Liberty Migration Toolkit Lab

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# **Liberty Migration Toolkit**

In this lab we will learn to use two different migration tools. The **Liberty Migration Toolkit** determines the suitability of migrating your applications from WebSphere Application Server, or other third party Java EE servers, to WebSphere Liberty. To analyze an application for migration suitability, the application must be imported into your Eclipse-based IDE.

The Migration Toolkit Eclipse plug-in includes a number of rule sets to scan Java EE applications for the use of vendor specific deployment descriptors, JSP files with proprietary APIs, and Java code with proprietary APIs. The rules scan applications for the use of Java technologies and APIs that are not supported in WebSphere Liberty.

The **Migration Toolkit for Application Binaries** is a stand-alone tool that is capable of scanning your application binaries, without source code, to give you a report of the programming models used by your application, and where they will run. It also offers an option to generate a detailed report about which line of your application may need to be changed.

In this lab exercise, you will learn:

* 1. Import the Sample Application onto Eclipse
  2. Scan the imported application
  3. View Migration Results and Generate Report.
  4. Create additional scan reports and compare.

You will also learn:

* + 1. How to install the Migration Toolkit for Application Binaries
    2. Use the toolkit to scan an application
    3. Generate an evaluation report
    4. Generate a detailed report

As prerequisites, you should:

* 1. Complete the Setup and discover lab to set up the lab environment, including JRE, and eclipse with WDT
  2. If you are not a Virtual POT Attendees, you need to install the migration toolkit on you own. From Eclipse, navigate to Help > Install WebSphere Software. Then choose “IBM Websphere Application Server Migration Toolkit”

To run this lab, your workstation must meet the following requirements:

* Approximately 8GB of storage available for the Windows 7 virtual image
* Approximately 3 GB of memory free to run the developer workbench and the server
* Connectivity to the internet is NOT required
* Please refer to the following table for file and resource location references on different operating systems.

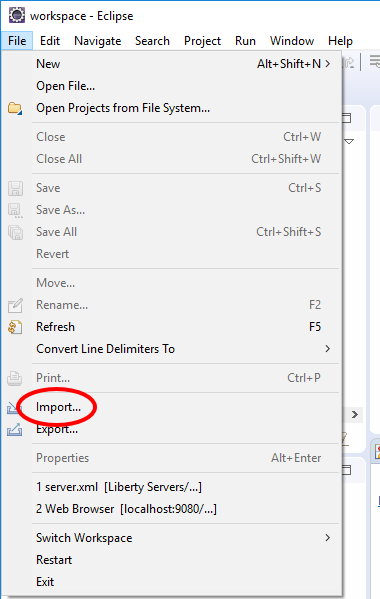
|  |  |  |
| --- | --- | --- |
| Location Ref. | OS | Absolute Path |
| *{LAB\_HOME}* | Windows | C:\WLP\_<version> |
| Linux | ~/WLP\_<version> |
| Mac OSX |  |

|  |
| --- |
| **Notice**   * You don’t need to be an Eclipse power-user. But, a basic level of familiarity with Eclipse is beneficial. * Efforts have been made to ensure the screen-shots in this lab are current and accurate. However, there may be subtle variations in what you actually see. The differences may be attributed to: * Platform (ie. Windows vs. Mac OS vs. Linux) * Eclipse version (ie. Luna vs. Mars vs. Neon vs Oxygen) |

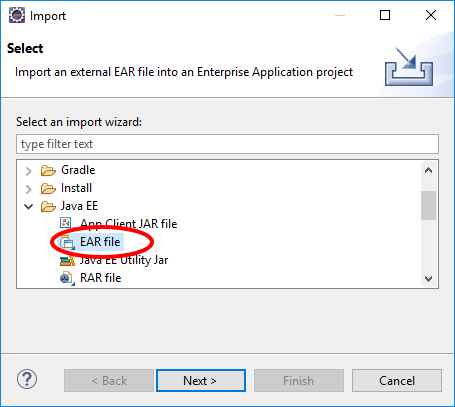
## Import the Sample Day Trader Application

To analyze an application for migration suitability, the application must be imported into your Eclipse-based IDE. If the application is not already in Eclipse, an easy way to import the application and organize it in projects that reflect their structure as EAR, WAR, and EJB files is by using the Eclipse import function as illustrated in the steps below.

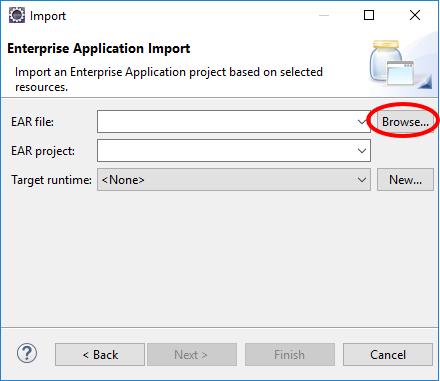
1. Select **File > Import** menu option.



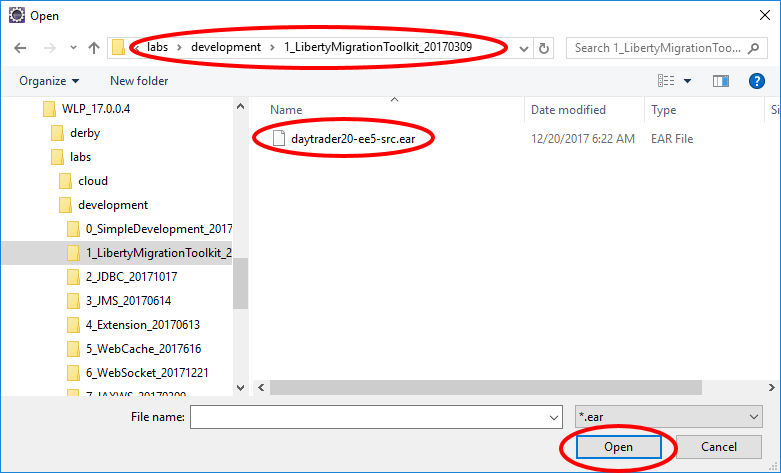
1. Expand **Java EE**, select **EAR** File, then click **Next**



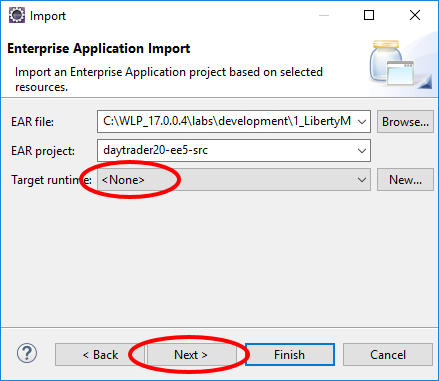
1. Click **Browse**.



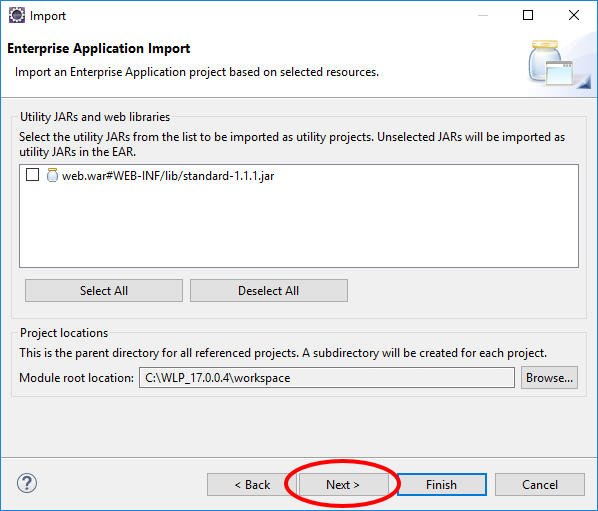
1. Navigate to **{LAB\_HOME}\labs\development\1\_LibertyMigrationToolkit\_timestamp** and select **daytrader20-ee5-src.ear**. Click **Open**



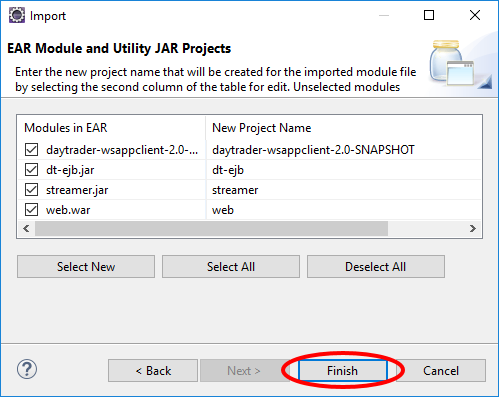
1. Set **Target runtime** to **None**. Click **Next**



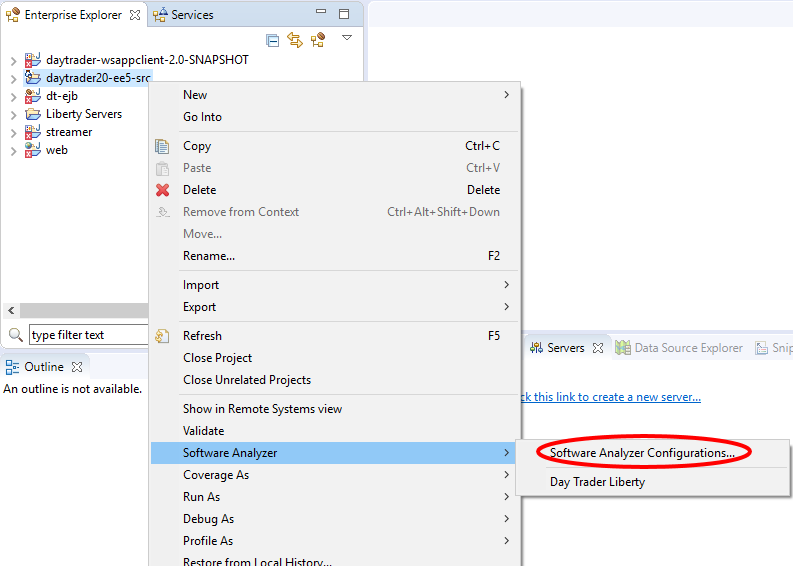
1. Click **Next**

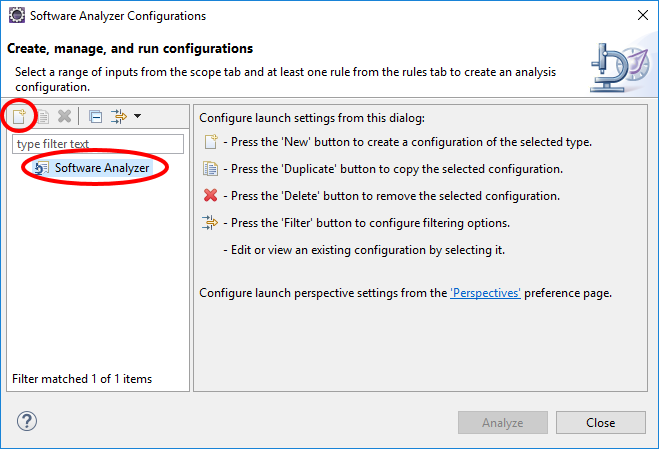


1. The next panel shows different additional projects that will be created. Later we will configure the migration toolkit to scan these projects. Click **Finish**.

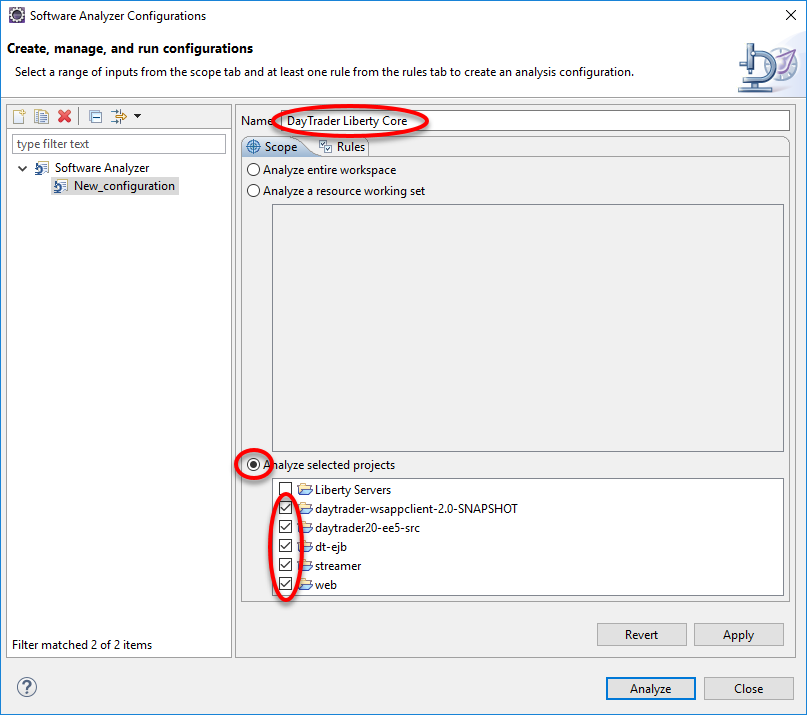


## Scan the DayTrader Sample application

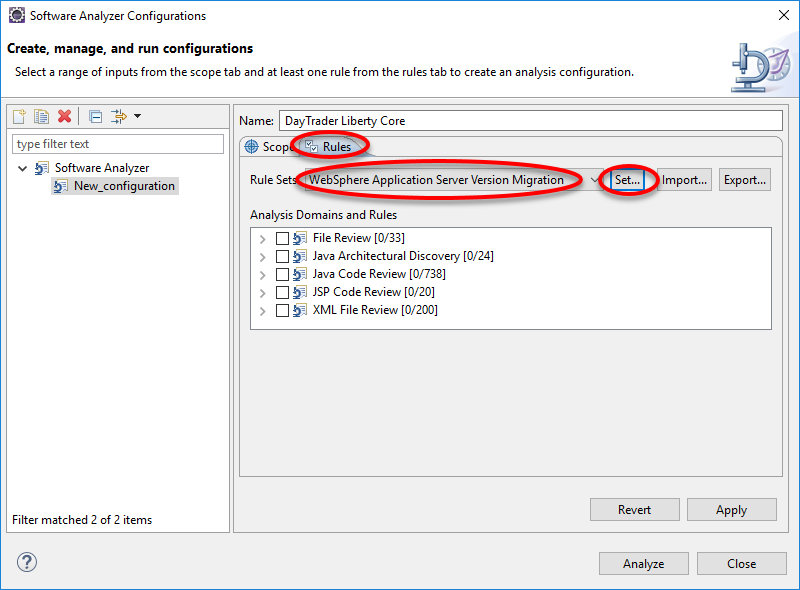
1. Right-click on the **daytrader20-ee5-src** sample application that we imported, and navigate to **Software Analyzer 🡪 Software Analyzer Configurations**
2. Click **Software Analyzer** then click the **New** button



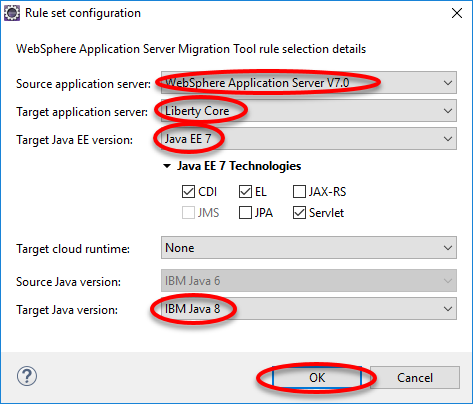
1. Enter **DayTrader Liberty Core** as the name of the new configuration. Click **Analyze selected projects**, and choose the five Day Trader application related projects.



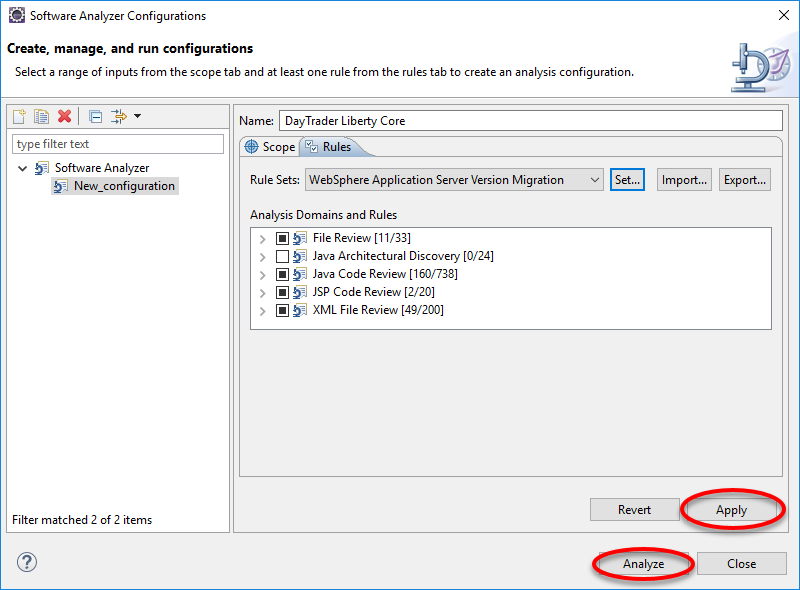
1. Click **Rules**. Select **WebSphere Application Server Version Migration** from the **Rule Sets** drop-down. Then click **Set**



1. In the pop-up, select **WebSphere Application Server V7.0** as the Source application server, **Liberty Core**  as the Target application server, **Java EE 7** as Target Java EE version and **IBM Java 8** as the Target java version. Then click **OK**.

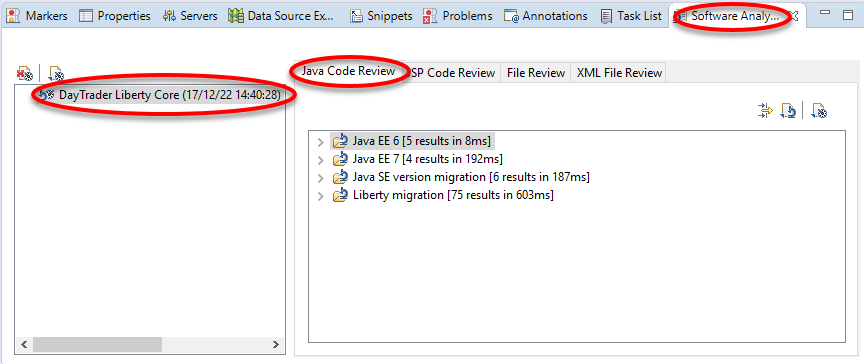


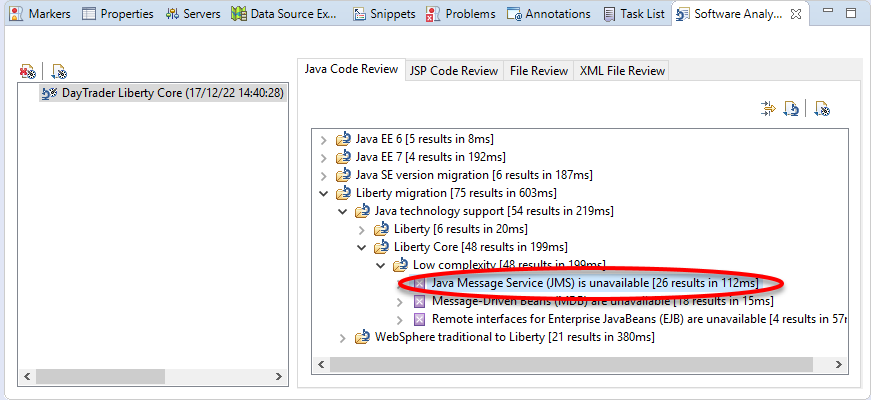
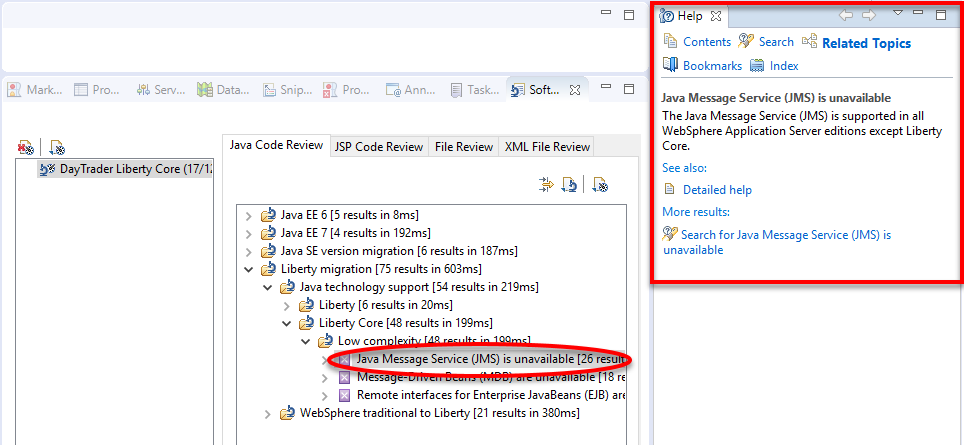
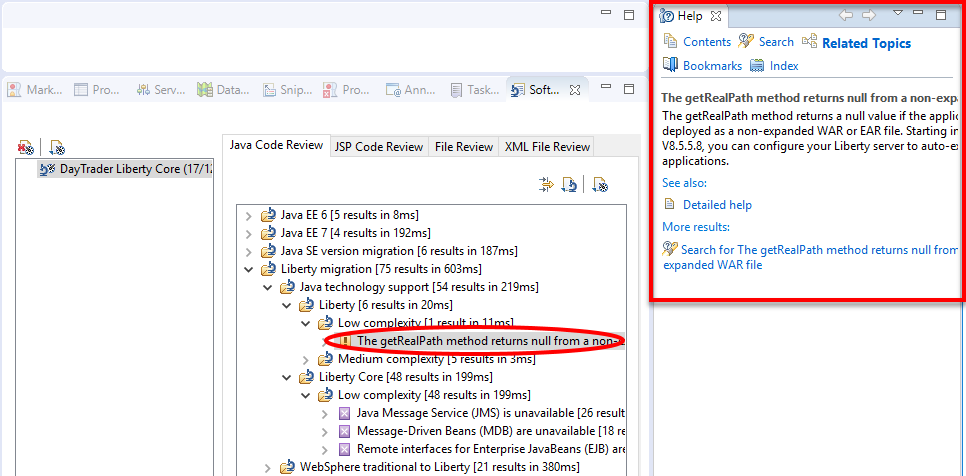
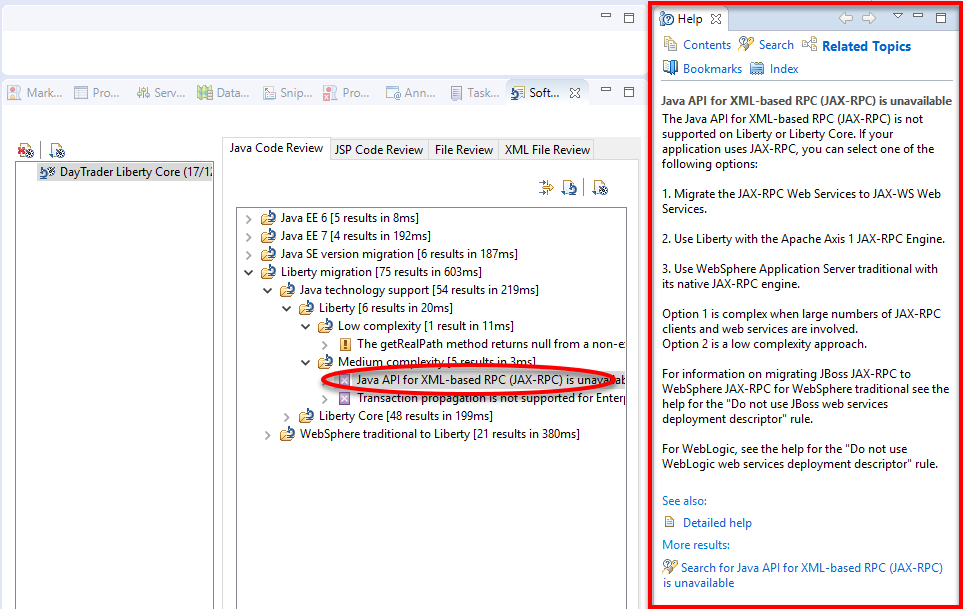
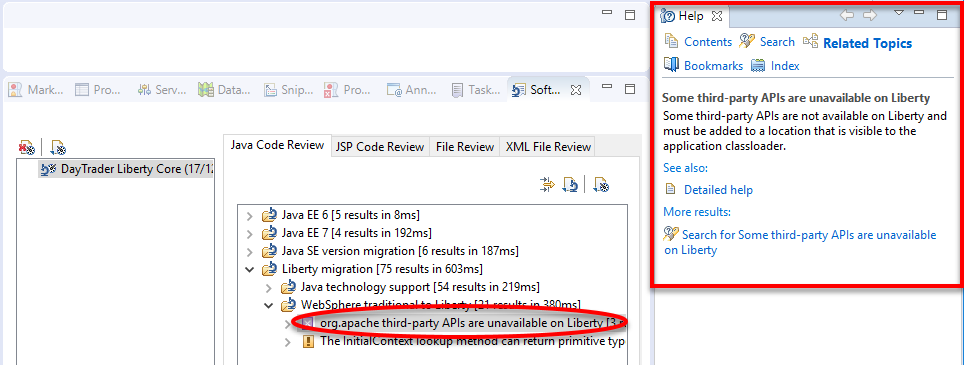
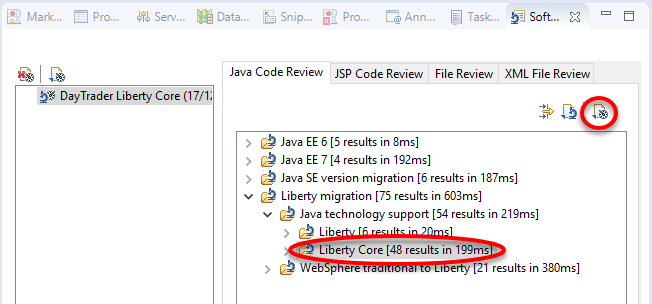
1. Click **Apply** and then **Analyze**

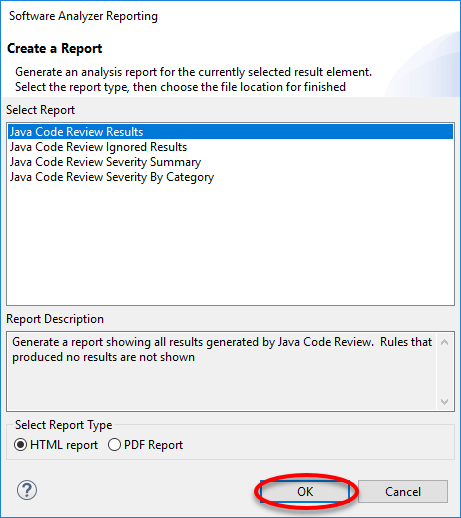


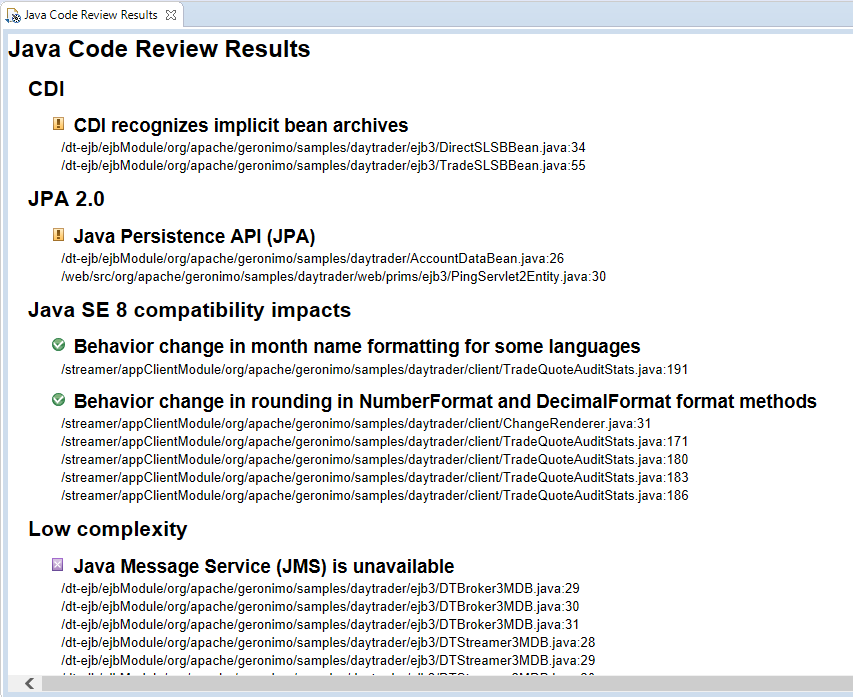
1. Click **Software Analyzer Results** pane, if not already selected, to inspect the scan results. On the left is the scan history. There is currently only one scan for **DayTrader Liberty Core**. Click the **Java Code review** tab to inspect the results of scanning Java code.

Note that there are results that apply to the **Liberty Core Edition**, and **Other Liberty Editions**.

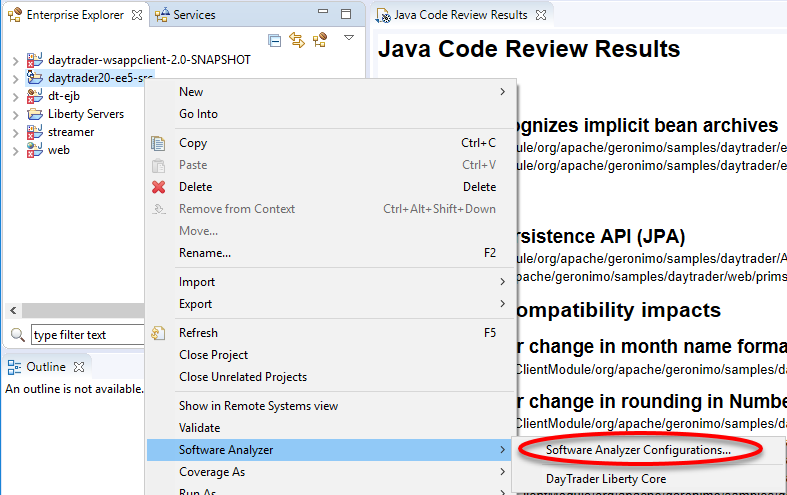
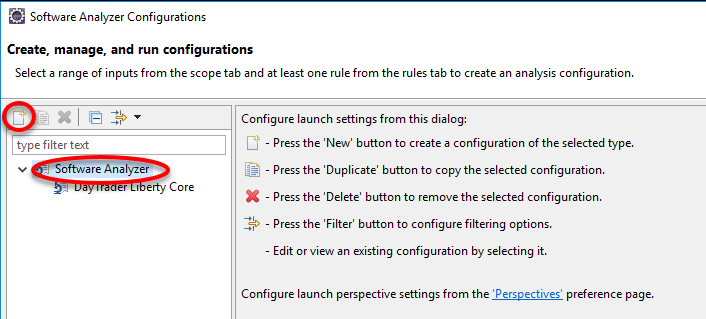


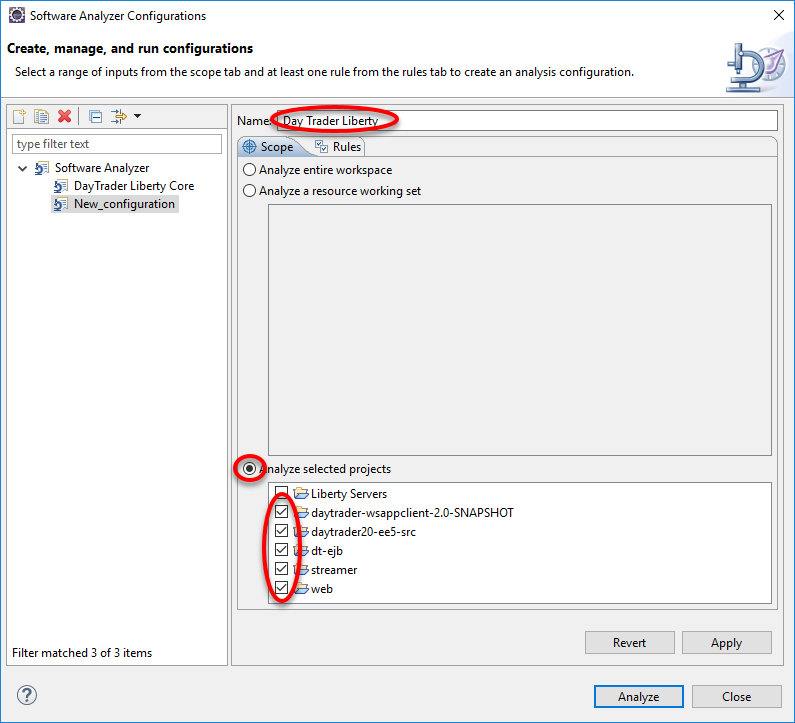
1. Expand and click on **Liberty Migration 🡪 Java Technology Support 🡪 Liberty Core 🡪 Low complexity 🡪 Java Message Service**.  
     
   
2. Press **F1** key to bring up the help window. Note that the help message explains that even though JMS is not supported for Liberty core edition, it is available in other editions via other features. The same restriction applies to MDB and remote EJBs. If **F1** doesn’t work, **Click Window > Show View > Other > Help > Help**  
   
3. Expand **Liberty** to examine additional scan results.
   1. Under **Low complexity**, click on ***getRealPath()*** and read the text in the **Help** window to make it work in the Liberty.   
        
      
   2. Under **Medium complexity**, click on **JAX-RPC** and read the **Help** text.  
        
      
4. Under **WebSphere traditional to Liberty** section, examine which third party APIs are not available in the Liberty
5. Select **Liberty Core** and click the **Generate Report** button.   
     
   
6. Click **OK** to view all the **Java Code Review** results



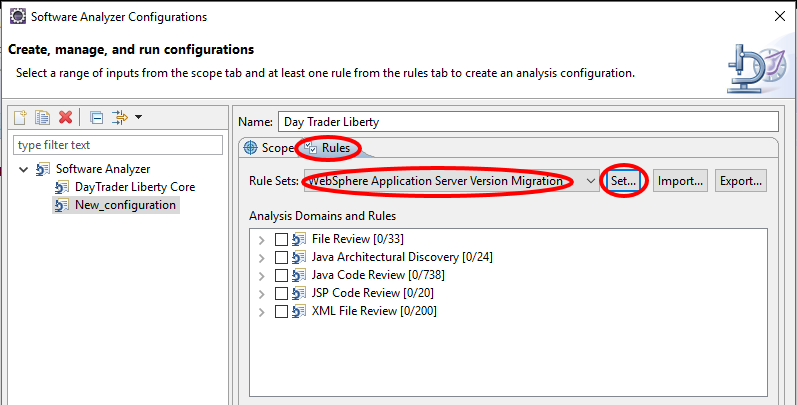
The result will appear in a different pane  
  


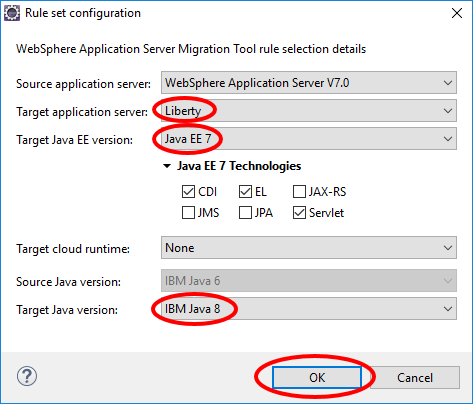
## Create Additional Scan Reports

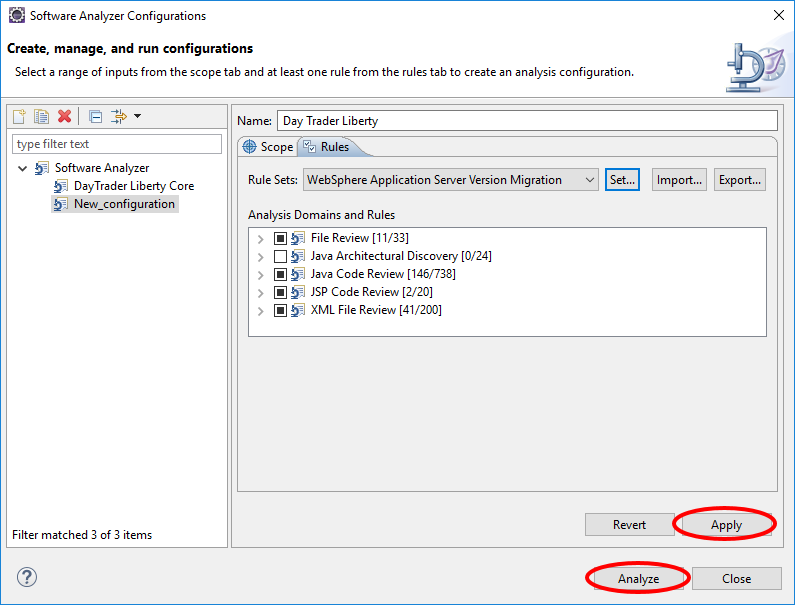
1. Right click on any **DayTrader** project and navigate to **Software Analyzer 🡪 Software Analyzer Configurations…**  
     
   
2. Click **Software Analyzer** then click the **New** button.  
     
   
3. Name the new configuration **Day Trader Liberty**, and select the same Day Trader related projects as before.



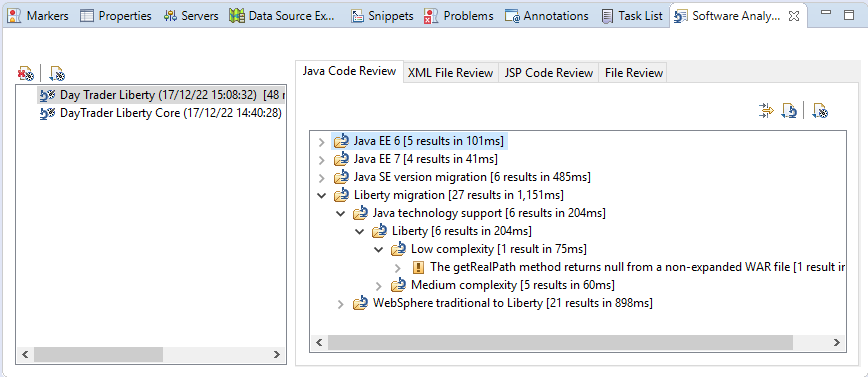
1. Click **Rules** and select **WebSphere Application Server Version Migration** rule set. Click **Set**



1. In the popup, select **WebSphere Application Server V7.0** for source, **Liberty** for Target application server, **Java EE 7** for Target Java EE version, and **IBM Java 8** for Target Java version. Then click **OK**.  
     
   
2. Click **Apply** and then **Analyze**



1. Note there are now two runs in the scan history pane. The most recent run uses the Liberty rule set. Compared to the previous run, **no JMS**, **MDB, or EJB** issues are reported because they only apply to the **Liberty Core Edition**



## Migration Toolkit for Application Binaries

1. Install the migration toolkit for application binaries.
   1. Set up a JAVA\_HOME in your terminal window and add it to your path.
      1. Linux

export JAVA\_HOME={LAB\_HOME}/wlp/java

export PATH=$PATH:$JAVA\_HOME/jre/bin

* + 1. Windows

set JAVA\_HOME={LAB\_HOME}\wlp\java

set PATH=%PATH%;%JAVA\_HOME%\jre\bin

* 1. Install the binary scanner  
       
     java -jar {LAB\_HOME}/MigrationToolkit/binaryAppScannerInstaller.jar {LAB\_HOME} –acceptLicense

You should see output similar to the following  
  
Before you can use, extract, or install IBM WebSphere Application

Server Migration Toolkit for Application Binaries, you must accept the

terms of International License Agreement for Non-Warranted Programs and

additional license information. Please read the following license

agreements carefully.

The --acceptLicense argument was found. This indicates that you have

accepted the terms of the license agreement.

Extracting files to c:\WLP\_17.0.0.4\wamt

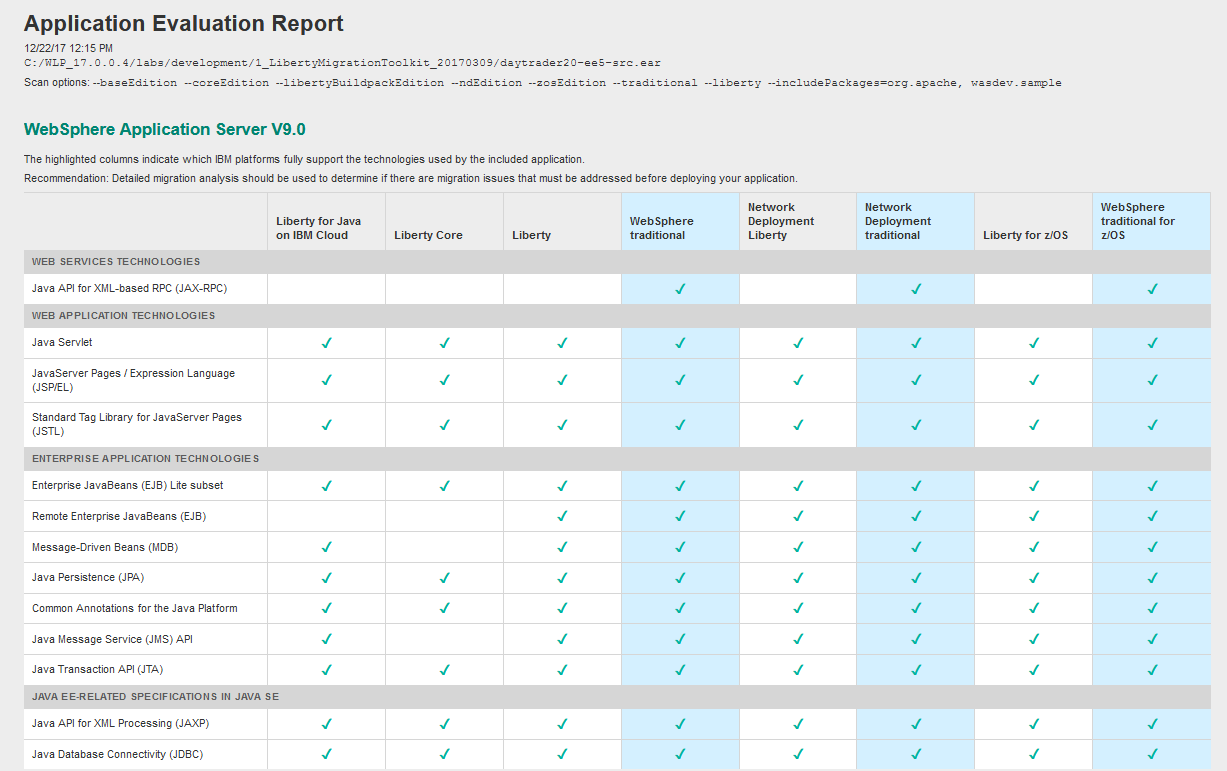
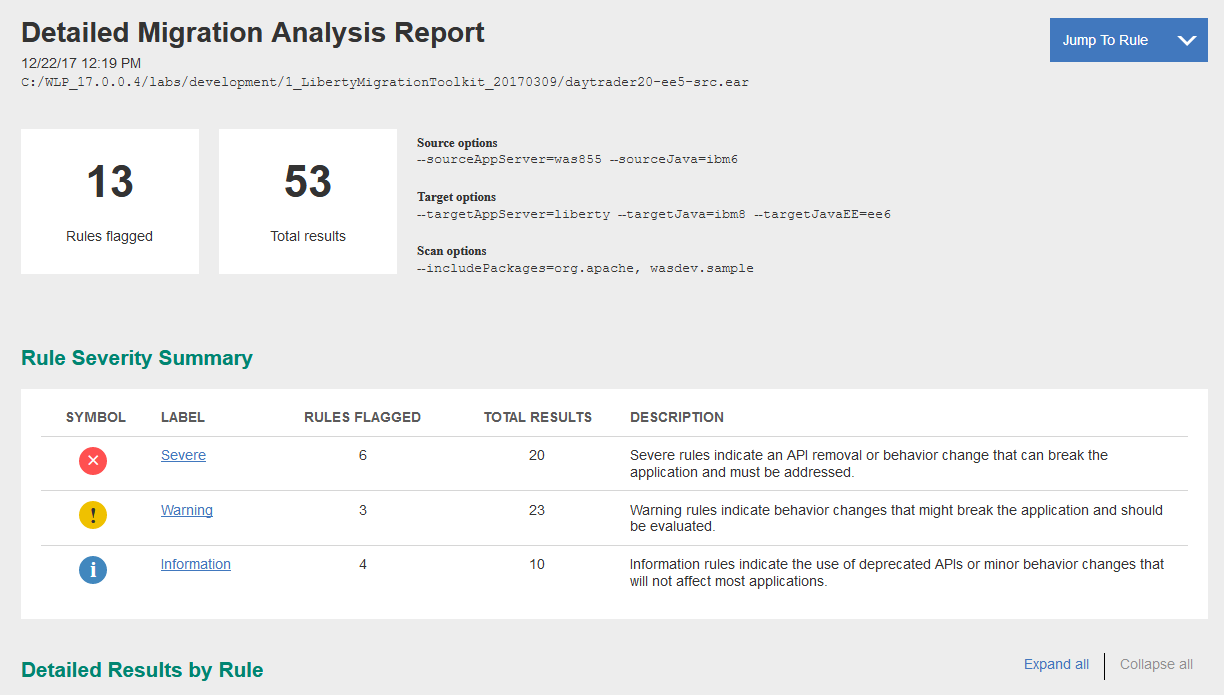
Successfully extracted all product files.

This will create a directory under {LAB\_HOME}/wamt. Examine the contents of the newly created directory.

1. To see a summary of the available command line options, run the binary scanner with the **--help** option.

java -jar {LAB\_HOME}/wamt/binaryAppScanner.jar --help

|  |
| --- |
| **Notice**   * It is a best practice to identify your custom application class packages with the  --includePackages option. By doing so, you avoid scanning Java EE and third-party packages which should not affect your migration effort. If no --includePackages or --excludePackages options are explicitly specified, the tool now excludes Java EE and some third-party packages by default. These packages are identified as scan options near the beginning of the report. * Previously, all classes packaged within the application were scanned, even if they were located in third-party JARs. This often caused reports to contain hundreds or even thousands of results that could and should be ignored. The inclusion of those results led to much confusion and inaccurate assessments of the migration effort. |

1. Run the command  
     
   java -jar {LAB\_HOME}/wamt/binaryAppScanner.jar {LAB\_HOME}/labs/development/1\_MigrationToolkit\_<timestamp>/daytrader20-ee5-src.ear --evaluate --includePackages=”org.apache,wasdev.sample”
2. A browser window will open showing a report about the programming models used by the application and where they will run. Review the report to see what programming models are used in the day trader application, and where they will run:  
     
   
3. Re-run the command, but this time with --analyze option.  
     
   java -jar {LAB\_HOME}/wamt/binaryAppScanner.jar {LAB\_HOME}/labs/development/1\_MigrationToolkit\_<timestamp>/daytrader20-ee5-src.ear --analyze --includePackages=”org.apache,wasdev.sample”
4. A browser window will open showing detailed information about which code may have to be changed:  
     
   
5. Review the output.

## Summary

In this lab you have learned:

* How to install and use Liberty Migration Toolkit on Eclipse
* How to install and use Migration Toolkit for Application Binaries

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