

Evaluate Java Applications with Transformation Advisor

Modernizing WebSphere / Java applications for container-based clouds



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Evaluate Java Applications with Transformation Advisor

This lab provides fundamental hands-on experience of the evaluation process of WebSphere application for their modernization journey to Liberty and container-based clouds. It shows 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 learn how to use this tool to quickly analyze on-premises Java applications without accessing their source code and to estimate the move to cloud efforts.

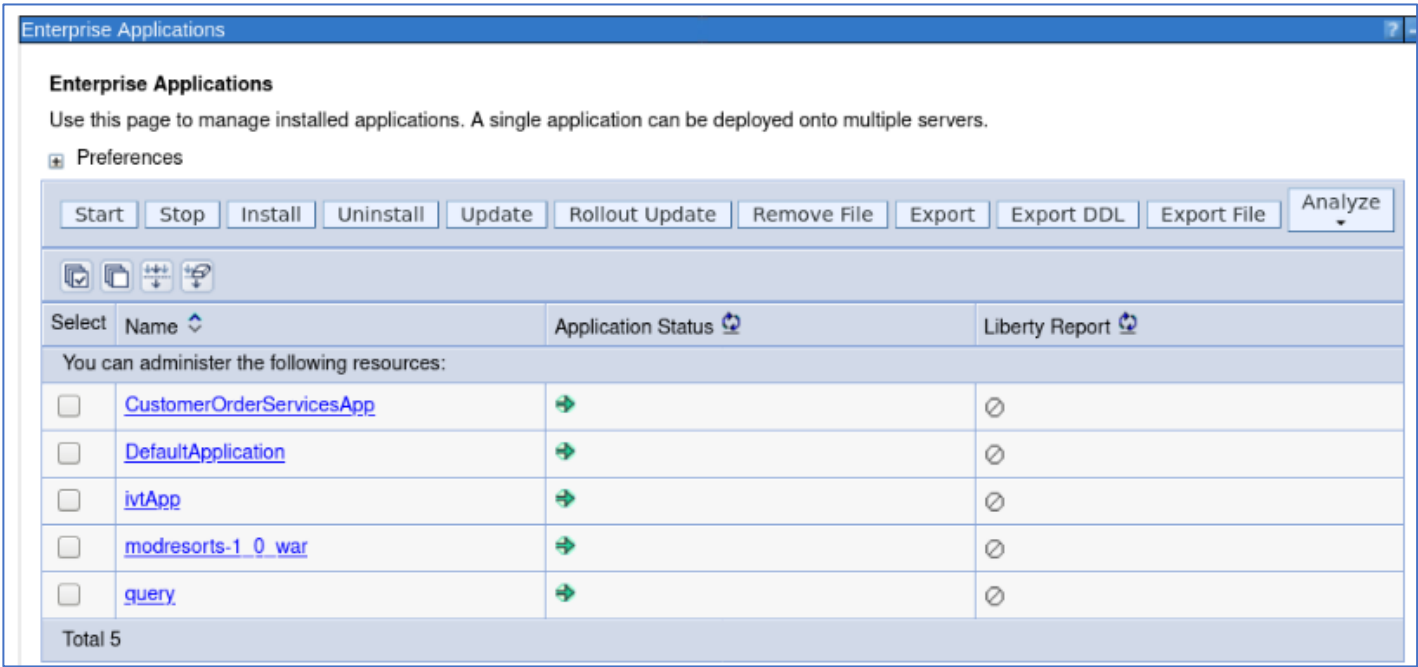
IBM Cloud Transformation Advisor (Transformation Advisor) is an application modernization tool that is entitled through IBM WebSphere Hybrid Edition. Transformation Advisor helps you quickly evaluate on-premises Java EE applications for deployment to the cloud. The Transformation Advisor tool can

- 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
- identify 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 accelerates application migrating to cloud process, minimize errors and risks and reduce time to market.

1. Business Scenario

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



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 applications 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.

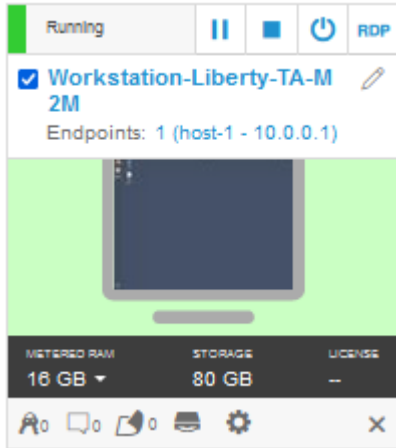
3. Prerequisites

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

- Familiarity with basic Linux commands
- Have internet access
- Have a SkyTap lab environment ready

4. The lab environment

One Linux VM is included in the environment and has been provided for this lab.



- The **Workstation-Liberty-TA-M2m VM** will be referred as the “**workstation**” VM throughout the lab.
- The login credentials for the **workstation VM** are:
 - User ID: **ibmdemo**
 - Password: **passw0rd**
- Transformation Advisor (TA) has already been installed on the Workstation VM. TA local runs in Docker containers.
- Get started using Transformation Adviser for yourself: <http://ibm.biz/cloudta>

5. Lab Tasks

In this lab, you will use 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 would typically run the Transformation Advisor **Data Collector tool** against a WebSphere server or cell. For this lab, you will simulate the process of running the data collector which generates a zip file containing the inventory of the content and structure of each application.

For this lab environment, the data collection zip archive file has already been generated. You will import that zip file into the Transformation Advisor UI for application analysis.

Using Transformation Advisor, you will gain insights into potential migration issues that may need to be remediated if you move the application to cloud. Reviewing the analysis reports, you will determine the complexity of the move-to-cloud efforts and select a candidate application to migrate to Liberty in a container-based cloud.

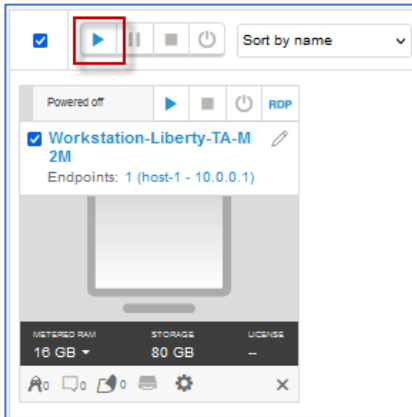
Here are the activities involved in this process:

- Simulate running the Transformation Advisor Data Collector tool against the WebSphere Application Server to get application data
- Load the zip archive file that was generated by the data collector, into Transformation Advisor UI for analysis.
- Review the analysis and reports that Transformation Advisor generates to identify the right candidate application for a rapid and cost-effective migration to cloud

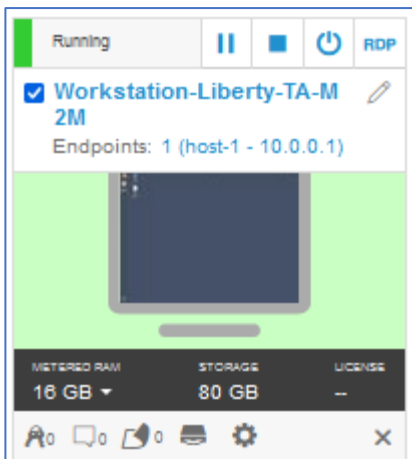
6. Execute Lab Tasks

6.1 Log in to the workstation VM and Get Started

1. If the VM is not already started, start it by clicking the play button for the whole group.



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

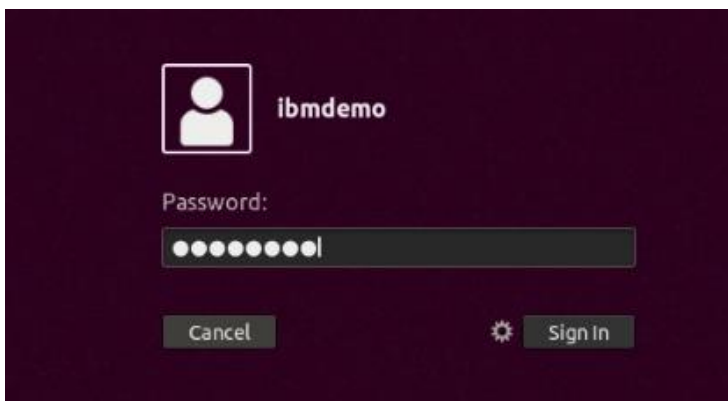


3. If you see a screen displaying only “**ibmdemo**”. Click on the screen to get to the password prompt to login.

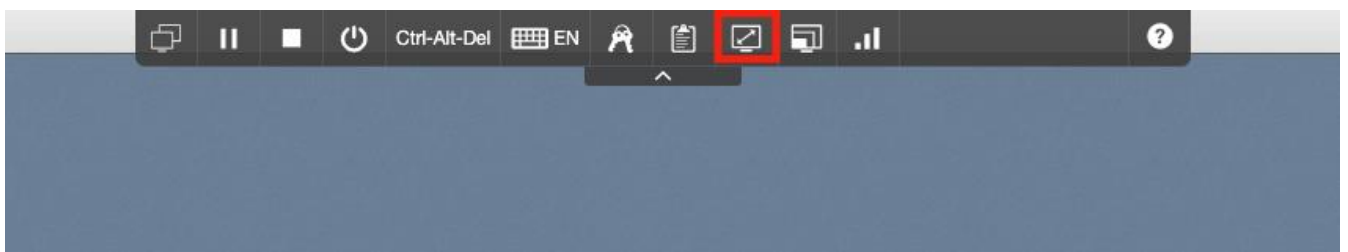


4. Login with **ibmdemo** ID.

- Click on the **ibmdemo** icon on the screen.
- When prompted for the password for **ibmdemo**, enter "**password**" as the password:



5. Resize the Skytap environment window for a larger viewing area while doing the lab. From the Skytap menu bar, click on the "**Fit to Size**" icon. This will enlarge the viewing area to fit the size of your browser window.

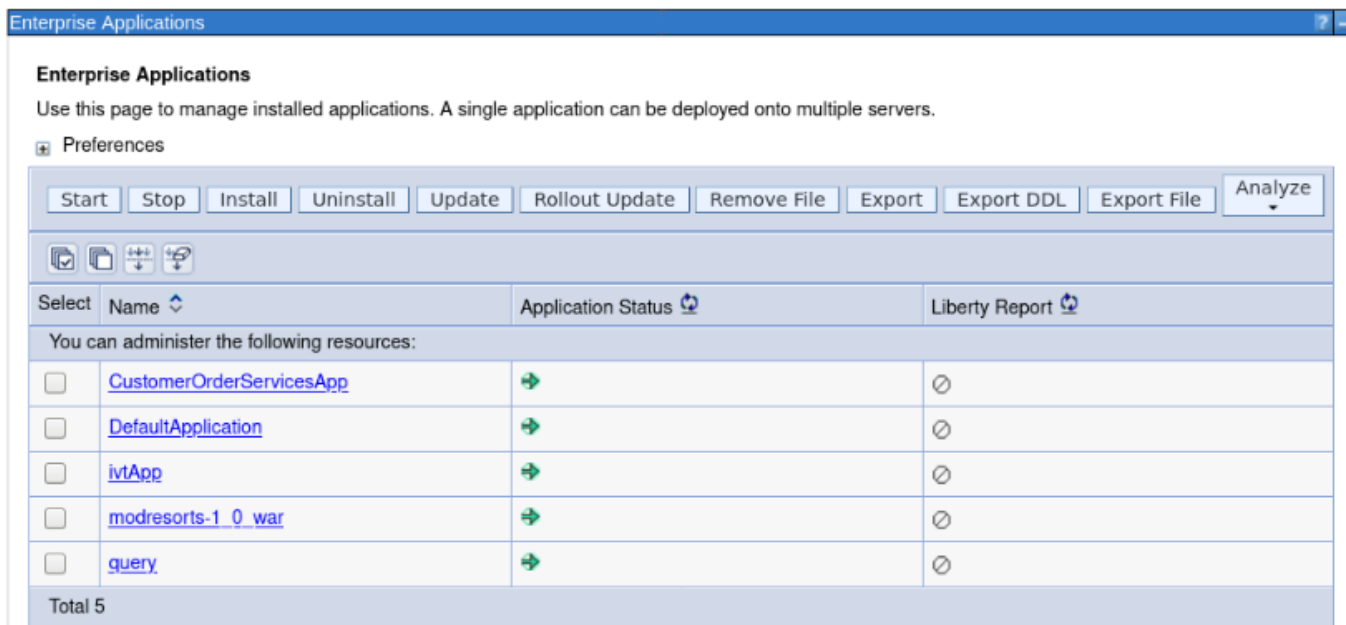


6.2 The WebSphere applications to be assessed

The illustration below shows the WebSphere applications that are deployed to the WebSphere Application Server (WAS) environment. We already ran the Transformation Advisor Data Collection tool against the WebSphere server, and provided the resulting data collection zip archive file on the Workstation VM to be used in the lab.

You will simulate the data collection process. However, not actually run the data collector since this lab environment does not have access to the WebSphere environment.

As illustrated below, Transformation Advisor will collect the application data for the following five applications. During the analysis of these applications, you will gain important insights regarding these applications, their JEE technologies used, relative complexity of each application, and detailed analysis of the overall effort and complexity of moving each application to Liberty and container-based cloud environments.



Enterprise Applications

Use this page to manage installed applications. A single application can be deployed onto multiple servers.

Preferences

Start Stop Install Uninstall Update Rollout Update Remove File Export Export DDL Export File Analyze

Select	Name	Application Status	Liberty Report
<input type="checkbox"/>	CustomerOrderServicesApp	➔	⊗
<input type="checkbox"/>	DefaultApplication	➔	⊗
<input type="checkbox"/>	ivtApp	➔	⊗
<input type="checkbox"/>	modresorts-1_0_war	➔	⊗
<input type="checkbox"/>	query	➔	⊗

Total 5

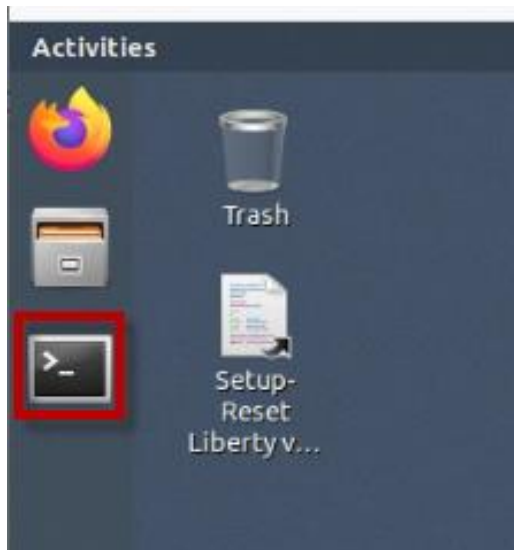
In the Enterprise Applications list above, you can see the applications that deployed to the WebSphere Application Server environment. Next, you use Transformation Advisor to analyze these applications to identify a good candidate to be moved to the cloud.

6.3 Launch Transformation Advisor (local)

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 installed locally on the **Workstation** VM. Launch the Transformation Advisor tool using the steps below.

1. From **Workstation** VM Desktop Tool Bar, click the Terminal icon to open a Terminal window.



2. Launch the **Transformation Advisor** with commands:

```
cd /home/ibmdemo/TA_LOCAL/transformation-advisor-local-2.5.0

./launchTransformationAdvisor.sh
```

Wait for Transformation Advisor to initialize and display the action menu list.

3. Type **5** and press **Enter** to start the **Transformation Advisor**.

```
Status
-----
Transformation Advisor 2.5.0 is available for us at the following URL> http://10.0.0.1:3000

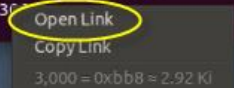
Select the operation.....

1) Install Transformation Advisor
2) Uninstall Transformation Advisor (keep database data)
3) Uninstall Transformation Advisor (remove database data)
4) Stop Transformation Advisor
5) Start Transformation Advisor
6) Check for latest Transformation Advisor
7) Working in an Air Gapped Environment
8) Quit
5
```

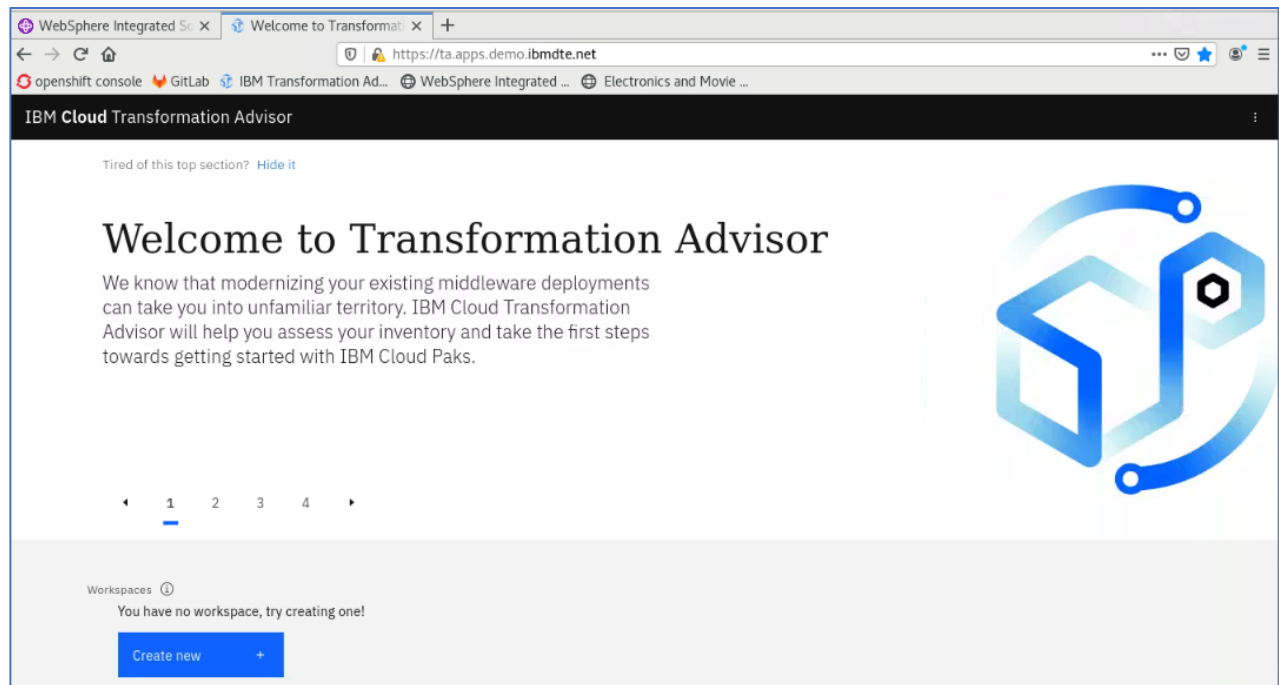
4. The **Transformation Advisor** application is started, right-click the application URL link and select **Open Link** to launch it in a web browser window

```
Select the operation.....

1) Install Transformation Advisor
2) Uninstall Transformation Advisor (keep database data)
3) Uninstall Transformation Advisor (remove database data)
4) Stop Transformation Advisor
5) Start Transformation Advisor
6) Check for latest Transformation Advisor
7) Working in an Air Gapped Environment
8) Quit
5
Starting Transformation Advisor...
Configuring Transformation Advisor.....
Status
-----
Transformation Advisor 2.5.0 is available for us at the following URL> http://10.0.0.1:3000
ibndemo@ibndemo-virtual-machine:~/TA_LOCAL/transformation-advisor-local-2.5.0$
```



This **Transformation Advisor** Home page is displayed in the Web Browser.



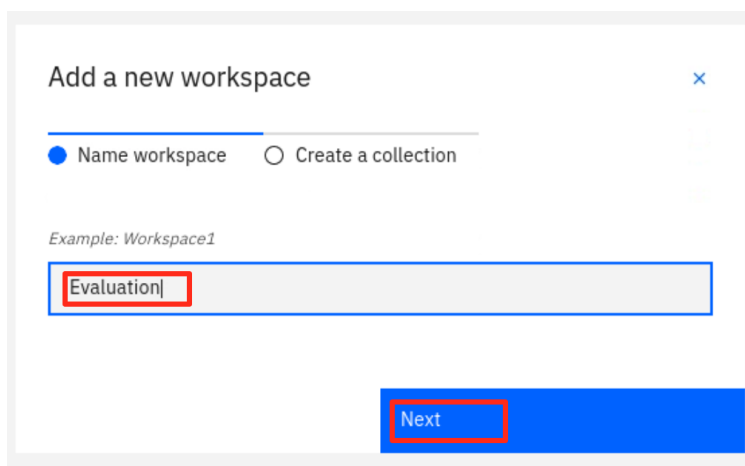
In the next section, you will use the Transformation Advisor UI to download the **data collector utility** for the environment that the WebSphere Application Server would be running, such as Windows, Linux Windows, Linux.

6.4 Download Transformation Advisor Data Collector utility

Now the Transformation Advisor is running, you will download its Data Collector utility that would run on a WebSphere Application Server.

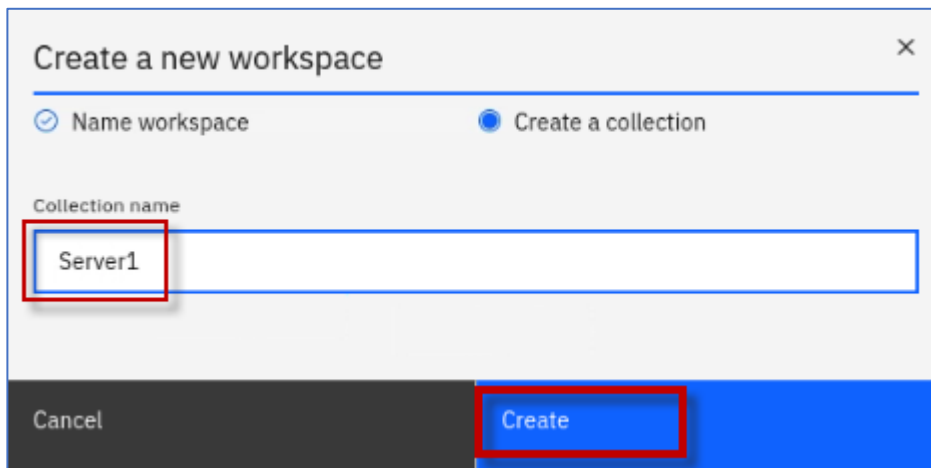
To evaluate on-premises Java applications, you need to run **Transformation Advisor Data Collector utility** against the Application server environment. It will extract application information from the environment. The utility can be downloaded from the Transformation Advisor web page.

1. From the Transformation Advisor Home page, add a **new workspace** by entering the workspace name as **Evaluation** and then clicking **Next**.



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

2. Enter the collection name as **Server1** and click **Create**



Create a new workspace

☐ Name workspace ☒ Create a collection

Collection name

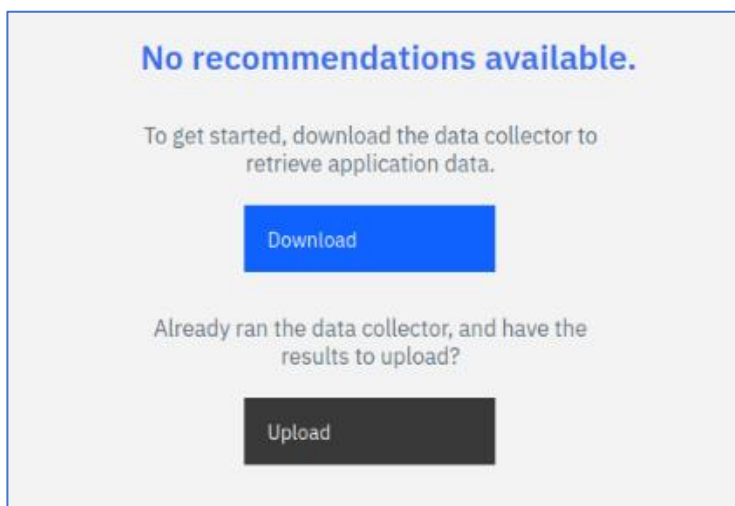
Server1

Cancel Create



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

Once the Workspace and Collection are created, you will have options to either **download** the Data Collector utility or **upload** existing data file.



No recommendations available.

To get started, download the data collector to retrieve application data.

Download

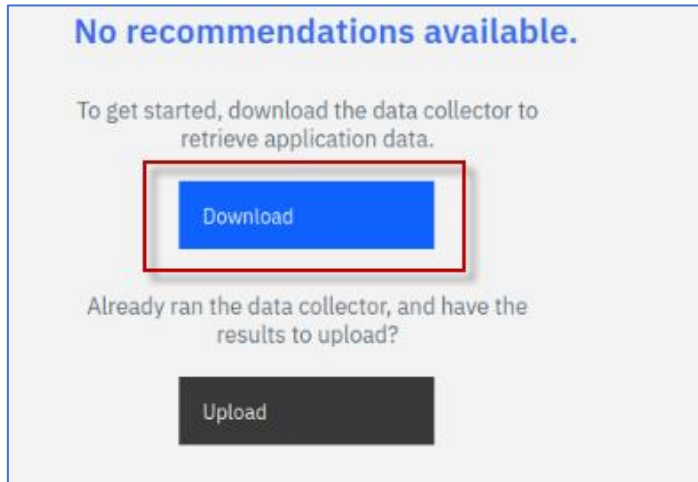
Already ran the data collector, and have the results to upload?

Upload

In this lab, we are going to perform the following steps:

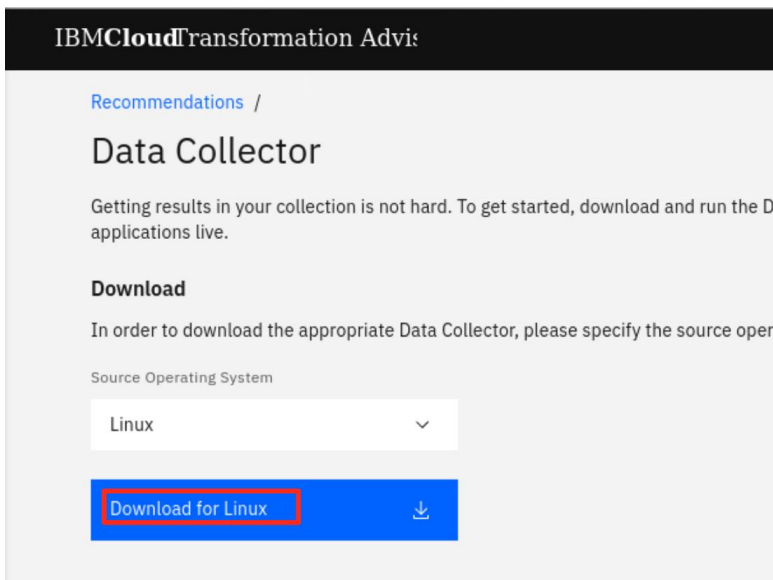
- download the Data Collector utility for the Linux environment
- Simulate running the data collector
- Upload an existing data file into Transformation Advisor for analysis

3. Click the **Download** button to download the data collector for Linux

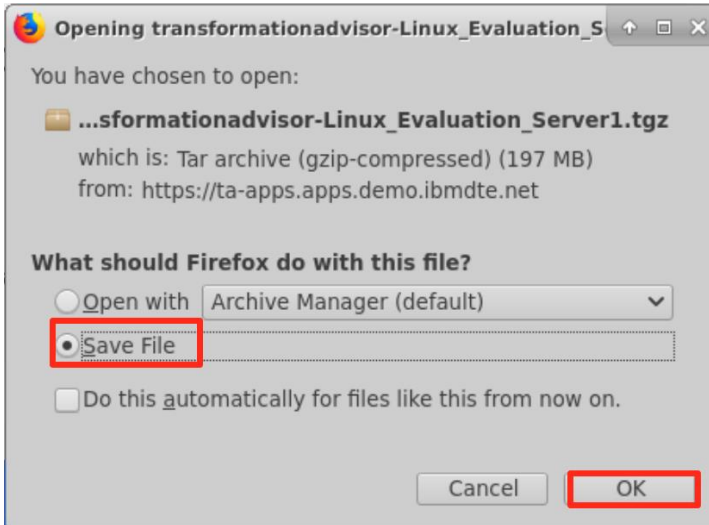


4. In the Download page, you can download different versions of the utility based on your source operating system. It also shows how to use the command line utility to collect application data from WebSphere, WebLogic, and Tomcat servers.

a. Since the lab VM is a Linux OS, click **Download Linux** to get the utility.



- b. 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 **Workstation** VM.

Continue to the next section of the lab to simulate running the data collector utility.

6.5 Simulate running the Transformation Advisor Data Collector utility

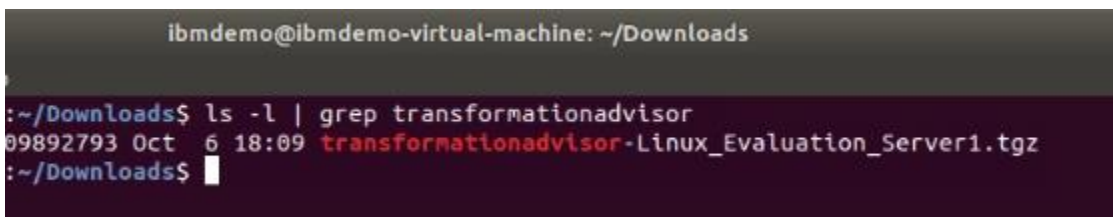
After downloading the zipped Data Collector utility, it needs to be unpacked and run against a WebSphere Application server (WAS) to collect all the data of deployed applications and their configuration from the WAS server.

Now, let's simulate the steps to run the data collector.

1. Go back to the terminal window and navigate the **/home/ibmdemo/Downloads** directory and view its contents with commands:

```
cd /home/ibmdemo/Downloads/  
  
ls -l | grep transformationadvisor
```

You can see the downloaded data collector utility file named “**transformationadvisor-Linux_Evaluation_Server1.tgz**”



```
ibmdemo@ibmdemo-virtual-machine: ~/Downloads  
:  
:~/Downloads$ ls -l | grep transformationadvisor  
89892793 Oct 6 18:09 transformationadvisor-Linux_Evaluation_Server1.tgz  
:~/Downloads$
```

2. Extract the data collector utility using the following command:

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

The data collector utility will be extracted to **/home/ibmdemo/Downloads/transformationadvisor-2.5.0** directory.

Note: At this point, the data collector is ready to execute against a WebSphere environment.

3. Return to the Transformation Advisor UI in the Web browser to view the section on “**Run the Tool**”, which shows the command to run on the WebSphere environment.
 - a. From the **Data Collector** page, scroll down to the “**Run Tool**” section.

The data collector command that would be executed is based on the **domain** and **analysis type** selections you make in this section.

Run Tool

Select your domain and analysis type below and run the generated command from the data collector directory to begin scanning.

Domain

IBM WebSphere ▾

Analysis of

Apps & Configuration ▾

Preferred method

```
./bin/transformationadvisor -w <WEBSPHERE_HOME_DIR> -p  
<PROFILE_NAME> [--scan-node --ignore-missing-binary  
--ignore-missing-shared-library --applications
```

4. Choose the **IBM WebSphere** Domain. Other domains include other JAVA EE runtimes IBM MQ. The data collector tool command changes based on this selection.

Run Tool

Select your domain and analysis type below and run the scanning.

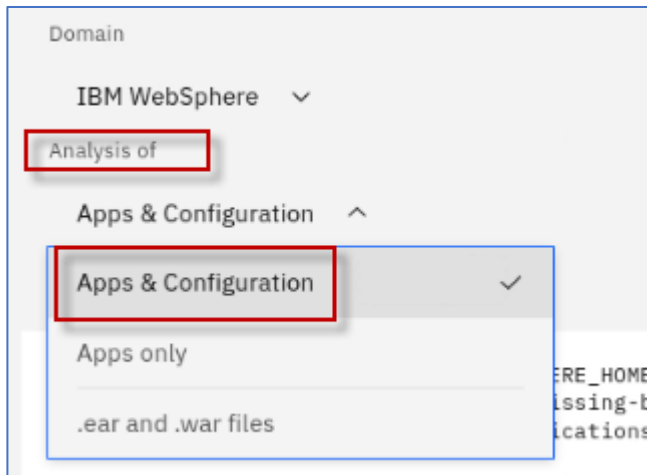
Domain

IBM WebSphere ^

- IBM WebSphere ✓
- Oracle WebLogic
- Red Hat JBoss
- Apache Tomcat
- IBM MQ

5. Select the Analysis type of “**Apps and Configuration**”

Selecting **Apps & Configuration** ensures that the application data and server configuration data is collected. The server configuration data is extremely helpful in Transformation Advisor to generate deployment artifacts in the migration bundle, which we will explore later in the lab.



6. Review the data collector command that is shown based on your selections.

```
./bin/transformationadvisor -w <WEBSphere_HOME_DIR> -p  
<PROFILE_NAME> [--scan-node --ignore-missing-binary  
--ignore-missing-shared-library --applications
```

If you were going to run the command, there are a few additional things that need to happen.

- Replace the <WEBSphere_HOME_DIR> and <PROFILE_NAME> variables with the values from the WebSphere environment
- If the WebSphere environment is not connected to the VM where Transformation Advisor is running, then the data collector utility that was downloaded must be copied and unpacked to the WebSphere environment.

6.5.1 FOR ILLUSTRATIVE PURPOSES ONLY: Simulation of running the Transformation Advisor Data Collector utility



Important:

This section is for illustrative purposes only.

DO NOT RUN THE COMMANDS shown!

If the WebSphere Application Server and Transformation Advisor has connectivity, the data collector could be run as follows.

1. Example of the **Data Collector** utility command to start collect the deployed applications information on the WebSphere Application server.

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

2. Type **1** to accept the license agreement and press **Enter**, as illustrated below

```
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.

6.6 Upload the data collection into Transformation Advisor

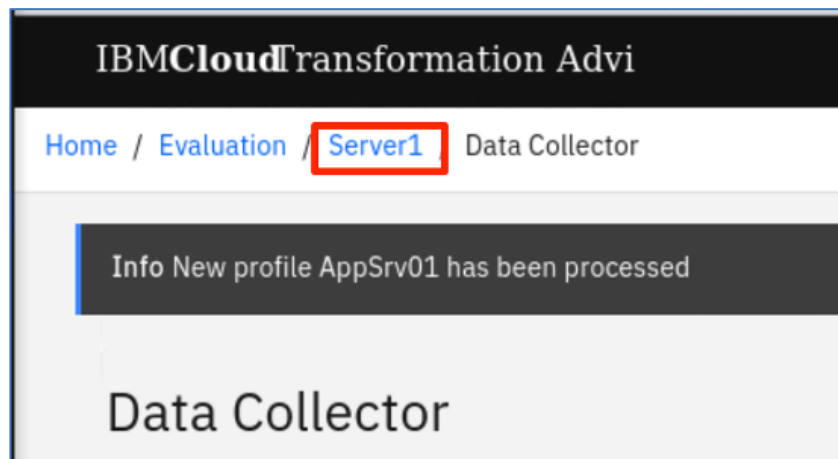
In this section, you will upload the data collection zip file “**AppSrv01.zip**” from the WebSphere environment for analysis.

Typically, before you can upload the data collector zip files, you will need to download the appropriate data collector for your target environments operation environment, such as Linux, Windows, etc.

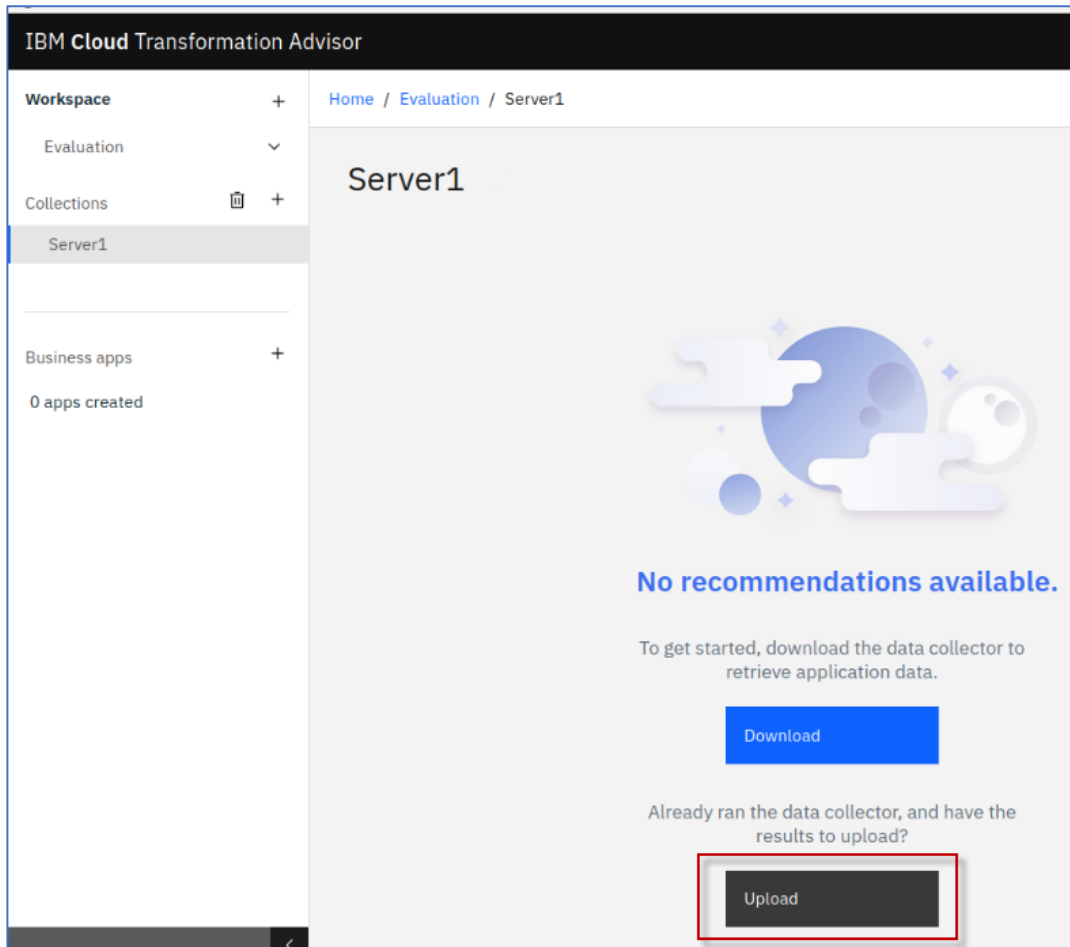
Additionally, you would run the data collector in the target environment to collect the data for your applications. Then, you can import the collection data into Transformation Advisor for analysis.

Tip: As noted in the previous section, the data collection steps have already been done, and the resulting AppSrv01.zip file is provided for you in the lab environment.

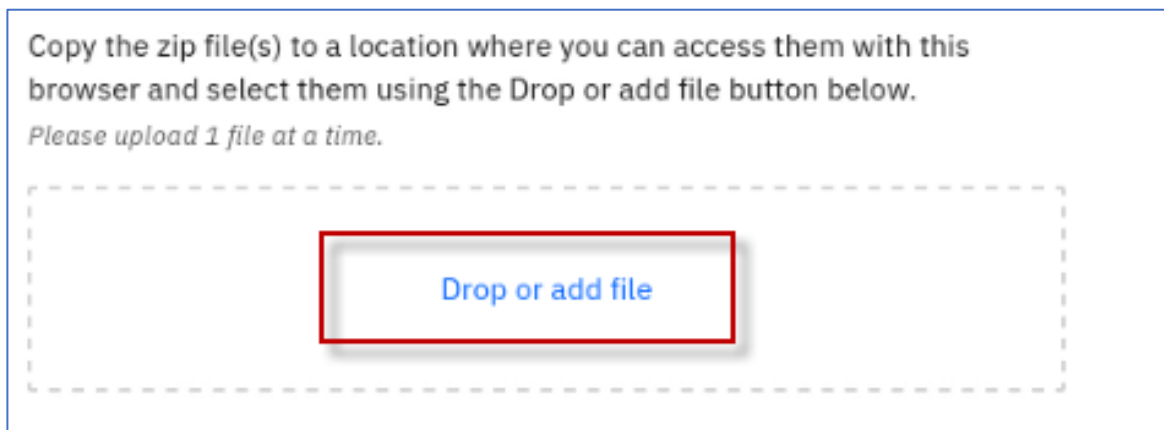
1. Go back to Transformation Advisor page in web browser, click the **Server1** link to go to the Recommendations page.



2. From the Evaluation / Server1 workspace, upload the “**AppSrv01.zip**” data collection file
 - a. Click the **Upload** button to upload a data collection file

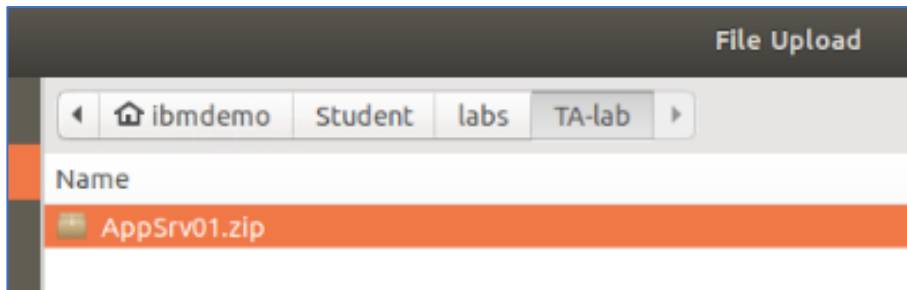


- b. From the Upload Data page, click the **Drop or add file** link

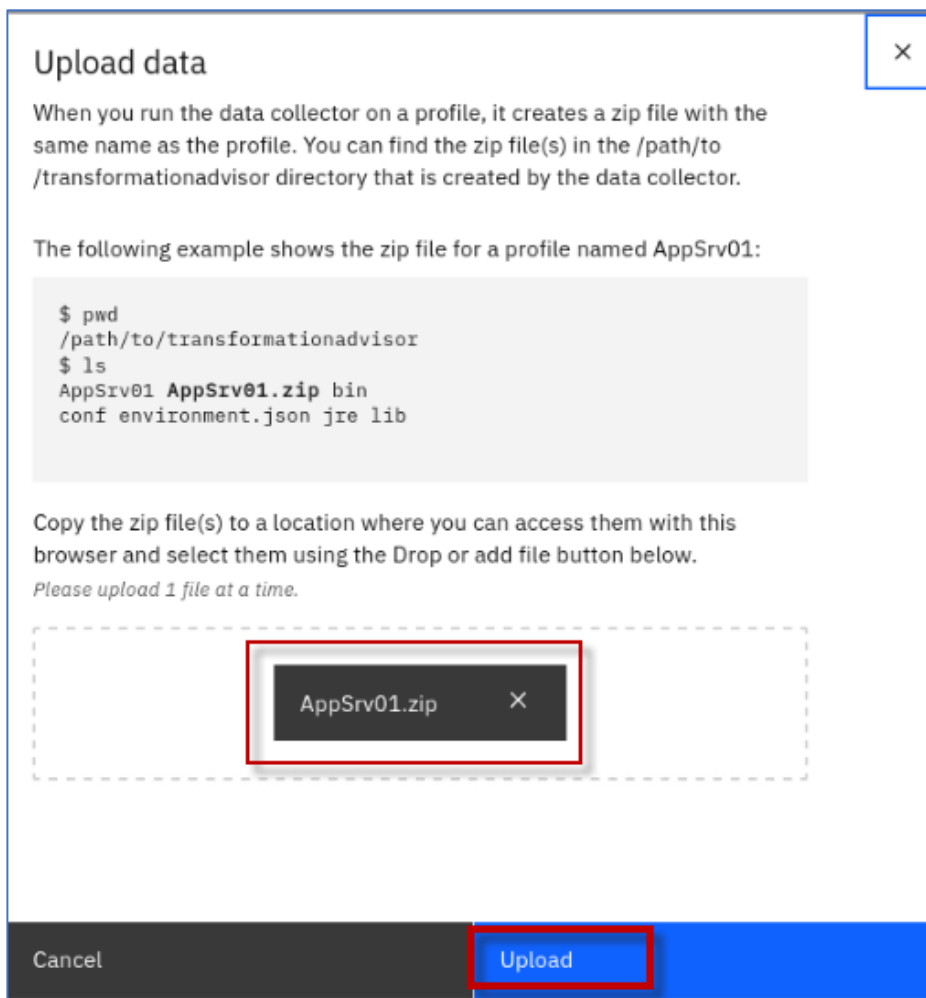


- c. Navigate to the location of the data collection file and add the **AppSrv01.zip** file. Then click the **Open** button on the Download page.

[Home](#) > [ibmdemo](#) > [Student](#) > [labs](#) > [TA-lab](#) > [AppSrv01.zip](#)



- d. The **AppSrv01.zip** data collection file is now ready to be uploaded. Click the **Upload** button to continue.



Once the data collection has been uploaded to Transformation Advisor, you are redirected back to the TA Recommendations screen. Notice that the **Profile** shown is for the **AppSrv01** profile from the WebSphere Application Server.

Home / Evaluation / Server1

Server1

Source environment
IBM WebSphere Application Server

Profile
AppSrv01
Version: 8.5.5.20

Migration target ⓘ
Liberty runtimes

Upload options ▼

Java applications (5)

Search

Name	Migration Target	Complexity	Issues	Estimated dev cost in days	
CustomerOrderServicesApp.ear	Open Liberty	Moderate	▲ 2 ■ 1 ● 5	3.5	⋮
CustomerOrderServicesApp.ear	WebSphere Liberty	Simple	● ● ● 4	0	⋮
DefaultApplication.ear	Open Liberty	Moderate	▲ 1 ● ● 4	0.5	⋮
ivtApp.ear	Open Liberty	Simple	● ● ● 1	0	⋮
modresorts-1_0_war.ear	Open Liberty	Simple	● ● ● 2	0	⋮
query.ear	Open Liberty	Moderate	▲ 2 ● ● 5	2.5	⋮

In the next section, you will use Transformation Advisor to view the application data analysis that was collected.

6.7 Evaluate On-Premises Java Applications

In this section, you are going to use the Transformation Advisor UI to view the application data analysis results that was collected in the previous section.

1. From the **Recommendations** page, you can see all applications analyzed from the WAS server are listed.

The screenshot displays the IBM Cloud Transformation Advisor interface. On the left, a sidebar shows the navigation menu with 'Workspace', 'Evaluation', 'Collections', and 'Server1' (selected). The main content area is titled 'Server1' and shows the 'Source environment' as 'IBM WebSphere Application Server', the 'Profile' as 'AppSrv01' (Version: 8.5.5.20), and the 'Migration target' as 'Liberty runtimes'. Below this, a section titled 'Java applications (5)' lists the following applications:

Name	Migration Target	Complexity	Issues	Estimated dev cost in days
CustomerOrderServicesApp.ear	Open Liberty	Moderate	2 (red triangle), 1 (yellow square), 5 (green circle)	3.5
CustomerOrderServicesApp.ear	WebSphere Liberty	Simple	4 (green circle)	0
DefaultApplication.ear	Open Liberty	Moderate	1 (red triangle), 4 (green circle)	0.5
ivtApp.ear	Open Liberty	Simple	1 (green circle)	0
modresorts-1_0_war.ear	Open Liberty	Simple	2 (green circle)	0
query.ear	Open Liberty	Moderate	2 (red triangle), 5 (green circle)	2.5

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 profile.

The target environment is **Liberty Runtimes**, which is the default target environment.

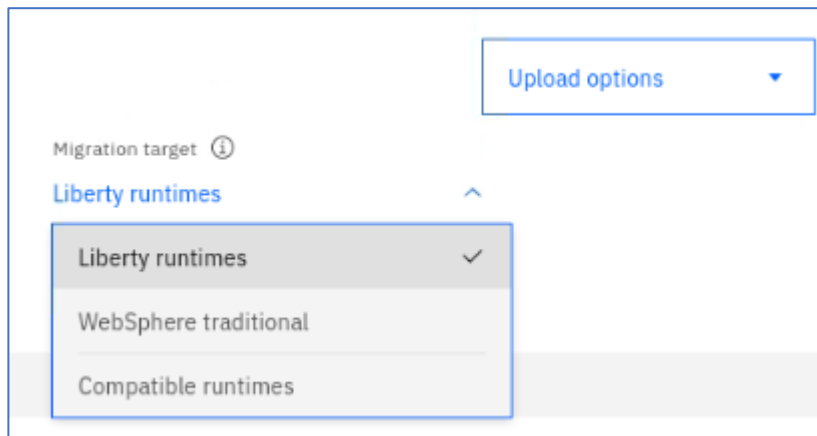
The Recommendations page also shows the summary analysis results for all the apps in the AppSrv01 environment to be moved to a Liberty on OpenShift environment. For each app, you can see these results:

- Name
- Migration Target
- Complexity
- Issues
- Estimated development cost (in days)

For example, if you want to move the **modresorts-1_0_war.ear** application to Open Liberty, the complexity level is Simple, 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 two minor level issue and the estimated development effort is zero day because no code change is required.

modresorts-1_0_war.ear	Open Liberty	Simple				2	0
------------------------	--------------	--------	--	--	--	---	---

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



In this lab you are focusing on identifying a good candidate application for moving to Open Liberty on OpenShift environment.

- Switch to the **Compatible Runtimes** view, which will show additional target runtime options, and their respective complexity of moving the application to that target environment.

Home / Evaluation / Server1

Server1

Source environment: IBM WebSphere Application Server

Profile: AppSrv01
Version: 8.5.5.20

Migration target ⓘ
Compatible runtimes

Upload options

Java applications (5)

Search

Name	Migration Target	Complexity	Issues	Estimated dev cost in days
CustomerOrderServicesApp.ear Open Liberty	Open Liberty	Moderate	▲ 2 ■ 1 ● 5	3.5
CustomerOrderServicesApp.ear WebSphere Liberty	WebSphere Liberty	Simple	● ● ● 4	0
CustomerOrderServicesApp.ear WebSphere traditional	WebSphere traditional	Simple	● ● ● 2	0
DefaultApplication.ear Open Liberty	Open Liberty	Moderate	▲ 1 ● ● 4	0.5
DefaultApplication.ear WebSphere traditional	WebSphere traditional	Simple	● ● ● 3	0
ivtApp.ear Open Liberty	Open Liberty	Simple	● ● ● 1	0
ivtApp.ear WebSphere traditional	WebSphere traditional	Simple	● ● ●	0

For this lab, you will focus on the modernization of **moderesorts-1.0_war.ear** to Open Liberty. Next, you will look at the analysis results for **moderesorts-1.0_war.ear** application in detail.

- Click the **modresorts-1_0_war.ear** link targeting **Open Liberty** to expand its analysis results.

Name	Migration Target	Complexity	Issues	Estimated in days
CustomerOrderServicesApp.ear	Open Liberty	Moderate	▲ 2 ■ 1 ● 5	3.5
CustomerOrderServicesApp.ear	WebSphere Liberty	Simple	● ● ● 4	0
DefaultApplication.ear	Open Liberty	Moderate	▲ 1 ● ● 4	0.5
ivtApp.ear	Open Liberty	Simple	● ● ● 1	0
modresorts-1_0_war.ear	Open Liberty	Simple	● ● ● 2	0
query.ear	Open Liberty	Moderate	▲ 2 ● ● 5	2.5

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.

IBM Cloud Transformation Advisor						
Home / Evaluation / Server1 / modresorts-1_0_war.ear						
modresorts-1_0_war.ear			Add to business application + View migration plan →			
Source environment	Migration Target	Complexity	Issues	Common code files	Total application cost	
IBM WebSphere Application Server AppSrv01 Version: 8.5.5.20	Open Liberty	Simple	● ● ● 2	0	0 days	

4. Scroll down to **Complexity Rules** section. You can see although there is no code change required and no development cost, the estimate migration over all develop cost is **0 days**. This estimate is based on data from IBM Services engagements, which includes migrating management, server configuration, and testing.

IBM Cloud Transformation Advisor

Home / Evaluation / Server1 / modresorts-1_0_war.ear

modresorts-1_0_war.ear

Add to business application + View migration plan →

Source environment	Migration Target	Complexity	Issues	Common code files	Total application cost
IBM WebSphere Application Server AppSrvv01 Version: 8.5.5.20	Open Liberty	Simple	2	0	0 days

Complexity rules
A level of domain knowledge or skill is required to prepare for migration.

Overall Complexity: Simple

No code changes are needed and dependencies are easily manageable Simple 2 issues

5. Expand the **Issues and issues details** section. You can see the only minor potential issue listed is on configuring the application in Docker container.

No code changes are needed and dependencies are easily manageable Simple 2 issues

Description: This issue can be resolved without code changes and the external dependencies can be accurately mapped by the migration tools

Related Issues

- CDI scans for implicit beans when there is no beans.xml file
- Handling application configuration in Docker containers

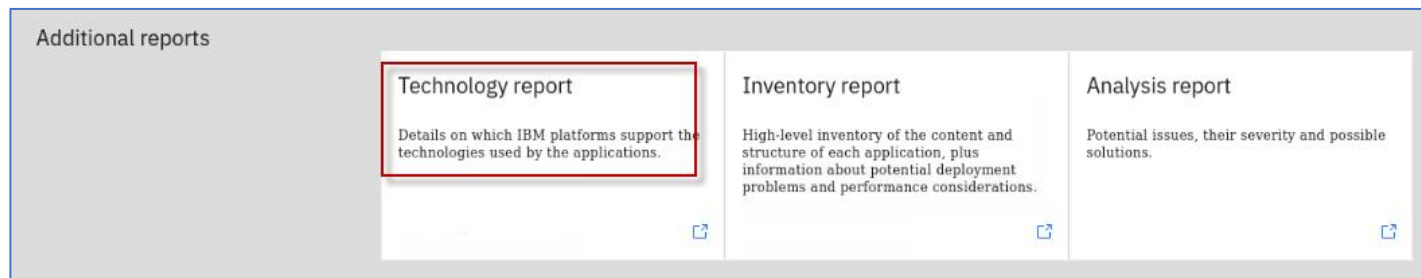
Issue details
You may have the following issues during migration. Issues result from breaking specific migration rules. Check each issue severity to see how urgent it is for you to address before migration.

Filter issues

- ☐ Critical (0)
- ☐ Potential (0)
- ☒ Suggested (2)

Additional information	0 days
CDI scans for implicit beans when there is no beans.xml file	0 days
Handling application configuration in Docker containers	0 days

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

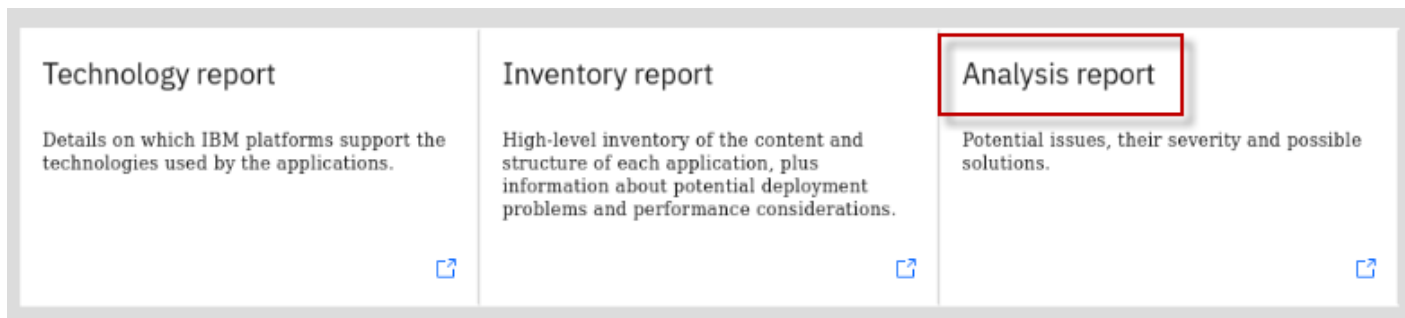


The **Technology report** lists all java technologies the application used and whether these technologies are supported by a specific WebSphere platform from Liberty for Java on IBM Cloud to WebSphere traditional for z/OS. It is used to determine whether a particular WebSphere product is suitable for an application.

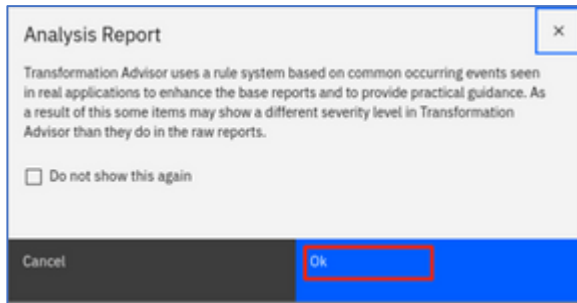
Application Technology Evaluation Report									
8/24/21 1:29 PM /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/config/cells/adminNode01Cell/applications/modresorts-1_0_war.ear/modresorts-1_0_war.ear									
Scan options: --baseEdition --coreEdition --liberty --libertyBuildpackEdition --ndEdition --traditional --zosEdition									
Excluded packages: --excludePackages=ch.qos, com.fasterxml, com.ibm, com.informix, com.lowagie, com.mchange, com.meterware, com.microsoft, com.sun, com.sybase, freemarker, groovy, java, javax, net, oracle, org, sqlj, sun, twitter4j, _ibmjsp									
Technology Evaluation									
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.									
	Open Liberty	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 editions.

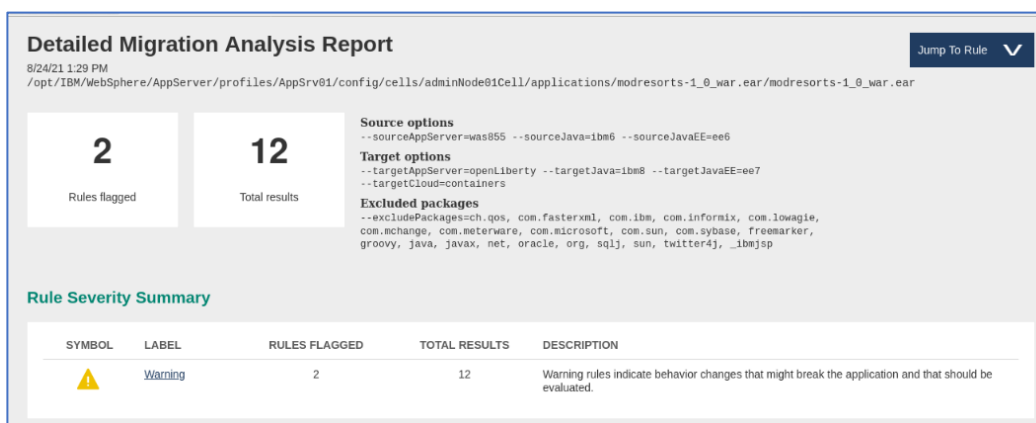
- Go back to the Transformation Advisor page and click the **Analysis Report** link.



- a. Click **OK** to continue.

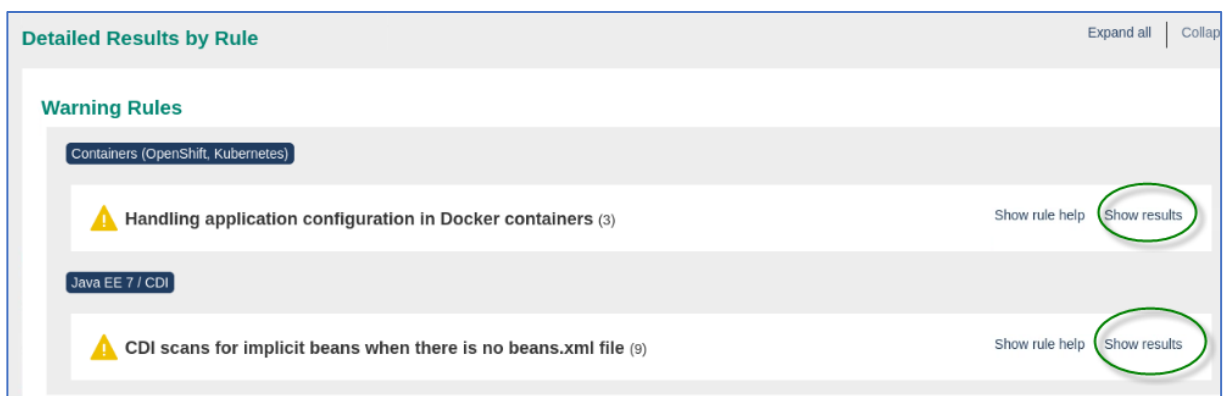


Now you see the Detailed Migration Analysis Report opened in a new browser window.

A screenshot of the "Detailed Migration Analysis Report" page. At the top, it shows the date and time "8/24/21 1:29 PM" and a file path. Below this, there are two large boxes: "2 Rules flagged" and "12 Total results". To the right, there are sections for "Source options", "Target options", and "Excluded packages". Below these is a "Rule Severity Summary" section with a table. The table has columns: SYMBOL, LABEL, RULES FLAGGED, TOTAL RESULTS, and DESCRIPTION. The first row shows a warning symbol, the label "Warning", 2 rules flagged, 12 total results, and a description: "Warning rules indicate behavior changes that might break the application and that should be evaluated." There is also a "Jump To Rule" dropdown menu in the top right corner.

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

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

A screenshot of the "Detailed Results by Rule" section. It has "Expand all" and "Collapse" buttons in the top right. Under the "Warning Rules" heading, there are two rule entries. The first is "Containers (OpenShift, Kubernetes)" with a warning icon and the text "Handling application configuration in Docker containers (3)". It has "Show rule help" and "Show results" links, with the "Show results" link circled in green. The second is "Java EE 7 / CDI" with a warning icon and the text "CDI scans for implicit beans when there is no beans.xml file (9)". It also has "Show rule help" and "Show results" links, with the "Show results" link circled in green.

For the Mod Resorts application, there are two warning rule regarding the application configuration in Docker containers.

- c. Click the **Show results** link next to the warning rules.

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

Warning Rules

Containers (OpenShift, Kubernetes)

Handling application configuration in Docker containers (3)

Results

FILE NAME	REFERENCE DETAILS	MATCH CRITERIA
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/httpclient-4.5.5.jar	org/apache/http/client/version.properties	(.*?)?.properties
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/httpcore-4.4.9.jar	org/apache/http/version.properties	(.*?)?.properties
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/httpmime-4.5.5.jar	org/apache/http/entity/mime/version.properties	(.*?)?.properties

- d. 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	
modresorts-1_0_war.ear/modresorts-1.0.war/WEB-INF/lib/commons-codec-1.10.jar			

This expands 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.

- | | | |
|---|--|--|
| <h3>Technology report</h3> <p>Details on which IBM platforms support the technologies used by the applications.</p>  | <h3>Inventory report</h3> <p>High-level inventory of the content and structure of each application, plus information about potential deployment problems and performance considerations.</p>  | <h3>Analysis report</h3> <p>Potential issues, their severity and possible solutions.</p>  |
|---|--|--|

Application Inventory Report

Report ID: 1234567890 | Generated: 2023-10-27 10:30:00 | Data Source: Application Inventory Database | Report Period: Last 30 Days | Report Type: Summary

Report Options: --include:all --exclude:dev --format:html --output:report.html --verbose

Category	Count
Java Applications	1
Python Applications	1
PHP Applications	0
JavaScript Applications	0
Web Frameworks	0
Mobile Frameworks	8
Application Libraries	0

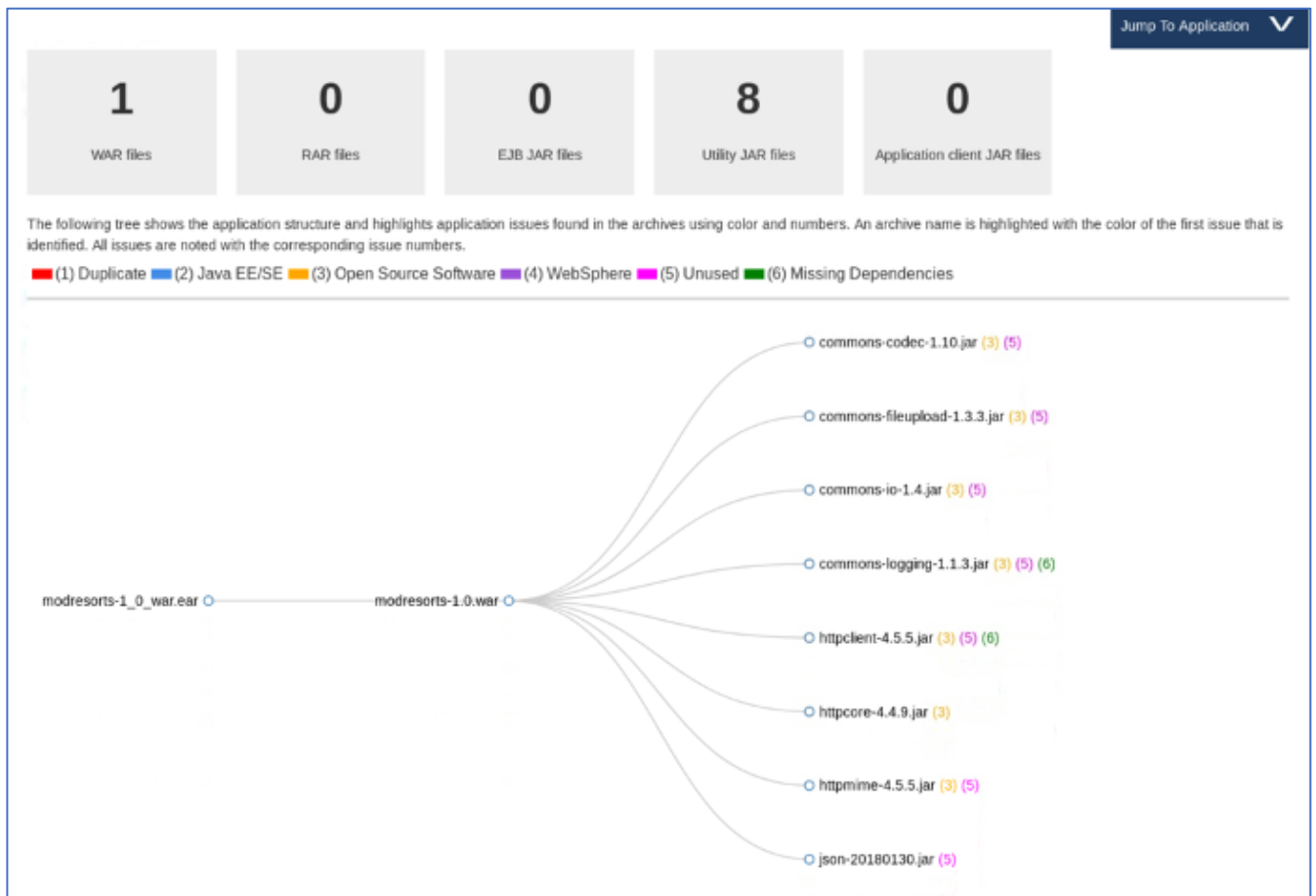
Summary

Technology	Count
Java Applications	1
Python Applications	1
PHP Applications	0
JavaScript Applications	0
Web Frameworks	0
Mobile Frameworks	8
Application Libraries	0
Database Drivers	0
Logging Libraries	0
Security Libraries	0
Testing Libraries	0
Build Tools	0

Inventory Details by Application

Expand all | Collapse all

- a. Scroll down to view this report which serves as good decision-making tool to info you what is inside your application runtime, and to help you to have a better understanding of the application 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 Open Liberty 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 Open Liberty in containers in the repackage process with minimum effort.

9. Now you know that the Mod Resorts application can be moved to Liberty, you want to know if it is also a good candidate for re-platform with traditional WebSphere in containers. To do that switch the target environment from **Compatible Liberty Runtime** to **WebSphere traditional**.

The screenshot shows the IBM Cloud Transformation Advisor interface. On the left, a sidebar contains a 'Workspace' section with 'Evaluation' and 'Collections' sub-sections. Under 'Collections', 'Server1' is selected. The main area displays 'Server1' details: 'Source environment' is 'IBM WebSphere Application Server', 'Profile' is 'AppSrv01' (Version: 8.5.5.20), and 'Migration target' is 'WebSphere traditional' (highlighted with a red box). A 'Java applications (5)' section is visible at the bottom.

As you can see from the TA recommendation that the Mod Resorts application is also a good candidate for re-hosting 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.

The screenshot shows the 'Server1' details page in the IBM Cloud Transformation Advisor. The 'Migration target' is 'WebSphere traditional'. Below this, the 'Java applications (5)' section is expanded, showing a table of applications. The 'modresorts-1_0_war.ear' application is highlighted with a red box.

Name	Migration Target	Complexity	Issues	Estimated in days
CustomerOrderServicesApp.ear	WebSphere traditional	Simple	2	0
DefaultApplication.ear	WebSphere traditional	Simple	3	0
ivtApp.ear	WebSphere traditional	Simple	0	0
modresorts-1_0_war.ear	WebSphere traditional	Simple	1	0
query.ear	WebSphere traditional	Simple	3	0

10.OPTIONAL: Evaluate the CustomerOrderServicesApp.ear Application

You can follow the same procedure you did for the Mod Resorts application to view the analysis results for any of the other applications that was analyzed, such as **CustomerOrderServicesApp.ear** application.

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, for WebSphere Liberty and WebSphere Traditional, which means that the application code can be deployed to Liberty on OpenShift without any changes.
- The estimated development effort is 0 day because no code changes are needed.

Server1

Upload option

Source environment
IBM WebSphere Application Server

Profile
AppSrv01
Version: 8.5.5.20

Migration target ⓘ
Compatible runtimes

Java applications (5)

Q Search

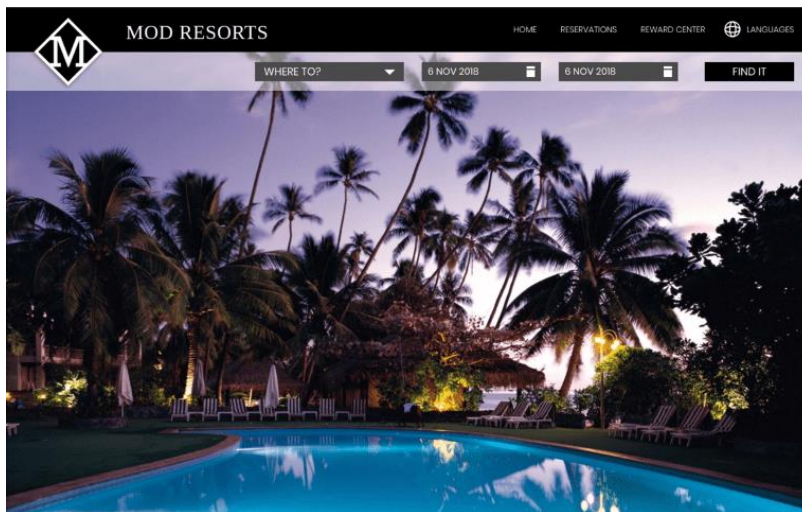
Name	Migration Target	Complexity	Issues	Estimated dev cost in days
CustomerOrderServicesApp.ear Open Liberty	Open Liberty	Moderate	▲ 2 ■ 1 ● 5	3,5
CustomerOrderServicesApp.ear WebSphere Liberty	WebSphere Liberty	Simple	● ● ● 4	0
CustomerOrderServicesApp.ear WebSphere traditional	WebSphere traditional	Simple	● ● ● 2	0

6.8 Overview of the Mod Resorts application

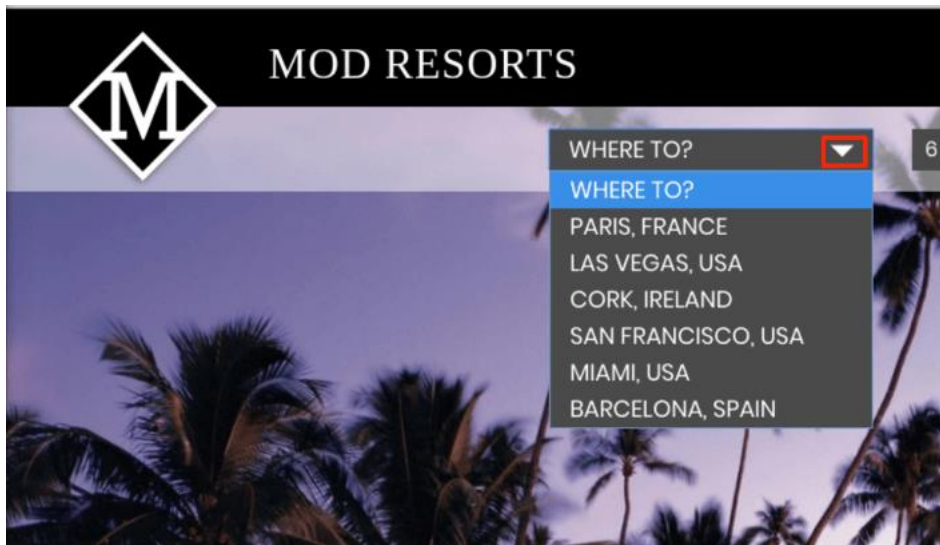
From the insights gained from Transformation Advisor, you learned that the Mod Resorts is a simple EE application and is a good candidate for moving to Open Liberty and container-based clouds.

For illustration purposes, in this short section, a few screen shots are captured to illustrate the Mod Resorts application.

The Mod Resorts application home page is illustrated here:



The user would select the destination of their travel



Perhaps the user wants to go to **PARIS, FRANCE**. Mod Resorts shows the weather of the city.



Continue to the last section of the lab where you are briefly introduced to Transformation Advisor's migration plan.

The migration plan includes a migration bundle of generated deployment artifact that accelerate the deployment of the application to Liberty in a container-based cloud deployment.

7. Explore the migration bundle for the Mod Resorts application

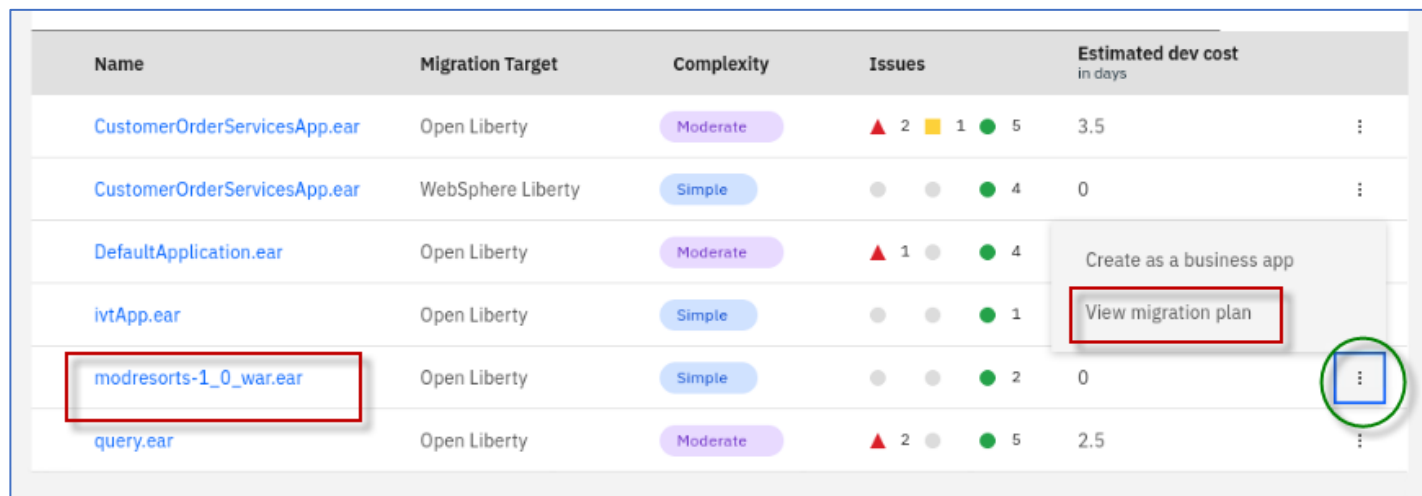
Transformation Advisor will display details about the **migration bundle** that it generated to accelerate the modernization of applications to containers in OpenShift. The migration bundle includes diverse artifacts, depending on the needs of the application to accelerate the build and deployment of an application Docker image into OpenShift platform.

The user can choose to create a migration bundle for either

- **binary** project of an application (uploading a WAR/EAR file and its dependent libraries)
- **source code** project of an application, so that the application source files can be modernized and maintained

Now, let's quickly explore a Migration Plan for the Mod Resorts application to see the artifacts that Transformation Advisor creates to expedite the app deployment to OpenShift Platform.

1. Click on the menu with the **hamburger icon** next to the ModResorts application analysis to display the menu choices and choose **View migration plan**:



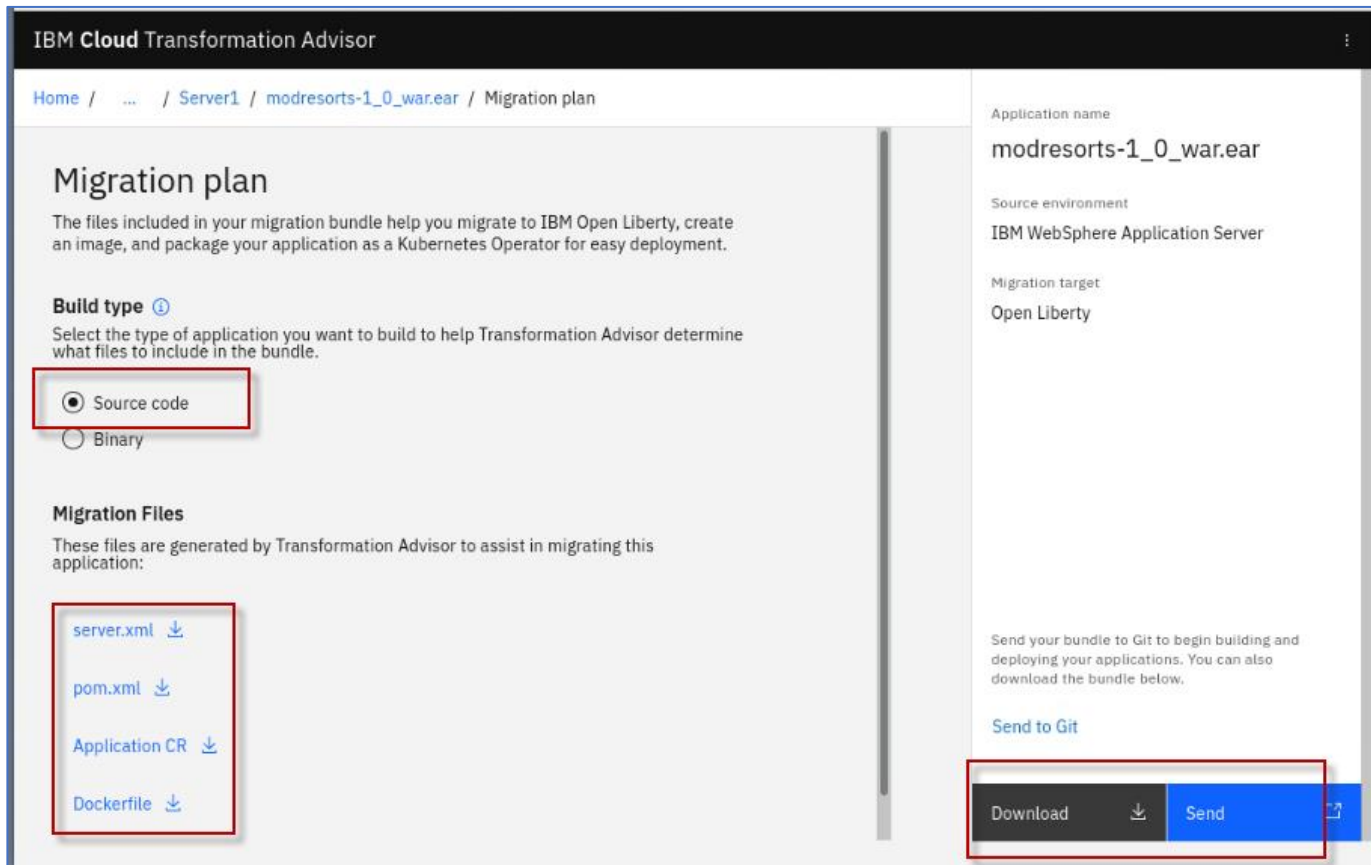
Name	Migration Target	Complexity	Issues	Estimated dev cost in days
CustomerOrderServicesApp.ear	Open Liberty	Moderate	▲ 2 ■ 1 ● 5	3.5
CustomerOrderServicesApp.ear	WebSphere Liberty	Simple	● ● ● 4	0
DefaultApplication.ear	Open Liberty	Moderate	▲ 1 ● ● 4	
ivtApp.ear	Open Liberty	Simple	● ● ● 1	
modresorts-1_0_war.ear	Open Liberty	Simple	● ● ● 2	0
query.ear	Open Liberty	Moderate	▲ 2 ● ● 5	2.5

2. Notice the contents of the migration bundle for the **Source code** option.

To accelerate the application modernization, the artifacts produced by Transformation Advisor include:

- **server.xml**: the configuration for the Liberty server
- **pom.xml**: Build the application using Maven
- **Application CR**: Custom Resource for the application to be deployed to OpenShift via the Open Liberty Operator
- **Dockerfile**: Create the Docker image for the application

The user will be able to choose to **download** the artifacts as a migration bundle or **push** the bundle contents into a GitHub repository.



8. Summary

In this lab, you learned how to evaluate the existing Java application using IBM Cloud Transformation Advisor. As a part of IBM Application Modernization solutions, 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.

Transformation Advisor accelerates application migrating to Liberty and containers and helps minimize errors and risks and reduce time to market. To learn more about Application Modernization solutions, please continue with the rest of the lab series.

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