

## Lab 4 Working with Files

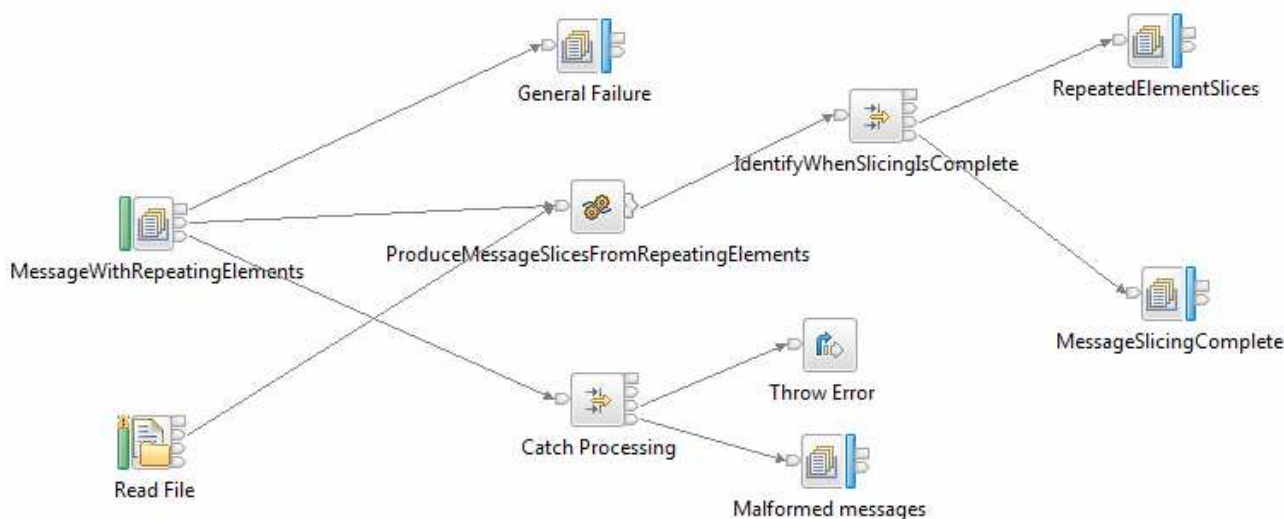
### 4.1 Overview

File processing is an important characteristic of an ESB. This lab will use one of the samples provided with IBM Integration Bus that shows how to read a large message and break it into multiple output messages (sometimes referred to as message shredding).

The sample takes in a large message with a repeating structure. It then processes each repeating message individually and writes an individual message for each repeating element. Since there are ten repeating elements, the input will result in ten smaller individual messages. This message flow will be modified to accept the same input in a file as well as an MQ message.

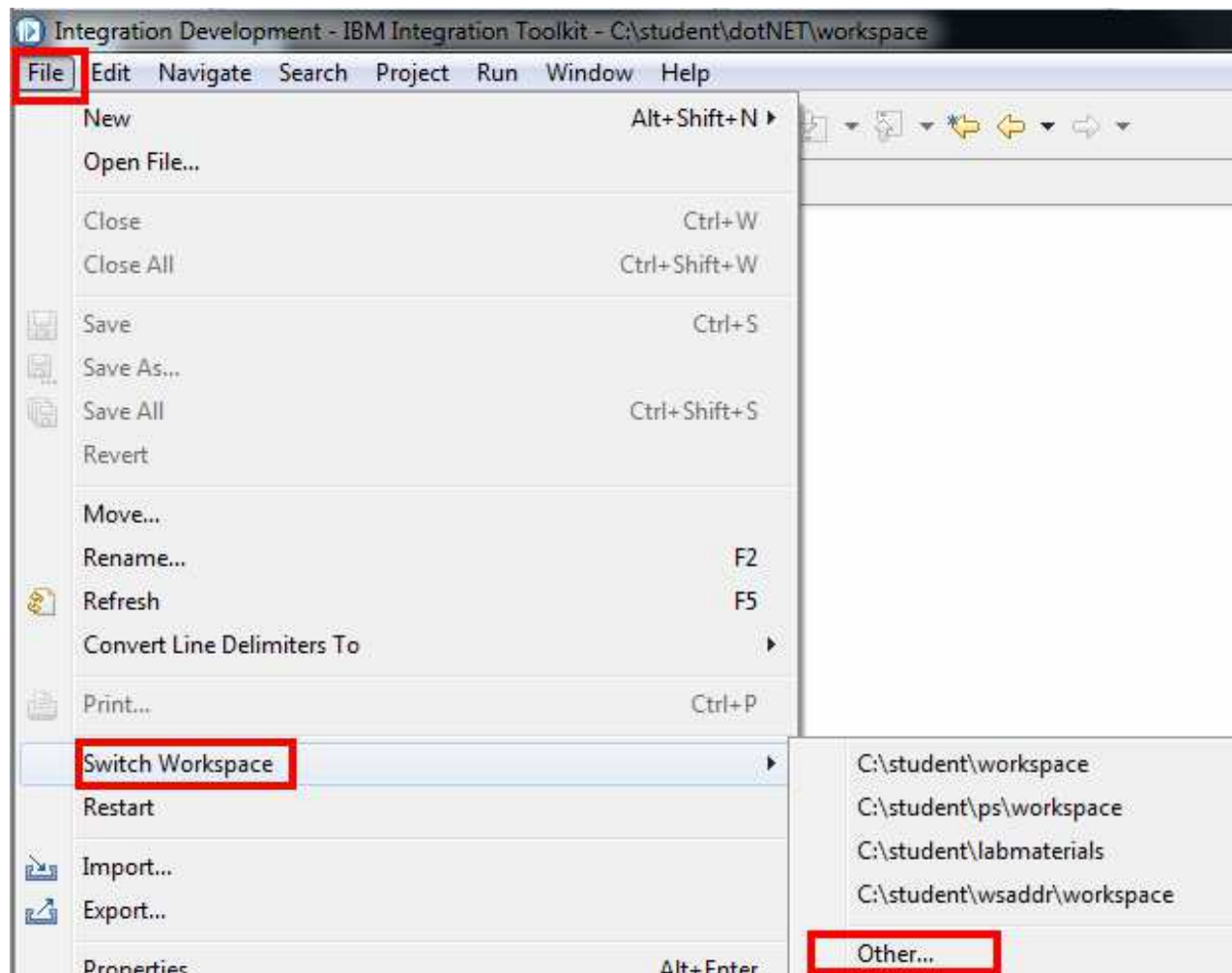
The techniques demonstrated in this sample flow show how very large files consisting of a large number of repeating segments can be processed efficiently, without requiring large amounts of memory.

The following message flow will be built.

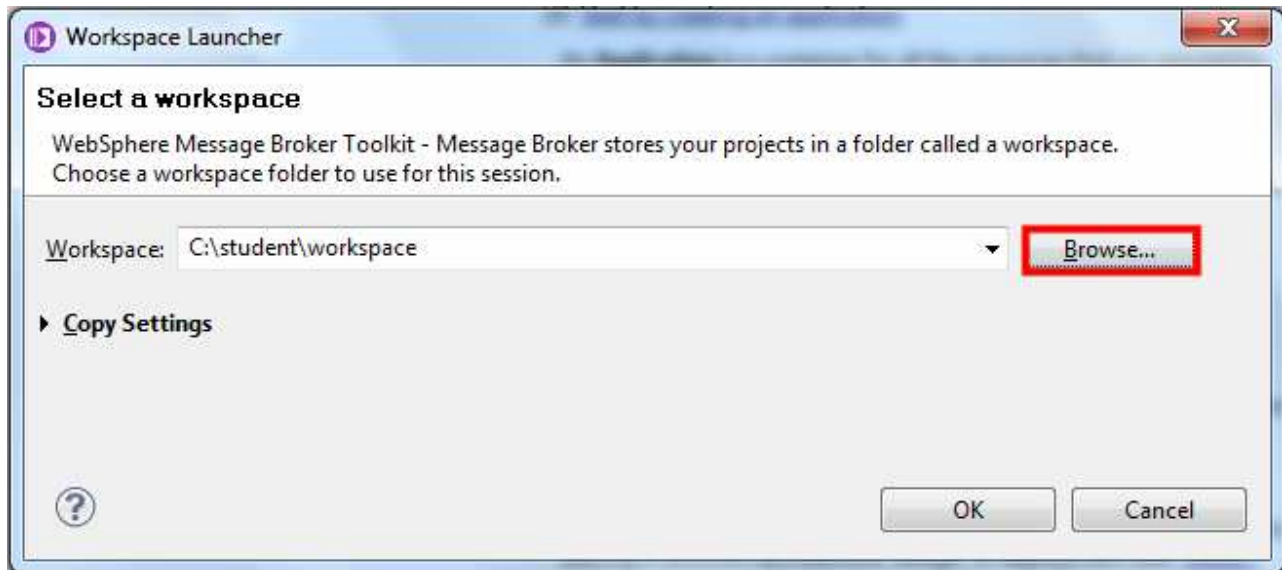


## Create the Message Flow

\_\_1. Select **File**→**Switch Workspace**→**Other**.

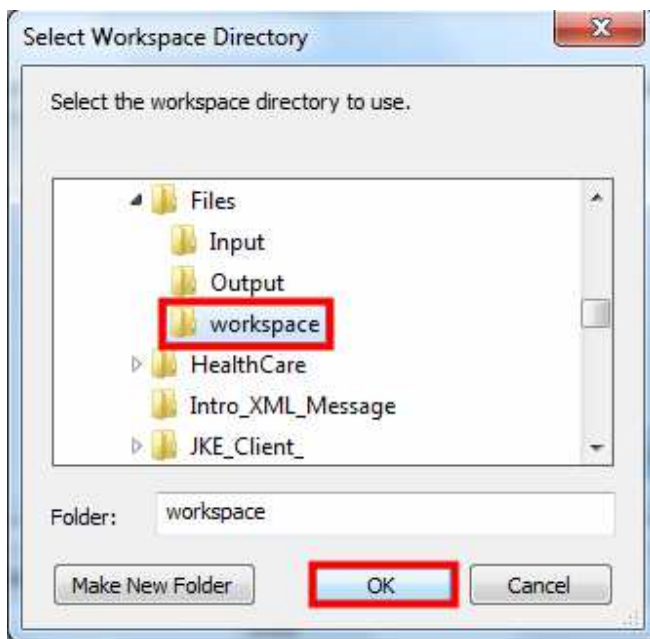


\_\_2. Press the **Browse** button to select the workspace.

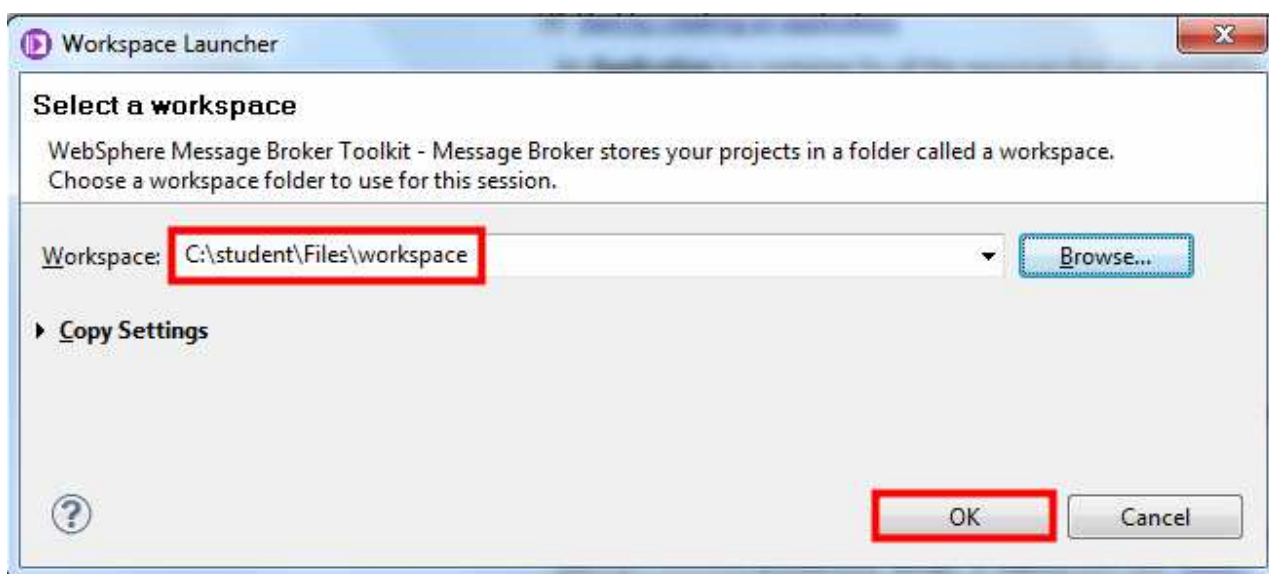


\_\_3. Navigate to the **C:\student\Files\workspace** directory.

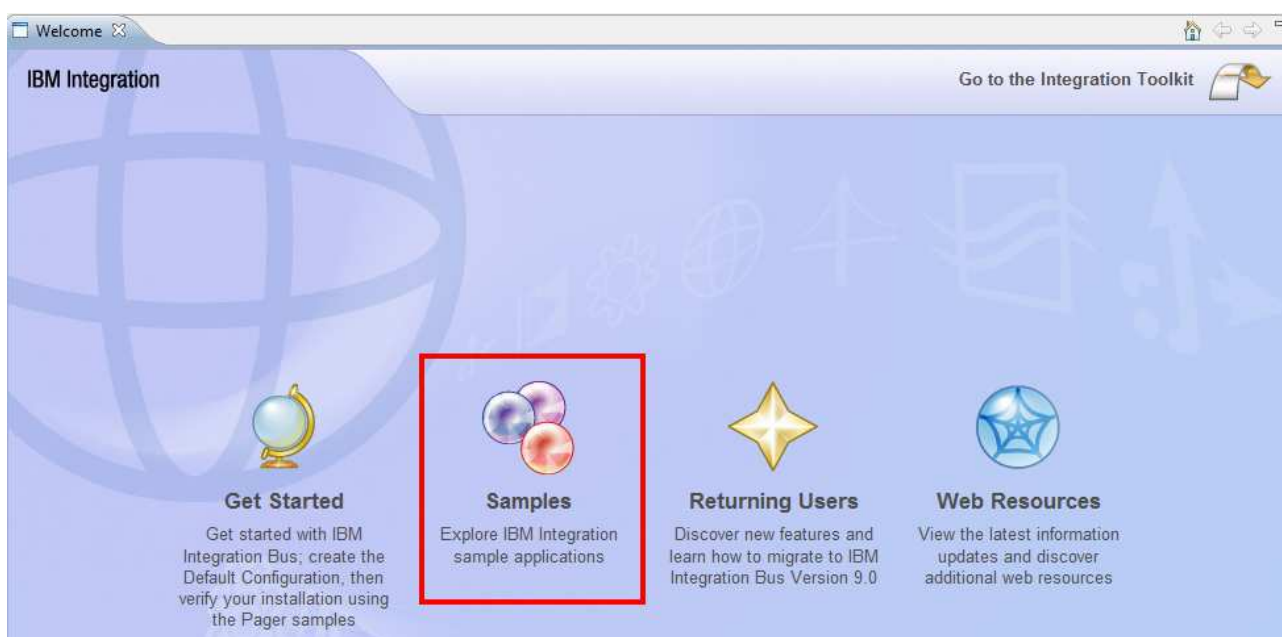
\_\_4. Press the **OK** button to select the workspace for this lab.



- \_\_5. Press the **OK** button to open the integration toolkit.



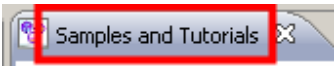
- \_\_6. Select the **Samples** icon hotspot.



\_\_7. Close the Welcome tab.

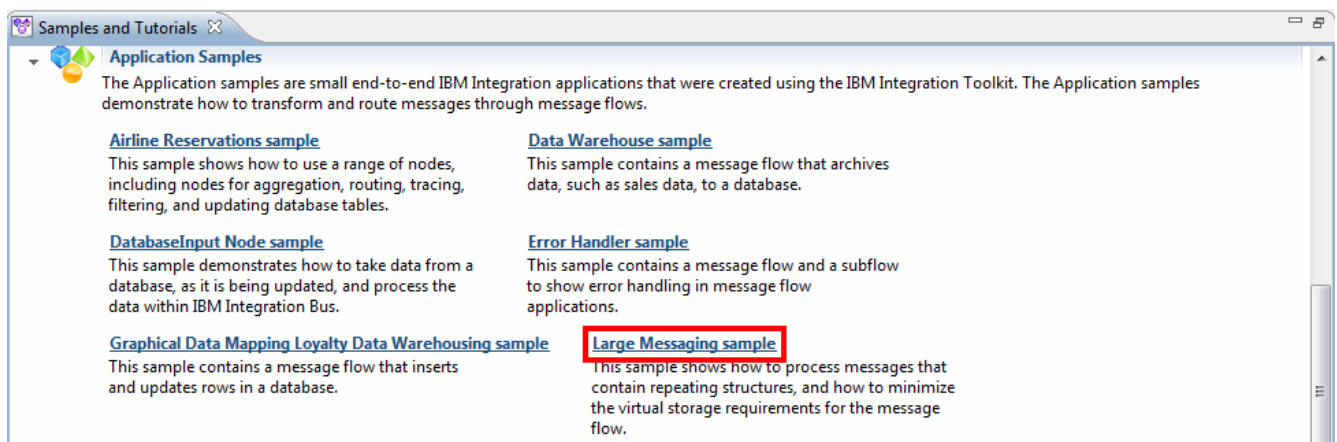


\_\_8. Double-click the Samples and Tutorials tab to open the samples in full screen mode.



\_\_9. Expand the **Application Samples**.

\_\_10. Click on the **Large Messaging sample** item.



A new window should open.

\_\_11. Select the **Import and deploy the sample** option.

IBM Integration Toolkit

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## Large Messaging sample

The Large Messaging sample is a message flow sample application based on the scenario of end-of-day processing of sales representing sales though the day are batched together in the store for transmission to the IT center. On receipt at the IT are split back out into their constituent parts for subsequent processing.

This splitting is achieved using an IBM Integration Bus message flow. Each of the individual messages representing a sale.

The Large Messaging sample demonstrates how to:

- Process messages that contain repeating structures. This includes processing the iterations of the repeating structures.
- Minimize the virtual memory requirements for the message flow. This technique can be useful in many situations when processing messages that are many megabytes in size.

The messages used in the sample are self-defining XML. This is used for simplicity. Other message formats could easily be used.

**NOTE:** In WebSphere Message Broker Version 8.0 and IBM Integration Bus, message model schema files contained in libraries to model messages for most data formats, including the new DFDL domain. Message sets continue to be supported, and MRM or IDOC domains. You can continue to import and deploy message sets for use in message flows. However, if you import message sets, message definitions, or message categories when using this sample, you must first enable message set development in the IBM Integration Toolkit. For more information, see [Enabling message set development](#) in the IBM Integration Bus documentation.

Click the following links to find out more about the sample and how to get the pre-built sample running using the wizards.

- [Import and deploy:](#) 5 minutes
- [Read about the sample](#)

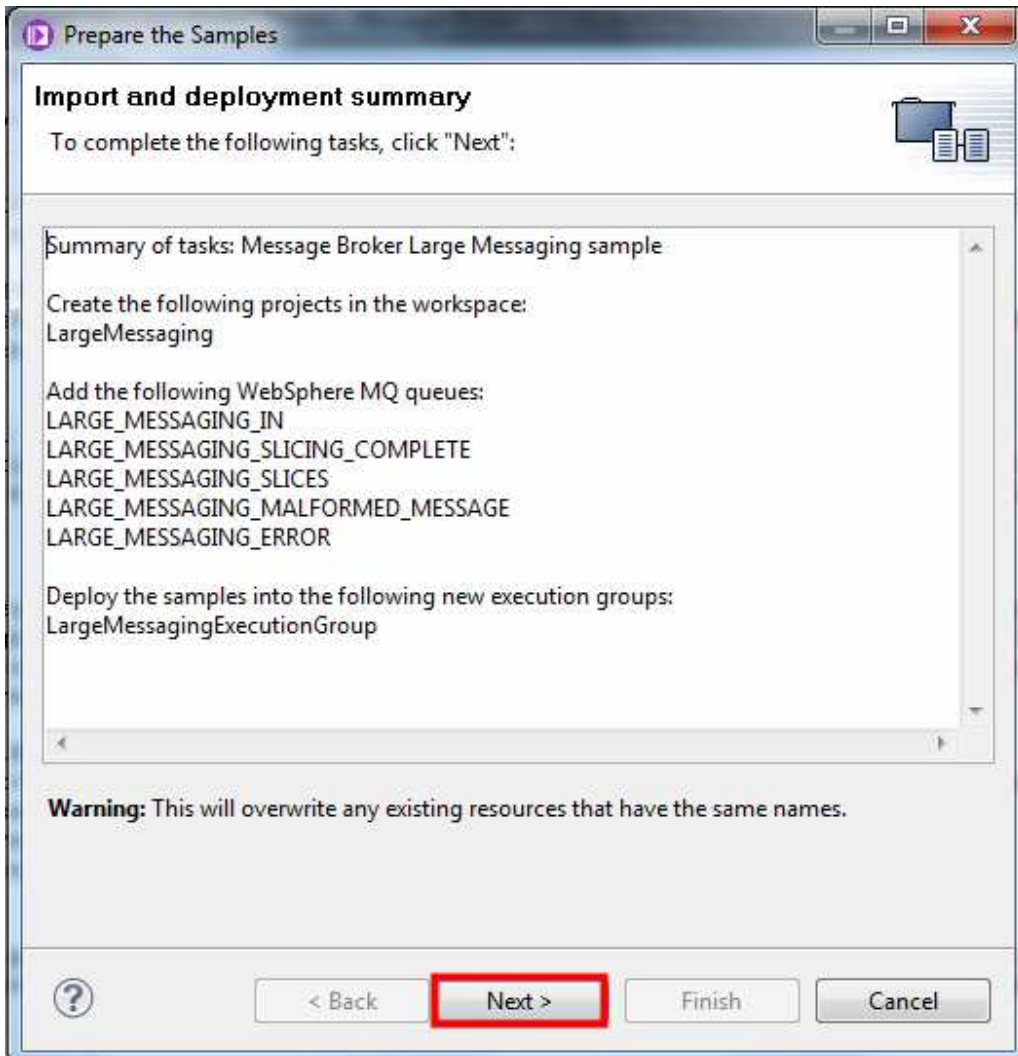
You can set up the sample in one of the following ways:

- [Import and deploy the sample](#)

This option imports the sample files into your workspace and deploys the sample to the integration node. This option also creates the resources for the sample, for example, WebSphere MQ queues.

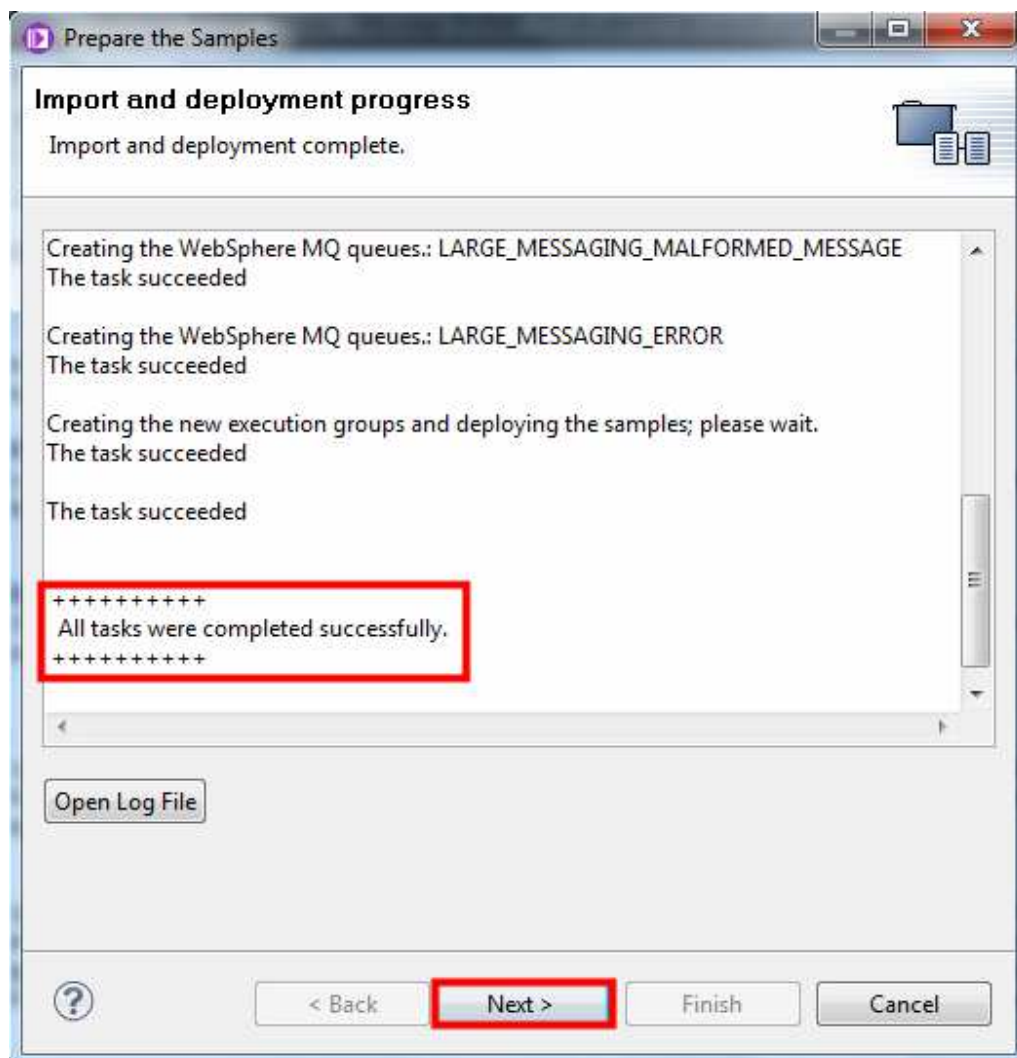
An **Import and deployment summary** dialog should appear.

- \_\_12. Press the **Next** button to import the sample project, create the queues and deploy the message flow.



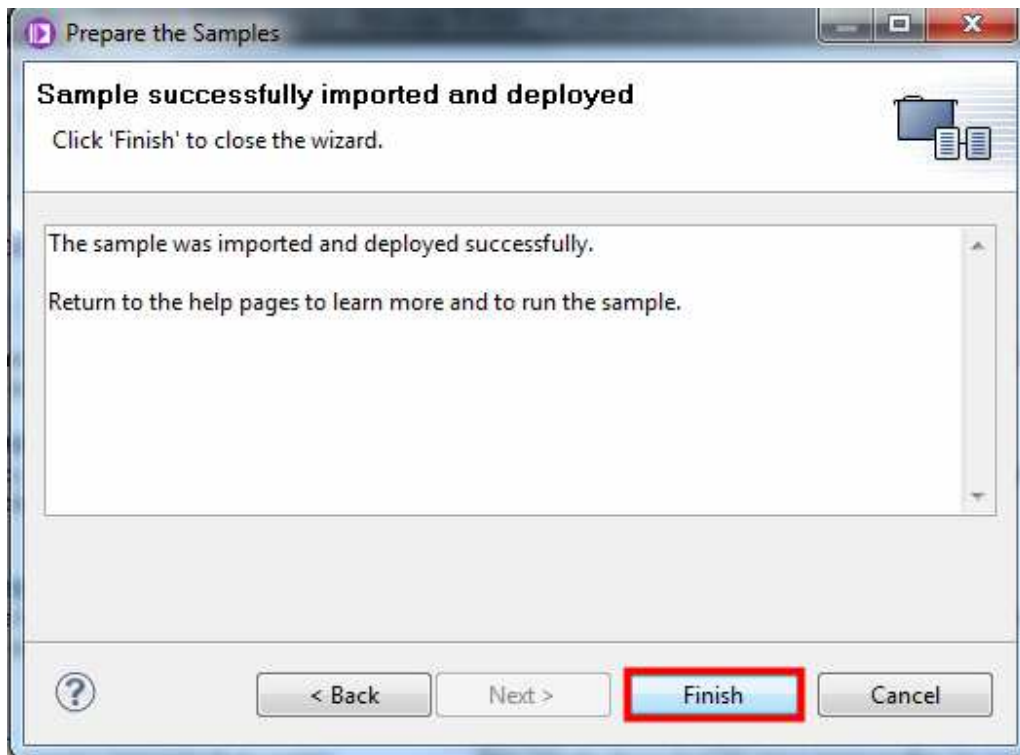


- \_\_13. Scroll down and confirm that all the tasks were successful.
- \_\_14. Press the **Next** button to continue.



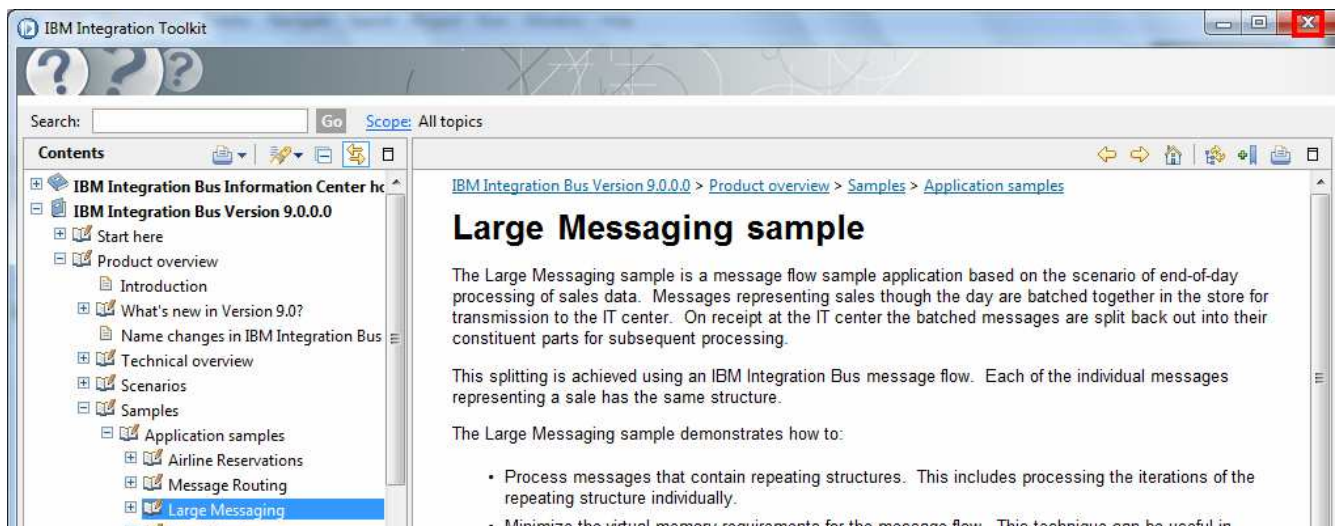


\_\_15. Press the **Finish** button to dismiss the dialog.

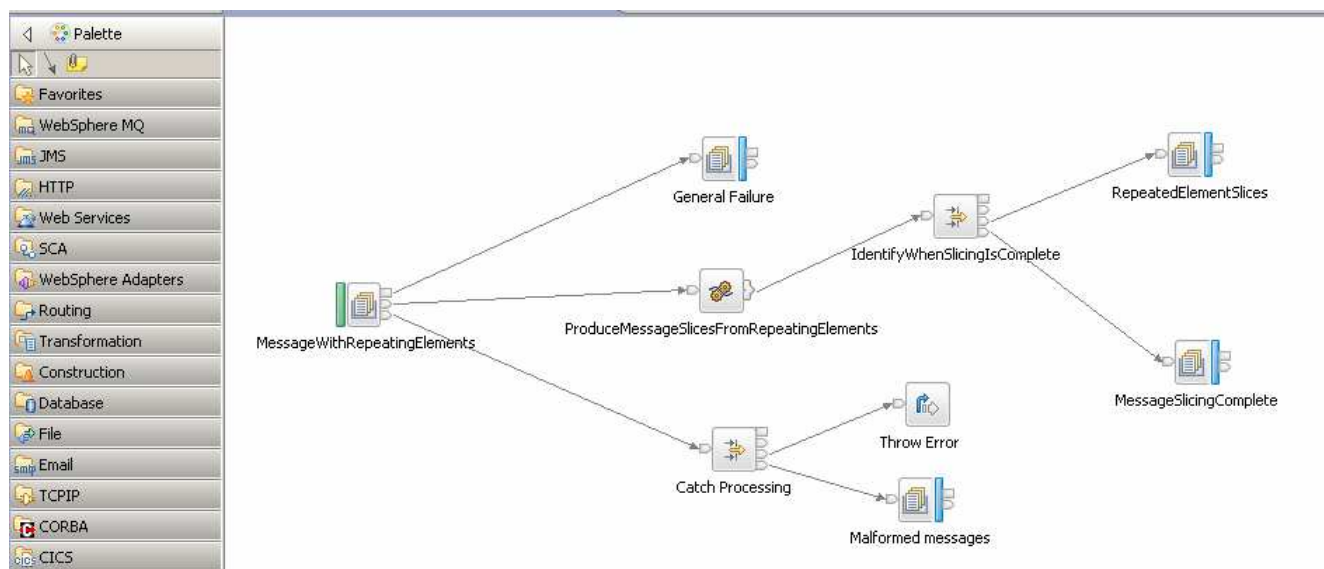


Take some time to read about the sample.

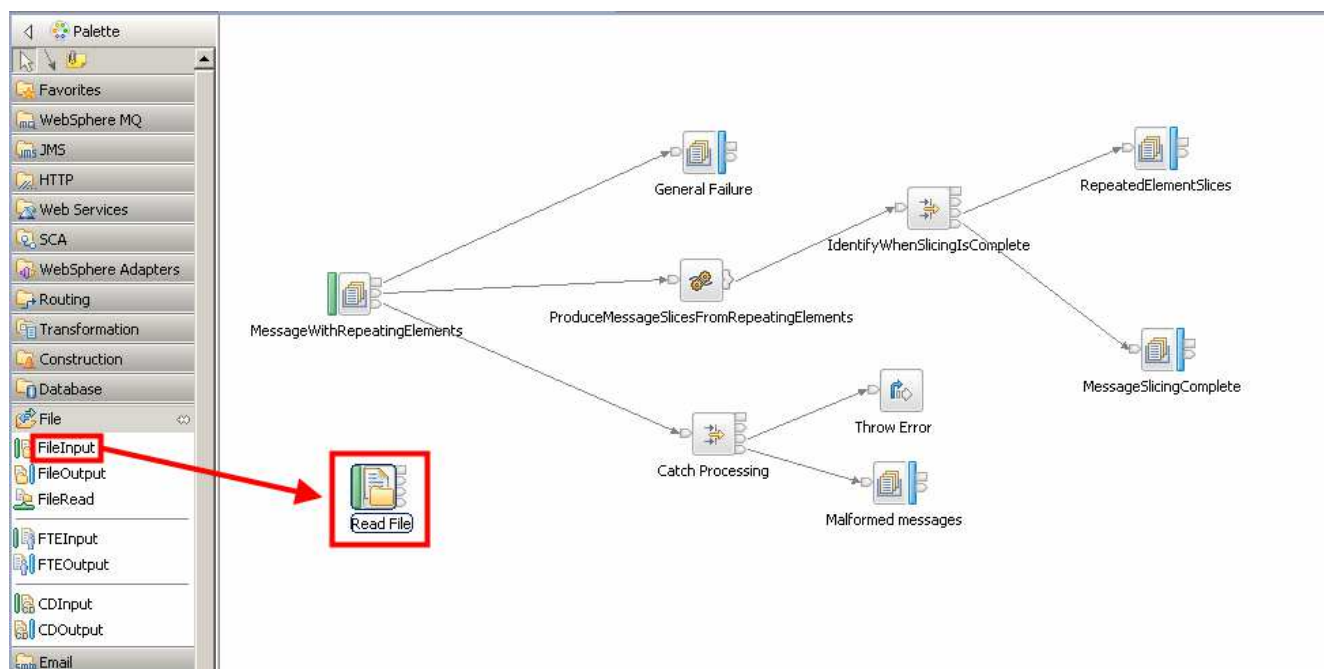
\_\_16. Close the **Information Center** window.



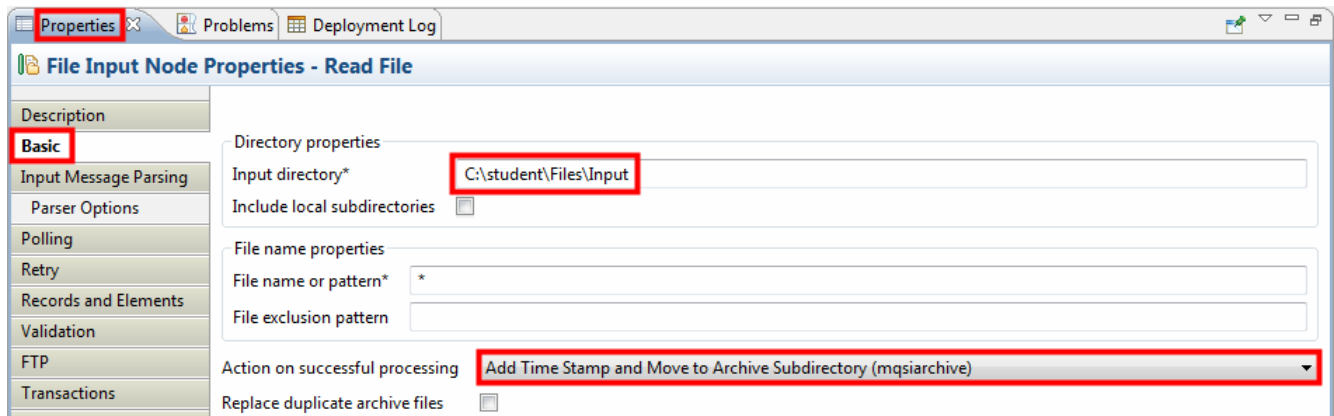
The imported message flow should be open in the message flow editor.



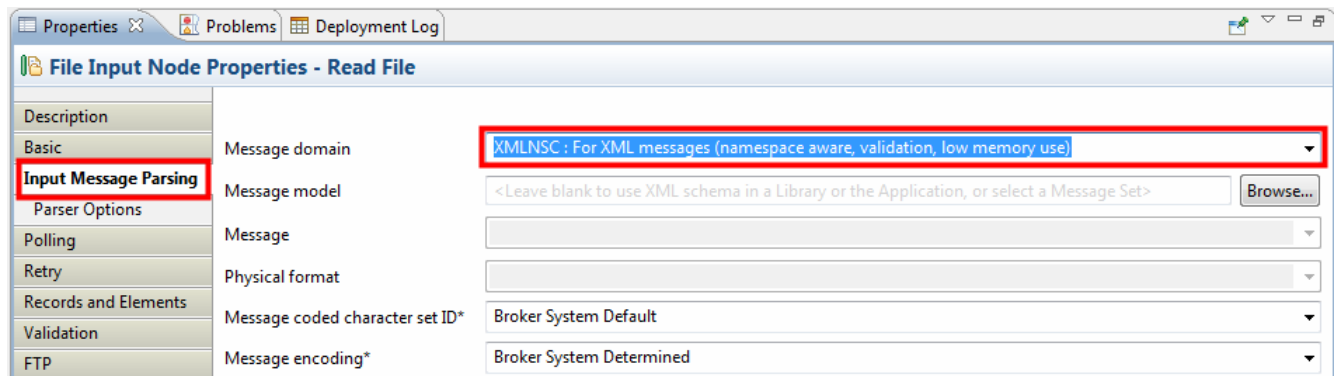
- \_\_17. Expand the **File** folder.
- \_\_18. Select the **FileInput** node.
- \_\_19. Drag it to the canvas and press the left mouse button to add the node to the message flow.
- \_\_20. Change the name of the new node to **Read File**.
- \_\_21. Press the **Enter** key to complete the rename operation.



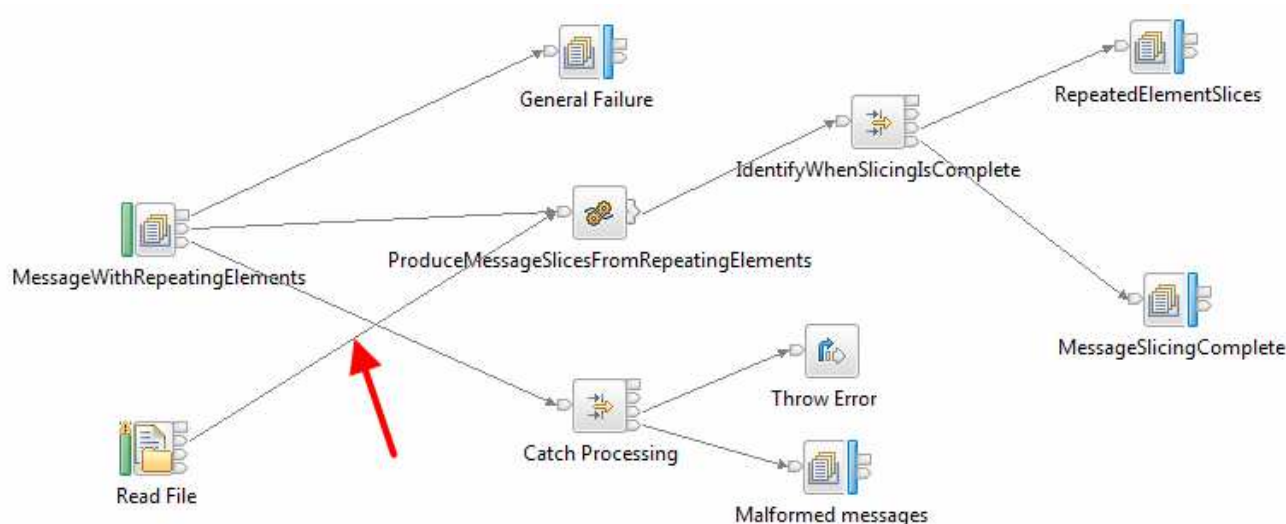
- \_\_22. If the flow editor is in full screen mode double-click the **Read File** node to display the properties.
- \_\_23. In the **Properties** pane select the **Basic** tab.
- \_\_24. Enter **C:\student\Files\Input** as the **Input directory**.
- \_\_25. Use the drop down menu to select the **Add Time Stamp and Move to Archive Subdirectory (mqsiarchive)** as the **Action on successful processing**.



- \_\_26. Select the **Input Message Parsing** tab.
- \_\_27. Use the drop down menu to select the **XMLNSC** parser for the **Message domain**.

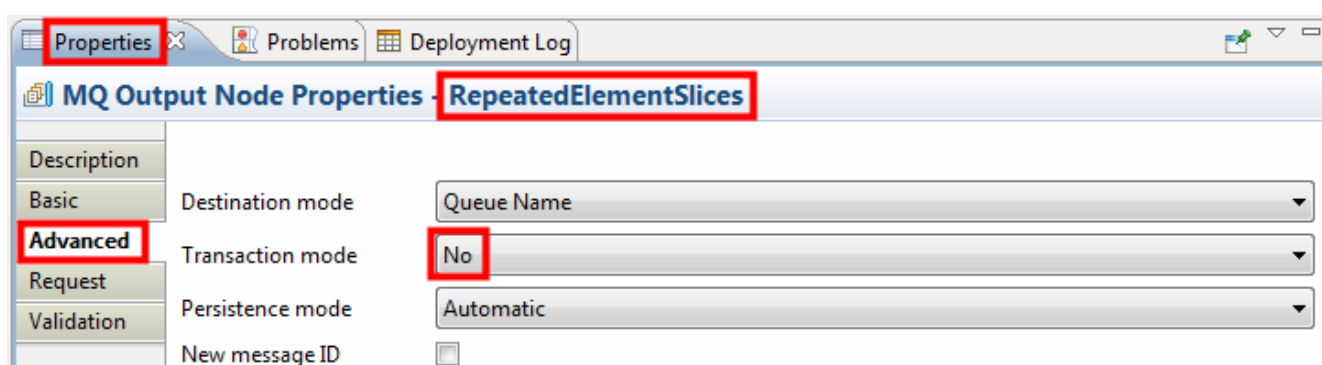


- \_\_28. Wire the **Out** terminal of the **Read File** node to the **In** terminal of the **ProduceMessageSlicesFromRepeatingElements** node.



One more change will be made to allow for a very large file. The processing of the sample is based on MQ messages and as such the output messages are part of a single unit of work. However, this would not scale to a very large file. The “repeated element slices” messages will therefore be written outside of a syncpoint. In a production environment this could lead to duplicate messages in the event of a failure. The duplicate messages could be easily handled by using a resequence node and putting a sequence number in the local environment. This would eliminate duplicate messages resulting from a failure.

- \_\_29. Select the **RepeatedElementSlices** node.
- \_\_30. In the **Properties** for the node select the **Advanced** tab.
- \_\_31. Use the drop down menu to select **No** as the **Transaction mode**.



- \_\_32.  Save the message flow.

The message flow is now complete. It has been modified to accept files as well as messages as input.

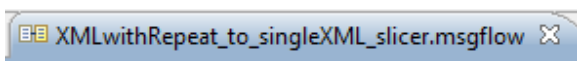
## Execute the Message Flow

The message flow will be tested using both a message and a file as inputs.

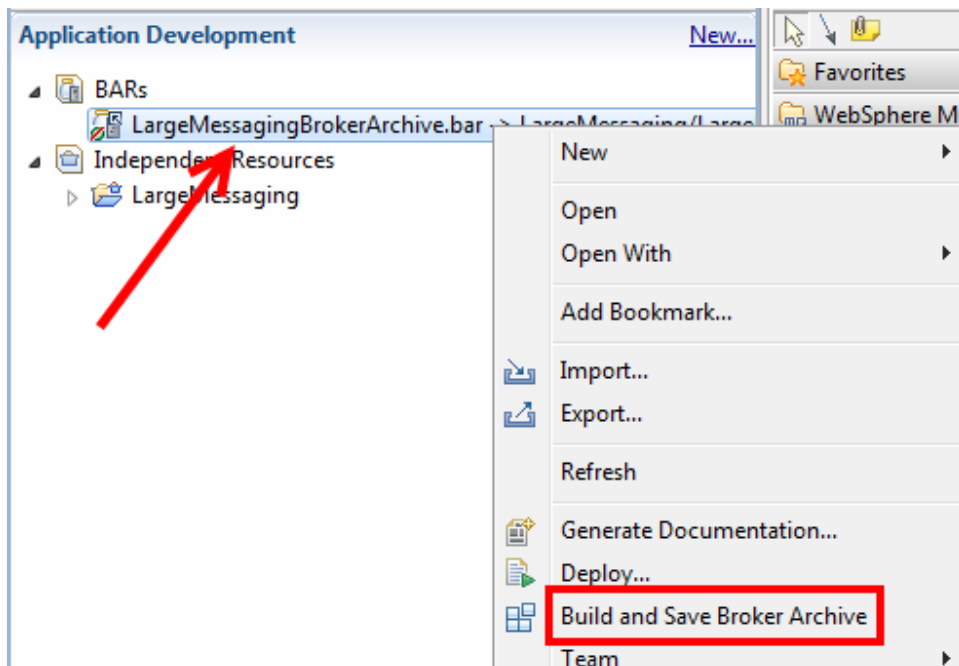
**If necessary.... create the C:\student\Files\input directory on your disk.**

The message path will be tested first. The sample program includes a flow test with data. This will be used to test the messaging path.

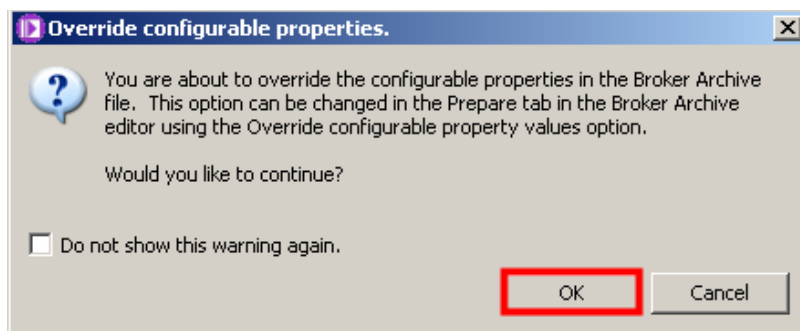
- \_\_1. If the screen is in full screen mode double-click the message flow editor tab to return to windowed mode.



- \_\_2. In the navigator pane, expand **Independent Resources**→**LargeMessaging**→**BARs**.
- \_\_3. Select the **LargeMessagingBrokerArchive.bar** broker archive file.
- \_\_4. Press the right mouse button.
- \_\_5. Select **Build and Save Broker Archive** from the menu.



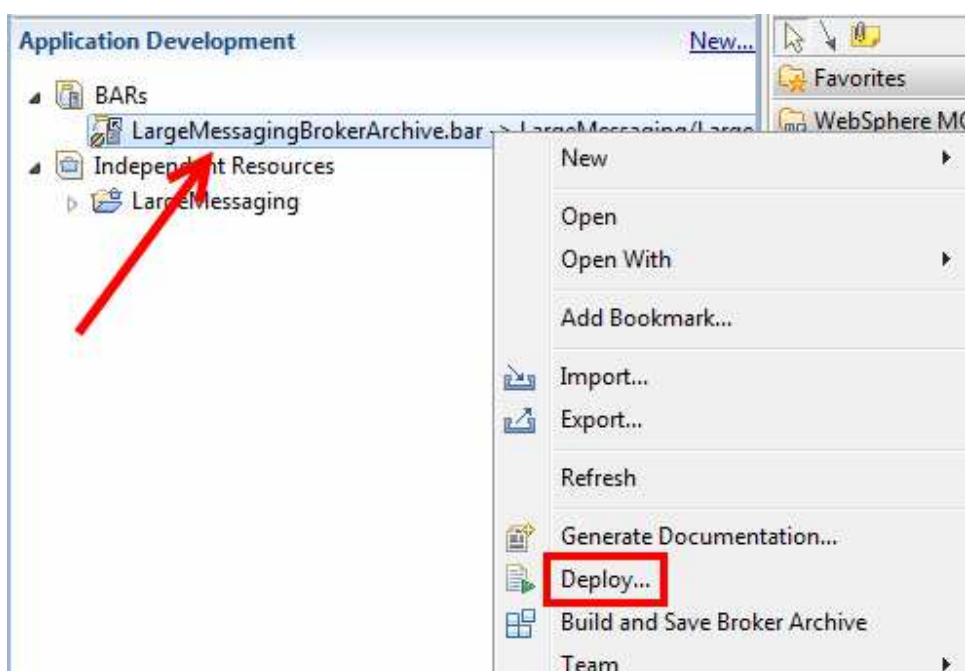
\_\_6. Press the OK button to dismiss the warning (if it appears).



\_\_7. In the Project Navigator pane select the **LargeMessagingBrokerArchive.bar** archive file.

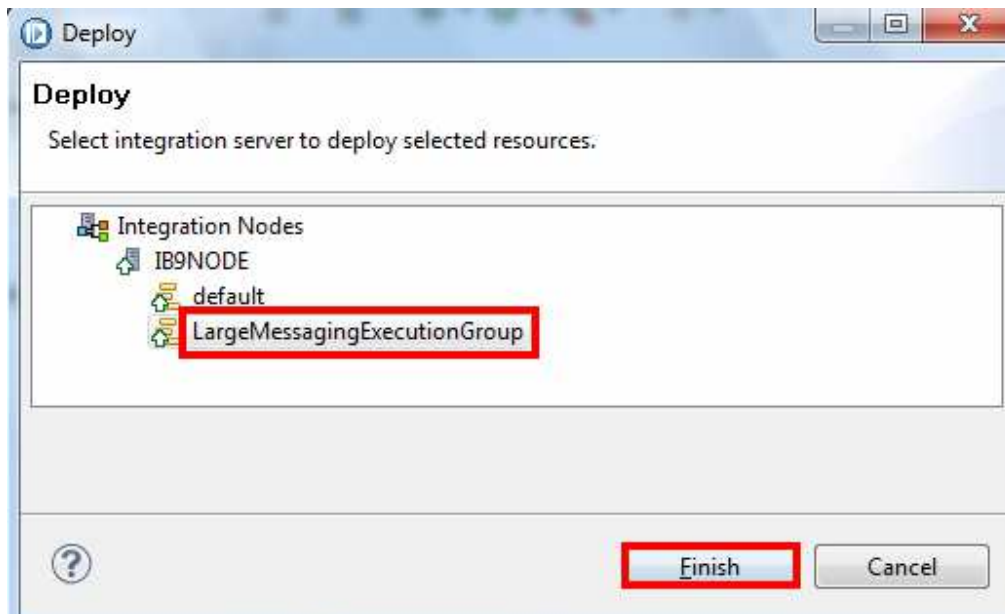
\_\_8. Press the right mouse button.

\_\_9. Select **Deploy...** from the menu.

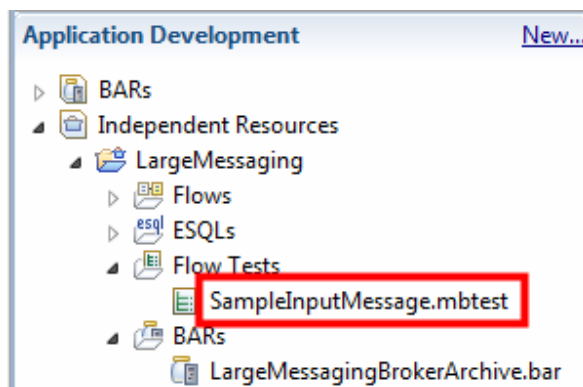


The import and deploy wizard created an additional integration server where it deployed the original version of the message flow. The updated message flow will be deployed to replace the original version.

- \_\_10. Expand **Integration Nodes**→**IB9NODE**.
- \_\_11. Select the **LargeMessagingExecutionGroup** integration server.
- \_\_12. Press the **Finish** button to initiate the deployment operation.



- \_\_13. In the navigator pane, expand **LargeMessaging**→**Flow Tests**.
- \_\_14. Double-click on the **SampleInputMessage.mbttest** file to launch the Test Client.





Examine the test client window. The **Enqueue** entry should be selected. This will write a message to the specified queue. The name of the queue and queue manager is specified under **Detailed Properties**. The input data is shown in the large text box in the **Message** area.

\_\_15. Press the **Send Message** button to send the data to the specified queue.

The screenshot displays the IBM MQ test client interface. On the left, the 'Message Flow Test Events' pane shows 'Enqueue' selected. The right pane is divided into 'General Properties' and 'Detailed Properties'. The 'Detailed Properties' section includes fields for Host (localhost), Port (0), Server channel (SYSTEM.BKR.CONFIG), Queue manager (IB9QMGR), and Queue (LARGE\_MESSAGING\_IN). Below these is the 'Message' section, which has a 'Body' dropdown set to 'Edit as text' and a 'Show in hexadecimal viewer (Read Only)' checkbox. The message body contains XML data. A red arrow points to the 'Queue manager' field, and another red arrow points to the message body text.

**General Properties**

**Detailed Properties**

Host: localhost

Port: 0

Server channel: SYSTEM.BKR.CONFIG

Queue manager: IB9QMGR

Queue: LARGE\_MESSAGING\_IN

Message

Header

Body: Edit as text

Show in hexadecimal viewer (Read Only)

```
<SaleEnvelope> <Header> <SaleListCount>10</SaleListCount> </Header> <SaleList> <Invoice>
y>Euros</Currency> </Invoice> </SaleList> <SaleList> <Invoice> <Initial>F</Initial> <Initial>f
ce> </SaleList> <SaleList> <Invoice> <Initial>g</Initial> <Initial>Z</Initial> <Surname>FQNIY
Invoice> <Initial>W</Initial> <Initial>g</Initial> <Surname>mtgcdraRGly</Surname> <Item:
al> <Initial>N</Initial> <Surname>ErfMwkQUAar</Surname> <Item> <Code>03</Code> <C
urname>oROIYxodmus</Surname> <Item> <Code>05</Code> <Code>07</Code> <Code>{
```

Import Source... Send Message

The results of the execution of the message flow will now be examined.

- \_\_16. Return to MQ Explorer. If it is not running start it.
- \_\_17. Expand the **IB9QMGR** queue manager.
- \_\_18. Select the **Queues** folder.
- \_\_19. In the right hand pane scroll down so the **LARGE\_MESSAGING\_SLICES** queue is visible.
- \_\_20. Confirm that there are ten messages in the **LARGE\_MESSAGING\_SLICES** queue.
- \_\_21. Confirm that there is one message in the **LARGE\_MESSAGING\_SLICING\_COMPLETE** queue.

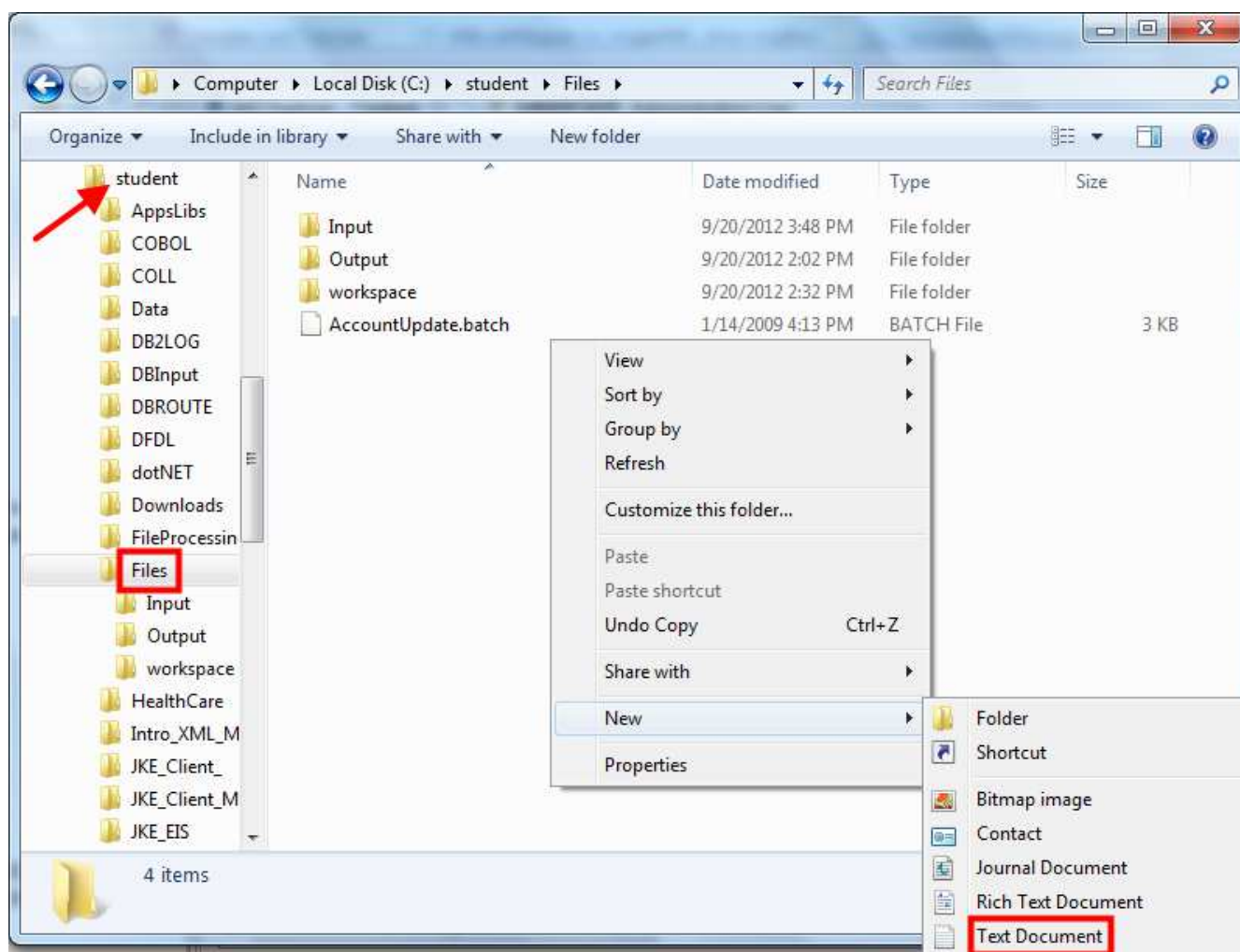
Queues				
Filter: Standard for Queues				
Queue name	Queue type	Open input count	Open output count	Current q
LAB.STATE	Local	0	0	0
LAB.US.OUT	Local	0	0	0
LARGE_MESSAGING_ERROR	Local	0	0	0
LARGE_MESSAGING_IN	Local	1	0	0
LARGE MESSAGING MALFORMED MESSAGE	Local	0	0	0
LARGE_MESSAGING_SLICES	Local	0	1	10
LARGE_MESSAGING_SLICING_COMPLETE	Local	0	1	1
MAP.ACCTCLOSE	Local	0	0	0

The same test data will now be copied into a file and the file path will be tested. A Windows Explorer session will be used.

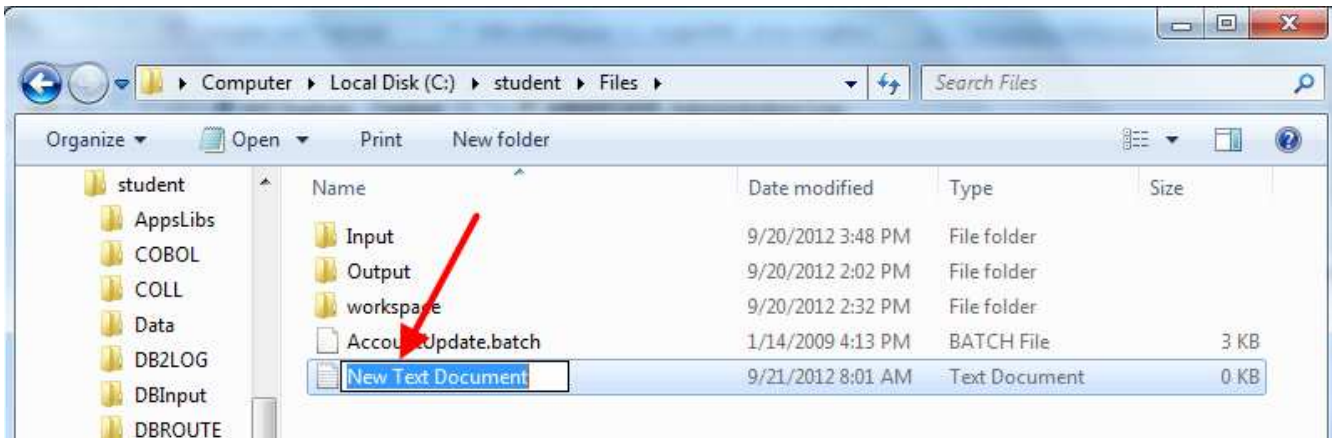
- \_\_22. Select the **Windows Start button**.
- \_\_23. Press the right mouse button.
- \_\_24. Select **Open Windows Explorer**.



- \_\_25. Navigate to the **C:\student\Files** directory.
- \_\_26. Select the **Files** directory.
- \_\_27. Point to a blank area in the right hand pane and press the right mouse button.
- \_\_28. Select **New**→**Text Document** from the menu that appears.



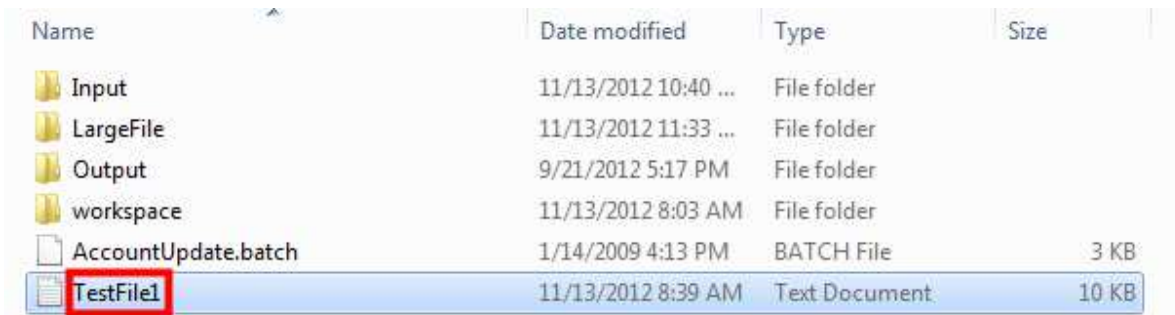
A new file should be created in the **Files** folder.



\_\_29. Change the name of the new file to **TestFile1**.

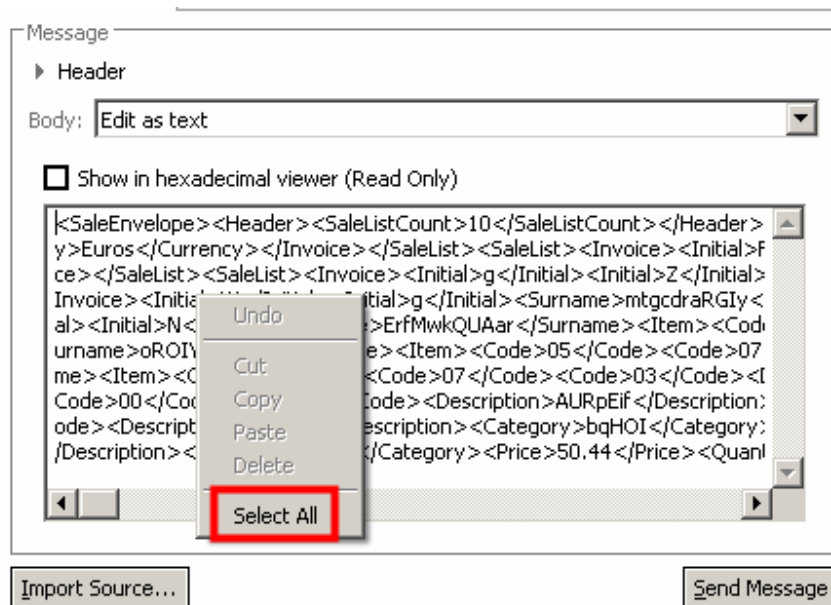
\_\_30. Press the **Enter** key to complete the rename operation.

\_\_31. Double-click the new **TestFile1** file to open the file in the notepad editor.

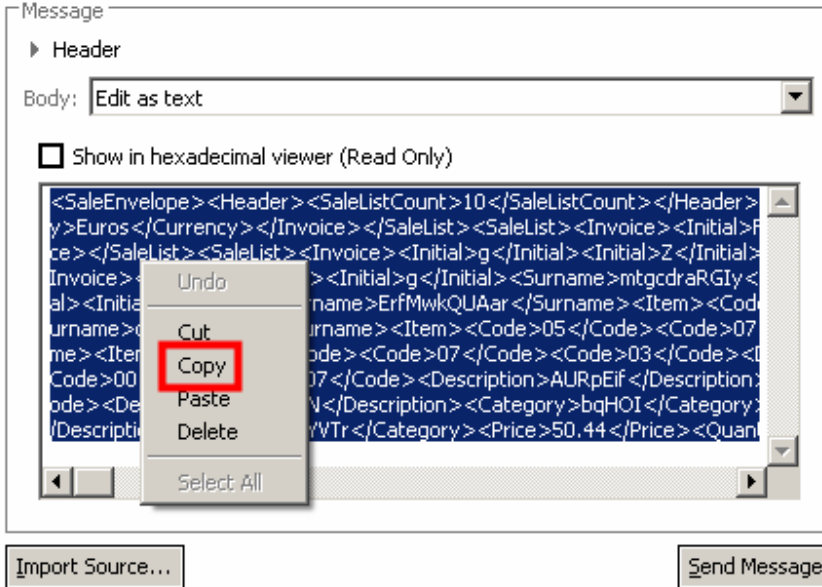


A notepad session should open. The file is currently empty. The test data from the test client will now be copied and pasted into the notepad session.

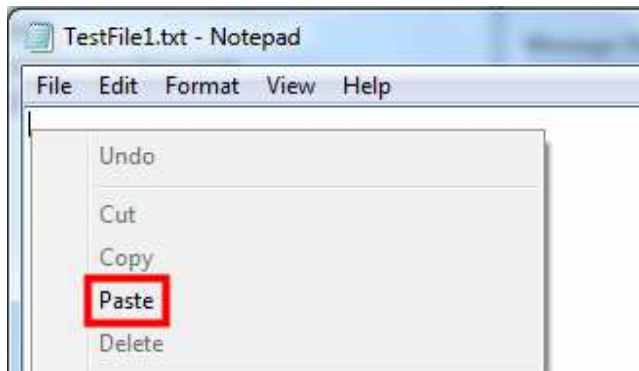
- \_\_32. Return to the test client in the integration toolkit.
- \_\_33. Move the mouse pointer to the message text.
- \_\_34. Press the right mouse button.
- \_\_35. Click the **Select All** menu item.



- \_\_36. Move the mouse pointer to the message text.
- \_\_37. Press the right mouse button.
- \_\_38. Click the **Copy** menu item.

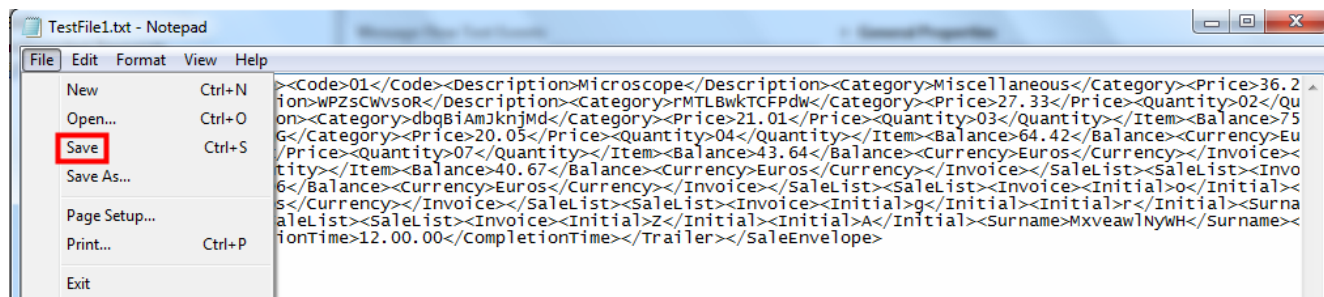


- \_\_39. Return to the notepad session.
- \_\_40. Point the mouse in a blank area of the notepad session and press the right mouse button.
- \_\_41. Select **Paste** from the menu.

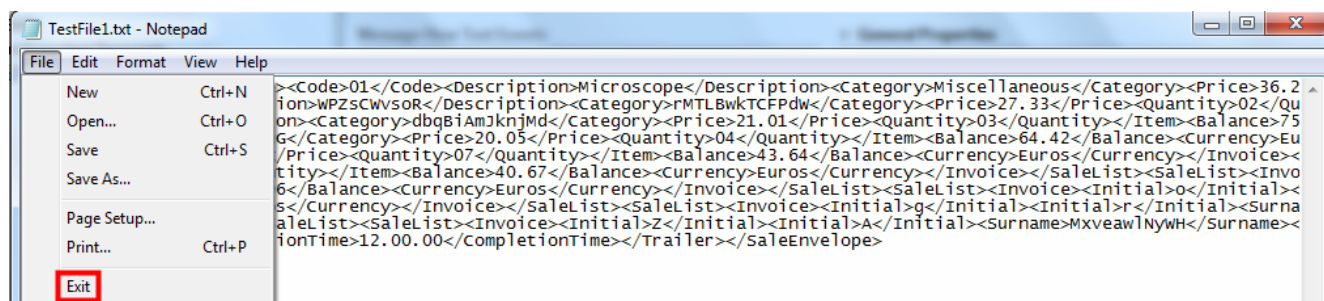


The data should now have been transferred into the notepad editor.

**42.** Select **File**→**Save** from the menu in the notepad editor (or use **Ctrl+S**).

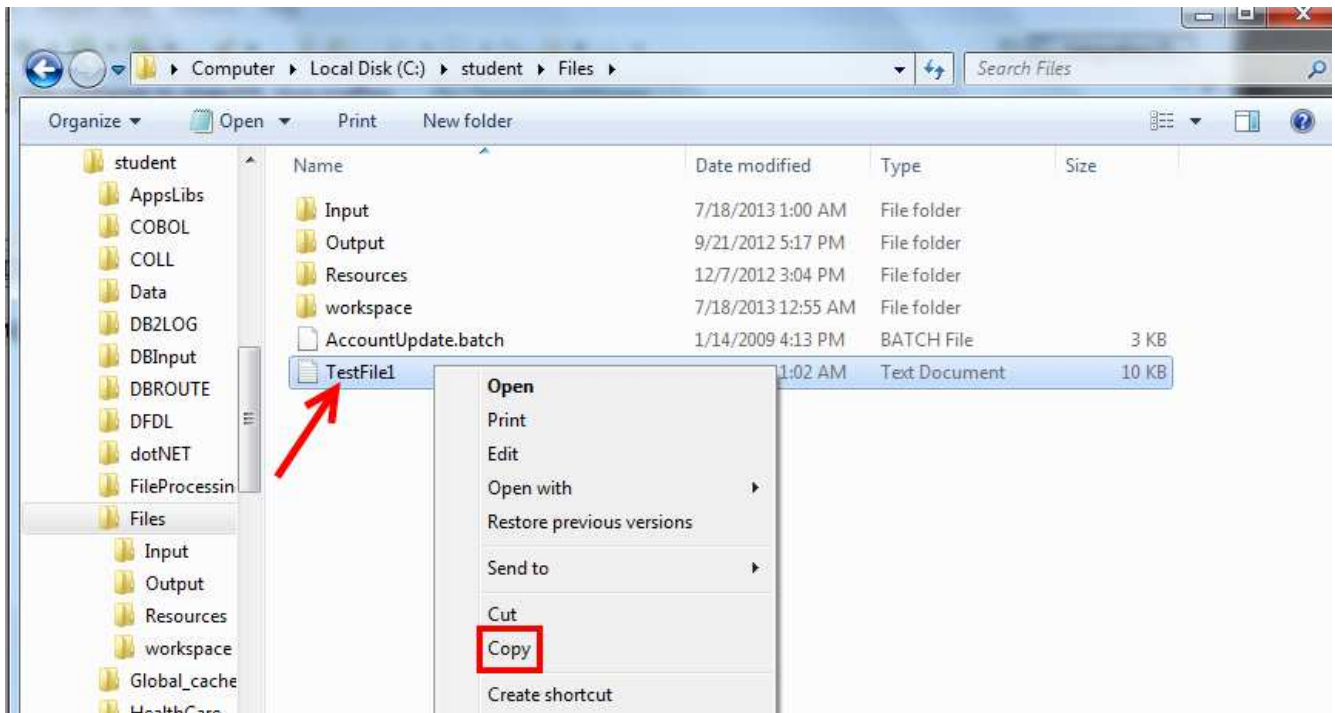


**43.** Close the notepad editor (either **Alt+F4** or **File**→**Exit**).

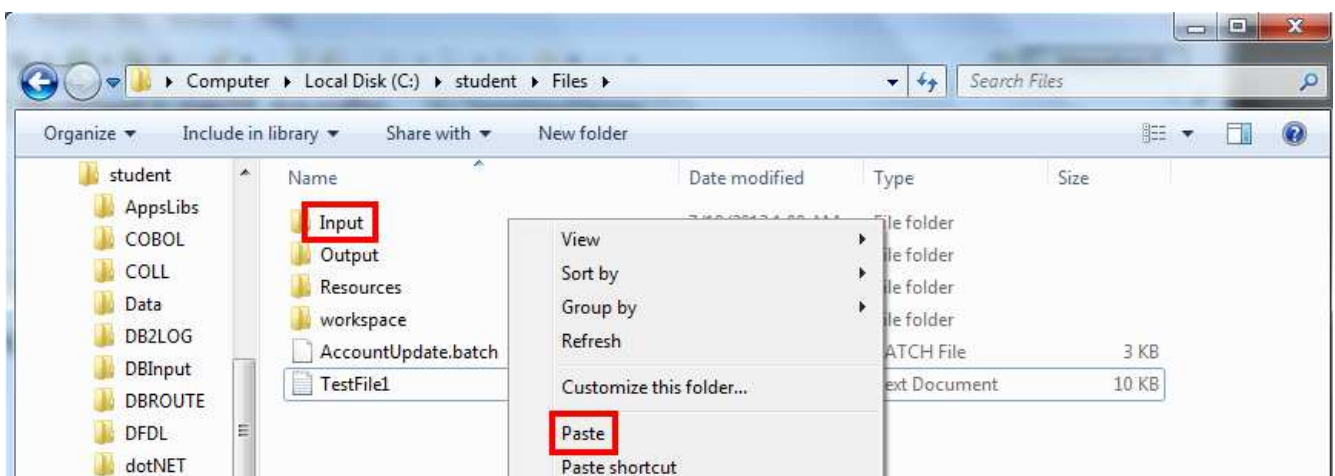




- \_\_44. Return to the Windows explorer window. The new **TestFile1.txt** file should be visible.
- \_\_45. Select the **TestFile1.txt** file.
- \_\_46. Press the right mouse button.
- \_\_47. Select **Copy** from the menu.



- \_\_48. Select the **Input** directory above the file.
- \_\_49. Press the right mouse button.
- \_\_50. Select **Paste** from the menu



- \_\_51. Return to the MQ Explorer and wait for a refresh cycle.
- \_\_52. The queue depth of the **LARGE\_MESSAGING\_SLICES** queue should now be twenty.

Queues

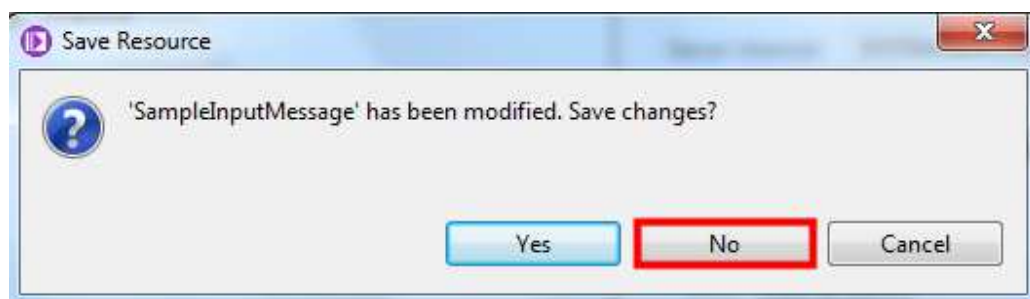
Filter: Standard for Queues

Queue name	Queue type	Open input count	Open output count	Current q
LAB.STATE	Local	0	0	0
LAB.US.OUT	Local	0	0	0
LARGE_MESSAGING_ERROR	Local	0	0	0
LARGE_MESSAGING_IN	Local	1	0	0
LARGE_MESSAGING_MALFORMED_MESSAGE	Local	0	0	0
<b>LARGE_MESSAGING_SLICES</b>	Local	0	2	20
<b>LARGE_MESSAGING_SLICING_COMPLETE</b>	Local	0	2	2
MAP.ACCTCLOSE	Local	0	0	0

- \_\_53. Return to the integration toolkit.
- \_\_54. **Close the Test Client.**



- \_\_55. Press the **No** button. The changes to the test client will not be saved.



\_\_56. Minimize the Windows Explorer window.

