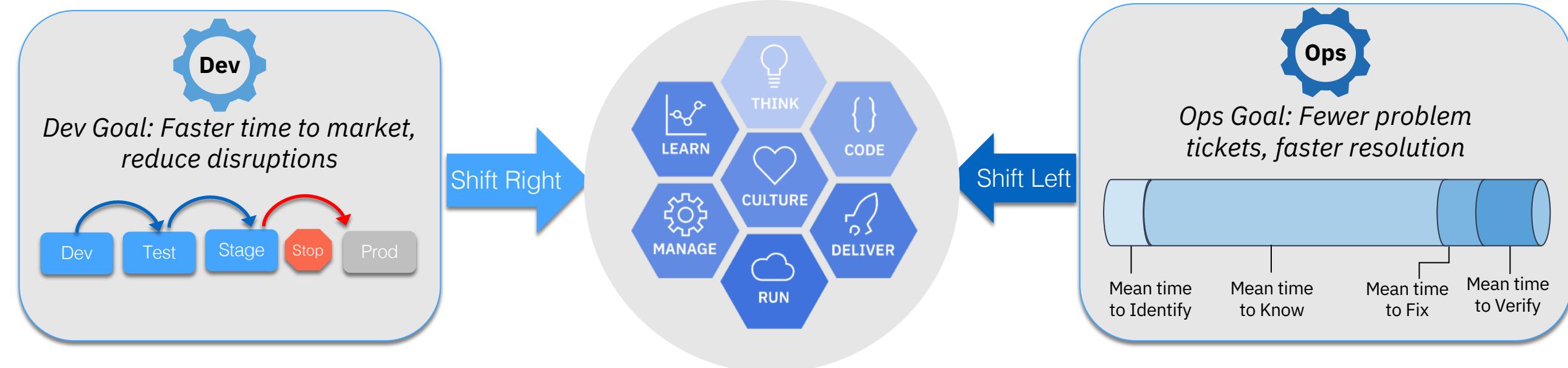
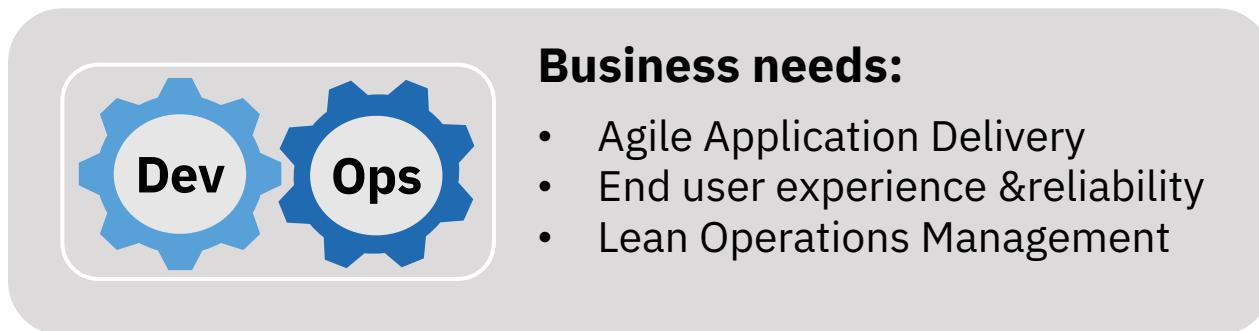
Rapidly compose and deliver new solutions and apps with APIs and microservices.

Continuously build, test and deploy high quality software.

Deploy apps and workloads regardless of cloud models and vendors – public, dedicated, private, on/off premises



# DevOps accelerates value for the Business



*Only IBM provides one solution for bridging **Dev** to **Ops***



- Embracing change in software delivery with DevOps
  - “Shift right” development
  - Accelerating delivery
  - Embracing multi-cloud
  - “Shift left” operations
  - DevOps insights

# “Shift right” development & the changing developer experience

- Create and Deliver new applications and services quickly



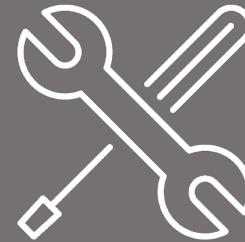
# Changing developer experience

**Create, edit, build, test and deploy**  
your applications via **Continuous Delivery pipelines** then run and manage them  
with **IBM Cloud**

3. Intelligent feedback



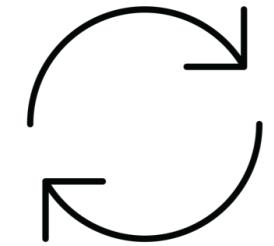
4. Diagnostic services



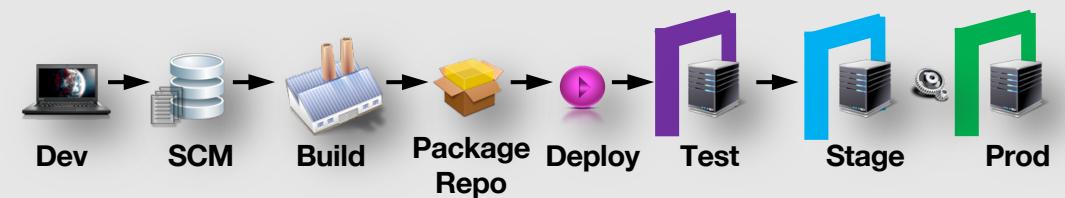
- 1. Containerized development



- 2. Rapid iteration



- 5. Integrated DevOps pipeline

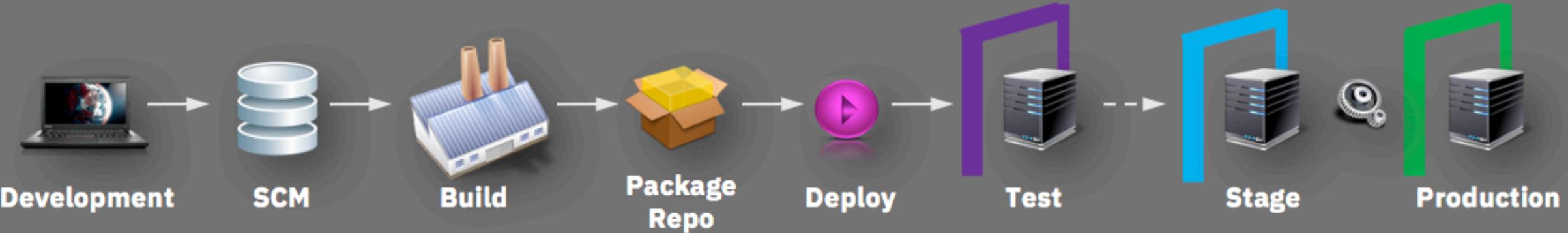


# Accelerating delivery

- DevOps practices that enterprises need to successfully deliver services and products quickly to the market place



# Accelerating delivery



Collaborative  
Development



Continuous  
Integration



Continuous  
Testing



Continuous  
Delivery



# Embracing multi-cloud

- Create and Deploy enterprise applications on market leading platforms



# Shift left operations

- Visibility, control and automation to manage apps and infrastructure anywhere



# Shift left to adaptively sense & respond to dynamic environments

Reactive

Real-time analytics



Proactive

Predictive insights



Adaptive

Cognitively enhanced workflow





## DevOps insights

- Improve agility, reliability, & security by using machine learning and analytics

# Capture insights and measure DevOps maturity to transform faster

Developer Insights



Team Dynamics



Deployment Risk



Delivery Insights



# How to get started ?

- [Learn about app mod @ Garage Architecture Center](#)
- [Field guide on IBM's POV on app mod](#)
- [Guided demo evaluating an on-prem app for cloud with Transformation Advisor](#)
- [See how a pension insurance company, Ilmarinen, modernized applications and accelerated change](#)
- [Learn and download Microclimate that provides end-to-end development experience](#)
- [Download IBM Cloud Private Community Edition](#)
- [Attend Think 2019 conference](#)

# Thank You!

# Backup

# IBM Cloud Transformation Advisor MQ Beta

**Simple:**  
DNS  
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required

**Complex:**  
Client  
Authentication  
reconfiguration

**Moderate:**  
Cluster  
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required,  
Changing  
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e.g. Exits

IBM Cloud Transformation Advisor

Recommendations

Source environment: IBM MQ | Installation: Install-01 | Preferred migration: MQ on Private Cloud

Search items

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Grapes	Complex	8
Kiwis	Moderate	5.5
Starfruit	Moderate	3
Strawberries	Simple	3

Items per page: 10 | 1 - 6 of 6 items

Export | Upload options

What's new | Join us on Slack

37

The screenshot shows the IBM Cloud Transformation Advisor interface. On the left, there's a sidebar with 'Workspace' set to 'modernize', 'Collections' containing 'mq data' (selected) and 'mq data 02', and sections for 'What's new' and 'Join us on Slack'. The main area is titled 'Recommendations' and displays a table of queue manager items. The table has columns for 'Queue Manager' (listing 'Apples', 'Bananas', 'Grapes', 'Kiwis', 'Starfruit', and 'Strawberries'), 'Issues' (with status icons), and 'Total effort in days'. A blue bracket on the left groups 'Apples', 'Bananas', and 'Strawberries' under the heading 'Simple'. Another blue bracket groups 'Grapes', 'Kiwis', and 'Starfruit' under the heading 'Complex'. A third blue bracket groups 'Bananas' and 'Grapes' under the heading 'Complex'.

# Classify Existing Apps Based on Migration Complexity

Migration Complexity

Simple:  
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Moderate:  
Code changes;  
moving to VMs

Complex:  
Incompatible  
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Data collector		Recommendations																																																					
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<p>1 of 1 pages &lt; 1 &gt;</p>																																																							

# Automate Simple Migrations

IBM Transformation Advisor

← Recommendations

Your migration bundle is ready!

**MIGRATION BUNDLE**

The files included in your migration bundle help you migrate to IBM WebSphere Liberty, create an image, and package your application as a helm chart for easy deployment.

[Download bundle](#)

**Migration files** [?](#)

✓ libertyserver.xml	<a href="#">Download</a>
✓ Dockerfile	<a href="#">Download</a>
✓ Deployment.yaml	<a href="#">Download</a>
✓ Helm chart	<a href="#">Download</a>

**Application dependencies** [?](#)

✓ application_binary1.ear	application_binary1.ear <a href="#">X</a>
✓ application_binary2.ear	application_binary2.ear <a href="#">X</a>
✓ application_binary3.ear	application_binary3.ear <a href="#">X</a>
✓ application_binary4.ear	application_binary4.ear <a href="#">X</a>

**APPLICATION**  
jpetsstore\_war.ear  
WebSphere Traditional

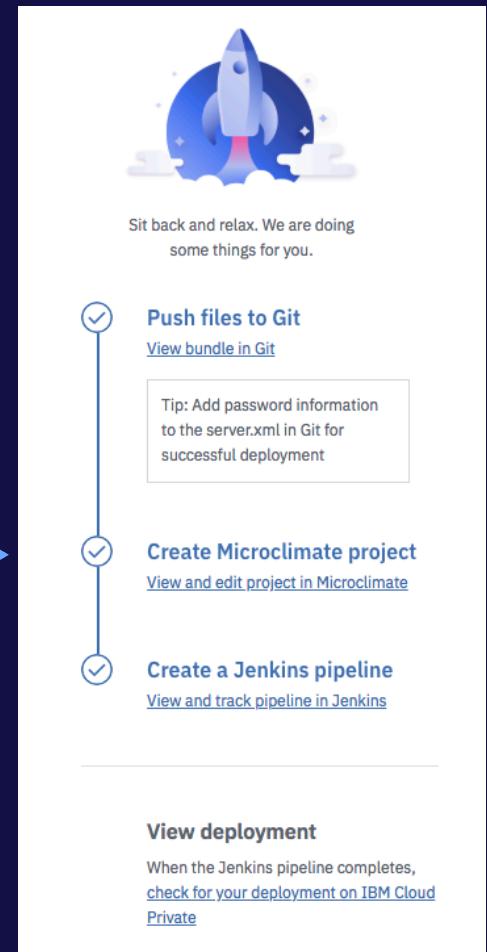
**MIGRATE TO**  
IBM WebSphere Liberty  
on IBM Cloud Private

**Deploy**

First time? Get started →

**HOW IT WORKS** [View the steps](#)

- ① Migrate to IBM WebSphere Liberty
- ② Containerize WebSphere Liberty
- ③ Deploy Liberty on to IBM Cloud Private



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

# Demo

Java EE Demo App  
Mod Resorts

WebSphere ND

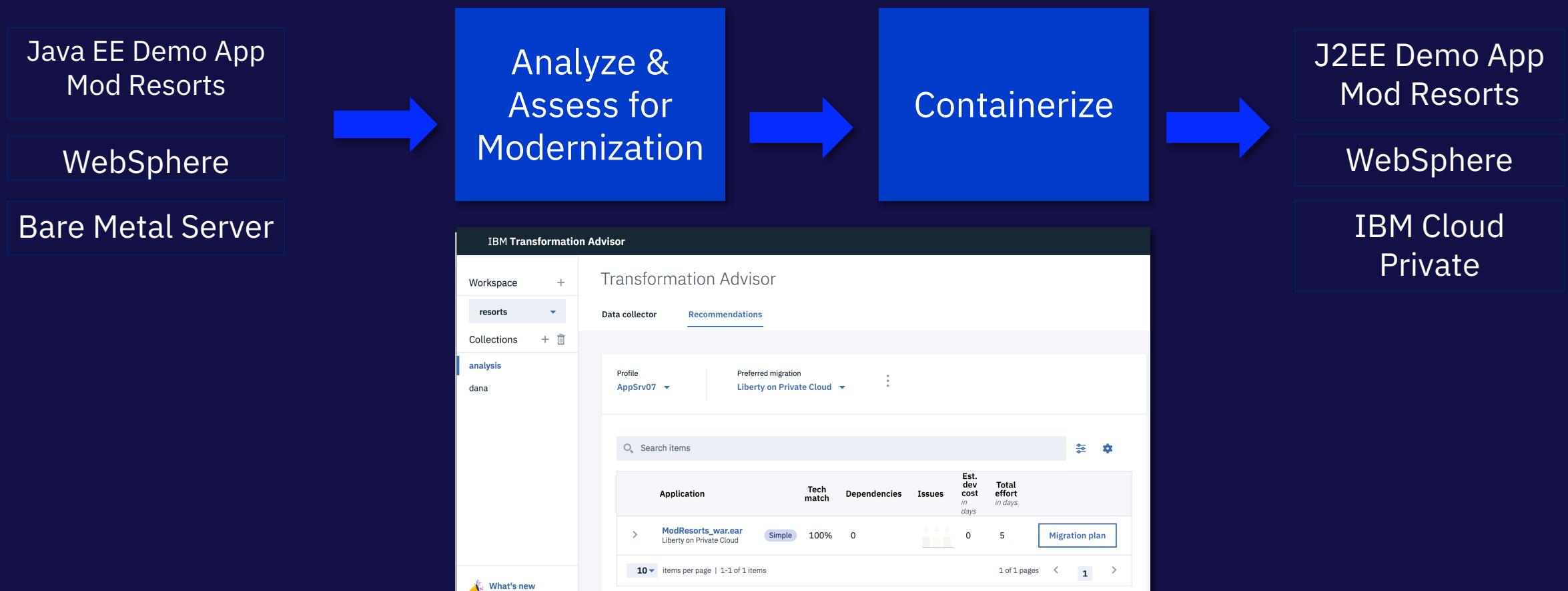
Bare Metal Server



The screenshot shows the MOD RESORT website. At the top left is the MOD logo, which is a stylized 'M' inside a diamond shape. The top navigation bar includes the MOD RESORT logo, a search bar with dropdown menus for 'WHERE TO?' and dates ('18 JUN 2018'), and buttons for 'FIND IT', 'HOME', 'RESERVATIONS', 'REWARD CENTER', and 'LANGUAGES'. Below the header is a large, dark photograph of a tropical resort at night, featuring palm trees, lounge chairs, and warm lighting.

# Demo

## Step 1 – Containerize and deploy application to IBM Cloud



# Demo

## Step 2 – Digital transformation by extension

Java EE Demo App  
Mod Resorts

WebSphere

IBM Cloud Private



Extend with  
cognitive  
solutions

### Watson Compare & Comply



#### Streamline Contract Analysis

Improve the speed and consistency with which contracts are reviewed and risks are identified.



#### Improve Employee Efficiency & Satisfaction

Reduce the time and effort to read and review contracts by classifying and comparing sentences.



#### Compare Across Documents

Easily identify discrepancies and ensure consistency by visually comparing documents.



#### Prove Value Quickly

Deliver a foundational solution to prove value within 4 weeks.



J2EE Demo  
App  
Mod Resorts

WebSphere

Watson  
Compare  
and Comply

IBM Cloud Private