

AM0100ST - Evaluate On-Premises Java Application with IBM Cloud Transformation Advisor



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Evaluate On-Premises Java Applications with IBM Cloud Transformation Advisor

On the journey to cloud, enterprise customers are facing challenges moving their existing on-premises applications to cloud quickly and cost-effectively. The **IBM Cloud Pak for Applications** provides a complete and consistent experience and solution to modernize enterprise applications for cloud-native deployments. Customers can easily modernize their existing applications with IBM's integrated tools and develop new cloud-native applications faster for deployment on any cloud. One of the tools included in the Pak is the IBM Cloud Transformation Advisor (**Transformation Advisor**), a developer tool that is available at no charge to help you quickly evaluate on-premises Java EE applications for deployment to the cloud. The Transformation Advisor tool can

- identify the Java EE programming models in the app.
- determine the complexity of apps by listing a high-level inventory of the content and structure of each app.
- highlight Java EE programming model and WebSphere API differences between the WebSphere profile types
- learn any Java EE specification implementation differences that might affect the app

Additionally, the tool provides a recommendation for the right-fit IBM WebSphere Application Server edition and offers advice, best practices and potential solutions to assess the ease of moving apps to Liberty or newer versions of WebSphere traditional. It will accelerate application migrating to cloud process, minimize errors and risks and reduce time to market.

This lab is a part of the Application Modernization lab series which focus on the evaluation, re-platforming, and rehosting modernization approaches and solutions. This lab covers the evaluation process. It will show the value of using **Transformation Advisor** to evaluate on-premises Java applications and identify a migration candidate for moving to the cloud. When you complete this lab, you will learn how to use this tool to quickly analyze on-premise Java applications without accessing their source code and to estimate the move to cloud efforts.

1. Business Scenario

As shown in the image below, your company has several web applications deployed to WebSphere Application Server (**WAS**) environment.

Select	Name	Application Status
<input type="checkbox"/>	DefaultApplication	
<input type="checkbox"/>	PlantsByWebSphereEE7	
<input type="checkbox"/>	ivtApp	
<input type="checkbox"/>	modresorts-1_0_war	
<input type="checkbox"/>	query	

Total 5

Your company wants to move these applications to a lightweight WebSphere Liberty server on cloud, but you are not sure how much effort the migration process might take. You decide to use the IBM Transformation Advisor to do a quick evaluation of these apps without their source code to identify a good candidate application to move to cloud based on the analysis result.

2. Objective

The objectives of this lab are to:

- learn how to collect Java application and configuration data using the Transformation Advisor Data Collector tool.
- learn how to use the Transformation Advisor to evaluate the move to cloud efforts and to identify the good candidate for migration.

3. Prerequisites

The following prerequisites must be completed prior to beginning this lab:

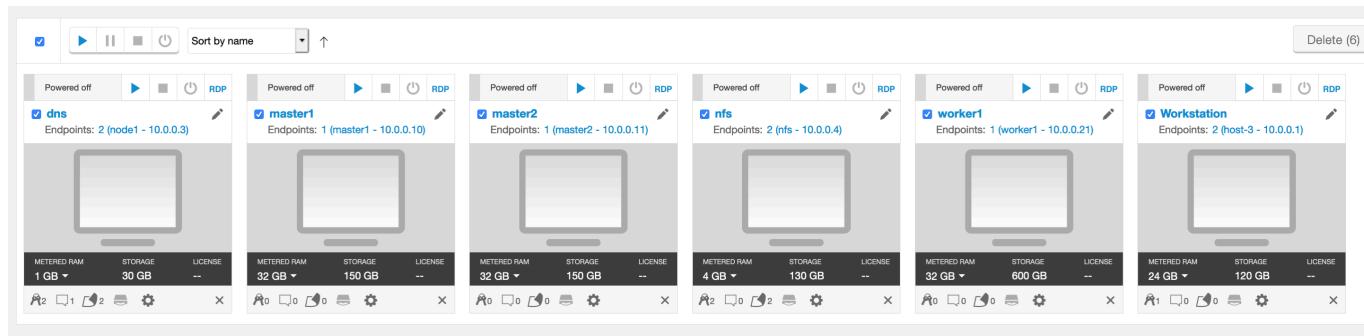
- Familiarity with basic Linux commands
- Have internet access
- Have basic Java app development knowledge.

The following symbols appear in this document at places where additional guidance is available.

Icon	Purpose	Explanation
	Important!	This symbol calls attention to a particular step or command. For example, it might alert you to type a command carefully because it is case sensitive.
	Information	This symbol indicates information that might not be necessary to complete a step, but is helpful or good to know.
	Trouble-shooting	This symbol indicates that you can fix a specific problem by completing the associated troubleshooting information.

4. What is Already Completed

Six Linux VMs have been provided for this lab.



- The Red Hat OpenShift Container Platform (**RHOCP**) v4.3, is installed in 4 VMs, the **master1** VM, the **master2** VM, the **dns** VM, and the **worker2** VM, with 2 master nodes and 3 compute nodes (the master nodes are serving as computer nodes as well).
- The **IBM Cloud Pak for Applications (CP4Apps)** v4.1 is installed on the **RHOCP**.
- The **Transformation Advisor** has been deployed to the **RHOCP** cluster as a part of **IBM Cloud Pak for Applications** installation. For information on how to install **IBM Cloud Pak for Applications** on OpenShift, please visit:
https://www.ibm.com/support/knowledgecenter/SSCSJL_4.x/welcome.html
- The **Workstation** VM is the one you will use to access and work with the **RHOCP cluster** in this lab.
The login credentials for the **Workstation** VM are:
User ID: **ibmdemo**
Password: **passw0rd**

Note: Use the Password above in the **Workstation** VM Terminal for **sudo** in the Lab.

- The CLI commands used in this lab are listed in the **Commands.txt** file located at the **/home/ibmdemo/cp4a-labs/am0100st** directory of the **Workstation** VM for you to copy and paste these commands to the Terminal window during this lab.

5. Lab Tasks

In this lab, you access WebSphere Application Server to review the deployment of the JEE applications. Then you are going to the Transformation Advisor to identify a good candidate application for moving to cloud. To identify which Java EE programming models are on the server, you could run the Transformation Advisor Data Collector tool against the server. The Transformation Advisor creates an inventory of the content and structure of each app and learn about problems that might occur if you move the app to cloud. Finally, you review the analysis reports to determine the complexity of the move-to-cloud efforts and select the migration candidate app.

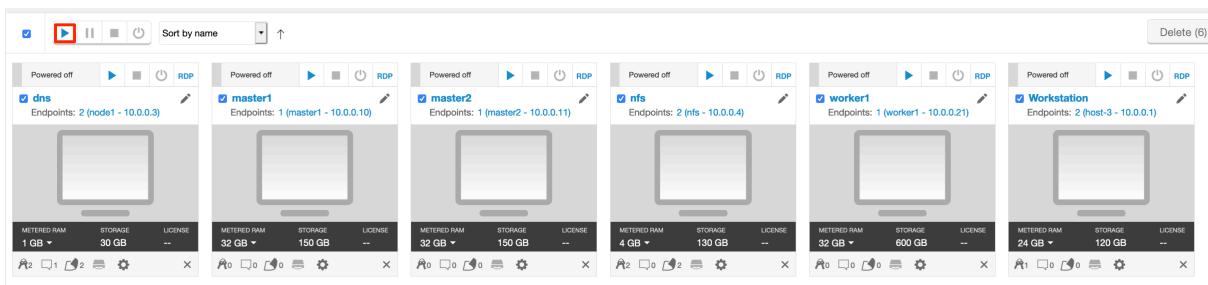
Here are the activities involved in this process:

- Log in to WebSphere Application Server to review the deployed JEE applications
- Run the Transformation Advisor Data Collector tool against the WebSphere Application Server to get application data
- Review the analysis reports that Transformation Advisor generates to identify the right candidate application for a rapid and cost-effective migration to cloud

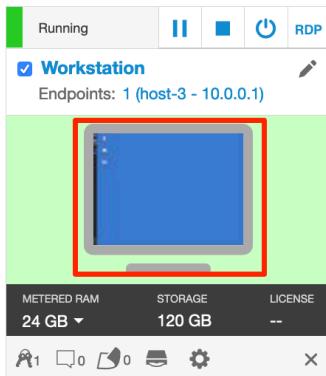
6. Execute Lab Tasks

6.1 Log in to the **Workstation** VM and Get Started

1. Launch the lab VMs by clicking the play button



2. After the VMs are started, click the **Workstation** VM icon to access it.



The **Workstation** Linux Desktop is displayed. You will execute all the lab tasks on this VM.

6.2 Review the on-prem WebSphere apps

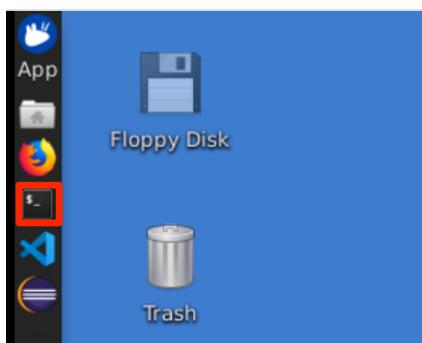
In this task, you will take a look at the sample applications deployed to the local WebSphere Application Server (WAS) environment. You are going to identify one of them to be the god candidate to move the cloud later.

_1. Start WebSphere Application Server

In the **Workstation** VM, you have a local WebSphere Application Server which hosts several sample applications.

To start the WAS server:

_a. Open a terminal window by clicking its icon on the **Workstation** VM desktop tool bar.



_b. In the terminal window, issue the command below to start the WAS server (You can copy and paste the command from the **Commands.txt** file in the **/home/ibmdemo/cp4a-labs/am0100st** directory).

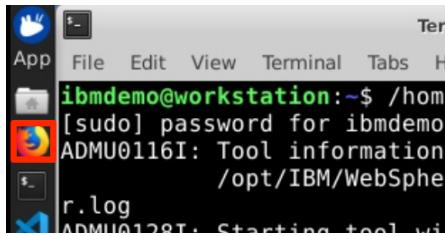
/home/ibmdemo/cp4a-labs/shared/startWAS.sh

when prompted, enter the **sudo** user password as: **passw0rd**.

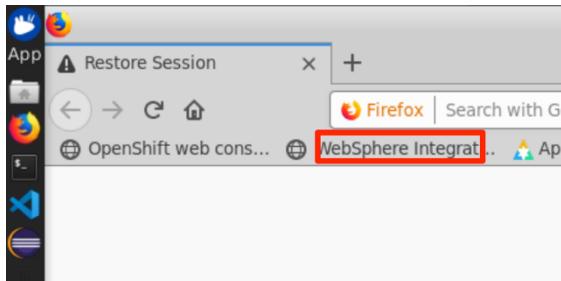
```
ibmdemo@workstation:~$ /home/ibmdemo/cp4a-labs/shared/startWAS.sh
[sudo] password for ibmdemo:
ADMU0116I: Tool information is being logged in file
          /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/startServer.log
ADMU0128I: Starting tool with the AppSrv01 profile
ADMU3100I: Reading configuration for server: server1
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server server1 open for e-business; process id is 4509
db2-pbw
ibmdemo@workstation:~$
```

Within a few minutes the WAS server will be ready.

- _c. Access the WAS Admin Console to view the application deployed by clicking the web browser icon desktop tool bar to open a browser window.



- _d. From the web browser window and click **WebSphere Integrated Solution Console** bookmark to launch the WAS console.



- _e. In the WAS Admin Console login page, enter the User ID and Password as: **wsadmin/passw0rd** and click **Login**.
- _f. On the WAS Console page, click **Applications -> Application Types -> WebSphere enterprise applications** to view the apps deployed.

The screenshot shows the WebSphere Integrated Solutions Console interface. On the left, there's a navigation sidebar with 'View: All tasks' at the top. Below it are sections for 'Welcome', 'Guided Activities', 'Servers', and 'Applications'. Under 'Applications', there are links for 'All applications', 'New Application', 'Install New Middleware Application', 'Application Types' (which is expanded to show 'WebSphere enterprise applications', 'Business-level applications', 'Assets', 'Edition Control Center', and 'Global deployment settings'), and 'Suite Name' which is set to 'WebSphere Application Server'. A red box highlights the 'WebSphere enterprise applications' link.

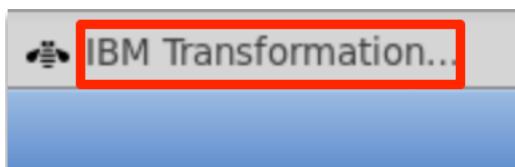
In the **Enterprise Applications** list, you can see all applications deployed. Next you will use Transformation Advisor to analyze these applications to identify a good candidate to be moved to the cloud.

6.3 Download Transformation Advisor Data Collector utility

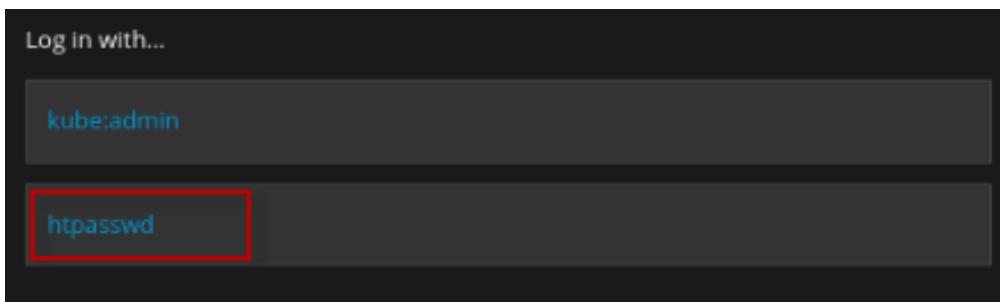
The Transformation Advisor can evaluate any Java based applications. In this lab, you are going to use it to evaluate whether the on-premises WebSphere application, **Mod Resorts**, is suitable to move to cloud and what the effort might be to get it there. The Transformation Advisor is running on OpenShift and you will use its Data Collector utility to get the application data from WebSphere Application Server running on the **Workstation VM**.

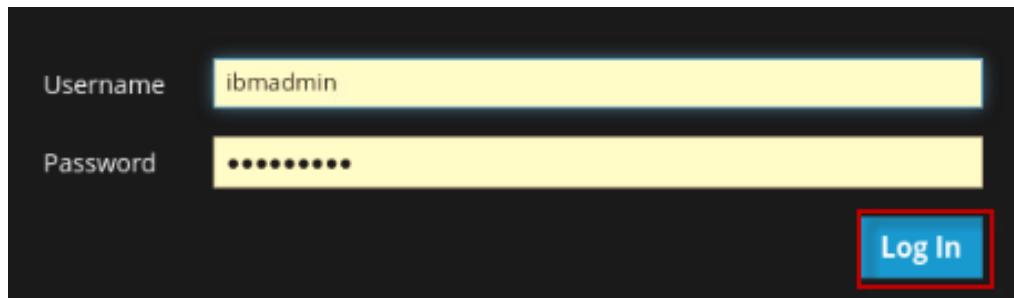
To evaluate on-premises Java applications, you need to run Transformation Advisor Data Collector utility against the Application server environment to extract all application information from the environment first. The utility can be downloaded from the Transformation Advisor web page.

- __1. From web browser window, click the **IBM Transformation Advisor** bookmark and launch it.



- __2. Since the **Transformation Advisor** is deployed to **RHOCP** as an operator, you will be redirected to the **RHOCP Login** page. Click **htpasswd** field. Then login with **ibmadmin / engageibm** as the username and password.

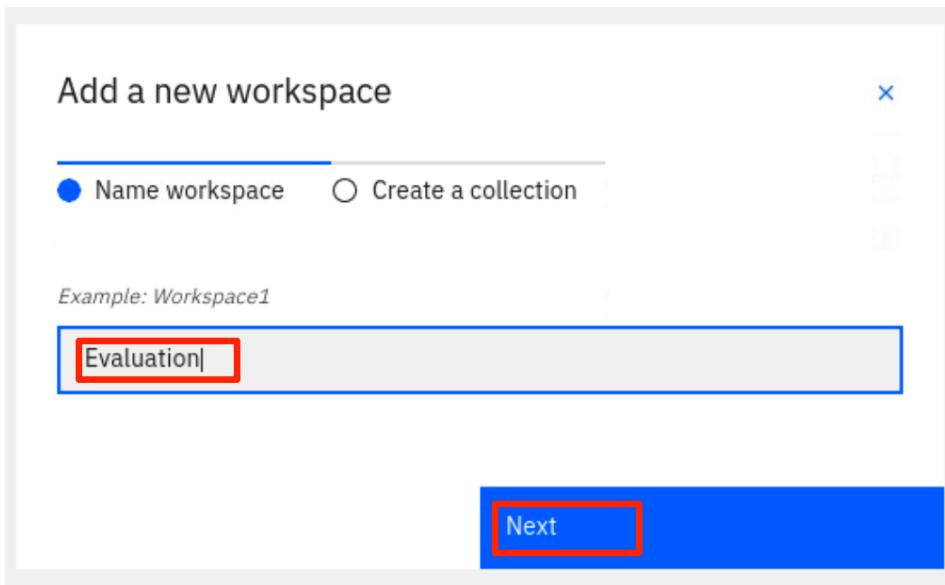




The **Transformation Advisor Home** page is displayed.

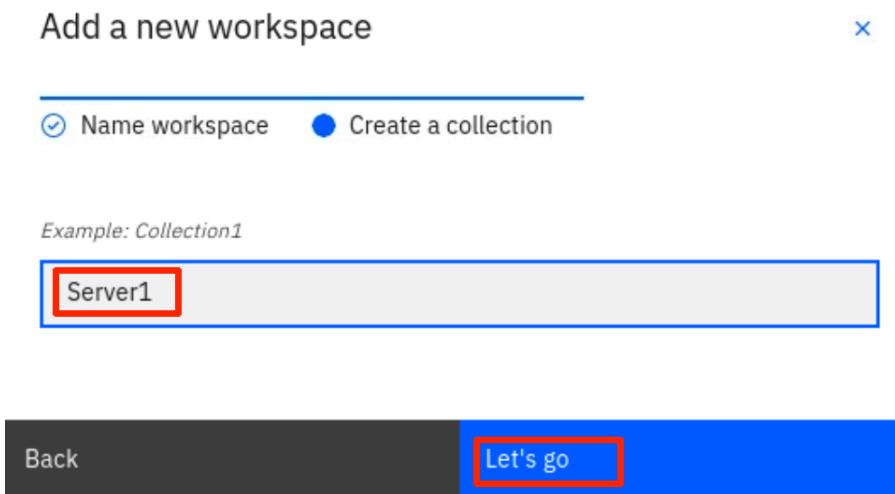
A screenshot of the Transformation Advisor Home page. The top navigation bar shows 'IBMCloud Transformation Advisor'. The main content area features a large 'Welcome to Transformation Advisor' heading. Below it is a paragraph about modernizing middleware deployments. To the right is a graphic of a compass inside a stylized map outline. At the bottom left is a section titled 'Let's get started.' with a 'Add a new workspace' button and a '+' icon. A small note at the bottom says 'You have no workspace, try creating one!'.

- 3. Create a new workspace by entering the workspace name as **Evaluation** and then clicking **Next**.



Note: A workspace is a designated area that will house the migration recommendations provided by **Transformation Advisor** against your application server environment. You can name and organize these however you want, whether it's by business application, location or teams.

4. Enter the collection name as **Server1** and click **Let's go**.



Note: Each workspace can be divided into collections for more focused assessment and planning. Like workspaces, collections can be named and organized in whatever way you want.

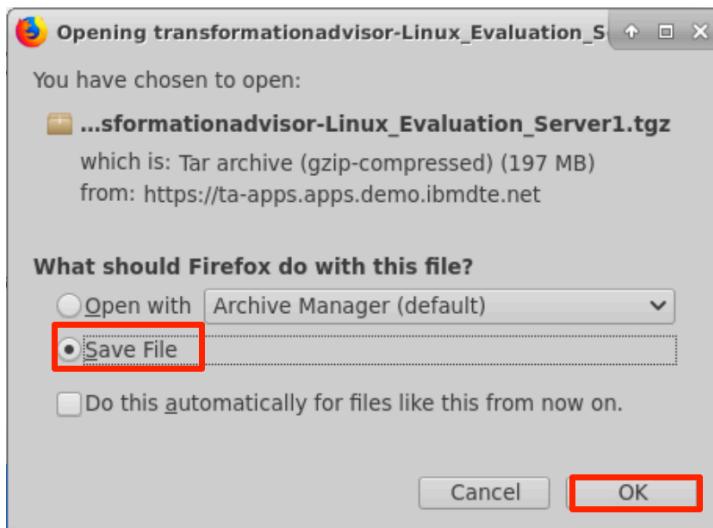
5. Once the Workspace and Collection are created, you will have options to either download the Data Collector utility or upload existing data file. In this lab, you are going to use the Data Collector utility. Click **Data Collector** to go to the download page.

The screenshot shows the IBMCloud Transformation Adviser interface. On the left, there's a sidebar with 'Workspace' (Evaluation), 'Collections' (Server1 selected), and 'Business apps' (0 apps created). The main area is titled 'Server1' and features a decorative globe icon. Below it, a message says 'No recommendations available.' A note below that says 'To get started, download the Data Collector to retrieve application data.' has a red box around the 'Data Collector' button. At the bottom, there's a question about previous Data Collector runs.

6. In the Download page, you can download different version of the utility based on your source operating system. It also shows how to use the utility in command line to collect application data from WebSphere, WebLogic and Tomcat servers. Since the lab VM is a Linux OS, click **Download Linux** to get the utility.

The screenshot shows the 'Data Collector' page for 'Server1'. It has a heading 'Data Collector' and a note about getting results. Below is a 'Download' section with a dropdown for 'Source Operating System' set to 'Linux'. A red box surrounds the 'Download for Linux' button, which is highlighted in blue.

7. In the Download dialog window, select the **Save File** option and click **OK**.

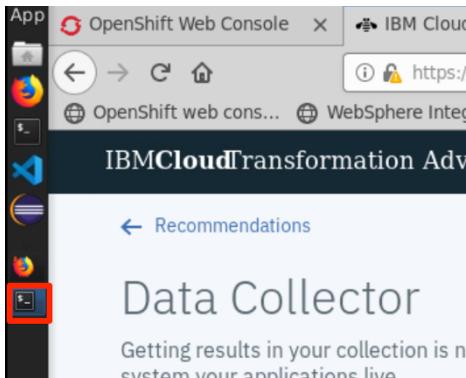


The zipped Data Collector utility file will be saved in **/home/ibmdemo/Downloads** directory of the lab desktop.

6.4 Run Transformation Advisor Data Collector utility

After downloading the zipped Data Collector utility, you need to unpack it and run the utility against the WAS server to collect all deployed applications and their configuration data from WAS server.

- 1. Go back to the terminal window by clicking its icon in the **Workstation VM** desktop toolbar.



- 2. In the terminal window, navigate the **/home/ibmdemo/Downloads** directory and view its contents with commands:

```
cd /home/ibmdemo/Downloads/
```

```
ls -l
```

You see the downloaded data collector utility file saved in the directory.

- 3. Extract the data collector utility with commands:

```
tar xvfz transformationadvisor-Linux_Evaluation_Server1.tgz
```

The data collector utility will be extracted to
/home/ibmdemo/Downloads/transformationadvisor-2.0.3 directory.

- __4. Execute the **Data Collector** utility with the commands below to start collect the deployed applications information on the WAS server.

```
cd /home/ibmdemo/Downloads/transformationadvisor-2.0.3
```

```
sudo ./bin/transformationadvisor -w /opt/IBM/WebSphere/AppServer -p AppSrv01  
wsadmin passw0rd
```

when prompted, enter the **sudo** password as: **passw0rd**.

- __5. Type **1** to accept the license agreement and press **Enter**.

```
is not subject to such limitation.  
10.2 Items for Which IBM is Not Liable  
The following replaces Items 10.2b and 10.2c:  
b. special, incidental, exemplary, or indirect damages or consequential damages;  
or  
c. wasted management time or lost profits, business, revenue, goodwill, or anticipated savings.  
Z125-3301-14 (07/2011)  
  
1. I have read and agreed to the license agreements  
2. Don't accept the license agreements  
  
1
```

The utility will start to collect application data.

```
=====+  
| Status: Running  
+-----+  
| Configuration analysis: Running  
+-----+  
| | Profile  
| | Currently processing: 0/1  
| | Profile name:  
+-----+  
| | Applications  
| | Total: 0  
| | Completed: 0  
+-----+  
| | Time  
| | Elapsed time: 00:00:20  
| | Time remaining: Calculating  
+-----+  
| | Progress  
| | 0%  
+-----+  
| Current Operation:  
| Configuration analysis is running  
=====
```

This process will take sometimes to complete depending on how many applications deployed on the WAS server. In this lab, it might be a few minutes. When it is done, you will see a message “**Thank you for uploading your data. You can proceed to the application UI for doing further analysis.**”

Your application data is collected, it is saved as a zip file under the tool directory as shown below.

```
ibmdemo@workstation:~/Downloads/transformationadvisor-2.0.3$ ls -l
total 876
drwxr-xr-x 2 root      root      4096 Mar 20 14:49 AppSrv01
-rw-r--r-- 1 root      root    724459 Mar 20 14:50 AppSrv01.zip
drwxr-xr-x 2 ibmdemo  ibmdemo   4096 Feb 13 09:23 bin
drwxr-xr-x 2 ibmdemo  ibmdemo   4096 Feb 13 09:23 conf
drwxr-xr-x 2 ibmdemo  ibmdemo   4096 Feb 13 09:23 docs
-rw-r--r-- 1 root      root     6139 Mar 20 14:49 environment.json
drwxr-xr-x 5 ibmdemo  ibmdemo   4096 Feb 13 09:23 jre
drwxr-xr-x 2 ibmdemo  ibmdemo   4096 Feb 13 09:23 lib
-rw-r--r-- 1 ibmdemo  ibmdemo  126894 Feb 13 09:23 LICENCE
-rw-r--r-- 1 root      root      0 Mar 20 14:46 licence_accepted
drwxr-xr-x 2 root      root     4096 Mar 20 14:46 logs
drwxr-xr-x 2 root      root     4096 Mar 20 14:46 tmp
-rw-r--r-- 1 root      root      5 Mar 20 14:46 version.txt
```

In general, if your application server and the **Transformation Advisor** are in the same network infrastructure, the collected data will be automatically uploaded to **Transformation Advisor** for you to view the analysis results. Otherwise, you have to manually upload the data to **Transformation Advisor** before you can view them.

6.5 Evaluate On-Premises Java Applications

In this section, you are going to use **Transformation Advisor** UI to view the application data analysis results.

- 1. Go back to **Transformation Advisor** page in web browser, click the **Server1** link to the **Recommendations** page.

In the **Recommendations** page, you can see all applications deployed to the WAS server are listed.

Name	Tech match	Dependencies	Issues	Estimated dev cost in days
DefaultApplication.ear	Complex	85%	3	4 1 4 14
ivtApp.ear	Moderate	100%	2	2 1 2 3
modresorts-1_0_war.ear	Simple	100%	None	1 0
PlantsByWebSphereEE7.ear	Simple	100%	3	2 1 5 0
query.ear	Moderate	100%	2	2 1 3 3

On the **Recommendations** page, the identified migration source environment is shown in the Profile section, and the target environment is shown in the Preferred migration section. The data collector tool detects that the source environment is your WebSphere Application Server ND **AppSrv01** profile. The target environment is **Liberty on OpenShift**, which is the default target environment.

The Recommendations page also shows the summary analysis results for all the apps in the **AppSrv01** environment to be moved to a **Liberty on OpenShift** environment. For each app, you can see these results:

- Name
- Complexity level
- Technology match
- Dependencies
- Issues
- Estimated development cost in days

For example, if you want to move the **modresorts-1_0_war.ear** application to **Liberty on OpenShift**, the complexity level is **Simple** and the Tech match is 100%, which indicates that the application code does not need to be changed before it can be moved to cloud. The application has no dependency, has 1 minor level issue and the estimated development effort is 0 day because no code change.

As you can see the default move to cloud environment is **Liberty on OpenShift**, however **Transformation Advisor** can also provide migration options if you want to migrate your application to different target environments as shown below:

Preferred migration on Cloud Pak for Apps

Liberty on OpenShift ^

Liberty on OpenShift

Traditional WebSphere Base on OpenShift

No Preference (Show all)

In this lab you are focusing on identifying a good candidate for moving to the **Liberty on OpenShift** environment, so the default target environment will work.

If you look at the complexities of these applications, you can see that the **moderorts-1.0_war.ear** (**Mod Resorts** app) and **pbw-ear.ear** (**PlansByWebSphere** app) has the simple complexity, which mean that these two apps can be migrated to cloud without any code change. But since the **moderorts-1.0_war.ear** app has lesser issue (1) than the **pbw-ear.ear** app (4), so let's look at the analysis results for **moderorts-1.0_war.ear** application in detail first.

- __2. Click the **moderorts-1_0_war.ear** link to expand its analysis results.

Java applications					
Name	Tech match	Dependencies	Issues	Estimated dev cost in days	
⚠ DefaultApplication.ear	Complex ⚡	85%	3	▲ 4 ■ 1 ● 4 14	⋮
ivtApp.ear	Moderate ⚡	100%	2	▲ 2 ■ 1 ● 2 3	⋮
moderorts-1_0_war.ear	Simple ⚡	100%	None	● 1 0	⋮
PlantsByWebSphereEE7.ear	Simple ⚡	100%	3	● 5 0	⋮
query.ear	Moderate ⚡	100%	2	▲ 2 ■ 1 ● 3 3	⋮

The first section in the detail analysis summary page is the **Complexity** section. The overall complexity for the application is simple, indicating that the application can be directly moved to cloud without any code change.

Complexity	
Overall Complexity: Simple	
Every Moderate or Complex rule discovered during analysis is listed here and must be resolved to enable a Simple migration	
Simple Rules	
Rule Name	Stand Alone Application
Rule Complexity	Simple
Description	This application can be migrated without code changes and has no external dependencies

- a. Scroll down to **Application Details** section. You can see although there is no code change required and no development cost, the estimate migration over all develop cost is 5 days. This estimate is based on data from IBM Services engagements, which includes migrating management, server configuration, and testing.

Application Details		
Application Name: modresorts-1_0_war.ear		Target Option: Liberty on Cloud Pak for Apps on Private Cloud
Cost	Explanation	Estimated Dev Cost
Development	The initial development effort estimate is based on how long it takes an experienced application developer to re-write code, for example: one Entity Enterprise Java Bean. Depending on your team's expertise, adjust the scaling factor to better estimate expected effort.	0 
Typical Overhead	In migrating, there will be some overhead costs like management, server configuration and unit testing. Adjust the estimate for how much overhead your team will need.	5
Total		5

- b. Continue to scroll down to the Issues section. You can see the only minor potential issue listed is on configuring the application in Docker container.

Technology Issues			
Issue	Severity	Dev Effort	
No issues found			
External Dependencies			
Issue	Severity	Dev Effort	
No issues found			
Additional Information			
Issue	Severity	Dev Effort	
Handling application configuration in Docker containers	<input checked="" type="checkbox"/>	0	

- c. Next, scroll down to the bottom of the page and click the **Technology Report** link, this will open a new browser window to show the application **Evaluation Report**.

Issue	Severity	Dev Effort
Handling application configuration in Docker containers	<input checked="" type="checkbox"/>	0
Technology Report		
See further details on which IBM platforms support the technologies used by the applications		
Inventory Report		
High-level inventory of the content and structure of each application, plus information about potential deployment problems and performance considerations		
Analysis Report		
Potential issues, their severity and possible solutions		

The report lists all java technologies the application used and whether these technologies are supported by a specific WebSphere platform from Liberty for Java on IBM Cloud to

WebSphere traditional for z/OS. It is used to determine whether a particular WebSphere product is suitable for an application.

Application Technology Evaluation Report

8/29/19 7:18 AM
 /opt/IBM/WebSphere/AppServer_V90/profiles/Dmgr01/config/cells/workstationCell01/applications/modresorts-1_0_war.ear/modresorts-1_0_war.ear
 Scan options: --baseEdition -coreEdition --libertyBuildpackEdition --ndEdition --zosEdition --traditional --liberty --excludePackages=com.ibm, com.informix, com.microsoft, com.sybase, com.sun, java, javax, net, oracle, org, sqlij, _ibmjsp

WebSphere Application Server V9.0

The highlighted columns indicate which IBM platforms fully support the technologies used by the included application.
 Recommendation: Detailed migration analysis should be used to determine if there are migration issues that must be addressed before deploying your application.

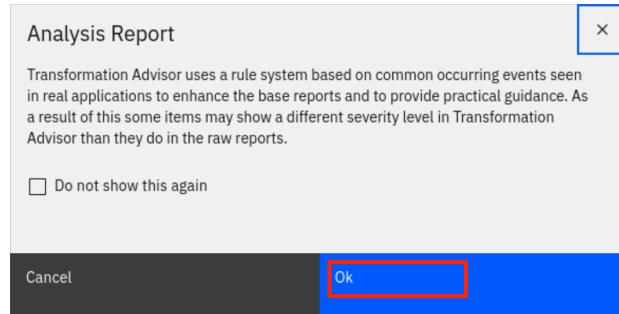
	Liberty for Java on IBM Cloud	Liberty Core	Liberty	WebSphere traditional	Network Deployment Liberty	Network Deployment traditional	Liberty for z/OS	WebSphere traditional for z/OS
WEB APPLICATION TECHNOLOGIES								
Java Servlet	✓	✓	✓	✓	✓	✓	✓	✓

As you can see from the report, the **Mod Resorts** application only uses Java Servlet which is supported by all WebSphere platforms.

- _d. Go back to the **Transformation Advisor** page and click the **Analysis Report** link.

Issue	Severity	Dev Effort
Handling application configuration in Docker containers	✓	0
Technology Report See further details on which IBM platforms support the technologies used by the applications	Inventory Report High-level inventory of the content and structure of each application, plus information about potential deployment problems and performance considerations	Analysis Report Potential issues, their severity and possible solutions

- _i. Click **OK** to continue.



Now you see the Detailed Migration Analysis Report opened in a new browser window.

Detailed Migration Analysis Report

8/29/19 7:18 AM
/opt/IBM/WebSphere/AppServer_V90/profiles/Dmgr01/config/cells/workstationCell01/applications/modresorts-1_0_war.ear/modresorts-1_0_war.ear

1	12
Rules flagged	Total results

Source options
--sourceAppServer=was90 --sourceJava=ibm8 --sourceJavaEE=ee7

Target options
--targetAppServer=liberty --targetJava=ibm8 --targetCloud=dockerIBMCLOUD

Scan options
--excludePackages=com.ibm, com.informix, com.microsoft, com.sybase, com.sun, java, javax, net, oracle, org, sqlj, _ibmjsp

Rule Severity Summary

SYMBOL	LABEL	RULES FLAGGED	TOTAL RESULTS	DESCRIPTION
	Warning	1	12	Warning rules indicate behavior changes that might break the application and should be evaluated.

This is the deep-dive report which shows all issue found at the code level.

- _ii. Scroll down to **Detailed Results by Rule** section, you can see all the java technology issues identified based on different migration rules.

Detailed Results by Rule

Warning Rules

Docker (IBM Cloud Kubernetes Service)

Handling application configuration in Docker containers (12) Show rule help Show results

Rules Analyzed

All application servers

File Rules

- Do not start unmanaged threads within the web or EJB container
- Servlets are not allowed to access files in the META-INF or WEB-INF directory

For the **Mod Resorts** application, there is one warning rule regarding the application configuration in Docker containers.

- _iii. Click the **Show results** link.

You can see the detail analysis of the issue at code level, in a specific class file and specific line. This will help developers to pinpoint where the issue is or potential issue may be.

Warning Rules

Docker (IBM Cloud Kubernetes Service)

Handling application configuration in Docker containers (12)[Show rule help](#) [Close results](#)**Results**

FILE NAME	REFERENCE DETAILS	MATCH CRITERIA	LINE NUMBER
modresorts-1_0_war.ear/modresorts-1.0.war			
META-INF/maven/com.ibm.ta/modresorts/pom.properties		(.*)?\\$.properties	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/commons-codec-1.10.jar			
META-INF/maven/commons-codec/commons-codec/pom.properties		(.*)?\\$.properties	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/commons-fileupload-1.3.3.jar			
META-INF/maven/commons-fileupload/commons-fileupload/pom.properties		(.*)?\\$.properties	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/commons-io-1.4.jar			
META-INF/maven/commons-io/commons-io/pom.properties		(.*)?\\$.properties	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/commons-logging-1.1.3.jar			
META-INF/maven/commons-logging/commons-logging/pom.properties		(.*)?\\$.properties	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/httpclient-4.5.5.jar			
META-INF/maven/org.apache.httpcomponents/httpclient/pom.properties		(.*)?\\$.properties	
org/apache/http/client/version.properties		(.*)?\\$.properties	

- _iv. Click the **Show rule help** link.

Warning Rules

Docker (IBM Cloud Kubernetes Service)

Handling application configuration in Docker containers (12)[Show rule help](#) [Close results](#)**Results**

FILE NAME	REFERENCE DETAILS	MATCH CRITERIA	LINE NUMBER
modresorts-1_0_war.ear/modresorts-1.0.war			
META-INF/maven/com.ibm.ta/modresorts/pom.properties		(.*)?\\$.properties	

This will expand the Rule Help section which provides recommended solutions on how to fix the issue.

Handling application configuration in Docker containers (12)[Close rule help](#) [Close results](#)**Rule Help**

This rule detects properties files packaged within an application and references to the load and loadFromXML methods on java.util.Properties. It is best practice to externalize configuration so that it can be injected into the container.

For more information, see [Using variables in configuration files](#) and [Store config in the environment](#).

For the Docker container configuration issue, the utility provides best practice suggestion to externalize the configuration for the container.

- _e. Go back to the **Transformation Advisor** page and click the **Inventory Report** link.

Issue	Severity	Dev Effort
Handling application configuration in Docker containers	✓	0
Technology Report See further details on which IBM platforms support the technologies used by the applications	Inventory Report	Analysis Report
	High-level inventory of the content and structure of each application, plus information about potential deployment problems and performance considerations	Potential issues, their severity and possible solutions

The **Inventory Report** will show up. This report helps you examine what is in your application, including the number of modules, their relationships and the technologies in those modules. It also gives you a view of all the utility JAR files in the application that tend to accumulate over time. Potential deployment problems and performance considerations are also included.

Application Inventory Report

8/29/19 7:18 AM
 /opt/IBM/WebSphere/AppServer_V90/profiles/Dmgr01/config/cells/workstationCell01/applications/modresorts-1_0_war.ear/modresorts-1_0_war.ear
 Scan options: --excludePackages=com.ibm, com.informix, com.microsoft, com.sybase, com.sun, java, javax, net, oracle, org, sqlj, _ibmjsp

1	1	0	0	0	8	0
EAR files	WAR files	RAR files	EJB JAR files	Web fragment JAR files	Utility JAR files	Application client JAR files

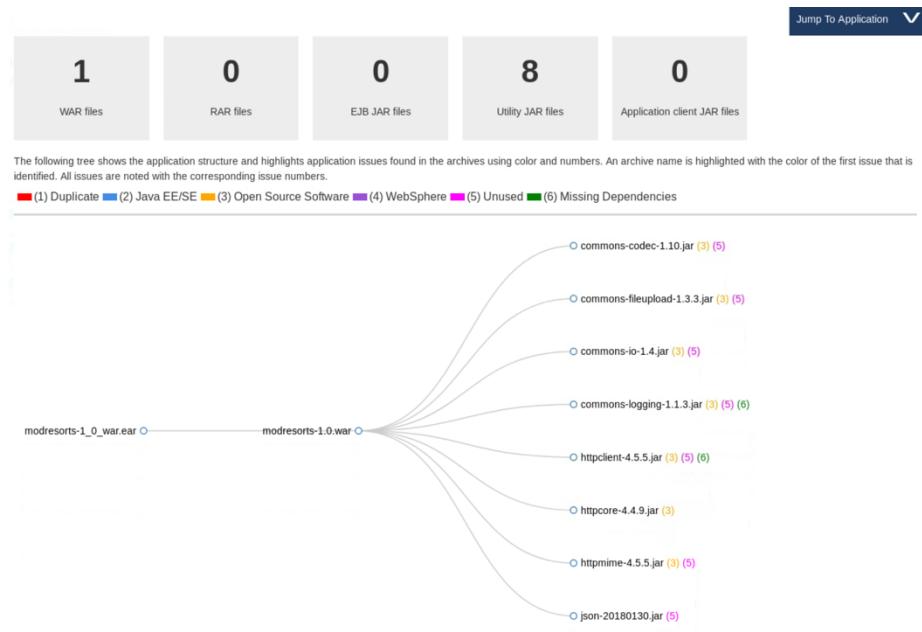
Summary

Technology	Count
Java Servlets	1
JSP files	0
JPA entities	0
BMP entity beans	0
CMP entity beans	0
Message-driven beans	0
Singleton session beans	0
Stateful session beans	0
Stateless session beans	0
Web Services	0

Inventory Details by Application

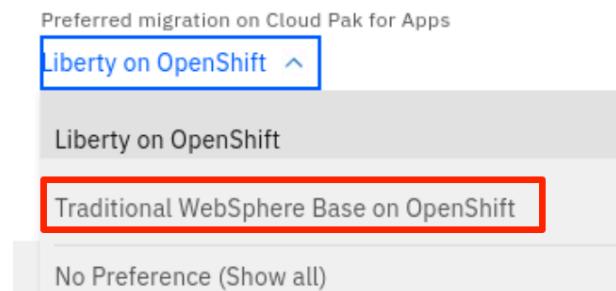
Expand all | Collapse all

- _i. Scroll down to view this report which serves as good decision-making tool to info you what is inside your app runtime, and to help you to have a better understanding of the app runtime, the components it has and the relationships among them.



From the analysis reports you looked at above, you know that the **Mod Resorts** application is supported by **Liberty on OpenShift** which is the target environment, and the issue that the tool identified would not affect the application migration. You can confidently select the application as a good candidate for moving to liberty on cloud in the repackage process with minimum effort.

- f. Now you know that the **Mod Resorts** application can be repacked to Liberty on cloud, you want to know if it is also a good candidate for re-platform with WAS on cloud. To do that switch the target environment from **Liberty on OpenShift** to **Traditional WebSphere Base on OpenShift**.



As you can see from the TA recommendation that the **Mod Resorts** application is also a good candidate for re-platform in WAS Base container on cloud. If you want to review the recommendation details, you can follow the same steps you did before to go over them.

Server1

[Upload options](#)

Source environment

IBM WebSphere Application Server Network Deployment

Profile

AppSrv01

Version: 8.5.5.14

Preferred migration on Cloud Pak for Apps

Traditional WebSphere Base on ...

Java applications (5)

Java applications

Search java applications

Name	Tech match	Dependencies	Issues	Estimated dev cost in days	⋮
DefaultApplication.ear	Moderate ⓘ	100%	3	● 2 ● 4 ● 1	⋮
ivtApp.ear	Moderate ⓘ	100%	2	● 1 ● 3 ● 1	⋮
modresorts-1_0_war.ear	Moderate ⓘ	100%	None	● ● ● 1 ● 0	⋮
PlantsByWebSphereEE7.ear	Moderate ⓘ	100%	3	● ● ● 6 ● 0	⋮
query.ear	Moderate ⓘ	100%	2	● 1 ● 3 ● 1	⋮

3. Evaluate the PlantsByWebSphere Application (Optional)

- a. You can follow the same procedure you did for the **Mod Resorts** application to view the analysis results for the **PlantsByWebSphere** application.

Name	Tech match	Dependencies	Issues	Estimated dev cost in days	⋮
DefaultApplication.ear	Moderate ⓘ	100%	3	● 2 ● 4 ● 1	⋮
ivtApp.ear	Moderate ⓘ	100%	2	● 1 ● 3 ● 1	⋮
modresorts-1_0_war.ear	Moderate ⓘ	100%	None	● ● ● 1 ● 0	⋮
PlantsByWebSphereEE7.ear	Moderate ⓘ	100%	3	● ● ● 6 ● 0	⋮
query.ear	Moderate ⓘ	100%	2	● 1 ● 3 ● 1	⋮

As you can see from the Summary list, the recommendations for the application to move to cloud are as follows:

- The complexity level is Simple.
- Tech match is 100%, which means that the application code can be deployed to **Liberty on OpenShift** without any changes.

- The app has 3 dependencies and 6 minor issues.
- The estimated development effort is 0 day because no code changes are needed.

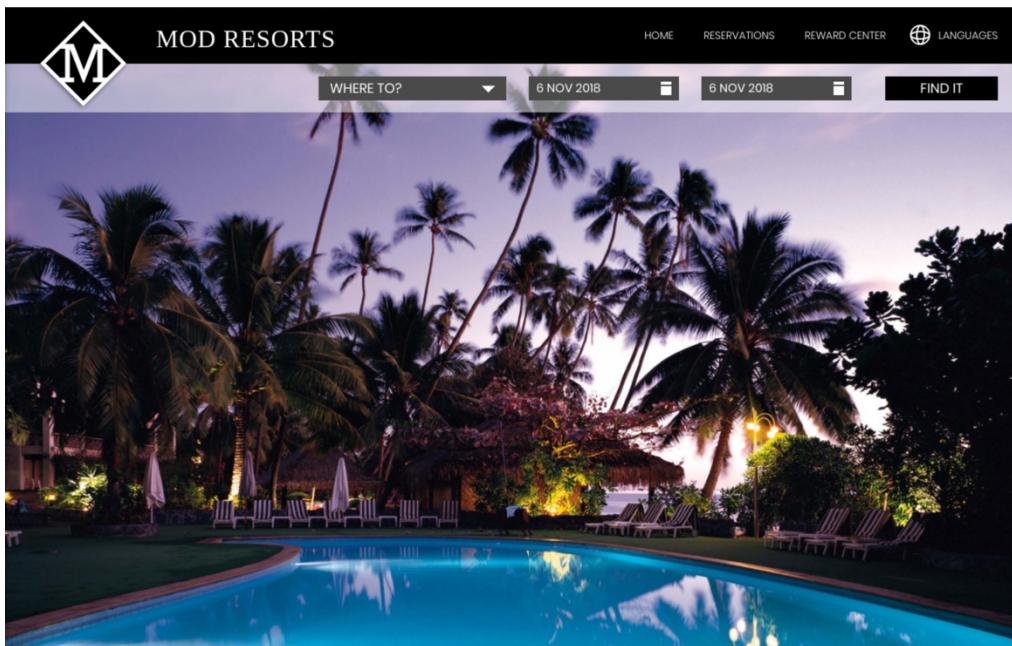
___b. Follow the same steps in section above to evaluate the **PlantsByWebSphereEE6.ear** application.

6.6 View the **Mod Resorts** application

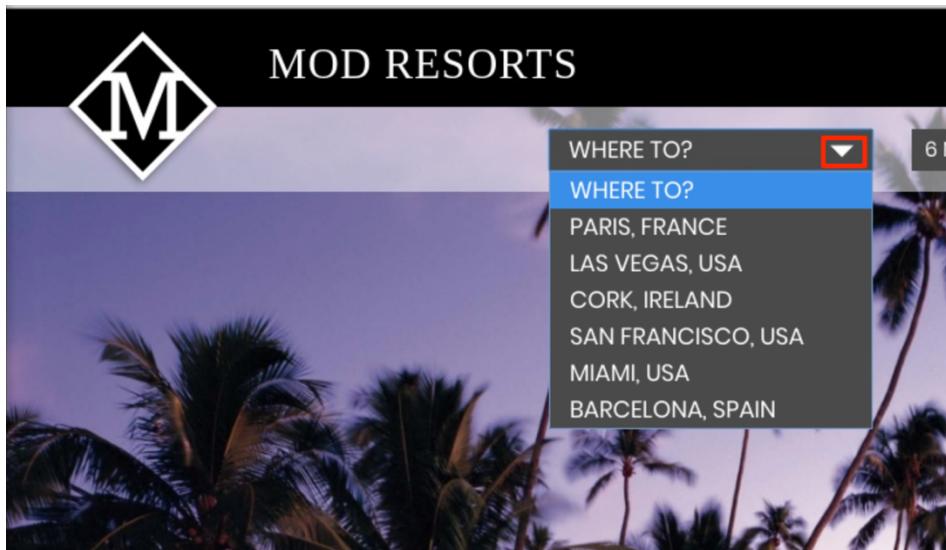
From the analysis you did above, you know that the **Mod Resorts** application is a good candidate for moving to cloud, let's view how the application looks like.

___1. From the web browser window, click new Tab to open a new browser window. Type the **Mod Resorts** application URL: <http://localhost:9080/resorts/> and press **Enter**.

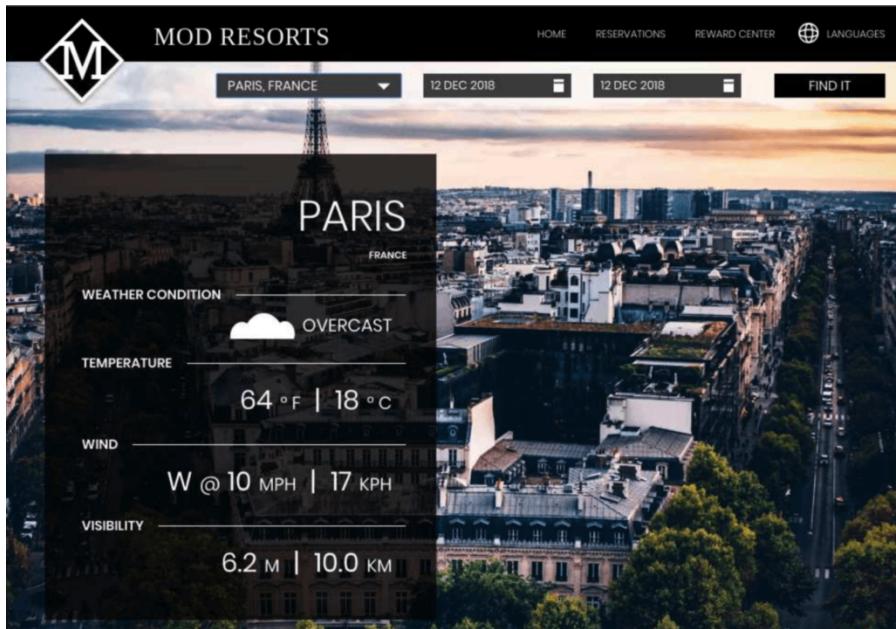
The **Mod Resorts** application home page is displayed.



___2. Click **WHERE TO?** dropdown menu to see the city list.



3. Click **PARIS, FRANCE** from the list, it will show the weather of the city.



Now you have reviewed the application, our next step is to move this application to cloud. Please go to the Part 2 of the lab series (Lab 2) to learn how to repackage the application for Liberty or to the Part 3 of the lab series (Lab 3) to learn how to re-platform it for WAS container in cloud.

7. Summary

In this lab, you learned how to evaluate the existing Java application using IBM Cloud Transformation Advisor. As a part of IBM App Modernization solutions in **IBM Cloud Pak for Applications**, the Transformation Advisor tool provides a recommendation for the right-fit IBM WebSphere Application Server edition and offers advice, best practices and potential solutions to assess the ease of moving

apps to Liberty or to WAS container, or to newer versions of WebSphere traditional. It will accelerate application migrating to cloud process, minimize errors and risks and reduce time to market. To learn more about IBM App Modernization solutions, please visit [Cloud Pak for Applications](#).

Congratulations! You have successfully completed the lab “Evaluate On-Premises Java Apps with Transformation Advisor”.

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