

IBM Cloud Private 3.1.2

Lab Exercise # 5
Application Modernization
Duration: 45 Min

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Objective

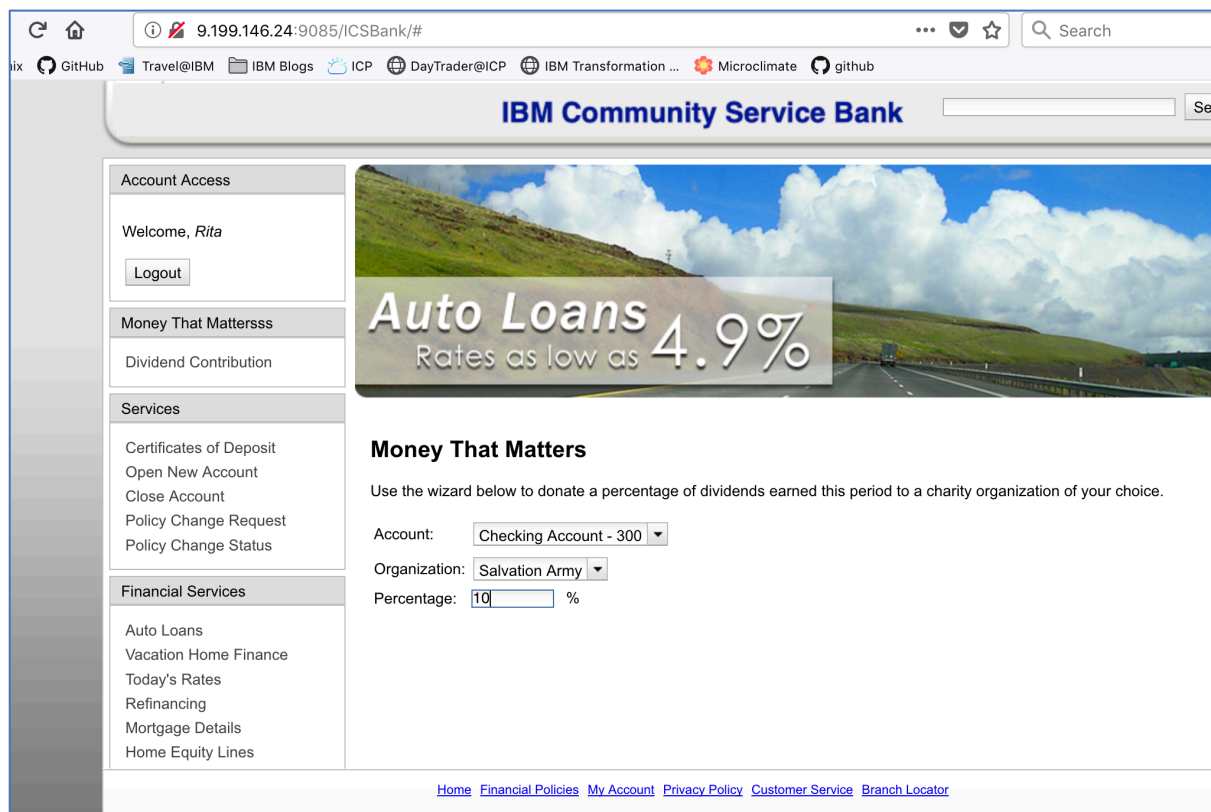
In this lab, we will use Transformation Advisor to evaluate an on-premise traditional WebSphere application and deploy the same on IBM Cloud Private (ICP) environment.

We'll use Transformation Advisor and look at the recommendations, then download the generated migration bundle, which will help us deploy the application on ICP.

Overview of application, which is planned for modernization

Application Scenario

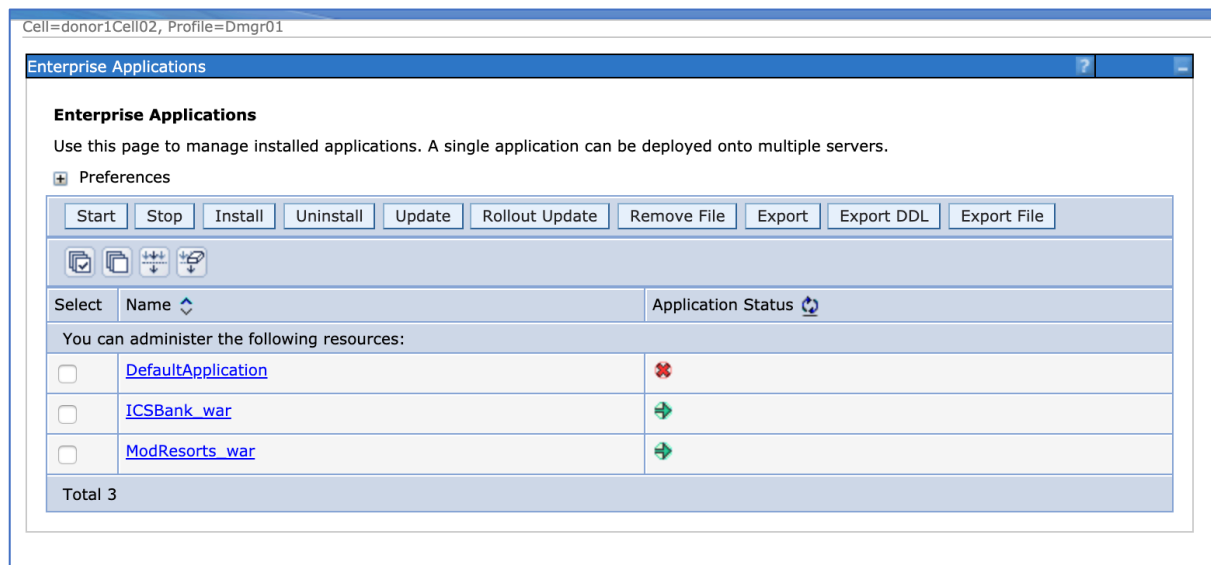
Customer has a Banking application called ICSBank. Along with the regular banking services, this application provides a wizard to donate a percentage of dividends earned this period to a charity organization of choice.



Existing Application and middleware details

Currently customer uses WebSphere Application Server 8.5.5.12 and DB2 V9.5 and both the servers are hosted in an on-prem environment.

WAS Admin Console:



Current environment has total 3 applications, including ICSBank Application.

Lab Preparation:

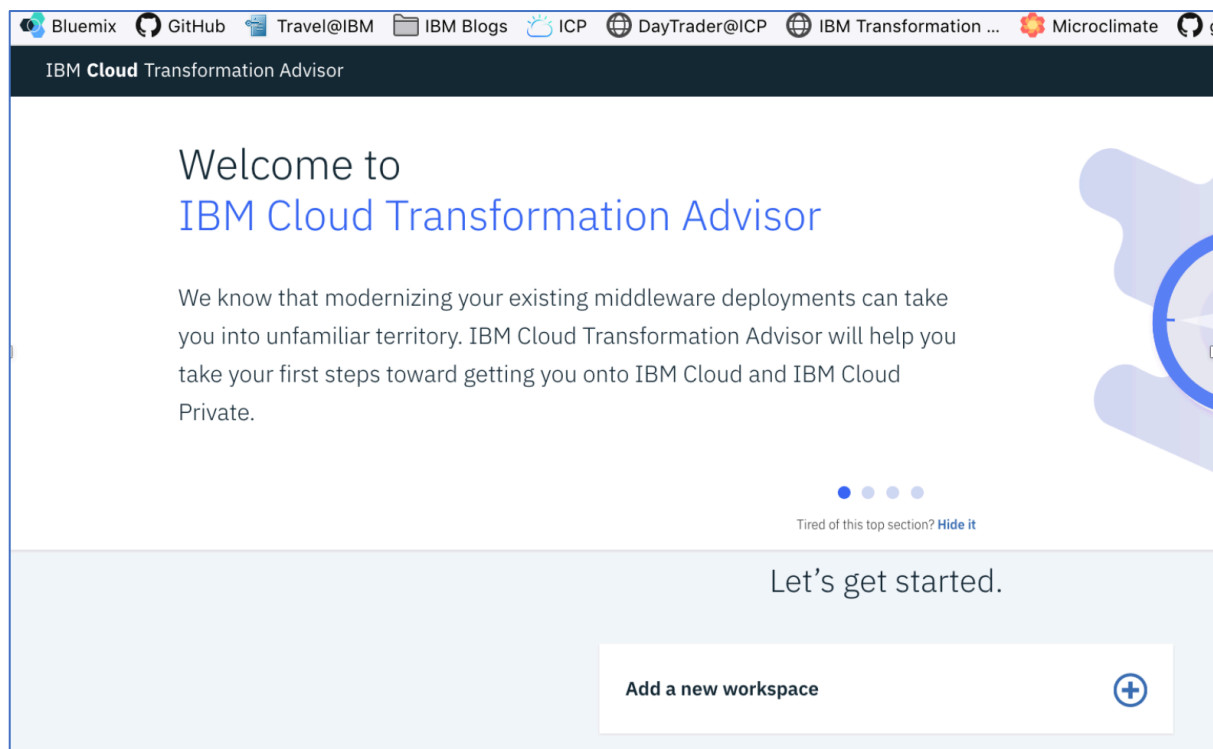
- Transformation Advisor is installed on the ICP lab environment in default namespace.
- Following files are given to you along with this lab.
 - ICSBank.war (presumed to be deployed on WAS ND Environment at the Bank).
 - Dmgr01.zip, this would be your Transformation Advisor data collected from existing WAS environment.

Detailed steps for Application Modernization Lab:

Step 1: Open Transformation Advisor from ICP Console:

Once installed access the URL from your browser as described below, you will see the following screen.

- Open transformation advisor URL <https://172.16.70.58/transadv-ui>
- Transformation Advisor screen is presented as shown below:




Step 2: Transformation Advisor: Create workspace for migration activities

You should get started by creating a new workspace that will be used to house your recommendations, this can be any string you want, such as the project name or the name for the portfolio of applications you will be analysing, basically anything that will help you to easily identify your work when you return to it at a later date.

- Create a workspace by clicking on 'Add a new workspace'
- Name the workspace as "<UserID>apps". Eg: user1apps
- Click 'Next'
- Provide a name for the Collection. Eg: "Collection1"


Add a new workspace

1 / 2 Name a new workspace to begin 

Example: Workspace1

Next

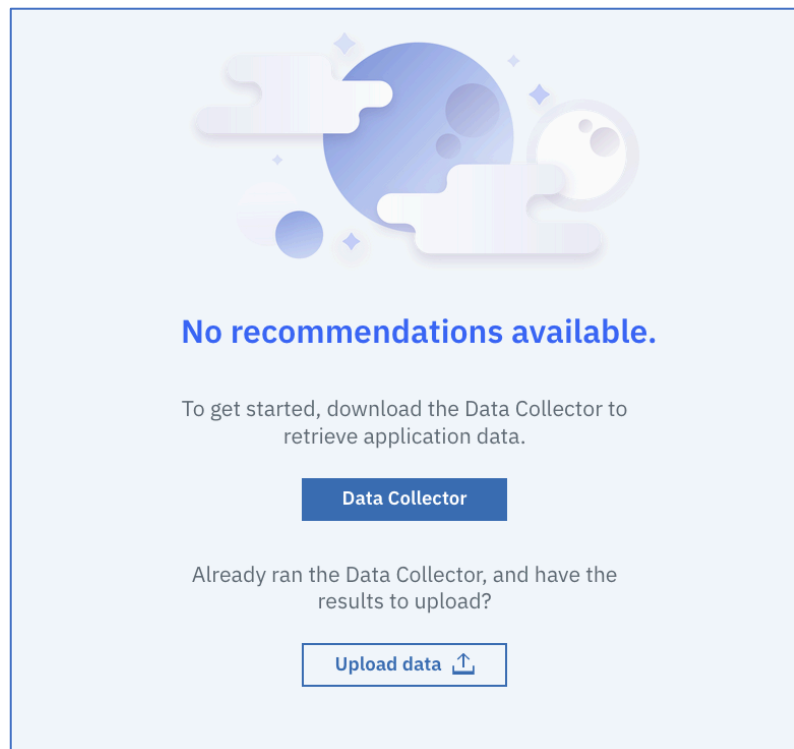
Add a new workspace

2 / 2 Create a collection to assign to your workspace 

Example: Collection1

Back **Let's go**

- The Data Collector tab should now display the screen shown below. The data collector is a downloadable zip file that needs to be extracted and run on your target server where the applications you wish to migrate are located ie your application server machine. You should choose the correct data collector for your target server's operating system.



- Download the zip file to your browsers download directory and copy / ftp to your target server, then follow the directions as described on the page to unzip and run the data collector.
- **Please note:** For this lab, WAS environment is not available, hence the downloading and running the data collector can be skipped.
- You can use the file 'Dmgr01.zip' which is collected from one of existing WAS environment for this lab.
- Click on 'Upload data' and use the Dmgr01.zip to upload existing WAS data and click on 'upload'.

Upload data

```
$ ls
AppSrv01 AppSrv01.zip bin
conf environment.json jre lib
```

02 Copy the zip file(s) to a location where you can access them with this browser and select them using the Drop or add file button below

Please upload 1 file at a time

Drop or Add File

Upload

- View the recommendations and cost estimates. The Recommendations view after the data collector has completed and uploaded results should display a screen similar to that shown below.

Workspace

+

user1apps

▼

Collections

+

📁

Collection1

Recommendations

Source environment

IBM WebSphere Application Server Network Deployment

Profile

Dmgr01

Version: 8.5.5.12

Preferred migration

Liberty on Private Cloud

▼

Applications (3)

Export

Upload options

🔍

Search items

🔃

⚙️

Name	Complexity	Tech match	Dependencies	Issues	Est. dev cost <small>in days</small>	
<div>▲</div> DefaultApplication.ear	Complex <div><D>🔗</div>	85%	3	<div>🔴 4</div> <div>🟡 1</div> <div>🟢 5</div>	14	<div>Migration plan</div>
ICSBank_war.ear	Simple <div>📄</div>	100%	1	<div>🟢 9</div>	0	<div>Migration plan</div>
ModResorts_war.ear	Simple <div>📄</div>	100%	None	None	0	<div>Migration plan</div>

The recommendations tab shows you a table with a summary row for each application found on your application server. Each row contains the following information :

Application Name : The name of the EAR/WAR file found on the application server.

Complexity : This is an indication of how complex Transformation Advisor considers this application to be if you were to migrate it to the cloud.

Technology Match : This is a percentage and if less than 100% it indicates that there may be some technologies that are not suitable for the recommended platform. You should investigate the details and ensure your application is actually using the technologies.

Dependencies : This shows potential external dependencies detected during the scan. Work may be needed to configure access to these external dependencies.

Possible Issues : This indicates the number and severity of potential issues migrating the application.

Dev Cost : This is an estimate in days of the development effort to perform the migration.

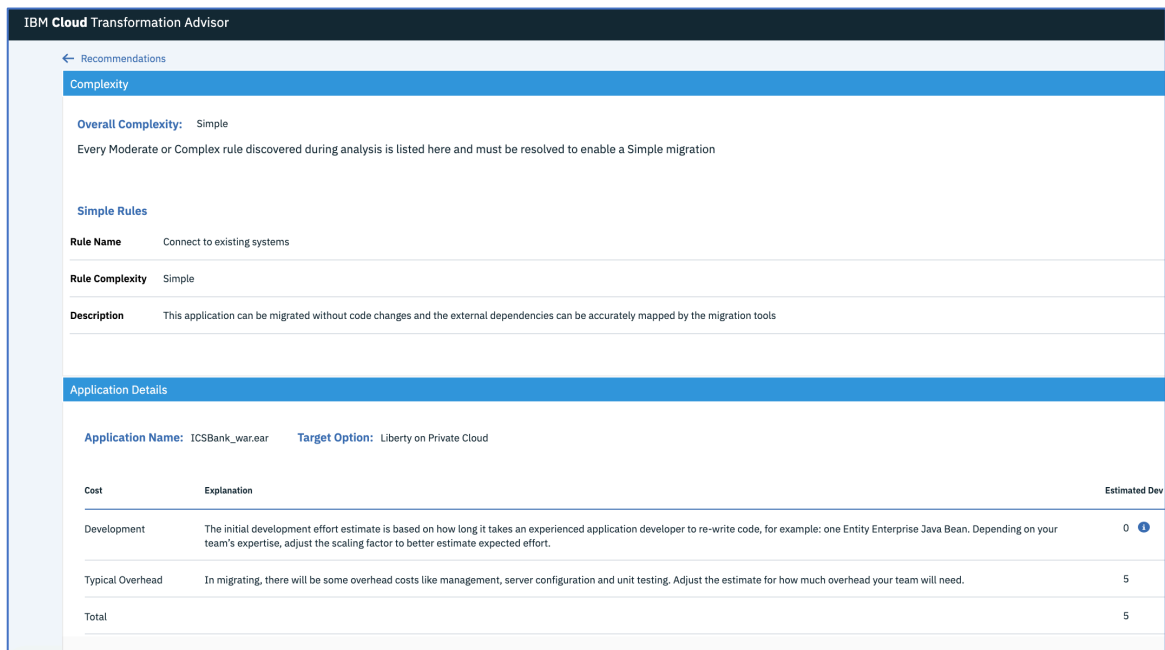
Total Cost : This is the total estimate in days of the overhead and development costs in migration up to the point of functional testing.

Migration Plan : This button will take you to the Migration tab for the application.

Step 3: Look at various reports for ICSBank Application

Clicking on any application row will show you the details behind the analysis. You can see a lot more detail. For starters, the complexity rating is explained for you.

- Click on ICSBank_war.ear file and look at the detail report:



IBM Cloud Transformation Advisor

← Recommendations

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	Rule Complexity	Description
Connect to existing systems	Simple	This application can be migrated without code changes and the external dependencies can be accurately mapped by the migration tools

Application Details

Application Name: ICSBank_war.ear Target Option: Liberty on Private Cloud

Cost	Explanation	Estimated Dev
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

- Scrolling to the end of the Recommendations screen will show three links to further detailed reports.
 - Analysis Report
 - Technology Report
 - Inventory Report

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
---	--	--

- Review all three reports (Analysis Report will give you detailed analysis of application and technologies it uses)
 - Analysis Report:** The binary scanner's detailed migration report digs deeper to understand the nitty-gritty details of the migration. The detailed report helps with migration issues like deprecated or removed APIs, Java SE version differences, and Java EE behaviour differences.

Detailed Migration Analysis Report

5/22/19 7:57 AM
/opt/IBM/WebSphere/AppServer/profiles/Dmgr01/config/cells/donor1Cell02/applications/ICSBank_war.ear/ICSBank_war.ear

9
Rules flagged

107
Total results

Source options
--sourceAppServer=was855 --sourceJava=ibm6 --sourceJavaEE=ee6

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

Scan options
--excludePackages=com.ibm, com.informix, com.microsoft, com.sybase, com.sun, _ibmjsp

Rule Severity Summary

SYMBOL	LABEL	RULES FLAGGED	TOTAL RESULTS	DESCRIPTION
	Severe	1	6	Severe rules indicate an API removal or behavior changes that may break your application.
	Warning	5	96	Warning rules indicate behavior changes that may affect your application.
	Information	3	5	Information rules indicate the use of deprecated APIs or technologies.

- Technology Report:** The binary scanner can examine your application and generate the Application Evaluation Report, which shows the editions of WebSphere Application Server that are best suited to run the application. The report provides a list of Java EE programming models that are used by the application, and it indicates on which platforms the application can be supported.

Application Technology Evaluation Report

5/22/19 7:57 AM
/opt/IBM/WebSphere/AppServer/profiles/Dmgr01/config/cells/donor1Cell02/applications/ICSBank_war.ear/ICSBank_war.ear

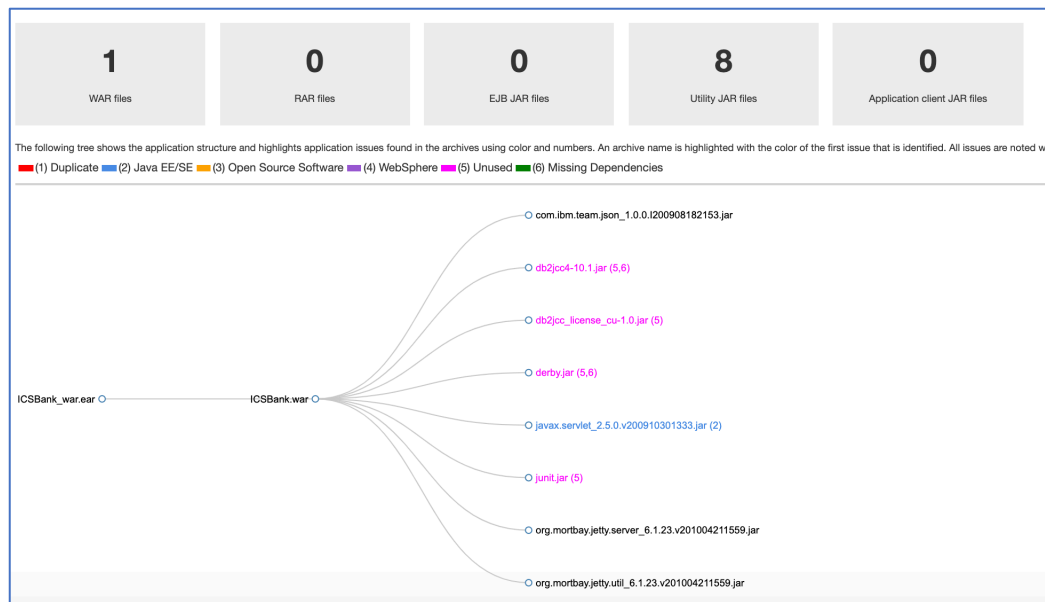
Scan options: --baseEdition --coreEdition --libertyBuildpackEdition --ndEdition --zosEdition --traditional --liberty --excludePackages=com.ibm, com.informix, com.microsoft, com.sybase, com.sun, _ibmjsp

WebSphere Application Server V9.0

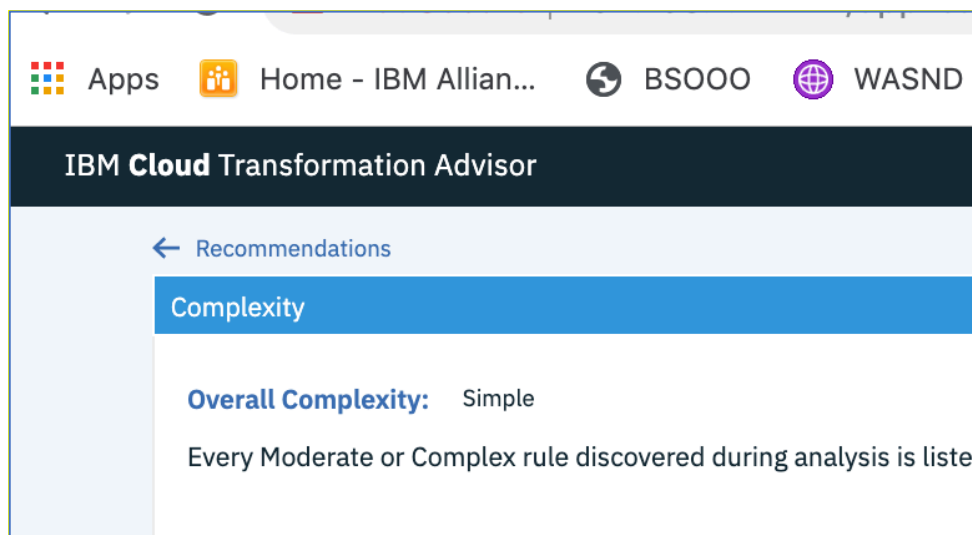
The highlighted columns indicate which IBM platforms fully support the technologies used by the included application.
Recommendation: Detailed migration analysis should be used to determine if there are migration issues that must be addressed before deploying your application.

	Liberty for Java on IBM Cloud	Liberty Core	Liberty	WebSphere traditional	Network Deployment Liberty
WEB APPLICATION TECHNOLOGIES					
Java Servlet	✓	✓	✓	✓	✓
JAVA EE-RELATED SPECIFICATIONS IN JAVA SE					
Java API for XML Processing (JAXP)	✓	✓	✓	✓	✓
Java Database Connectivity (JDBC)	✓	✓	✓	✓	✓

- Inventory Report:** The binary scanner has an inventory report that helps you examine what's in your application including the number of modules and the technologies in those modules.



- To go back to recommendation screen, click on 'recommendation'.



- Similar to ICSBank, click on other applications as well. You can see that 'DefaultApplication.ear' is identified as a complex one. You can look at the Analysis Report of same and understand why is it considered as complex.

Name	Complexity	Tech match	Dependencies	Issues	Est. dev cost in days
▲ DefaultApplication.ear	Complex <D>	85%	3	4 1 5	14
ICSBank_war.ear	Simple	100%	1	9	0
ModResorts_war.ear	Simple	100%	None	None	0

Step 4: Look at the all the artefacts generated by Transformation Advisor

Once you have decided on an application you would like to migrate, hit the Migrate button and you will land on the Migration Tab.

- Click on 'Migration Plan' button of ICSBank application:

Recommendations

Export

Upload options

Source environment

IBM WebSphere Application Server Network Deployment

Profile

Dmgr01

Version: 8.5.5.12

Preferred migration

Liberty on Private Cloud

Search items

Application

▲

DefaultApplication.ear

Complex

85%

3

4 1 5

14

Migration plan

ICSBank_war.ear

Simple

100%

1

9

0

Migration plan

ModResorts_war.ear

Simple

100%

None

None

0

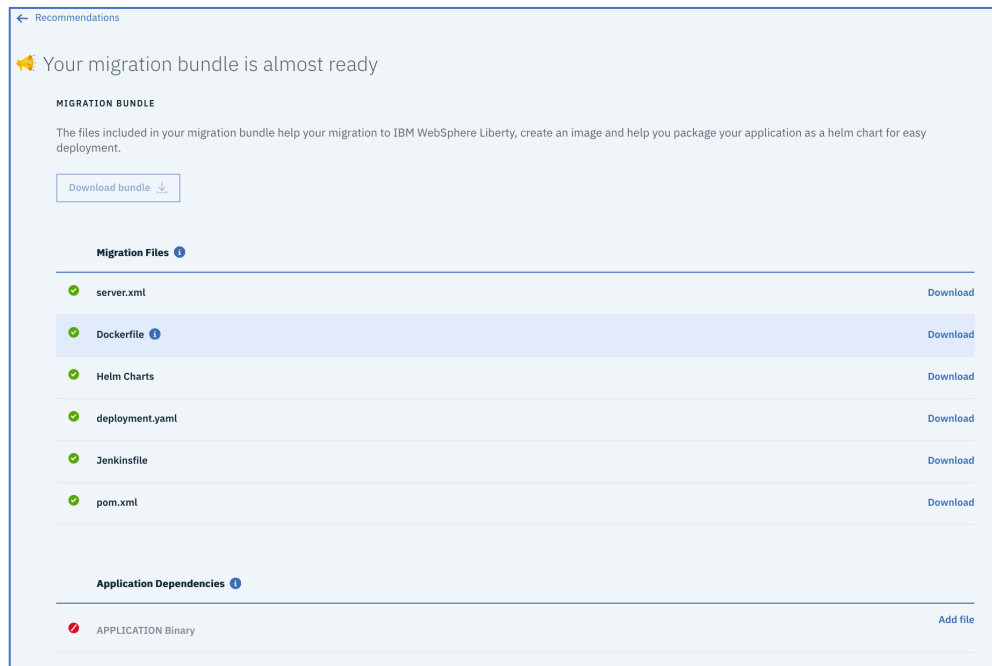
Migration plan

Items per page: 10 | 1-3 of 3 items

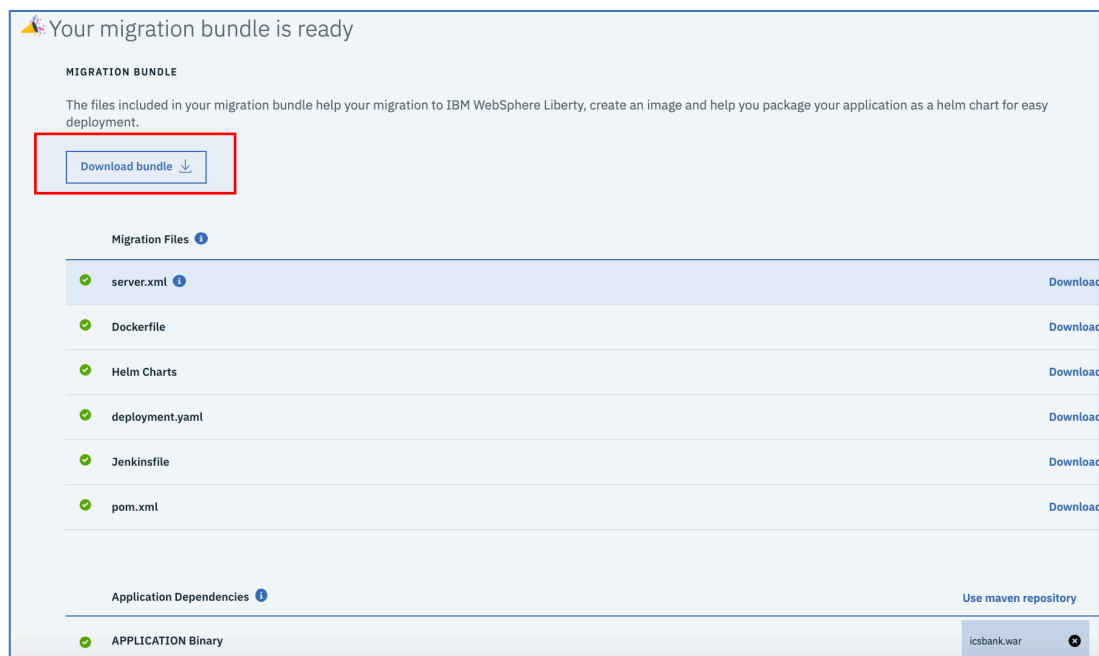
1 of 1 pages

1

- TA will automatically generate the artefacts you will need to containerize your application running on liberty and deploy to IBM Cloud Private. You will have the opportunity on this page to upload your application binaries and any external drivers we have detected that you may need. You can then download them all in a single zip and use them for the next steps to migrate.
- A pdf document is included in the zip bundle that will give you detailed instructions on the next steps you need to take. Alternatively as you will see on the right hand side there are instructions also available here.
- Please note that the Application Binary is not downloaded by data collector, and user need to provide it.



- Click on “Add File” link as shown in the above screen and upload the ICSBank.war file provided in the lab material.
- Once upload is complete, you will notice that the ‘Download Bundle’ button is enabled at the top of the screen.



- Click on ‘Download Bundle’ and save the zip file to local machine.
- You will find file named ‘icsbankwar_migrationBundle.zip’.
- Unzip it to some new folder (say ‘TALab’ folder).


```

15  ## Common image variables
16  #####
17  image:
18    repository: "mycluster.icp:8500/default/icsbankwar"
19    tag: latest
20    pullPolicy: IfNotPresent

```

- Change this to `ilon1.icp:8500/namespace(id)/icsbankwar` (for example for user1, it would be to `ilon1.icp:8500/namespace01/icsbankwar`)
- Add image pull secret as mentioned below:

```

replicaCount: 1
revisionHistoryLimit: 1
image:
  repository: "ilon1.icp:8500/default/icsbankwar"
  tag: "latest"
  pullPolicy: "IfNotPresent"
  pullSecret:
    - "registry-secret"

```

Add "registry-secret" as mentioned above
Save the values.yaml.

Please note: Ideally, you need to run `docker build` and push the new image for this application. But for this lab, we have already uploaded the image into image repository of ICP. So you can proceed to Deploying Helm Chart.

Step 6: Deploy Application Helm Chart

- `cd TALab/chart`
- `helm install icsbankwar --name icsbank(uniqueuserid) --tls`

```

[root@icp012019-icp012019-1 chart]# helm install icsbankwar --tls
NAME: honest-labradoodle
LAST DEPLOYED: Tue May 14 15:25:21 2019
NAMESPACE: default
STATUS: DEPLOYED

RESOURCES:
==> v1/Service
NAME                                TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
honest-labradoodle-icsbankwar-service NodePort    10.0.176.177  <none>         9080:32575/TCP,9443:31405/TCP 1s

==> v1beta1/Deployment
NAME                                DESIRED    CURRENT    UP-TO-DATE    AVAILABLE    AGE
honest-labradoodle-icsbankwar-deployment 1          0          0              0            1s

==> v1/Pod(related)
NAME                                READY      STATUS      RESTARTS    AGE
honest-labradoodle-icsbankwar-deployment-5c5b7dbdd6-s5995 0/1        Pending    0            1s

```

- Wait for few min (check application status by 'kubectl get pods')
- Open the browser in Private/Incognito mode.
- Access the application using <https://172.16.70.58:Port/ICSBank/>

Getting hostname and and portnumber

- Host = Proxy Host IP (172.16.70.58)
- Port = (`kubectl get svc | grep icsbank`) and look at the http or https node port
- Access the application using <https://172.16.70.58:Port/ICSBank/>

This is application which is migrated to ICP and running inside Liberty Container /

- You can login with user(id) e.g. user1 and password as Passw0rd.

Summary

In this lab, we have successfully migrated WAS Application, running on WAS ND environment to Liberty Container on ICP. This application is running on container platform and this is the first step towards application modernization.