

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

FTP Adapter outbound lab

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What this exercise is about

The objective of this lab is to provide you with an understanding of the IBM WebSphere Adapter for FTP and outbound processing. In this lab you will deploy the WebSphere Adapter for FTP, using WebSphere Integration Developer, and integrate it with an SCA application that processes outbound requests to the file system.

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Lab requirements

List of system and software required for the student to complete the lab

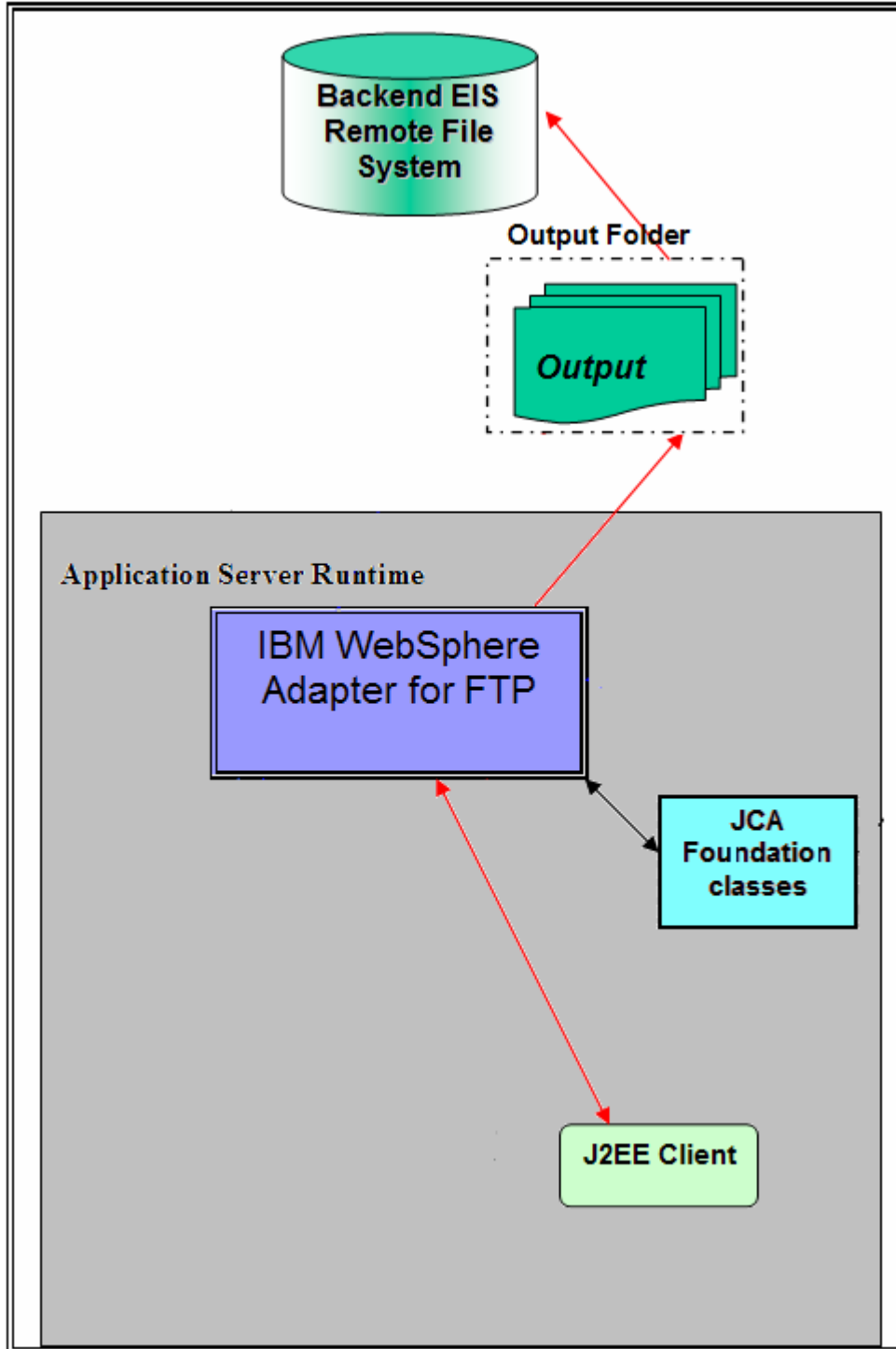
- WebSphere Integration Developer V6.1 installed and updated with latest fixes
- WebSphere Process Server V6.1 test environment installed and updated with latest fixes
- FTP server installed and configured
- Unzip LabFiles61.zip to your C:\ (your root) drive

What you should be able to do

- Import FTP adapter RAR file into WebSphere Integration Developer
 - Use the external service wizard to configure Activation Spec Properties, Resource Adapter Properties to generate Business Objects and other artifacts and then define your Data Binding and Data Handler, and Operations
 - Deploy the adapter application onto the WebSphere Process Server test environment
 - Test the deployed application using WebSphere Process Server test environment for both pass-through and non pass-through using different scenarios and patterns
 - Restore the server configuration
-

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Introduction



The Java™ EE Client makes a SCA call by giving the outbound operation name and the input data object and then the custom data binding is called and it invokes other content-specific data handler based on the ContentType set in the child data object.

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The protocol specific properties like directory Name, file name which are required during outbound operation are populated in the wrapper data object present in BG. These values are set on to the FTPFileUnstructuredRecord in the custom data binding and sent to the adapter.

Exercise instructions

Some instructions in this lab might be specific for Windows platforms. If you run the lab on a platform other than Windows, you will need to run the appropriate commands, and use appropriate files (for example .sh in place of .bat) for your operating system. The directory locations are specified in the lab instructions using symbolic references as follows:

Reference variable	Windows location	Linux location
<WID_HOME>	C:\Program Files\IBM\WID61	
<WPS_HOME>	C:\<WID_HOME>\runtimes\bi_v6	
<FTPADAPTER_HOME>	<WID_HOME>\ResourceAdapters\FTP_6.1.0.0\deploy	
<LAB_FILES>	C:\LabFiles61	/tmp/LabFiles61
<WORKSPACE>	<LAB_FILES>\FTPOutbound\workspace	
<OUT_DIR>	<LAB_FILES>\ FTPOutbound\output	
<RETRIVE_ARCHIVE>	<LAB_FILES>\ FTPOutbound\retrievearchive	
<FTPFILES>	<LAB_FILES>\FTPFiles	
<LOCAL_DIR>	<LAB_FILES>\FTPOutbound\LocalDir	
<TEMP>	C:\temp	/tmp

Windows users: When directory locations are passed as parameters to a Java program such as EJBdeploy or wsadmin, you must replace the backslashes with forward slashes to follow the Java convention. For example, replace C:\Labfiles61\ with C:/Labfiles61/.

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Instructions if using a remote server for testing

Note that the previous table is relative to where you are running WebSphere Integration Developer. The following table is related to where you are running the remote test environment:

Reference variable	Example: Remote Windows test server location	Example: Remote z/OS [®] test server location	Input your values for the remote location of the test server
<SERVER_NAME>	server1	sssr011	
<WAS_HOME>	C:\Program Files\IBM\WebSphere\AppServer	/etc/sscell/AppServer	
<HOSTNAME>	localhost	mvsxxx.rtp.raleigh.ibm.com	
<SOAP_PORT>	8880	8880	
<TELNET_PORT>	N/A	1023	
<PROFILE_NAME>	AppSrv01	default	
<USERID>	N/A	ssadmin	
<PASSWORD>	N/A	fr1day	

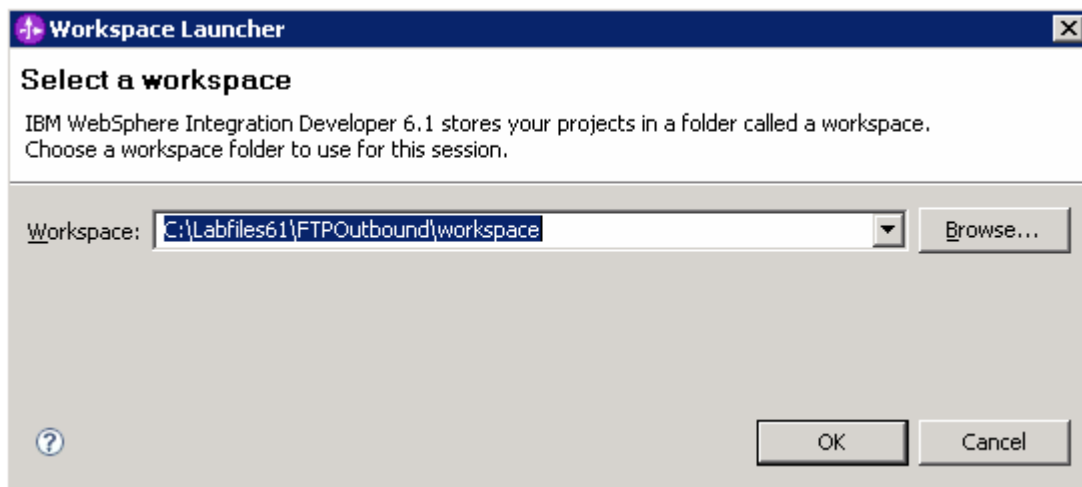
Instructions for using a remote testing environment, such as z/OS, AIX or Solaris, can be found at the end of this document, in the section [“Task: Adding remote server to WebSphere Integration Developer test environment”](#).


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Part 1: Initialize the workspace and prepare for the lab

This part of the lab, you will start the WebSphere Integration Developer V6.1 with a new workspace and extract the lab files to your local system.

- ___ 1. Extract the provided LabFiles61.zip to your C:\ (root) drive, if you have not already done so. This creates the necessary subdirectory structure to complete the lab, and provides you with sample text files.
- ___ 2. Start the WebSphere Integration Developer V6.1 with a new workspace
 - ___ a. Select **Start > Programs > IBM Software Development Platform > IBM WebSphere Integration Developer > IBM WebSphere Integration Developer**
 - ___ b. From the Workspace Launcher window, enter **<WORKSPACE>** for the Workspace field



- ___ 3. Click on the  button on the right corner to close the Welcome page and proceed with the workbench
- ___ 4. Create directory structure on your FTP Server
 - ___ a. Log onto your FTP Server using your ftp user and its password
 - ___ b. Create an Output directory named **OutDir** under the user's home directory
 - 1) **mkdir OutDir**
 - 2) **mkdir RetrieveArchive**

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Part 2: Review properties

This part of the lab will give you brief description of some the properties that are used in this lab at various stages.

- **NEW - Sequence File:** If the sequence file name with the complete path is entered for the Sequence file property, the adapter will append a sequence number to the output file name specified in the request. For example, if the output file name in the request is xyz.txt, a file with the name xyz.n.txt is created, where 'n' is the sequence number for a particular request. The sequence will start with 1. If another request with output file name abc.txt is received, a new sequence starting with 1 is generated for abc.txt. If the file name already exists, the adapter will flag a DuplicateRecordException.

The sequence file will store the sequences in this format: **<dirPath>xyz.txt = 1**, where 1 is the sequence number with which the current file has been created. The next time a request comes with the same output file name and directory path, the sequence number is incremented and used to create the xyz.2.txt file.

If the sequence file is deleted manually, the sequence is lost and will start from 1 again. You can also reset the sequence by changing the sequence value in the sequence file.

- **Default target file name:** This value if specified at Managed Connection factory level is used as default to create the new file. You can use this along with Sequence file.
- **chunkFileName:** this is populated during Inbound or on Retrieve operation during outbound and the presence of this indicates that it is a chunked file. This is used for Inbound and Retrieve outbound operations where chunking is enabled.
- **fileContentEncoding:** This encoding is used while writing to the file. If this property is not specified, the RA tries to write without using any specific encoding. You can specify any Java supported encoding set like UTF-8 for this attribute. If the file content is non-English, the corresponding encoding needs to be chosen so the adapter uses the encoding while writing to the file system.
- **NEW - includeEndBODelimiter:** This is used during the outbound Create/Append/Overwrite operations. The File content is appended with the value of IncludeEndBODelimiter. For example, if the operation chosen is Append and the specified values for this property is ####, when the BO content is written to the file, the include BO Delimiter content is also appended as part of the BO content at the end of the file.
- **stagingDirectory:** This directory is used only for the create and overwrite operations. The file is written to the staging directory completely and then just renamed programmatically to the Output directory specified in the directoryPath
- **NEW - generateUniqueFile:** During outbound Create operation the adapter creates a unique file when this property is true. When this property is set to true the adapter ignores any value set for file name property.

The name of the unique file generated by FTP adapter will have this format:

A random number prefixed by 'ftpa' and with an extension '.tmp'. For example, ftpa23423.tmp

Note: If the **Sequence file** has a value and an output file name is specified, with the 'generateUniqueFile' is set, the 'generateUniqueFile' property takes precedence.

- **NEW - createFileIfNotExists:** During Append and Overwrite operations, if the file does not exist, then the adapter creates the file when this property is set to true. If this property is false and file does not exist then the adapter flags an error.

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And while creating file for this condition, if 'generateUniqueFile' is also set to true, then the adapter generates a unique file. At this time the adapter ignores the value present in file name property. If the file to be appended does not exist and this property is set to false, a RecordNotFoundException is thrown to the calling component.

- **NEW - splitFunctionClassName:** This value takes a fully qualified class name of the class to be used in order to split the retrieved file during outbound retrieve operation. It takes two values as of now:

com.ibm.j2ca.utils.filesplit.SplitBySize - a class which splits the file based on file size

com.ibm.j2ca.utils.filesplit.SplitByDelimiter - a class which splits the file based on delimiter (used to separate BO's in event file)

The delimiter or file size is given in SplitCriteria.

If RetrieveContentType is null, then this is automatically set to class name which does splitting based on size.

- **NEW - splitCriteria:** This attribute takes different values based on value set in splitFunctionClassName.

If splitFunctionClassName is set to com.ibm.j2ca.utils.filesplit.SplitByDelimiter, then splitCriteria must contain the delimiter which separates the BO's in the retrieved file.

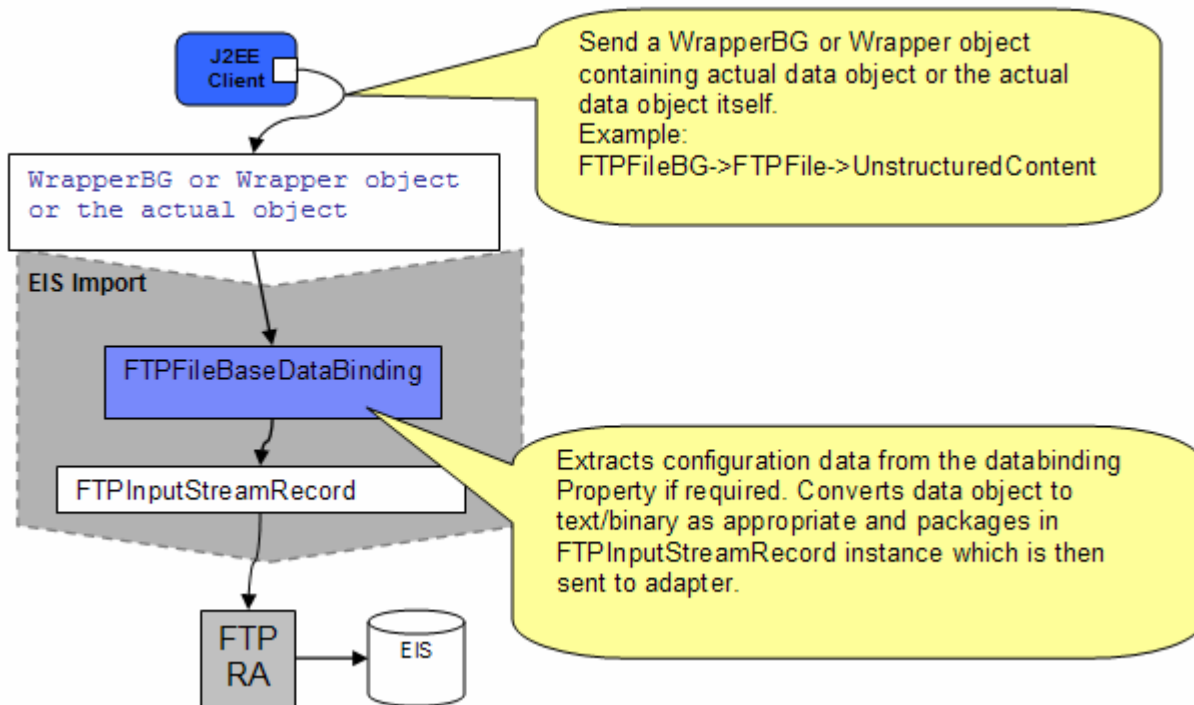
If splitFunctionClassName is set to com.ibm.j2ca.utils.filesplit.SplitBySize, then splitCriteria must contain a valid number which represents the size in bytes. If retrieved file size is greater than this value, it is split into chunks of this value and so many chunks are posted. If file size is less than this value the entire event file is posted in one shot. When SplitCriteria=0, chunking is disabled.

- **NEW - deleteOnRetrieve:** If this property is set to true, during Retrieve operation, after the file content is retrieved, the file is deleted from the directory on the file system.
- **NEW- archiveDirectoryforDeleteOnRetrieve:** If the deleteOnRetrieve property is set to true, the adapter will optionally archive (if this directory is valid) the file to this folder before it is deleted.

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Part 3: Pass through scenario

Outbound support can be broadly classified into two flows, one that involves data transformation and another without it (pass-through). The incoming BO can be a content specific BO or a generic FTP BO. This part of the lab deals with the pass through:



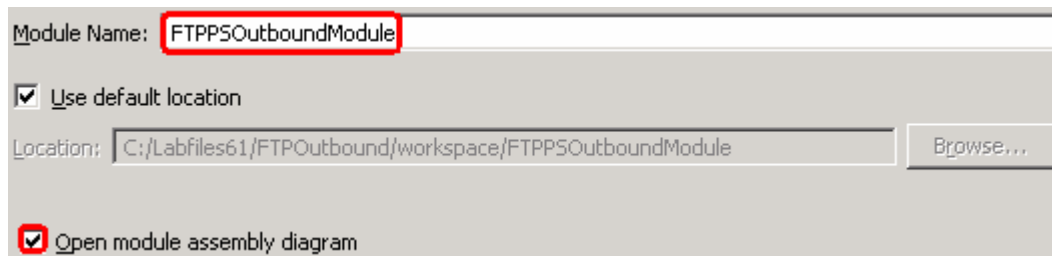
- In the Java EE client, if you intend to use business graph (FTPFileBG) along with the wrapper data object (FTPFile) present in the WrapperBG, business graph is populated for protocol specific information. The “Content” attribute of FTPFile is populated with an UnstructuredContent BO. The wrapper data object and the outbound operation name are sent as input by making an SCA call (or).
- If you intend to use the wrapper data object (FTPFile), it is populated with protocol specific information and the “Content” attribute of FTPFile is populated with an UnstructuredContent BO. The wrapper data object and the outbound operation name are sent as input by making an SCA call (or).
- Based on the Data Binding (FTPFileBaseDataBinding) configured while running the external service wizard, that particular data binding is called and it gets the actual data object either from wrapper data object if the wrapper data object is used or from the wrapper data object present in the business graph if the business graph is used or the data object itself if neither wrapper or business graph is used.
- The FTPFileBaseDataBinding recognizes the content as Unstructured and does a passThrough. It just instantiates the FTPInputStreamRecord, sets the actual content (as input stream) and optionally sets the protocol specific information when user needs wrapper.
- This Record object is sent to the adapter and the outbound operation is executed. The output of the outbound operation is an FTPStructuredRecord which is sent back to the configured Data Binding (FTPFileBaseDataBinding) for List, Exists and Retrieve operations. For Create, Append, OverWrite and ExecuteFTPScript, if output required is true, then the FTPStructuredRecord is sent back to the configured Data Binding (FTPFileBaseDataBinding) and a data object containing the output is sent back to the Java EE client.

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3.1. Configure pass through using the external service wizard

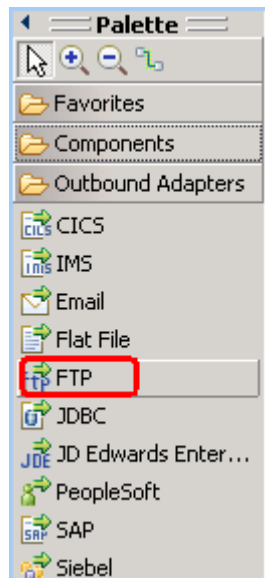
In this part, you will use this new external service feature to create and configure the data binding, Operations, which generates the business objects and other artifacts.

- ___ 1. Create FTPPSOutboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **FTPPSOutboundModule** for the Module Name
 - ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**



You will now see a new module, FTPPSOutboundModule, created in your Business Integration window

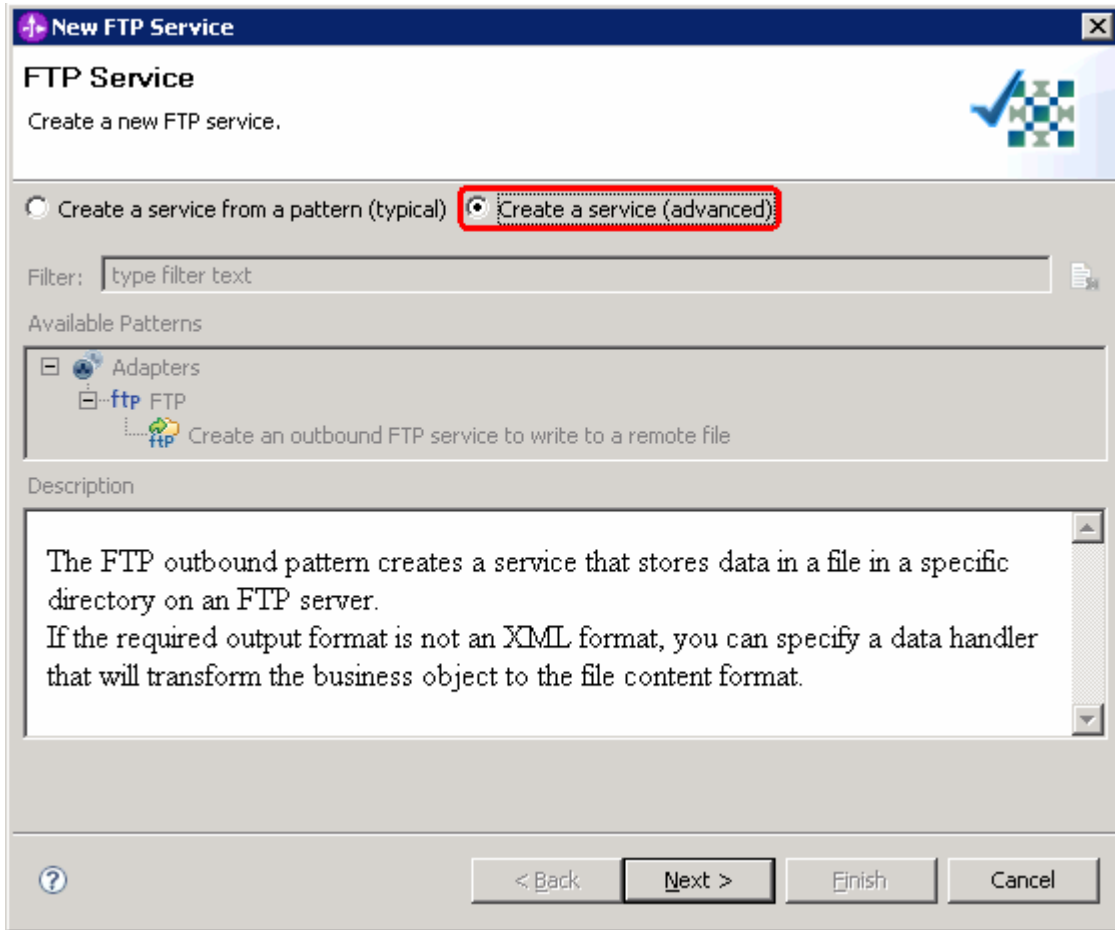
- ___ 2. To start the external service from the Palette:
 - ___ a. From the **Palette** on the left side of Assembly Diagram, click on **Outbound Adapters**:



- ___ b. Under Outbound Adapters, click on the **FTP** and then click on the empty canvas of the assembly diagram. The New FTP Service wizard is opened

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___ 3. From the FTP Service screen, select **Create a service (advanced)**



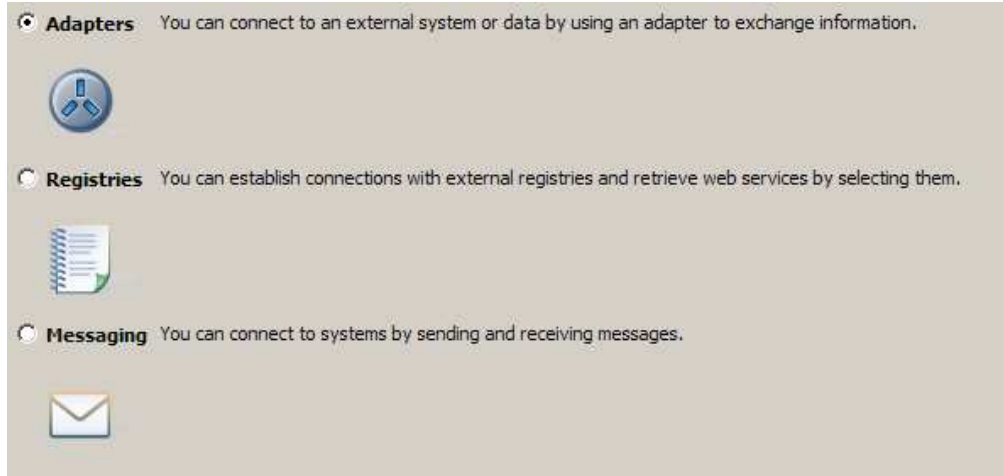
___ a. Click **Next**

Note: You can also start the external service from the **File menu** option:

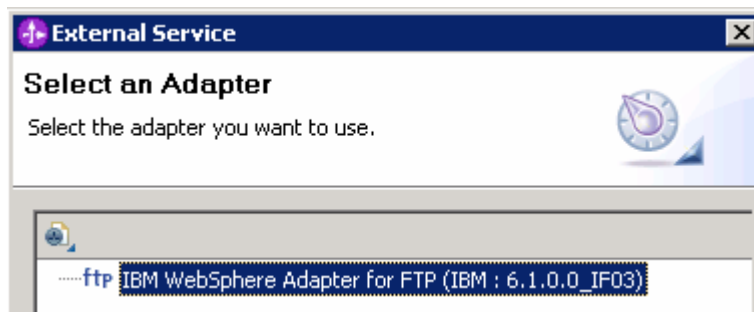
From the main menu, select **File > New > External Service**. This opens an external service wizard that helps you obtain a service which establishes connectivity with other systems. The wizard provides three connectivity options – Adapters, Registers, and Messaging

Select the radio button next to **Adapters** and click **Next**

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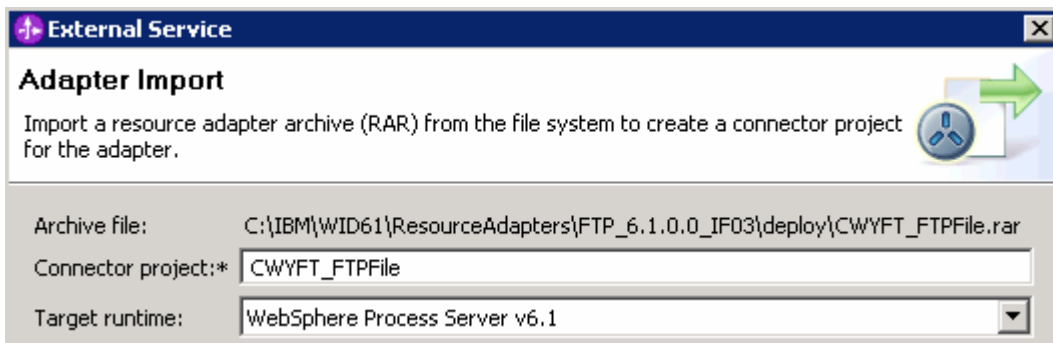
- ___ 4. On the Select an Adapter screen, select **IBM WebSphere Adapter for FTP (IBM : 6.1.0.0_IF03)** and click **Next**



- ___ 5. Adapter Import screen:

In this step, you will import a connector resource adapter archive from the file system into your WebSphere Integration Developer workspace. The adapter RAR file already exists under **<FTPADAPTER_HOME>**.

- ___ a. The default Connector file is selected which is shipped along with WebSphere Integration Developer
- ___ b. Accept the default name for Connector project, **CWYFT_FTPFile**. You can change it to any other name, but for this lab, you can leave the default name.
- ___ c. For Target server, ensure that **WebSphere Process Server v6.1** is selected



- ___ d. Click **Next**

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Note: The resource adapter archive file is imported and a new connector project, **CWYFT_FTPFile**, is listed under Business Integration view.

Note: If you are using the **File menu** option to start the external service wizard, you are asked to select the **Processing Direction** at this point. Select the radio button next to **Outbound** and click **Next** to proceed to the next step.

___ 6. Service Configuration Properties:

___ a. Deploy connector project: ensure that the default option **With module for use by single application** is selected

___ b. Enter these for FTP system connection information:

- 1) Host name: **<FTP_Machine_Name>** (or IP Address of the machine that has FTP Server), for Ex: `wsbeta181.austin.ibm.com`
- 2) Directory: **full path of the OutDir created in on the machine where FTP server is existing** (for Ex: `/home/wsbeta/OutDir`)

Note: This is the folder where the adapter will create the file.

3) Port number: **21** (default)

4) Protocol: **FTP** (default)

Deploy connector project: **With module for use by single application**

Connection properties: **Use properties below**

Connection properties

FTP system connection information

Host name: * **wsbeta181.austin.ibm.com**

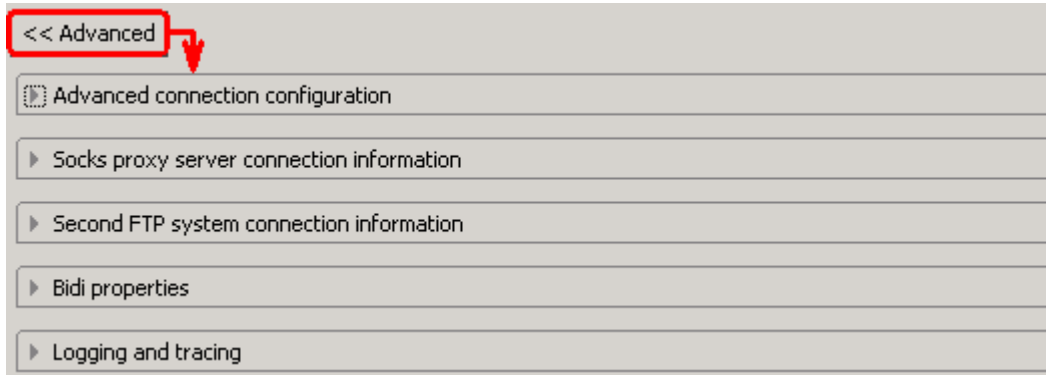
Directory: * **/home/wsbeta/OutDir**

Port number: 21

Protocol: FTP

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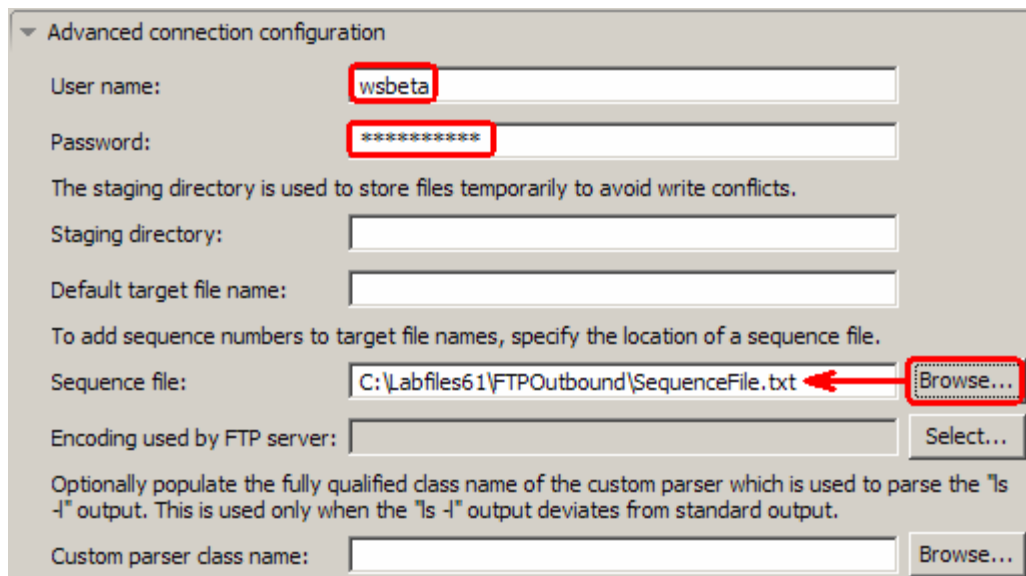
__ c. Click on **Advanced >>** to see the hidden advanced properties that can be configured:



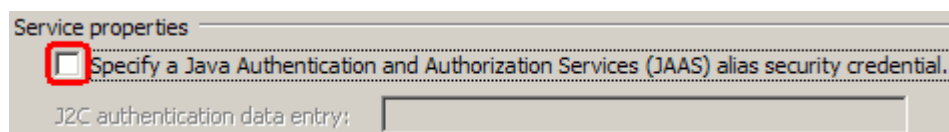
__ d. Click on **Advanced connection configuration**

- 1) User name: **username using which you connect to your FTP server** (for Ex: wsbeta)
- 2) Password: **password for the above user to connect to your FTP server**
- 3) Click on **Browse...** next to **Sequence file** and enter any location. For ex:
<LABFILES>\FTPOutbound\SequenceFile.txt

Note: Refer to Review Properties part of this lab for the detailed explanation of this new feature. This file should already be created at the specified location.



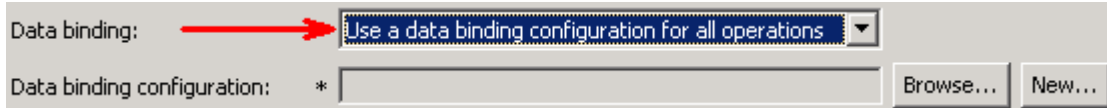
___ 7. For this lab, you are not going to use the J2C authentication. So, **uncheck** the box next to **Specify a Java Authentication and Authorization Services (JAAS) alias security credentials**.



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8. You can define data binding in two places - service level (current screen of the external service wizard) or later at the method level (Operations screen of the external service wizard). In this lab, you will define data binding at the service level (from this screen)

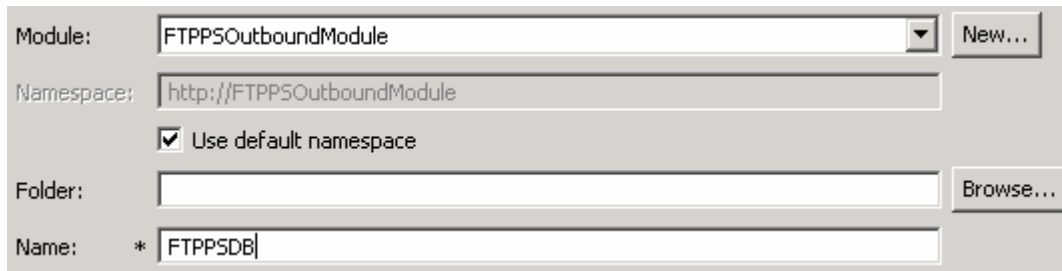
a. From the dropdown menu next to Data binding, select 'Use a data binding configuration for all operations'



b. Click **New...** next to **Data binding configuration**. A Resource Configuration window is opened.

c. Ensure that the selected module is **FTPPSOutboundModule**

d. For the **Name**, enter any string, for Ex: **FTPPSDB**

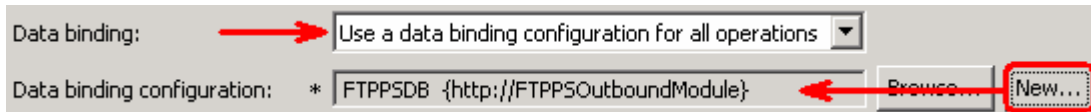


e. Click **Next**

f. Accept the default data binding Class Name, **com.ibm.j2ca.ftp.emd.runtime.FTPFileBaseDataBinding** and click **Next**

g. For pass through, you **do not** need to configure any data handler. So, click **Finish** on this screen

9. Now the **FTPPSDB** is displayed for **Data binding configuration**:



10. Check the box next to **Change logging properties for wizard** to view the output location of the log file and the logging level. You can change the logging level using the drop down menu.

a. Click **Next**

Define Operations: In this screen, you will add the required operations that is supported by the adapter functions on the remote file system

Note: The precedence of the parameters is as follows: WrapperBO, Interaction Spec, and Managed Connection Factory. The adapter will first search for the parameters passed in the WrapperBO; if it is not available there, it will then subsequently search in the Interaction Spec, and then the Managed Connection Factory instance. **In this lab, for all the operations, you will enter the values at the WrapperBO level in the later part using the WebSphere Integration Developer test client.**

Define Operation: createFTPBG

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- ___ 11. Click on **Add...** to open Add Operation window
- ___ a. For **Operation kind**, select **Create** from the drop down list
- ___ b. For **Data type for operation**, select **Generic FTP business object with business graph** from the drop down list
- ___ c. Select the check box next to **Output required**

Operation kind: Create

Operation properties

The data type for the operation input: Generic FTP business object with business graph

Output required

- ___ d. Click **Next**

The Data type for input and output are populated based on the selection of the Data type for the operation in the previous step. Since you have chosen Generic FTP business object with business graph, the **Input type** is **FTPFileBG** and because you have selected Output required box, the **Output type** is **CreateResponseBG**

Specify the operation input

Input type: FTPFileBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

Data binding configuration: Browse... New...

Specify the operation output

Output type: CreateResponseBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/createresponsebg} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

- ___ e. For Operation name, enter **createFTPBG**
- Define Data Binding for **input**:
- ___ f. For **Data binding**, select **Use a data binding configuration** from the dropdown list
- ___ g. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.
- ___ h. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**
- Define Data Binding for **output**:
- ___ i. For **Data binding**, select **Use a data binding configuration** from the dropdown list
- ___ j. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.
- ___ k. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**

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__ l. The Operation screen now should look like this:

__ m. Click **Finish** from the Add Operation window

The operation, createFTPBG, will now be displayed under Operations list.

___ 12. You can click on **Advanced >>** under 'InteractionSpec properties for createFTPBG' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.

Define Operation: appendFTPBG

___ 13. Click on **Add...** to open Add Operation window

__ a. For **Operation kind**, select **Append** from the drop down list

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__ b. For **Data type for operation**, select **Generic FTP business object with business graph** from the drop down list

__ c. Select the check box next to **Output required**

Operation kind: Append

Operation properties

The data type for the operation input: Generic FTP business object with business graph

Output required

__ d. Click **Next**

The Data type for input and output are populated based on the selection of the Data type for the operation in the previous step. Since you have chosen Generic FTP business object with business graph, the **Input type** is **FTPFileBG** and because you have selected Output required box, the **Output type** is **AppendResponseBG**

Specify the operation input

Input type: FTPFileBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

Data binding configuration: Browse... New...

Specify the operation output

Output type: AppendResponseBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/appendresponsebg} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

__ e. For Operation name, enter **appendFTPBG**

Define Data Binding for **input**:

__ f. For **Data binding**, select **Use a data binding configuration** from the dropdown list

__ g. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.

__ h. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**

Define Data Binding for **output**:

__ i. For **Data binding**, select **Use a data binding configuration** from the dropdown list

__ j. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.

__ k. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**

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__ l. The Operation screen now should look like this:

Operation name: * **appendFTPBG**

Specify the operation input

Input type: FTPFileBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg} Browse... New...

Data binding: Use a data binding configuration ←

Data binding configuration:* FTPPSDB {http://FTPPSOutboundModule} ← **Browse...** New...

Specify the operation output

Output type: AppendResponseBG {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/appendresponsebg} Browse... New...

Data binding: Use a data binding configuration ←

Data binding configuration:* FTPPSDB {http://FTPPSOutboundModule} ← **Browse...** New...

__ m. Click **Finish** from the Add Operation window

The operation, appendFTPBG, will now be displayed under Operations list.

___ 14. You can click on **Advanced >>** under 'InteractionSpec properties for appendFTPBG' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.

Operations:

- createFTPBG ({http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg}FTPFileBG) : {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/createreponsebg}CreateResponseBG
- appendFTPBG** ({http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg}FTPFileBG) : {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/appendresponsebg}AppendResponseBG

InteractionSpec properties for 'appendFTPBG'

FTP system connection information

Remote directory on FTP system:

Default target file name:

Local directory: Browse...

Archive file in the local directory for create operation

Local archive directory for create operation: Browse...

Remote archive directory for retrieve operation:

Advanced >>

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Define Operation: listFTP

- ___ 15. Click on **Add...** to open Add Operation window
- ___ a. For **Operation kind**, select **List** from the drop down list
- ___ b. For **Data type for operation**, select **Generic FTP business object** from the drop down list
- ___ c. Note that the check box next to **Output required** is selected by default

Operation kind: List

Operation properties

The data type for the operation input: Generic FTP business object

Output required

- ___ d. Click **Next**

The Data type for input and output are populated based on the selection of the Data type for the operation in the previous step. Since you have chosen Generic FTP business object, the **Input type** is **FTPFile** and because Output required box is selected by default, the **Output type** is **ListResponse**

Specify the operation input

Input type: FTPFile {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfile} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

Data binding configuration: Browse... New...

Specify the operation output

Output type: ListResponse {http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/listresponse} Browse... New...

Data binding: Use suggested data binding 'FTPFileBaseDataBinding'

- ___ e. For Operation name, enter **listFTP**

Define Data Binding for **input**:

- ___ f. For **Data binding**, select **Use a data binding configuration** from the dropdown list
- ___ g. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.
- ___ h. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**

Define Data Binding for **output**:

- ___ i. For **Data binding**, select **Use a data binding configuration** from the dropdown list
- ___ j. Click **Browse...** next to **Data binding configuration**. A Resource Configuration window is opened.
- ___ k. From the Data Binding Selection screen, select **FTPPSDB** and click **OK**

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__ l. The Operation screen now should look like this:

__ m. Click **Finish** from the Add Operation window

The operation, listFTP, will now be displayed under Operations list.

___ 16. You can click on **Advanced >>** under 'InteractionSpec properties for listFTP' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.

Define Operation: retrieveFTP

___ 17. Follow the steps under **Define Operation: listFTP** (Step 15) of this part to with these inputs:

- __ a. Operation kind (Step 15.a): **Retrieve**
- __ b. Operation name (Step 15.e): **retrieveFTP**
- __ c. While defining data binding for **output**, you can select **Use data binding configuration 'FTPPSDB'** from the drop down list for **Data binding**

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___ d. You should see this:

___ e. Click **Finish** from the Add Operation window

The operation, retrieveFTP, will now be displayed under Operations list.

___ 18. You can click on **Advanced >>** under 'InteractionSpec properties for retrieveFTP' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.

Define Operation: executeFTPScript

___ 19. Repeat steps under '**Define Operation: appendFTPBG**' (Step 13) of this part to with these inputs:

___ a. Operation kind (Step 13.a): **ExecuteFTPScript**

___ b. Operation name (Step 13.e): **executeFTPScript**

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__ c. You should see this:

__ d. Click **Finish** from the Add Operation window

You have now defined four operations:

The operation, executeFTPScript, will now be displayed under Operations list.

___ 20. You can click on **Advanced >>** under 'InteractionSpec properties for executeFTPScript' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.

__ a. Click **Next** from the Operations window

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___ 21. From the Generate Artifacts screen, enter these:

__ a. For **Name**, enter **FTPPSOutboundInterface**

Properties for service

Module: New...

Namespace:

Use default namespace

Name: *

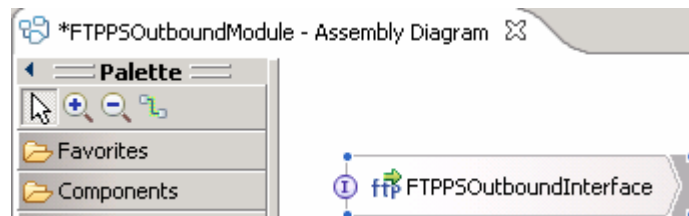
Save business objects to a library

Library: New...

Description:

__ b. Click **Finish**

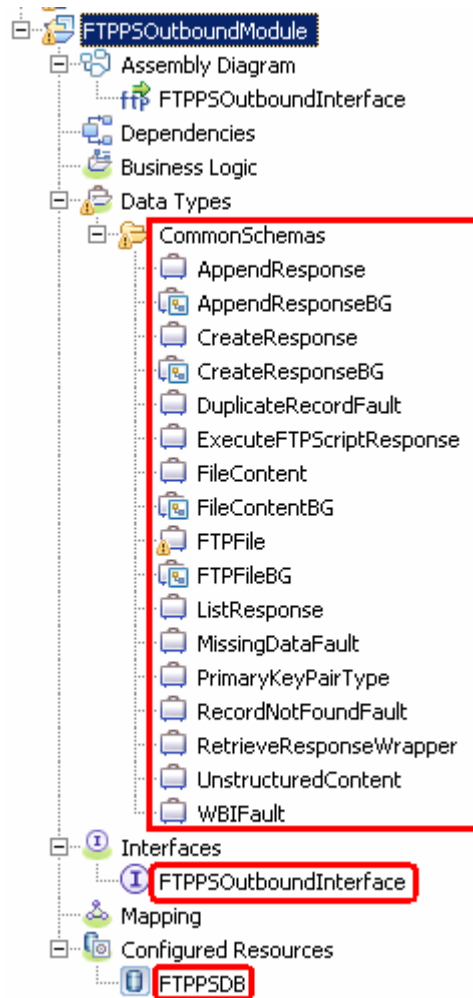
___ 22. You will now see a new import component, **FTPPSOutboundInterface** in the assembly diagram of FTPPSOutboundModule



__ a. Save (**Ctrl+S**) your changes to the assembly diagram

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- ___ 23. Review the FTPPSOutboundModule: The generated **Data Types**, **Interface**, and the Data binding (**FTPPSDB**) under Configured Resources can be found inside FTPPSOutboundModule



You can open each of these generated artifacts and business objects and review the properties inside.

Review the created methods inside the interface:

- ___ a. From the Business Integration view, expand FTPPSOutboundModule > Interfaces and then double-click on **FTPPSOutboundInterface** to open it

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__ b. You should see these five operations:

Operations and their parameters

	Name	Type
▼ createFTPBG		
Input(s)	createFTPBGInput	FTPFileBG
Output(s)	createFTPBGOutput	CreateResponseBG
▼ appendFTPBG		
Input(s)	appendFTPBGInput	FTPFileBG
Output(s)	appendFTPBGOutput	AppendResponseBG
▼ listFTP		
Input(s)	listFTPInput	FTPFile
Output(s)	listFTPOutput	ListResponse
▼ retrieveFTP		
Input(s)	retrieveFTPInput	FTPFile
Output(s)	retrieveFTPOutput	RetrieveResponseWrapper
▼ executeFTPScript		
Input(s)	executeFTPScriptInput	FTPFile
Output(s)	executeFTPScriptOutput	ExecuteFTPScriptResponse

__ c. Close the interface, FTSPSOutboundInterface

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3.2. Test pass through scenario

- ___ 1. Start WebSphere Process Server (if not started already)
 - ___ a. From the **Servers** view of WebSphere Integration Developer, right click on **WebSphere Process Server v6.1** and select Start from the pop-up menu
 - ___ b. Wait until the server status shows as **Started**
- ___ 2. Add the project to the WebSphere Process Server Test Environment
 - ___ a. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. In the Add and Remove Projects window, select the **FTPPSOutboundModuleApp** project from the Available projects panel
 - ___ c. Click **Add >** to add it to the Configured projects panel
 - ___ d. The project is now moved to Configured projects. Click **Finish**

Wait for the project to be published to the server and you can confirm this by seeing this message in the console messages:

- ___ 3. Open the test client for the module
 - ___ a. From the Business Integration perspective, right-click on the **FTPPSOutboundModule** and select **Test > Test Module**
 - ___ b. The **FTPPSOutboundModule_Test** window is opened in the Assembly editor

You have five operations that were defined in the previous part in this module:

- createFTPBG
- appendFTPBG
- listFTP
- retrieveFTP
- executeFTPScript

Test Create operation:

- ___ 4. Under **Detailed Properties**, for the **Operation** field, select **createFTPBG** from the drop down menu
Fill out the fields for Initial request parameters:
 - ___ a. For **DirectoryPath**, enter full path of the **OutDir** that is already created in your FTP server

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__ b. For **Filename**, enter any name, for Ex: PassthroughTest.txt

▼ **Detailed Properties**

Configuration:	Default Module Test
Module:	FTPPSOutboundModule
Component:	FTPPSOutboundInterface
Interface:	FTPPSOutboundInterface
Operation:	createFTPBG

Initial request parameters

Name	Type	Value
createFTPBGInput	FTPFileBG	✓
verb	verb<string>	✓
FTPFile	FTPFile	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ PassThroughTest.txt

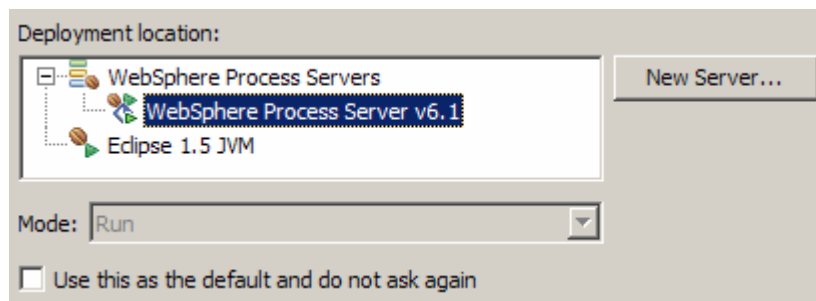
__ c. Under **Content**, for **AsText**, enter some test message, for Ex: **Testing Create operation for pass through**

Content	UnstructuredContent	✓
ContentType	string	✓
ObjectName	string	✓
AsText	string	✓ Testing Create operation for pass through
AsBinary	hexBinary	✓ 0

__ d. Click **Continue** button under Events



__ e. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**



__ f. You should see a window similar to this, that contains the data you just entered in the previous steps:

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Note: Since you have specified a Sequence File name while running the external service, the file name is created with '1' appended to it.

The screenshot shows the 'Events' pane on the left with a tree view containing: Invoke (FTPPSOutboundInterface:createFTPBG), Invoke started, Invoke (FTPPSOutboundInterface:createFTPBG), Return (FTPPSOutboundInterface:createFTPBG) (highlighted with a red box), and Invoke returned. The 'Detailed Properties' pane on the right shows the following information:

- Module: [FTPPSOutboundModule](#)
- Component: [FTPPSOutboundInterface](#)
- Interface: [FTPPSOutboundInterface](#)
- Operation: [createFTPBG](#)

Return parameters:

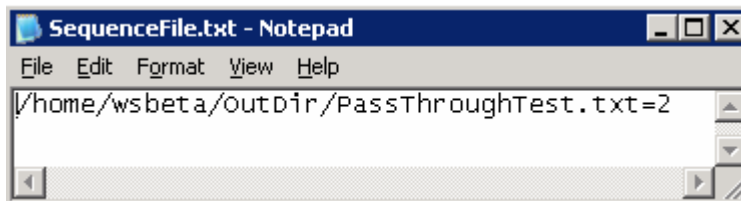
Name	Type	Value
createFTPBGOutput	CreateResponseBG	✓
verb	string	✓
CreateResponse	CreateResponse	✓
Filename	string	✓ PassThroughTest.1.txt

5. Verify the created file and its contents

a. You will see a new file, **PassThroughTest.1.txt** created under **OutDir** on your FTP server. Open that file to see the content

```
Testing Create operation for pass through
~
~
~
~
~
"PassThroughTest.1.txt" [noeol] 1L, 41C
```

b. Now browse to <LAB_FILES>\FTPOutbound and open the **SequenceFile.txt** file. You should see an entry in the file. The adapters makes an entry in this Sequence file for each file created and if the same file is created again, then it updates the entry for that particular file by increasing the number at the end of that entry.



Test Append operation.

6. Click on **Invoke** (Invoke icon) under Events to start a new event

7. Under **Detailed Properties**, for the **Operation** field, select **appendFTPBG** from the drop down menu

Fill out the fields for Initial request parameters:

a. For **DirectoryPath**, enter full path of the **OutDir** that is already created in your FTP server

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__ b. For **Filename**, enter **PassThroughTest.1.txt** (the file created during the above Create operation)

__ c. Under **Content**, for **AsText**, enter some test message, for Ex: **Test message for Append operation**

▼ **Detailed Properties**

Configuration: Default Module Test

Module: FTPPSOutboundModule

Component: FTPPSOutboundInterface

Interface: FTPPSOutboundInterface

Operation: **appendFTPBG**

Initial request parameters

Name	Type	Value
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ PassThroughTest.1.txt
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODelimiter	string	✓
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	68
SplittingFunctionClassName	string	✓
SplitCriteria	string	✓
DeleteOnRetrieve	boolean	✓ false
ArchiveDirectoryForRetrieve	string	✓
Content	UnstructuredContent	✓
Content Type	string	✓
ObjectName	string	✓
AsText	string	✓ Test message for Append operation
AsBinary	hexBinary	✓ 0

__ d. Click **Continue** button under Events

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- ___ e. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**
- ___ f. You should see a window similar to this, which contains the data you just entered in the previous steps:

The screenshot shows the 'Events' pane on the left and the 'Detailed Properties' pane on the right. In the 'Events' pane, the event 'Return (FTPPSOutboundInterface:appendFTPBG)' is highlighted with a red box. In the 'Detailed Properties' pane, the 'Return parameters' table is visible, with the 'PassThroughTest.1.txt' entry highlighted in red.

Name	Type	
appendFTPBGOutput	AppendResponseBG	✓
verb	string	✓
AppendResponse	AppendResponse	✓
Filename	string	✓ PassThroughTest.1.txt

- ___ 8. Verify the created file and its contents
 - ___ a. Browse to the **OutDir** on your FTP server
 - ___ b. You will see a new file, **PassThroughTest.1.txt** created under that directory. Open the file and observe the appended content

```
Testing Create operation for pass through Test message for Append operation
~
~
~
~
"PassThroughTest.1.txt" [noeol] 1L, 74C
```

Test List operation:

- ___ 9. Click on **Invoke** (🚀) under Events to start a new event
- ___ 10. Under **Detailed Properties**, for the **Operation** field, select **listFTP** from the drop down menu

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- ___ 11. Fill out the fields for Initial request parameters:
 - ___ a. For **DirectoryPath**, enter full path of the **OutDir** that is already created in your FTP server
 - ___ b. You can leave all the other fields empty

▼ Detailed Properties

<u>Configuration:</u>	Default Module Test
<u>Module:</u>	FTPP5OutboundModule
<u>Component:</u>	FTPP5OutboundInterface
<u>Interface:</u>	FTPP5OutboundInterface
<u>Operation:</u>	listFTP

Initial request parameters

Name	Type	Value
listFTPInput	FTPFile	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓

- ___ c. Click **Continue** button under Events
- ___ d. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**
- ___ e. Test client will return the list of files under the <OUT_DIR>. Adapter will list all the files present in the **OutDir** on the FTP server

Events

- Invoke (FTPP5OutboundInterface:createFTPBG)
 - Invoke started
 - Invoke (FTPP5OutboundInterface:createFTPBG)
 - Return (FTPP5OutboundInterface:createFTPBG)
 - Invoke returned
- Invoke (FTPP5OutboundInterface:appendFTPBG)
 - Invoke started
 - Invoke (FTPP5OutboundInterface:appendFTPBG)
 - Return (FTPP5OutboundInterface:appendFTPBG)
 - Invoke returned
- Invoke (FTPP5OutboundInterface:listFTP)
 - Invoke started
 - Invoke (FTPP5OutboundInterface:listFTP)
 - Return (FTPP5OutboundInterface:listFTP)**
 - Invoke returned

► General Properties

▼ Detailed Properties

Module: [FTPP5OutboundModule](#)

Component: [FTPP5OutboundInterface](#)

Interface: [FTPP5OutboundInterface](#)

Operation: [listFTP](#)

Return parameters:

Name	Type	Value
listFTPOutput	ListResponse	✓
ListOfFileNames	List<Object>	✓
ListOfFileNames	String	✓ PassThroughTest.1.txt

Test Retrieve operation:

- ___ 12. Click on **Invoke** (🚀) under Events to start a new event
 - ___ 13. Under **Detailed Properties**, for the **Operation** field, select **retrieveFTP** from the drop down menu
- Fill out the fields for Initial request parameters:

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- ___ a. For **DirectoryPath**, enter full path of the **OutDir** that is already created in your FTP server
- ___ b. For **Filename**, enter **PassThroughTest.1.txt** (The file name should already exist for retrieve operation. PassThroughTest.1.txt was created in the previous test)
- ___ c. For **DeleteOnRetrieve**, change it to **true** from the drop down list
- ___ d. For **ArchiveDirectoryForDeleteOnRetrieve**, enter **RetrieveArchive** (this should already be created on your FTP server)

▼ **Detailed Properties**

Configuration:	Default Module Test
Module:	FTPPSOutboundModule
Component:	FTPPSOutboundInterface
Interface:	FTPPSOutboundInterface
Operation:	retrieveFTP

Initial request parameters

Name	Type	Value
retrieveFTPInput	FTPFile	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ PassThroughTest.1.txt
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODElimiter	string	✓
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	68
SplittingFunctionClassName	string	✓
SplitCriteria	string	✓
DeleteOnRetrieve	boolean	✓ true
ArchiveDirectoryForRetrieve	string	✓ /home/wsbeta/RetrieveArchive
Content	anyType	✓

- ___ e. Click **Continue** button under Events

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- ___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**
- ___ g. You should see a window similar to this, which contains the data you just entered in the previous steps:

The screenshot displays the IBM WebSphere Adapter 6.1 interface. On the left, the 'Events' pane shows a sequence of operations: 'Invoke (FTPPSOutboundInterface:createFTPBG)', 'Invoke (FTPPSOutboundInterface:appendFTPBG)', 'Invoke (FTPPSOutboundInterface:listFTP)', and 'Invoke (FTPPSOutboundInterface:retrieveFTP)'. The 'Return (FTPPSOutboundInterface:retrieveFTP)' event is highlighted with a red box. On the right, the 'General Properties' pane shows 'Detailed Properties' for the 'retrieveFTP' operation. The 'Return parameters' table is as follows:

Name	Type	Value
retrieveFTPOutput	RetrieveResponseWr...	✓
Content	Object[]<Object>	✓
Content	FileContent	✓
Filename	String	PassThroughTest.1.txt
Content	UnstructuredContent	✓
ContentType	String	✓
ObjectName	String	http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/retrieveresponsewrapper
AsText	String	Testing Create operation for pass throughTest message for Append operation
AsBinary	[B	✓
SavedFileToLocalDirectory	boolean	✓

___ 14. Verify the results

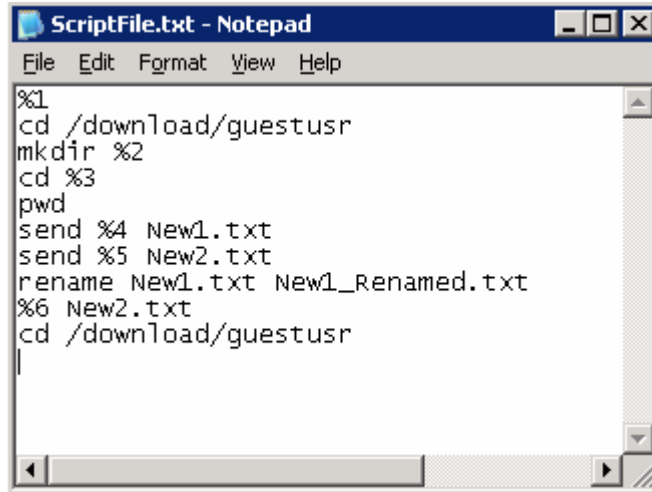
- ___ a. The file **PassThroughTest.1.txt** is deleted from **OutDir** on your FTP server
- ___ b. There is a new file created in RetrieveArchive directory on your FTP server. You can open the file in this directory to confirm the same contents

Test ExecuteFTPScript operation: This operation executes the commands present in a FTP Script file (file in the adapter machine). The operation executes only those commands that are supported by the FTP Server and ignores the rest. If the operation fails the adapter flags an FTPFileExecuteFTPScriptException.

Also the script file should not contain connection related commands like open as you use an already established connection to run the commands. The location of the script file is given in DirectoryPath and Filename. If the commands in the script file need to be run in a particular directory on the FTP Server, then the script file should contain the first command to change to that directory. The list of commands ran and their reply strings is returned back to the calling application after executing the script file. The adapter also supports parameter substitution in the ftp script file (replacing parameters %1, %2 with actual values). The values are sent as part of the request.

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For your convenience, a script file, **ScriptFile.txt** is already created at <LABFILES>\FTPOutbound. Open the file and make a note of the parameters that should be passed to this file from the test client:



```

ScriptFile.txt - Notepad
File Edit Format View Help
%1
cd /download/guestusr
mkdir %2
cd %3
pwd
send %4 New1.txt
send %5 New2.txt
rename New1.txt New1_Renamed.txt
%6 New2.txt
cd /download/guestusr

```

%1 through %6 are replaced with the parameters specified in the test client.

%1 = any command to be performed on FTP server (Ex: pwd) - replaced by the SplitFileParameters[0]


%2 = the directory that you want to create in FTP server (FTPScriptDir) - replaced by the SplitFileParameters[1]

%3 = the same directory specified for %2 (FTPScriptDir) - replaced by the SplitFileParameters[2]

%4 = location of any file that should be copied to New1.txt - replaced by the SplitFileParameters[3]

%5 = location of any file that should be copied to New2.txt - replaced by the SplitFileParameters[4]

%6 = any operation you want to do on New2.txt (for Ex: delete) - replaced by the SplitFileParameters[5]

___ 15. Click on **Invoke** () under Events to start a new event

___ 16. Under **Detailed Properties**, for the **Operation** field, select **executeFTPScript** from the drop down menu

Fill out the fields for Initial request parameters:

___ a. For **DirectoryPath**, enter <LABFILES>\FTPOutbound

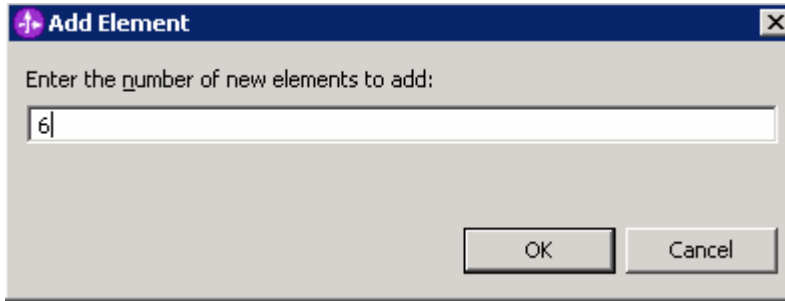
___ b. For **Filename**, enter **ScriptFile.txt**

___ c. Add the required script file parameters

1) Right-click on **ScriptFileParameters** and then select **Add Elements** from the pop-up menu

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2) Enter **6** from the Add Element window and click OK



___ d. You will see six ScriptFileParameters added. Enter these for each of the parameters

- 1) ScriptFileParameters[0]: **pwd**
- 2) ScriptFileParameters[1]: **FTPScriptDir**
- 3) ScriptFileParameters[2]: **FTPScriptDir**
- 4) ScriptFileParameters[3]: **C:\Labfiles61\FTPOutbound\ScriptContent.txt**
- 5) ScriptFileParameters[4]: **C:\Labfiles61\FTPOutbound\ScriptContent.txt**
- 6) ScriptFileParameters[5]: **delete**

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▼ Detailed Properties

Configuration:	Default Module Test
Module:	FTPPSOutboundModule
Component:	FTPPSOutboundInterface
Interface:	FTPPSOutboundInterface
Operation:	executeFTPScript

Initial request parameters

Name	Type	Value
executeFTPScriptInput	FTPFile	✓
DirectoryPath	string	✓ C:\Labfiles61\FTPOutbound
Filename	string	✓ ScriptFile.txt
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODelimiter	string	✓
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	68
ScriptFileParameters[0]	string	✓ pwd
ScriptFileParameters[1]	string	✓ FTPScriptDir
ScriptFileParameters[2]	string	✓ FTPScriptDir
ScriptFileParameters[3]	string	✓ C:\Labfiles61\FTPOutbound\ScriptContent.txt
ScriptFileParameters[4]	string	✓ C:\Labfiles61\FTPOutbound\ScriptContent.txt
ScriptFileParameters[5]	string	✓ delete
SplittingFunctionClassName	string	✓
SplitCriteria	string	✓

___ e. Click **Continue** button under Events

___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**

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17. Verify Results

a. You should see a window similar to this, which contains the results of all the ftp commands the were performed in the previous step:

▼ Detailed Properties

Module: [FTPPSOutboundModule](#)
 Component: [FTPPSOutboundInterface](#)
 Interface: [FTPPSOutboundInterface](#)
 Operation: [executeFTPScript](#)

Return parameters:

Name	Type	Value
executeFTPScriptOutput	ExecuteFTPScriptResponse	✓
CommandTrace	List<Object>	✓
CommandTrace	String	✓ pwd:257 "/"download/guestusr" is current directory....
CommandTrace	String	✓ cd:250 CWD command successful....
CommandTrace	String	✓ mkdir:257 MKD command successful....
CommandTrace	String	✓ cd:250 CWD command successful....
CommandTrace	String	✓ pwd:257 "/"download/guestusr/FTPScriptDir" is current directory...
CommandTrace	String	✓ send:226 Transfer complete....
CommandTrace	String	✓ send:226 Transfer complete....
CommandTrace	String	✓ rename:250 RNTD command successful....
CommandTrace	String	✓ delete:250 DELE command successful....
CommandTrace	String	✓ cd:250 CWD command successful....

b. Check for the **FTPScriptDir** in your FTP server which is created during this test

c. There is a new file, **New1_Renamed.txt** under FTPScriptDir

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

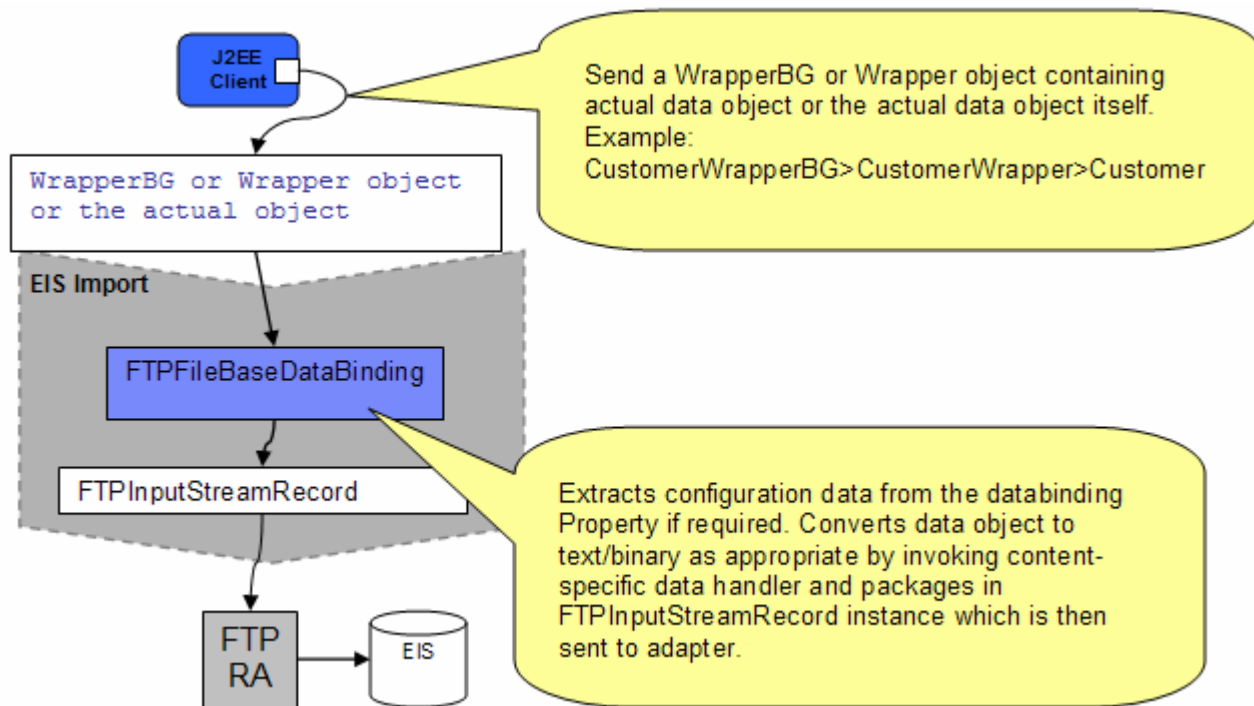
3.3. Restore Server Configuration

- ___ 1. Close the **FTPPSOutboundModule_Test** window and click **No** for the Save Resources window
- ___ 2. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
- ___ 3. Select **FTPPSOutboundModuleApp** under Configured projects and click **< Remove**
- ___ 4. Click **Finish** after you see the application moved to Available projects. Wait until the application is unpublished

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

Part 4: Content specific (non-pass through) scenario

Of the two outbound flows, you have just tested the pass-through which does not involve data transformation. In this part of the lab you will perform the non-pass through that uses the data transformation:



- In the J2EE client, if you intend to use business graph (CustomerWrapperBG) along with the wrapper data object (CustomerWrapper) present in the WrapperBG, it is populated for protocol specific information. The actual data object (for example: Customer) is set in the wrapper data object. The wrapper data object and the outbound operation name are sent as input by making an SCA call (or).
- If you intend to use the wrapper data object (CustomerWrapper), it is populated for protocol specific information and the actual data object (for example: Customer) is set in the wrapper data object. The wrapper data object and the outbound operation name are sent as input by making an SCA call (or).
- If want to send the actual data without wrapper or business graph then the protocol specific information should already be set in the interaction spec and the actual data object (for example: Customer) and the outbound operation name are sent as input by making an SCA call.
- Based on the Data Binding (FTPFileBaseDataBinding) configured while running the external service wizard, that particular data binding is called and it gets the actual data object either from wrapper data object if the wrapper data object is used or from the wrapper data object present in the business graph if the business graph is used or the data object itself if neither wrapper or business graph is used.
- The FTPFileBaseDataBinding checks the data handler information and it is invoked. If the data handler information is not valid, then appropriate error is thrown by the Data Transformation Framework.

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

- The output of the custom data binding (FTPFileBaseDataBinding) is an FTPInputStreamRecord. This Record object is sent to the adapter and the outbound operation is executed. The output of the outbound operation is an FTPStructuredRecord which is sent back to the configured Data Binding (FTPFileBaseDataBinding) for List, Exists and Retrieve operations. For Create, Append, OverWrite and ExecuteFTPScript, if output required is true, then the FTPStructuredRecord is sent back to the configured Data Binding (FTPFileBaseDataBinding) and a data object containing the output is sent back to the Java EE client.

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4.1. Configure non-pass through using the external service wizard

In this part you use the new WebSphere Integration Developer feature, External Service, to create/configure the Data Binding, **Data Handler**, and Operations, which generates the business objects and other artifacts.

- ___ 1. Create FTPCustomOutboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **FTPCustomOutboundModule** for the Module Name
 - ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**

You will now see a new module, FTPCustomOutboundModule, created in your Business Integration window

- ___ 2. Import required business objects
 - ___ a. Expand FTPCustomOutboundModule (if not already expanded), right-click on **Data Types** and select **Import...** from the pop-up menu
 - ___ b. From the Import window, expand **General** and select **File System** and then click **Next**
 - ___ c. Enter From directory
 - 1) Click on **Browse...** next to **From directory**
 - 2) From the Import from directory window, select **<FTPFILES>** and click **OK**

Now, you will see FTPFiles folder added on the left side, and all the xsds and ear files under that folder on the right side.

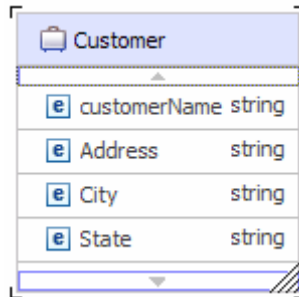
- ___ d. Select the box next to **Customer.xsd**
- ___ e. Ensure that the **FTPCustomOutboundModule** is selected for Into folder
- ___ f. Click **Finish** from the Import window

The Business Integration window is updated with the imported business objects.

- ___ 3. Review the imported business objects:
 - ___ a. Expand **FTPCustomOutboundModule > Data Types** and you will now see a new data type **Customer** under it.

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

__ b. Double-click on **Customer** to view its fields:



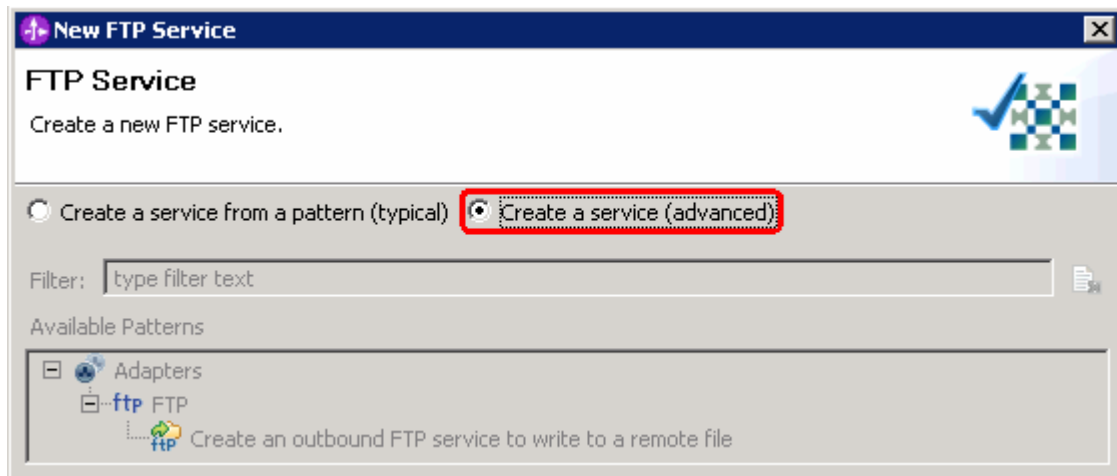
___ 4. After reviewing, close the Customer business object from the Assembly editor

___ 5. To start the external service from the Palette:

__ a. From the **Palette** on the left side of Assembly Diagram, click on **Outbound Adapters**:

__ b. Under Outbound Adapters, click on the **FTP** and then click on the empty canvas of the assembly diagram. The New FTP Service wizard is opened

___ 6. From the FTP Service screen, select **Create a service (advanced)**



__ a. Click **Next**

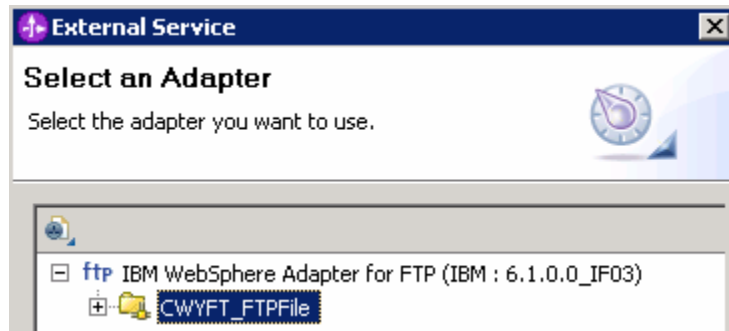
Note: You can also start the external service from the **File menu** option:

From the main menu, select **File > New > External Service**. This opens an external service wizard that helps you obtain a service which establishes connectivity with other systems. The wizard provides three connectivity options – Adapters, Registers, and Messaging

Select the radio button next to **Adapters** and click **Next**

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

- ___ 7. On the Select an Adapter screen, select IBM WebSphere Adapter for FTP (IBM : 6.1.0.0_IF03) and click Next



- ___ 8. Service Configuration Properties:
- ___ a. Deploy connector project: ensure that the default option **With module for use by single application** is selected
 - ___ b. Enter these for FTP system connection information:
 - 1) Host name: **<FTP_Machine_Name>** (or IP Address of the machine that has FTP Server), for Ex: wsbeta181.austin.ibm.com
 - 2) Directory: **full path of the OutDir created in on the machine where FTP server is existing** (for Ex: /home/wsbeta/OutDir)

Note: This is the folder where the adapter will create the file.

- 3) Port number: **21** (default)
- 4) Protocol: **FTP** (default)

Deploy connector project: With module for use by single application

Connection properties: Use properties below

Connection properties

FTP system connection information

Host name: * wsbeta181.austin.ibm.com

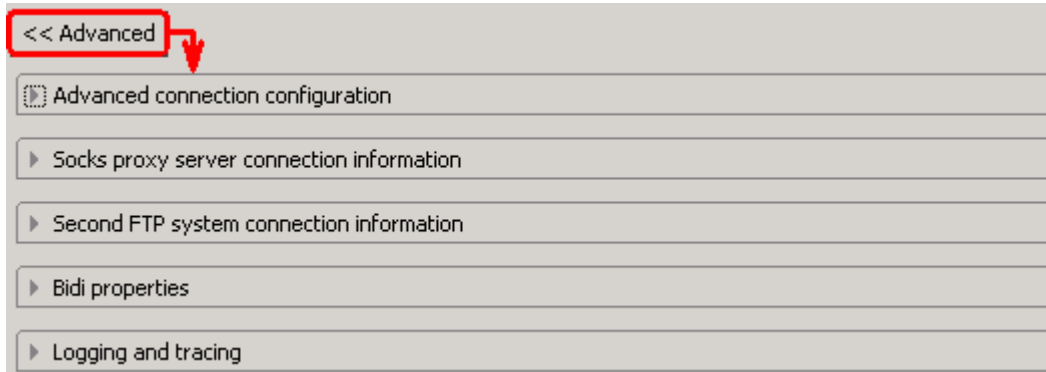
Directory: * /home/wsbeta/OutDir

Port number: 21

Protocol: FTP

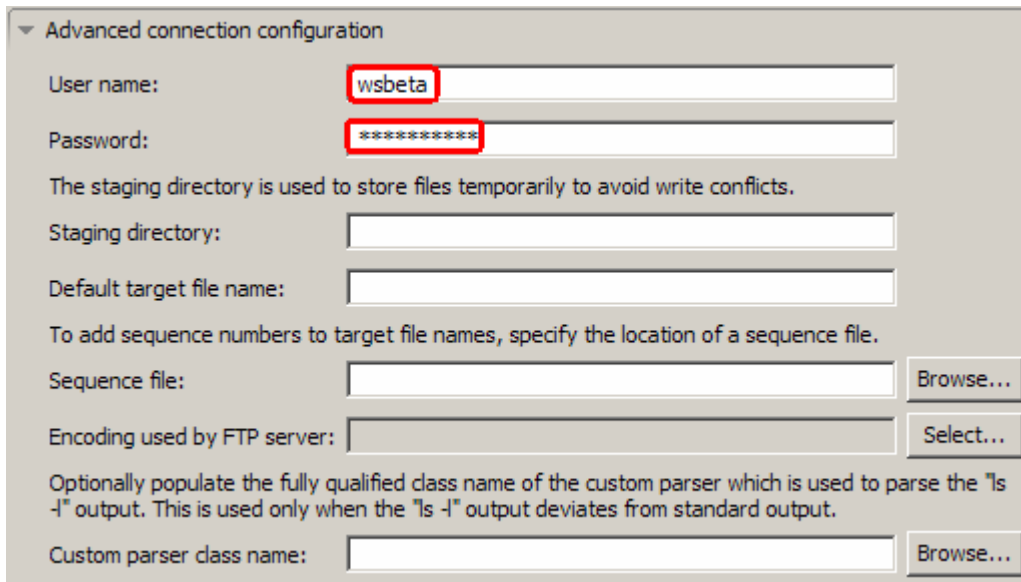
IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

__ c. Click on **Advanced >>** to see the hidden advanced properties that can be configured:

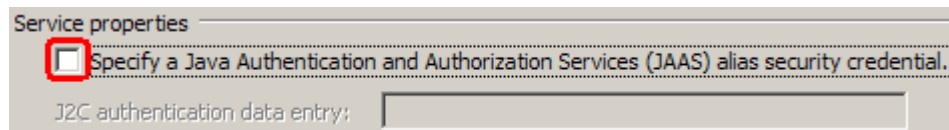


__ d. Click on **Advanced connection configuration**

- 1) User name: **username using which you connect to your FTP server** (for Ex: wsbeta)
- 2) Password: **password for the above user to connect to your FTP server**



___ 9. For this lab, you are not going to use the J2C authentication. So, **uncheck** the box next to **Specify a Java Authentication and Authorization Services (JAAS) alias security credentials**.

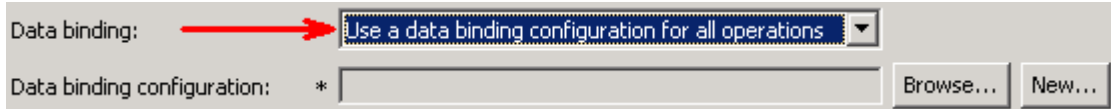


Data binding and Data handler configuration:

___ 10. You can define data binding in two places - service level (current screen of the external service wizard) or later at the method level (Operations screen of the external service wizard). In this lab, you will define data binding at the service level (from this screen)

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

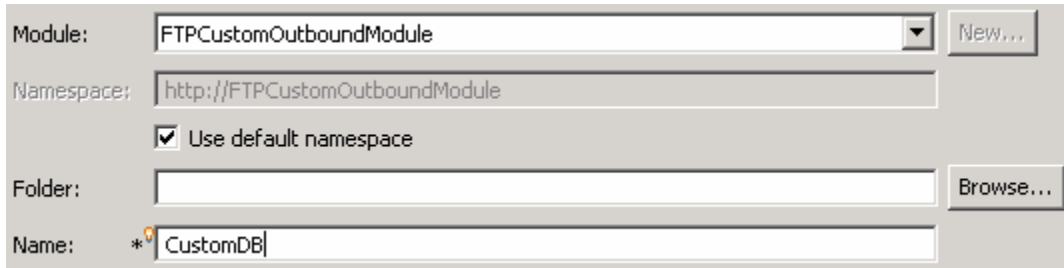
- ___ a. From the dropdown menu next to Data binding, select 'Use a data binding configuration for all operations'



- ___ 11. Click **New...** next to **Data binding configuration**. A Binding Resource Configuration window is opened

- ___ a. Ensure that the selected module is **FTPCustomOutboundModule**

- 1) For the **Name**, enter **CustomDB**



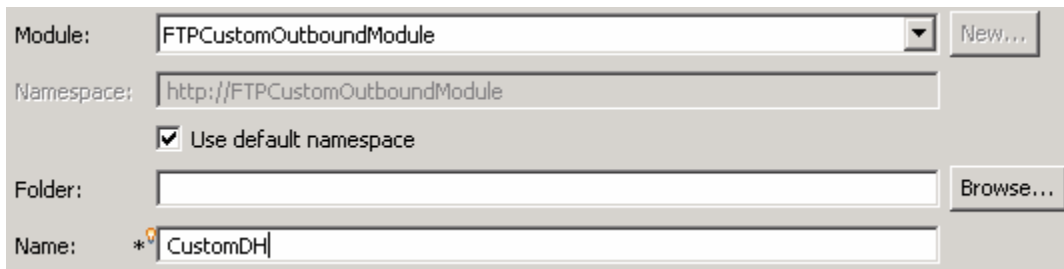
- 2) Click **Next**

- ___ b. Accept the default data binding Class Name, **com.ibm.j2ca.ftp.emd.runtime.FTPFileBaseDataBinding:**

- ___ c. Click **Next**

- ___ 12. Click on **New...** next to **Data handler configuration name**. A new Resource Configuration window is opened for you to define the data handler

- ___ a. Ensure that the module selected is **FTPCustomOutboundModule** and enter **CustomDH** for the Name of the data handler that is created.



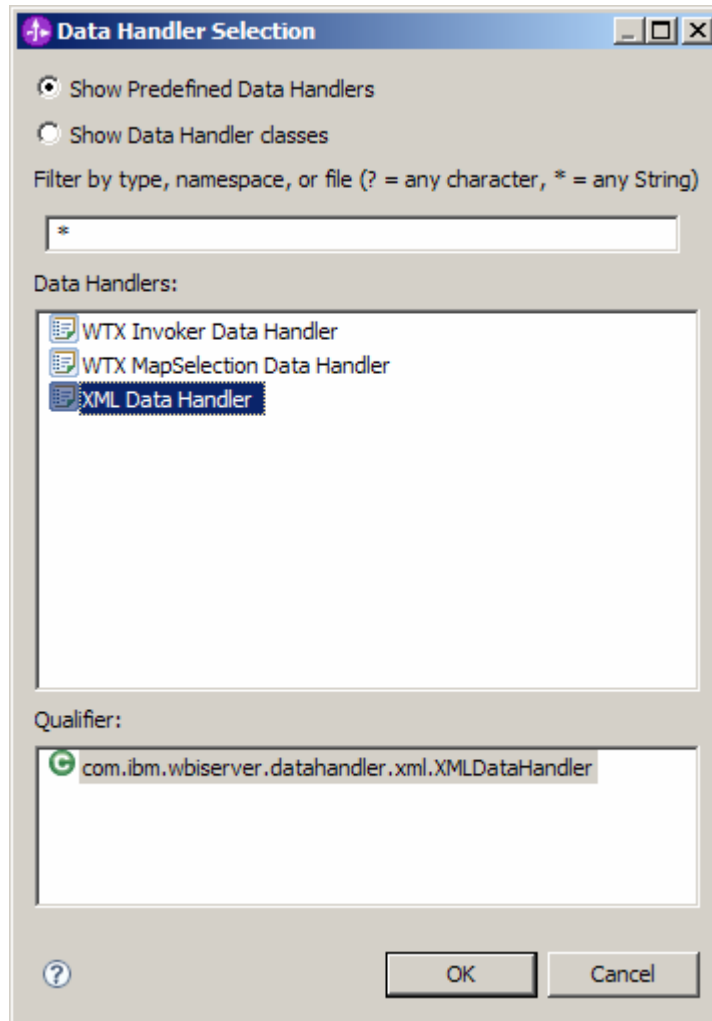
- ___ b. Click **Next**

By default, the radio button next to **Data Handler** is selected

- ___ c. Click on **Browse...** next to Class Name. Data Handler Selection window is opened.

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

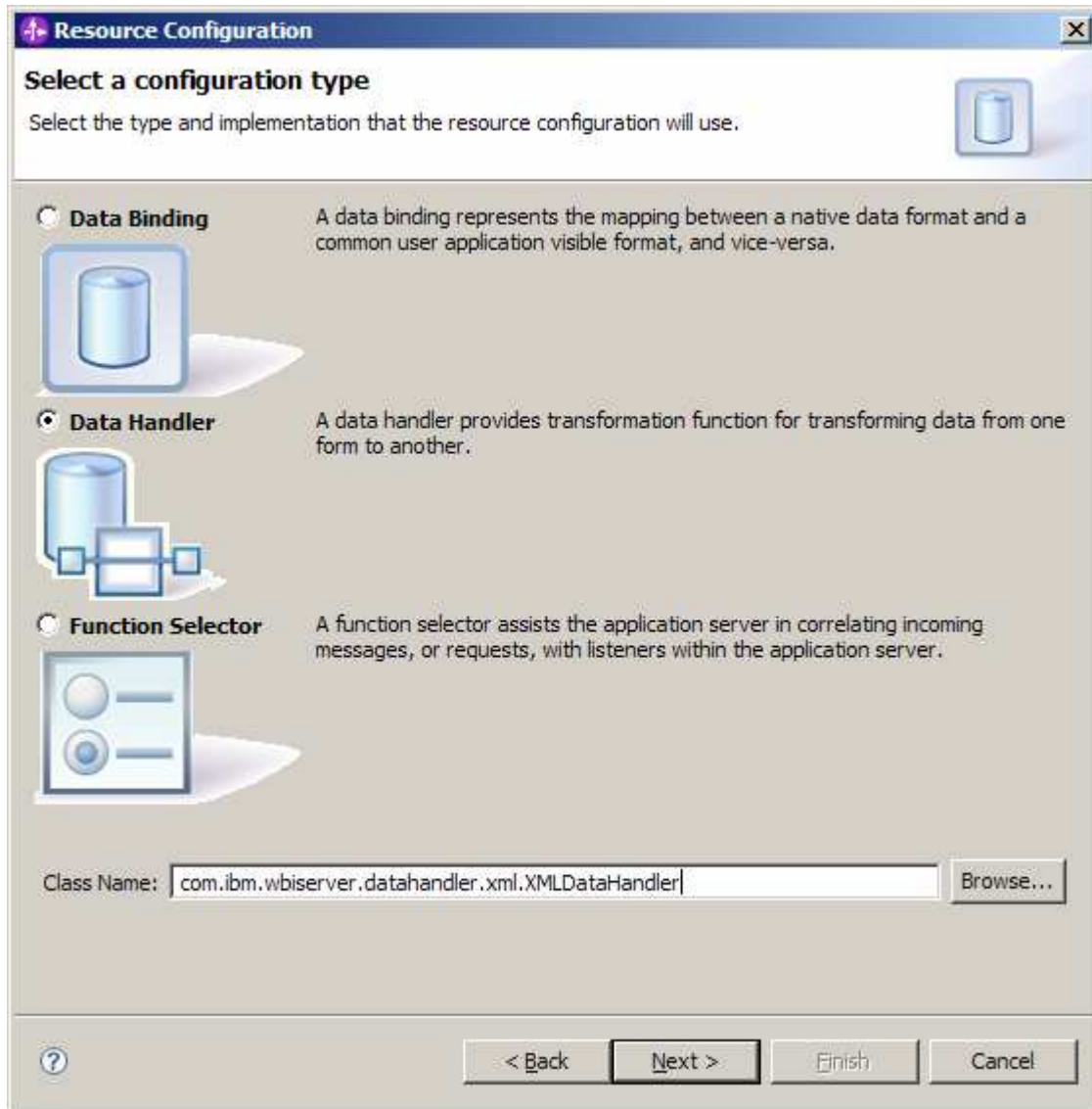
__ d. Select **XML Data Handler** from the Data Handlers list



__ e. Click **OK**

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

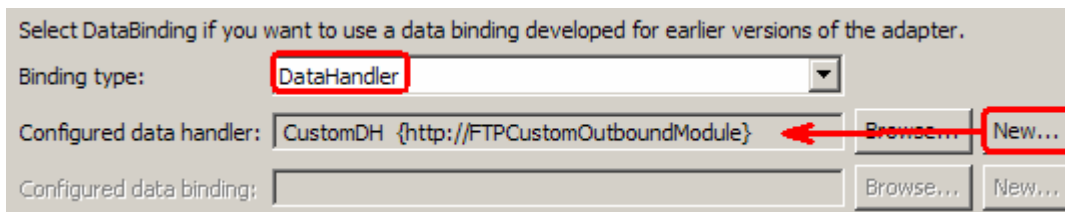
- ___ f. You are now back to Resource Configuration window and the above selected data handler, **com.ibm.wbiserver.datahandler.xml.XMLDataHandler**, is displayed as the Class Name of Data Handler:



- ___ g. Click **Next**

- ___ h. Accept the default value '**UTF-8**' for encoding and click **Finish**

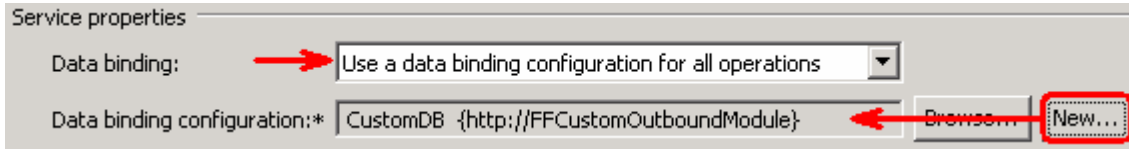
- ___ i. From the next screen, the Data handler configuration name, **CustomDH** is displayed which was defined in the previous steps



IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

___ j. Click **Finish**

___ k. Now the **CustomDB** is displayed for **Data binding configuration**



___ 13. Check the box next to **Change logging properties for wizard** to view the output location of the log file and the logging level and click **Next**

Define Operations: In this screen, you will add the required operations that is supported by the adapter functions on the remote file system

Note: The precedence of the parameters is as follows: WrapperBO, Interaction Spec, and Managed Connection Factory. The adapter will first search for the parameters passed in the WrapperBO; if it is not available there, it will then subsequently search in the Interaction Spec, and then the Managed Connection Factory instance. **In this lab, for all the operations, you will enter the values at the WrapperBO level in the later part using the WebSphere Integration Developer test client.**

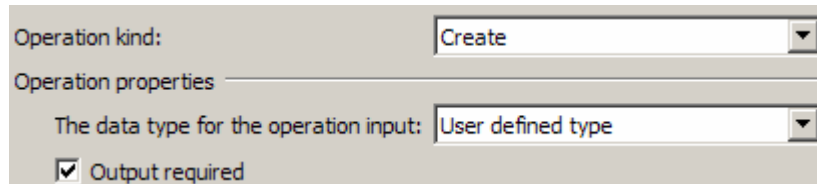
Define Operation: createCustomFile:

___ 14. Click on **Add...** to open Add Operation window

___ a. For **Operation kind**, select **Create** from the drop down list

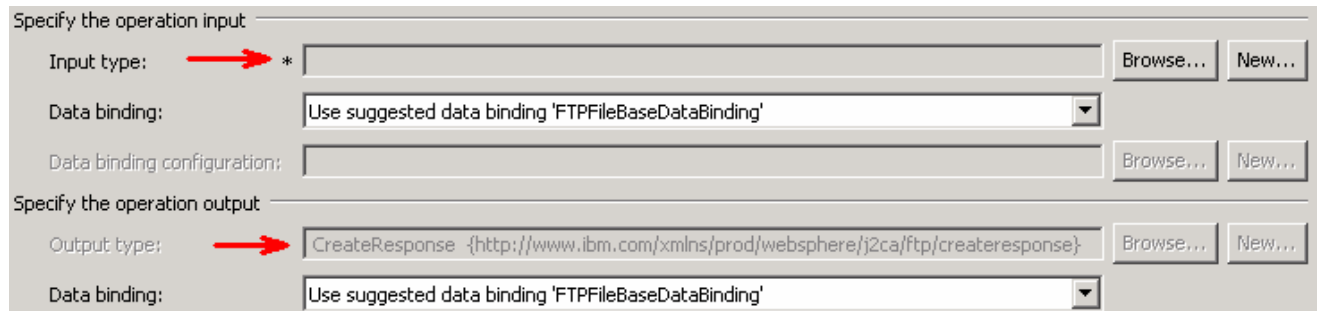
___ b. For **Data type for operation input**, select **User defined type** from the drop down list

___ c. Select the check box next to **Output required**



___ d. Click **Next**

The Data type for input and output are populated based on the selection of the Data type for the operation in the previous step. Since you have chosen User defined type, the **Input type** is **blank** and because you have selected Output required box, the **Output type** is **CreateResponse**

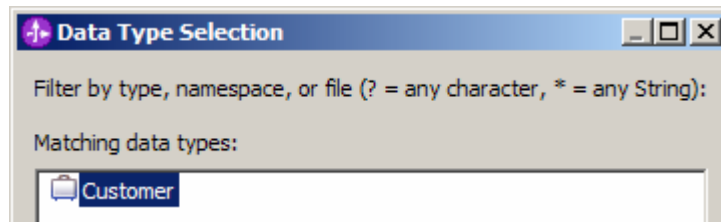


___ e. For Operation name, enter **createCustomFile**

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

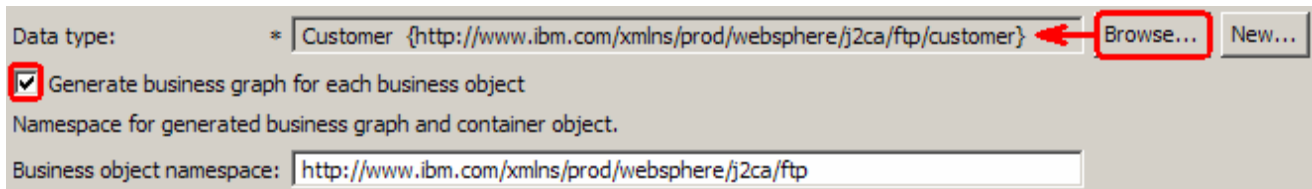
__ f. Define Input type:

- 1) Under **Specify the operation input**, click **New...** next to **Input type** to open a New Business Object window
- 2) Ensure that the Module selected is **FTPCustomOutboundModule** and click **Next**
- 3) From this window, Click on **Browse...** next to Data type
- 4) From the Data Type Selection window, select **Customer** under Matching data types:



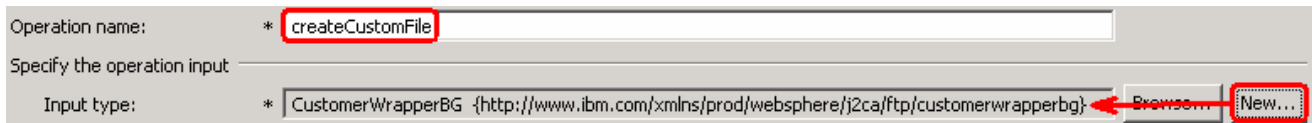
- 5) Click **OK**

__ g. From the Business Object window, **check** the box next to **Generate business graph for each business object**



__ h. Click **Finish**

In the Add Operation window, under Specify the operation input, you will see the Input type **CustomerWrapperBG** (because you have selected to have business graph (BG) generated):



Define Data Binding type for **input**:

__ i. For Data binding, select **Use data binding configuration 'CustomDB'** from the drop down list

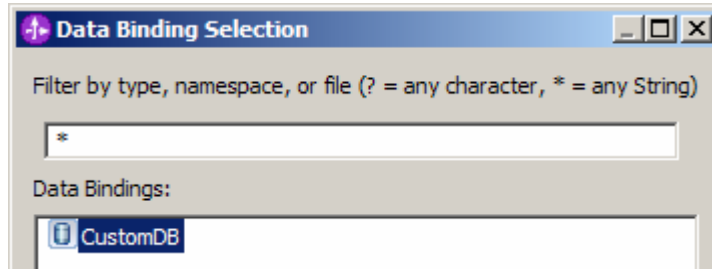
Next define the Data binding configuration for the **output**:

__ j. For **Data binding**, select **Use a data binding configuration** from the dropdown list

__ k. Click **Browse...** next to **Data binding configuration**. A Data Binding Selection window is opened.

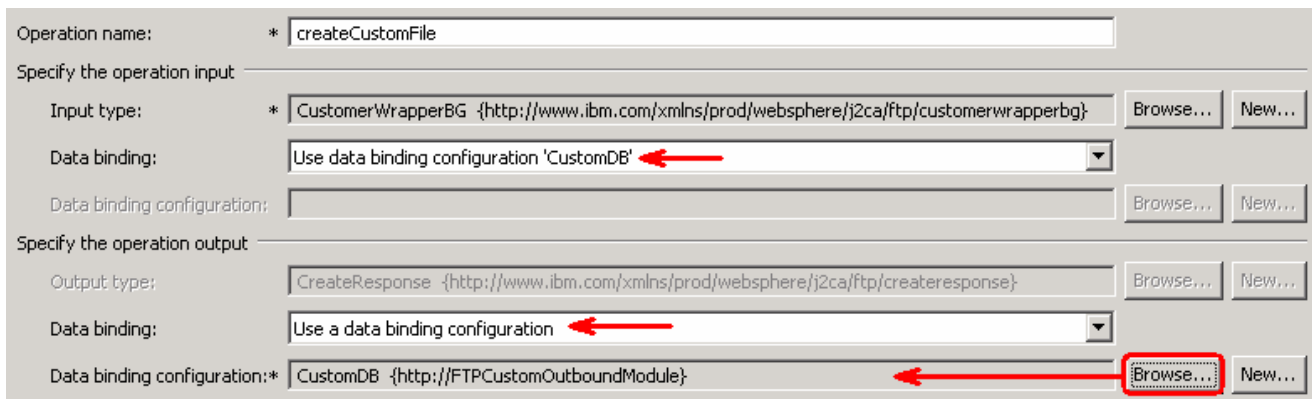
IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

___ l. Select **CustomDB** from Data Bindings list



___ m. Click **OK**

___ n. The Operation screen now should look like this:



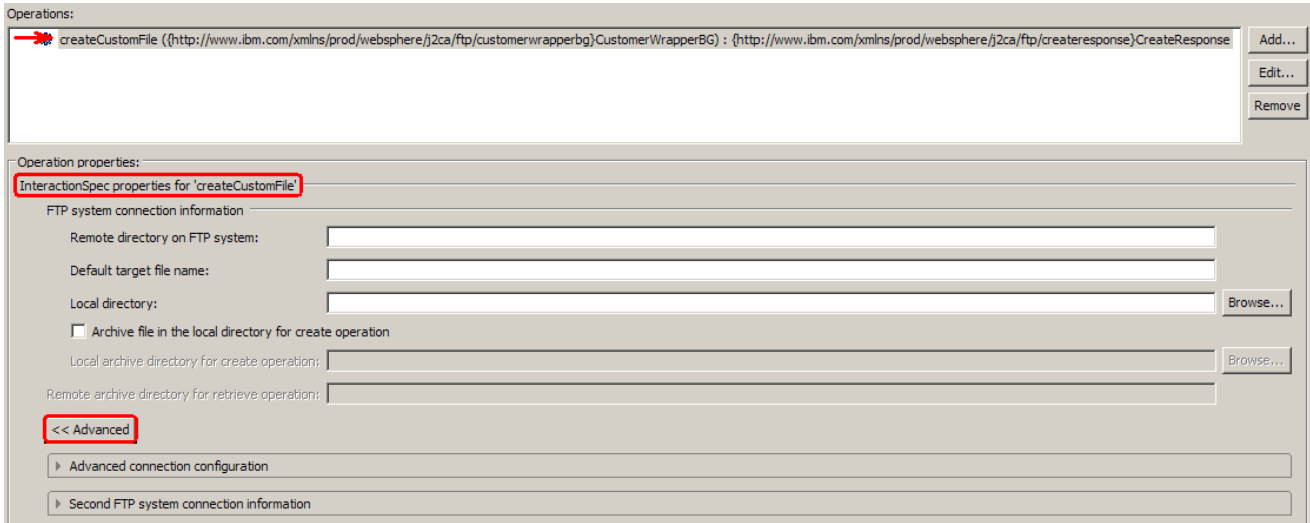
___ o. Click **Finish** from the Add Operation window

The operation, createCustomFile, will now be displayed under Operations list.

___ 15. You can click on **Advanced >>** under 'InteractionSpec properties for createCustomFile' to review the properties available at Interaction spec level

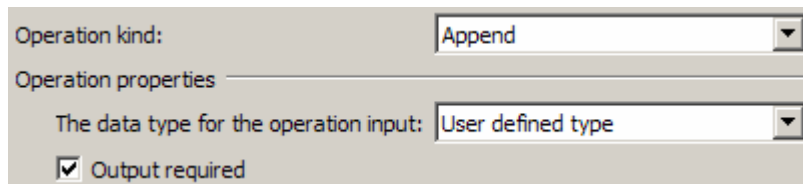
IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.



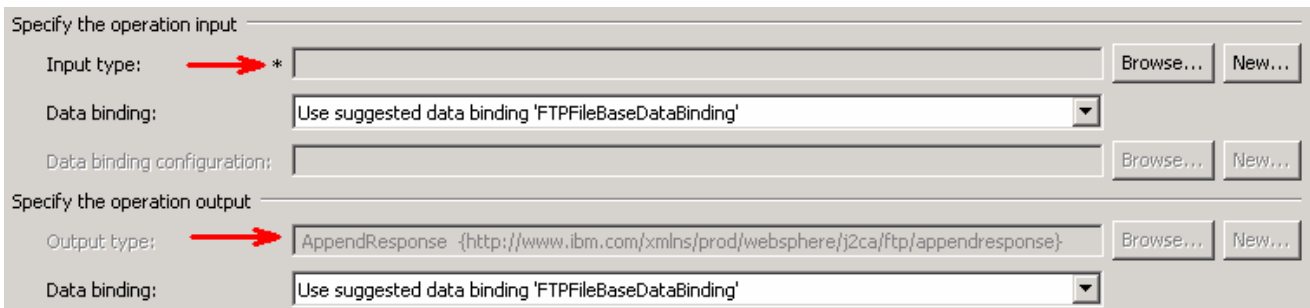
Add Operation: appendCustomFile:

- ___ 16. Click on **Add...** to open Add Operation window
 - ___ a. For **Operation kind**, select **Append** from the drop down list
 - ___ b. For **Data type for operation input**, select **User defined type** from the drop down list
 - ___ c. Select the check box next to **Output required**



- ___ d. Click **Next**

You are now back to Operation window and because you chose the User defined data type, the Input type and Output type is blank and because you have selected Output required box, the Output type is AppendResponse:



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__ e. For Operation name, enter **appendCustomFile**

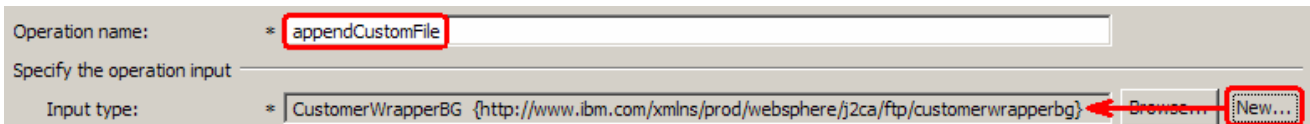
__ f. Define Input type:

- 1) Under **Specify the operation input**, click **New...** next to **Input type** to open a New Business Object window
- 2) Ensure that the Module selected is **FTPCustomOutboundModule** and click **Next**
- 3) From this window, Click on **Browse...** next to Data type
- 4) From the Data Type Selection window, select **Customer** under Matching data types:
- 5) Click **OK**

__ g. From the Business Object window, **check** the box next to **Generate business graph for each business object**

__ h. Click **Finish**

In the Add Operation window, under Specify the operation input, you will see the Input type **CustomerWrapperBG** (because you have selected to have business graph (BG) generated):



Define Data Binding type for **input**:

__ i. For Data binding, select **Use data binding configuration 'CustomDB'** from the drop down list

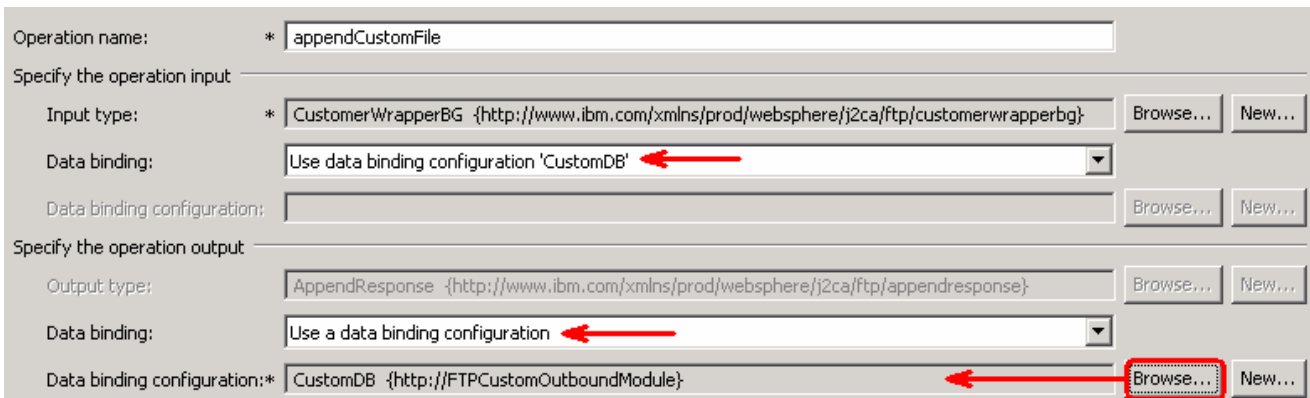
Next define the Data binding configuration for the **output**:

__ j. For **Data binding**, select **Use a data binding configuration** from the dropdown list

__ k. Click **Browse...** next to **Data binding configuration**. A Data Binding Selection window is opened.

__ l. Select **CustomDB** from Data Bindings list and click **OK**

__ m. You should now see this:



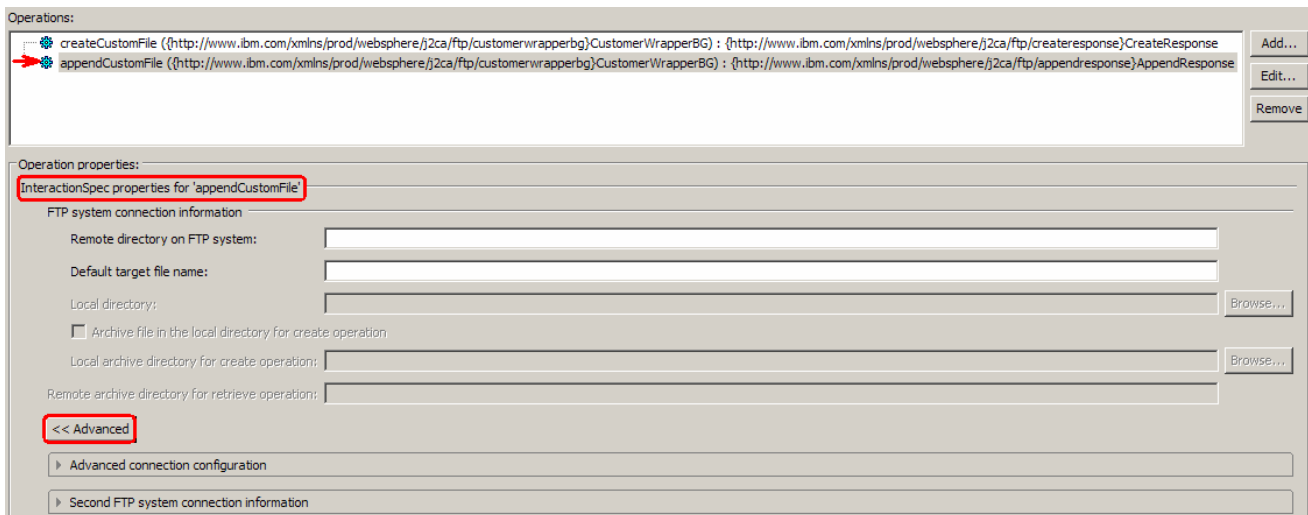
__ n. Click **Finish** from Add Operation window

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

The operation, appendCustomFile, will now be displayed under Operations list.

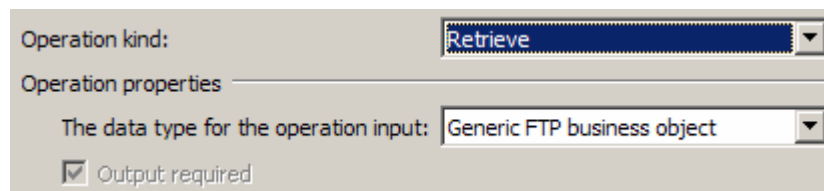
- ___ 17. You can click on **Advanced >>** under 'InteractionSpec properties for appendCustomFile' to review the properties available at Interaction spec level

Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.



Add Operation: retrieveCustomFile

- ___ 18. Click on **Add...** to open Add Operation window
- ___ a. For **Operation kind**, select **Retrieve** from the drop down list
- ___ b. For **Data type for operation**, select **Generic FTP business object** from the drop down list
- ___ c. Note that the box next to **Output required** is checked by default



- ___ d. Click **Next**

In the Add Operation window, under Specify the operation input, you will see the Input type **FTPFile** (because you have selected **not to** have business graph (BG)) and you will also see the Output type **RetrieveResponseWrapper** under Specify the operation output (because the Output was selected by default).

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___ 19. For Operation name, enter **retrieveCustomFile**

Define Data Binding type for **input**:

- ___ a. For **Data binding**, select **Use a data binding configuration** from the dropdown list
- ___ b. Click **Browse...** next to **Data binding configuration**. A Data Binding Selection window is opened.
- ___ c. Select **CustomDB** from Data Bindings list and click **OK**

Define Data Binding type for **output**:

- ___ d. For Data binding, select **Use data binding configuration 'CustomDB'** from the drop down list

You should now see this:

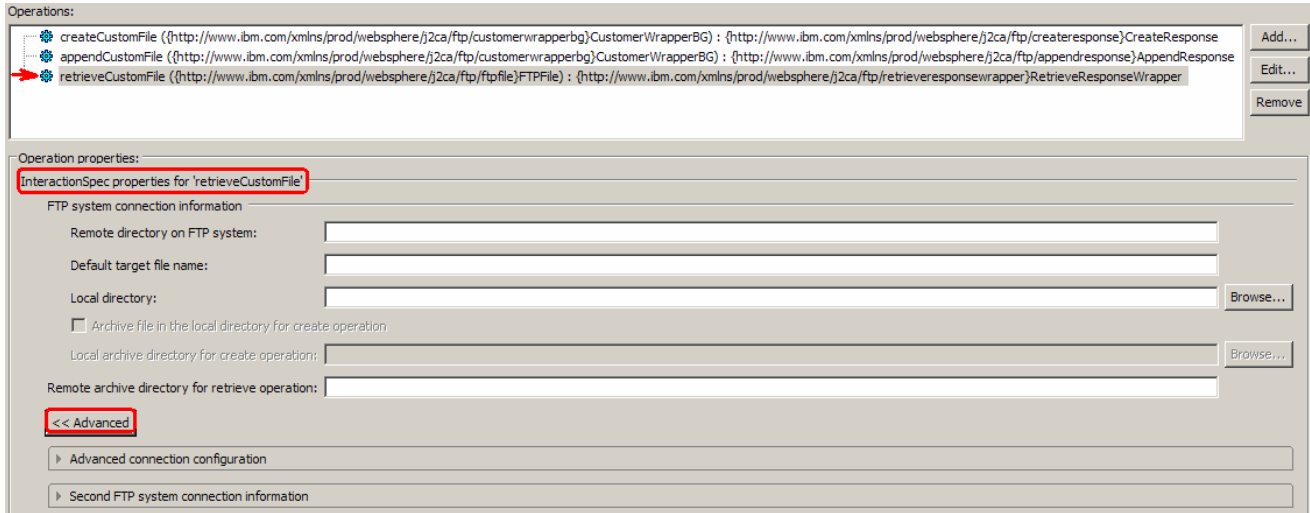
- ___ e. Click **Finish** from the Add Operation window

The operation, retrieveCustomFile, will now be displayed under Operations list.

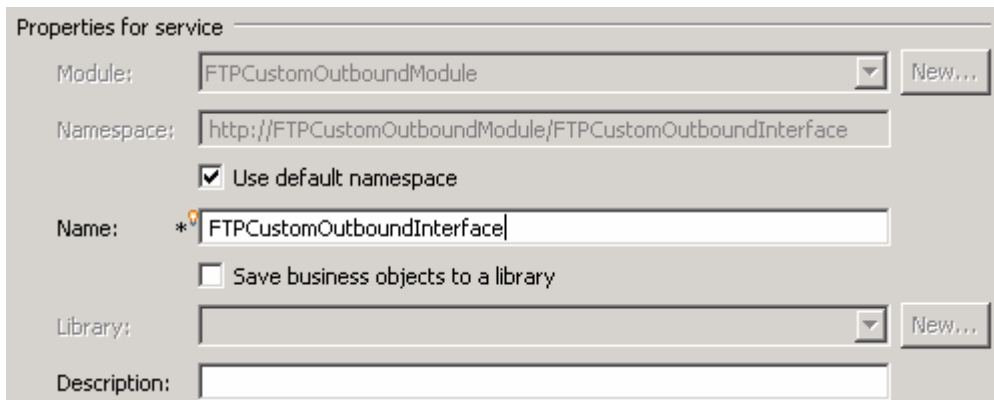
___ 20. You can click on **Advanced >>** under 'InteractionSpec properties for retrieveCustomFile' to review the properties available at Interaction spec level

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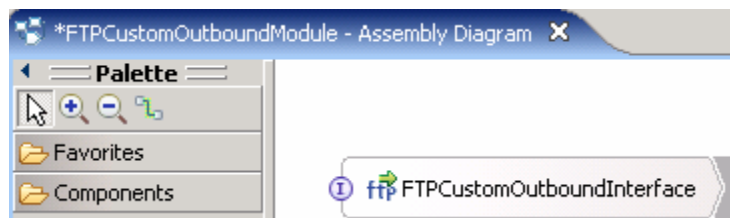
Note: Refer to http://www-1.ibm.com/support/docview.wss?rs=0&dc=DB520&q1=waftpv61rnote&uid=swg21288762&loc=en_US&cs=utf-8&lang= for the limitation in WebSphere Adapter for FTP 6.1 on precedence of properties in outbound flow.



- ___ 21. Click **Next** from the Operations window
- ___ 22. From the Generate Artifacts screen, enter these:
 - ___ a. For **Name**, enter **FTPCustomOutboundInterface**



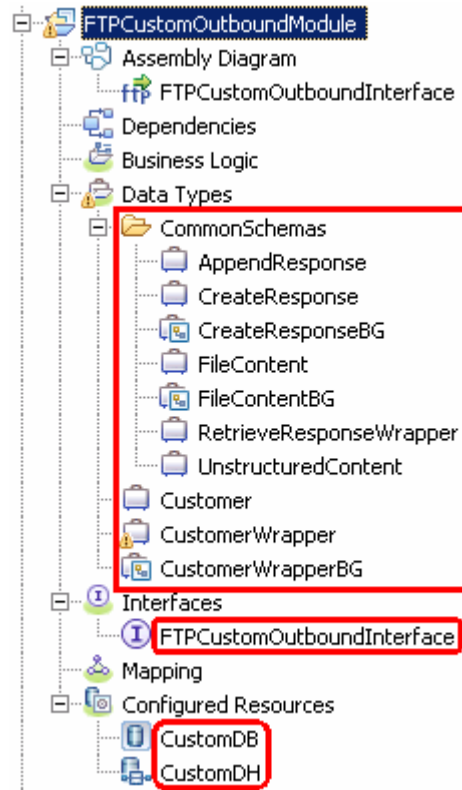
- ___ b. Click **Finish**
- ___ 23. You will now see a new import component, **FTPCustomOutboundInterface** in the assembly diagram of FTPCustomOutboundModule



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- ___ a. Save (**Ctrl+S**) your changes to the assembly diagram

- ___ 24. Review the FTPCustomOutboundModule: The generated **Data Types**, **Interface**, and the Data binding (**CustomDB**), and Data handler (**CustomDH**) under Configured Resources can be found inside FTPCustomOutboundModule



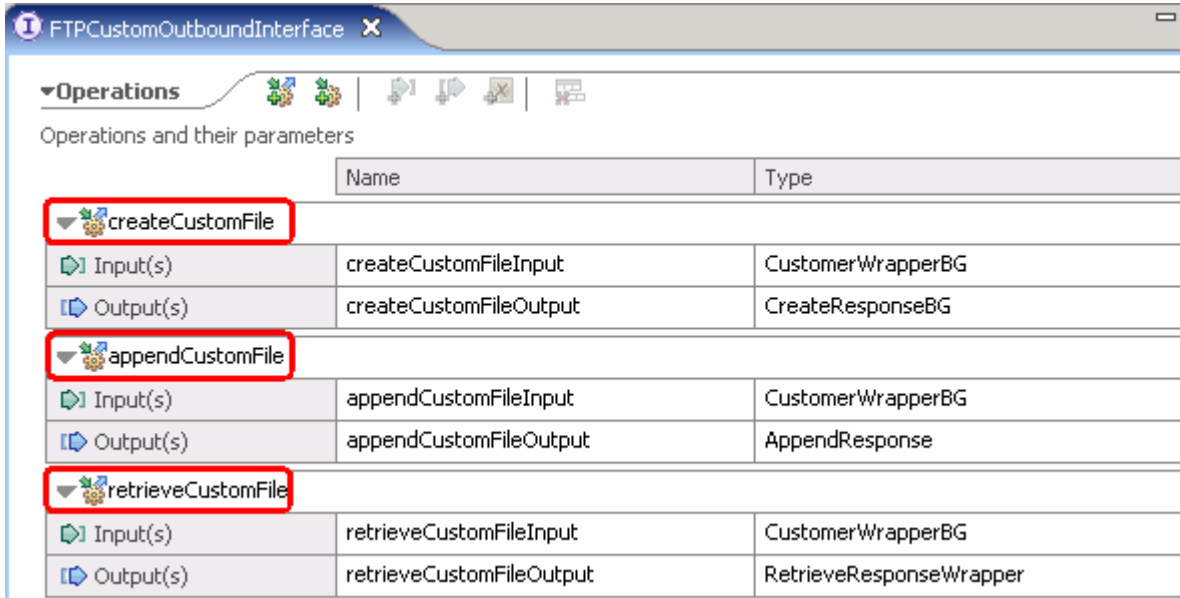
You can open each of these generated artifacts and business objects and review the properties inside.

Review the created methods inside the interface:

- ___ a. From the Business Integration view, expand FTPCustomOutboundModule > Interfaces and then double-click on **FTPCustomOutboundInterface** to open it

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

__ b. You should see these three operations:



Operations and their parameters		
	Name	Type
▼ createCustomFile		
Input(s)	createCustomFileInput	CustomerWrapperBG
Output(s)	createCustomFileOutput	CreateResponseBG
▼ appendCustomFile		
Input(s)	appendCustomFileInput	CustomerWrapperBG
Output(s)	appendCustomFileOutput	AppendResponse
▼ retrieveCustomFile		
Input(s)	retrieveCustomFileInput	CustomerWrapperBG
Output(s)	retrieveCustomFileOutput	RetrieveResponseWrapper

__ c. Close the interface, FTPCustomOutboundInterface

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4.2. Test content specific scenario

- ___ 1. Start WebSphere Process Server (if not started already)
- ___ a. From the **Servers** view of WebSphere Integration Developer, right click on **WebSphere Process Server v6.1** and select Start from the pop-up menu
 - ___ b. Wait until the server status shows as **Started**
- ___ 2. Add the project to the WebSphere Process Server Test Environment
- ___ a. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. In the Add and Remove Projects window, select the **FTPCusomOutboundModuleApp** project from the Available projects panel
 - ___ c. Click **Add >** to add it to the Configured projects panel
 - ___ d. The project now is moved to Configured projects. Click **Finish**

Wait for the project to be published to the server.

- ___ 3. Open the test client for the module
- ___ a. From the Business Integration perspective, right-click on the **FTPCustomOutboundModule** and select **Test > Test Module**
 - ___ b. The **FTPCustomOutboundModule_Test** window is opened in the Assembly editor

You have three operations that were defined in the previous part in this module:

- createCustomFile
- appendCustomFile
- retrieveCustomFile

Test Create operation:

- ___ 4. Under **Detailed Properties**, for the **Operation** field, select **createCustomFile** from the drop down menu

Fill out the fields for Initial request parameter

- ___ a. For **DirectoryPath**, enter **full path of the OutDir** that is already created in your FTP server
- ___ b. For **Filename**, enter **UserDefined.xml**
- ___ c. For **IncludeEndBODelimiter**, enter **#####**
- ___ d. For **Content**, enter any random data. For Ex:

- 1) Name: ABC
- 2) Address: 11501 Burnet Rd
- 3) City: Austin

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

4) State: TX

▼ Detailed Properties

<u>Configuration:</u>	Default Module Test
<u>Module:</u>	FTPCustomOutboundModule
<u>Component:</u>	FTPCustomOutboundInterface
<u>Interface:</u>	FTPCustomOutboundInterface
<u>Operation:</u>	createCustomFile

Initial request parameters

Name	Type	
createCustomFileInput	CustomerWrapperBG	✓
verb	verb<string>	✓
CustomerWrapper	CustomerWrapper	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ UserDefined.xml
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODelimiter	string	✓ #####
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	60
SplittingFunctionClassName	string	✓
SplitCriteria	string	✓
DeleteOnRetrieve	boolean	✓ false
ArchiveDirectoryForRetrieve	string	✓
Content	Customer	✓
CustomerName	string	✓ ABC
Address	string	✓ 11501 Burnet Rd
City	string	✓ Austin
State	string	✓ TX

__ e. Click **Continue** button under Events

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- ___ 7. Under **Detailed Properties**, for the **Operation** field, select **appendCustomFile** from the drop down menu

Fill out the fields for Initial request parameters:

___ a. For **DirectoryPath**, enter **full path of the OutDir** that is already created in your FTP server

___ b. For **Filename**, enter **UserDefined.xml** (The file name should already exist for append operation. PassThroughTest.txt was created during Create operation test)

___ c. For **IncludeEndBODelimiter**, enter **#####**

___ d. For **Content**, enter any random data. For Ex:

1) Name: IBM

2) Address: 11901 RTP

3) City: Raleigh

4) State: NC

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▼ Detailed Properties

Configuration:	Default Module Test
Module:	FTPCustomOutboundModule
Component:	FTPCustomOutboundInterface
Interface:	FTPCustomOutboundInterface
Operation:	appendCustomFile

Initial request parameters

Name	Type	
appendCustomFileInput	CustomerWrapperBG	✓
verb	verb<string>	✗
CustomerWrapper	CustomerWrapper	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ UserDefined.xml
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODElimiter	string	✓ #####
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	68
SplittingFunctionClassName	string	✓
SplitCriteria	string	✓
DeleteOnRetrieve	boolean	✓ false
ArchiveDirectoryForRetrieve	string	✓
Content	Customer	✓
CustomerName	string	✓ IBM
Address	string	✓ 11901 RTP
City	string	✓ Raleigh
State	string	✓ NC


___ e. Click **Continue** button under Events

___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**

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If splitting needs to be done based on a delimiter, then `splitFunctionClassName` should be `com.ibm.j2ca.utils.filesplit.SplitByDelimiter` which does this functionality and the `splitCriteria` (the delimiter which actually separates the BO's present in the event file) should be given.

This lab will guide you through the later splitting criteria, `SplitByDelimiter`.

- ___ 9. Click on **Invoke** () under Events to start a new event
- ___ 10. Under **Detailed Properties**, for the **Operation** field, select **retrieveCustomFile** from the drop down menu

Fill out the fields for Initial request parameters:

- ___ a. For **DirectoryPath**, enter full path of the **OutDir** that is already created in your FTP server
- ___ b. For **Filename**, enter **UserDefined.xml** (The file name should already exist for retrieve operation. UserDefinedTest.xml was created during Create operation test)
- ___ c. For **LocalDirectoryPath**, enter **<LOCAL_DIR>**

Note: `LocalDirectoryPath` is mandatory for Retrieve operation during the content specific scenario. If you set the **FileInLocalDirectory** to **true** along with the `LocalDirectoryPath`, then `UserDefined.xml` is copied to `<LOCAL_DIR>` and you can see the retrieved contents by opening the file copied to `LocalDirectoryPath`. This lab will show you the case where you set only the `LocalDirectoryPath` and leave the `FileInLocalDirectory` with the default false.

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__ d. For **splitFunctionClassName**, enter **com.ibm.j2ca.utils.filesplit.SplitByDelimiter**

__ e. For **splitCriteria**, enter **#####**

▼ Detailed Properties

Configuration:	Default Module Test
Module:	FTPCustomOutboundModule
Component:	FTPCustomOutboundInterface
Interface:	FTPCustomOutboundInterface
Operation:	retrieveCustomFile

Initial request parameters

Name	Type	Value
retrieveCustomFileInput	CustomerWrapperBG	✓
verb	verb<string>	✓
CustomerWrapper	CustomerWrapper	✓
DirectoryPath	string	✓ /home/wsbeta/OutDir
Filename	string	✓ UserDefined.xml
ChunkInfo	string	✓
FtpServerHostName	string	✓
FtpServerEventDirectory	string	✓
DataConnectionMode	string	✓
FileTransferType	string	✓
SecondServerDirectory	string	✓
SecondServerUsername	string	✓
SecondServerPassword	string	✓
FileContentEncoding	string	✓
IncludeEndBODelimiter	string	✓
FileInLocalDirectory	boolean	✓ false
LocalDirectoryPath	string	✓ C:\Labfiles61\FTPOutbound\LocalDir
LocalArchivingEnabledForCreate	boolean	✓ false
LocalArchiveDirForCreate	string	✓
StagingDirectory	string	✓
GenerateUniqueFile	boolean	✓ false
CreateFileIfNotExists	boolean	✓ false
ScriptFileParameters	string[]	68
SplittingFunctionClassName	string	✓ com.ibm.j2ca.utils.filesplit.SplitByDelimiter
SplitCriteria	string	✓ #####
DeleteOnRetrieve	boolean	✓ false
ArchiveDirectoryForRetrieve	string	✓

__ f. Click **Continue** button under Events

__ g. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**

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11. Verify the results:

a. You should see a window similar to this, that contains the content of the two business objects existing in the UserDefined.xml file:

The screenshot displays the IBM WebSphere Adapter 6.1 interface. On the left, the 'Events' pane shows a sequence of operations: 'Invoke (FTPCustomOutboundInterface:createCustomFile)', 'Invoke (FTPCustomOutboundInterface:appendCustomFile)', and 'Invoke (FTPCustomOutboundInterface:retrieveCustomFile)'. The 'Return (FTPCustomOutboundInterface:retrieveCustomFile)' event is highlighted with a red box. On the right, the 'General Properties' pane shows the following details:

- Module: [FTPCustomOutboundModule](#)
- Component: [FTPCustomOutboundInterface](#)
- Interface: [FTPCustomOutboundInterface](#)
- Operation: [retrieveCustomFile](#)

The 'Detailed Properties' pane shows the return parameters for the 'retrieveCustomFile' operation. The parameters are organized into a tree structure:

- retrieveCustomFileOutput (RetrieveResponseWrapper) ✓
- Content (Object[unknown][]) ✓
 - Content[0] (Customer) ✓
 - CustomerName (string) ✓ ABC
 - Address (string) ✓ 11501 Burnet Rd
 - City (string) ✓ Austin
 - State (string) ✓ TX
 - Content[1] (Customer) ✓
 - CustomerName (string) ✓ IBM
 - Address (string) ✓ 11901 RTP
 - City (string) ✓ Raleigh
 - State (string) ✓ NC
- SavedFileToLocalDirectory (boolean) ✓

The values for CustomerName, Address, City, and State for both Content[0] and Content[1] are circled in red in the original image.

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4.3. Restore server configuration

- ___ 1. Close the **FTPCustomOutboundModule_Test** window and click **No** for the Save Resources window
- ___ 2. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
- ___ 3. Select **FTPCustomOutboundModuleApp** under Configured projects and click **< Remove**
- ___ 4. Click **Finish** after you see the application moved to Available projects. Wait until the application is unpublished

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

Part 5: Use default function selector and data binding

This part of the lab will show you how to use the default use the default function selector and data binding options from the external service wizard and generate other required artifacts.

When you use the default function selector, you cannot define the rules as you did in Part 2 and hence there will only be one method that handles all types of files.

When you use the default data binding, you cannot have multiple data types as in Part 3 and each data type is handled by different method. Instead, there will only be one method and one data type.

After running the external service wizard, you will continue to test the adapter.

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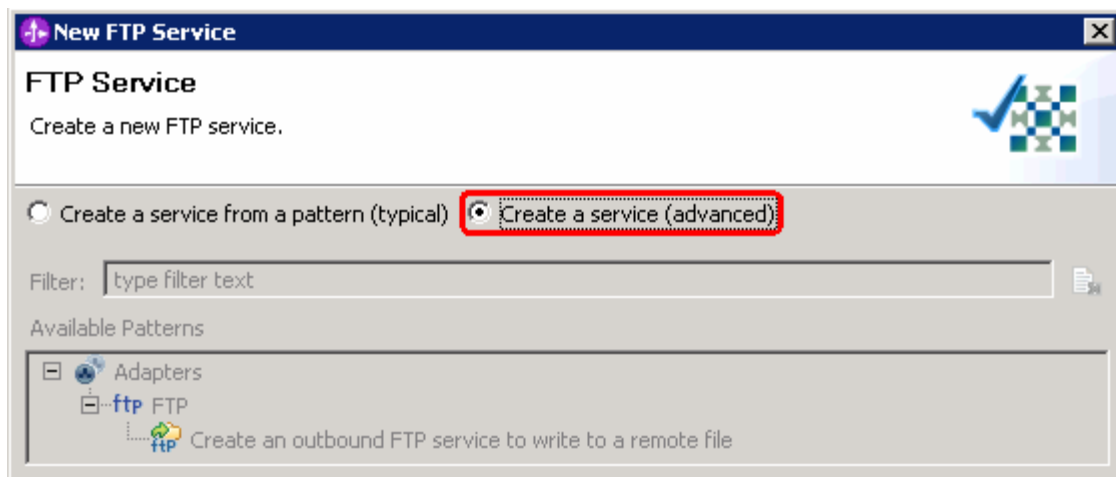
5.1. Configure outbound using default function selector and data binding

In this part of the lab you will use the default function selector and data binding options from the external service wizard and generate other required artifacts to test the outbound scenario.

- ___ 1. Create FTPDefaultsOutboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **FTPDefaultsOutboundModule** for the Module Name
 - ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**

You will now see a new module, FTPDefaultsOutboundModule, created from your Business Integration window

- ___ 2. To start the external service wizard from the Palette:
 - ___ a. From the **Palette** on the left side of Assembly Diagram, click on **Outbound Adapters**:
 - ___ b. Under Outbound Adapters, click on the **FTP** and then click on the empty canvas of the assembly diagram. The New FTP Service wizard is opened
- ___ 3. From the FTP Service screen, select **Create a service (advanced)**



- ___ a. Click **Next**

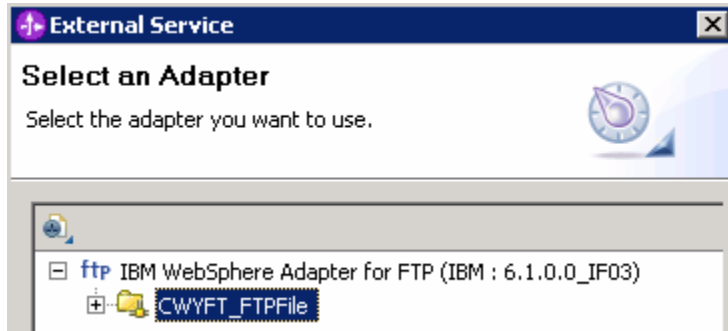
Note: You can also start the external service wizard from the **File menu** option:

From the main menu, select **File > New > External Service**. This opens an external service wizard that helps you obtain a service which establishes connectivity with other systems. The wizard provides three connectivity options – Adapters, Registers, and Messaging

Select the radio button next to **Adapters** and click **Next**

IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

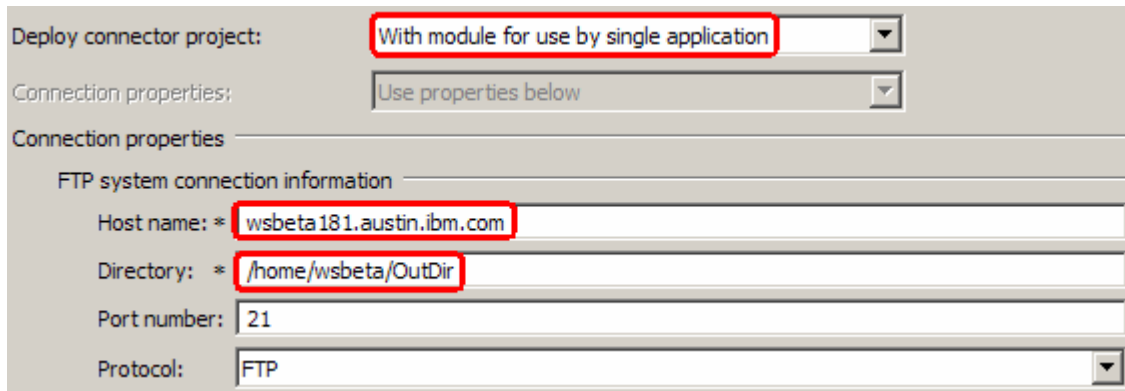
- ___ 4. On the Select an Adapter screen, expand **IBM WebSphere Adapter for FTP (IBM : 6.1.0.0_IF03)** and select **CWYFT_FTPFile**



- ___ a. Click **Next**
- ___ 5. Service Configuration Properties:
 - ___ a. Deploy connector project: ensure that the default option **With module for use by single application** is selected
 - ___ b. Enter these for FTP system connection information:
 - 1) Host name: **<FTP_Machine_Name>** (or IP Address of the machine that has FTP Server), for Ex: wsbeta181.austin.ibm.com
 - 2) Directory: **full path of the OutDir created in on the machine where FTP server is existing** (for Ex: /home/wsbeta/OutDir)

Note: This is the folder where the adapter will create the file.

- 3) Port number: **21** (default)
- 4) Protocol: **FTP** (default)



- ___ c. Click on **Advanced >>** to see the hidden advanced properties that can be configured:

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___ d. Click on **Advanced connection configuration**

- 1) User name: **username using which you connect to your FTP server** (for Ex: wsbeta)
- 2) Password: **password for the above user to connect to your FTP server**

- ___ 6. For this lab, you are not going to use the J2C authentication. So, **uncheck** the box next to **Specify a Java Authentication and Authorization Services (JAAS) alias security credentials**.
- ___ 7. For **Data binding**, select **Use default data binding 'FTPFileBaseDataBinding' for all operations** from the drop down list

- ___ 8. Check the box next to **Change logging properties for wizard** to view the output location of the log file and the logging level and click **Next**

Define createFTPFileBG operation:

- ___ 9. From the Operations screen, click on **Add...**
 - ___ a. For **Operation kind**, select **Create** from the drop down list
 - ___ b. For **Data type for the operation input**, select **Generic FTP business object with business graph** from the drop down list
 - ___ c. Select the check box next to **Output required**

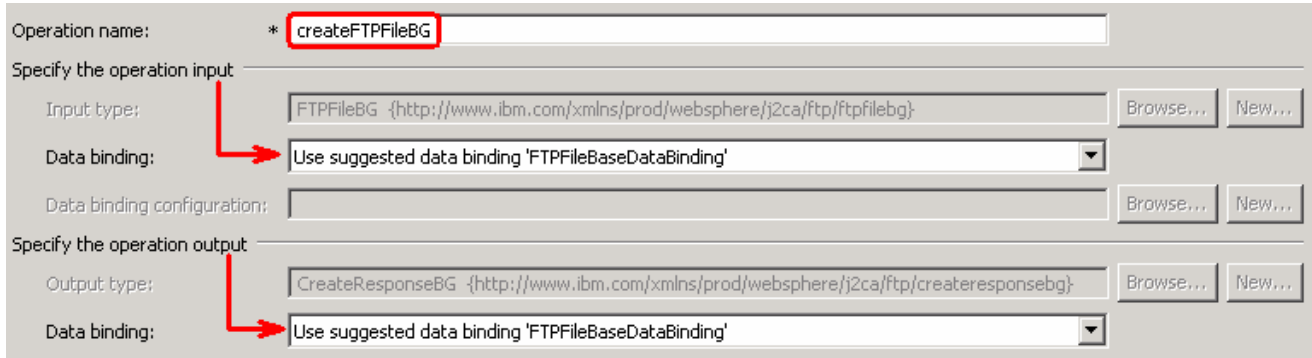
___ d. Click **Next**

The Data type for input and output are populated based on the selection of the Data type for the operation in the previous step. Since you have chosen Generic FTP business object with business graph, the **Input type** is **FTPFileBG** and because you have selected Output required box, the **Output type** is **CreateResponseBG**

- ___ 10. For **Operation name**, enter any name, for Ex: **createFTPFileBG**

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___ 11. Accept the default selection, **Use suggested data binding 'FTPFileBaseDataBinding'**, for **Data binding** for both input and output

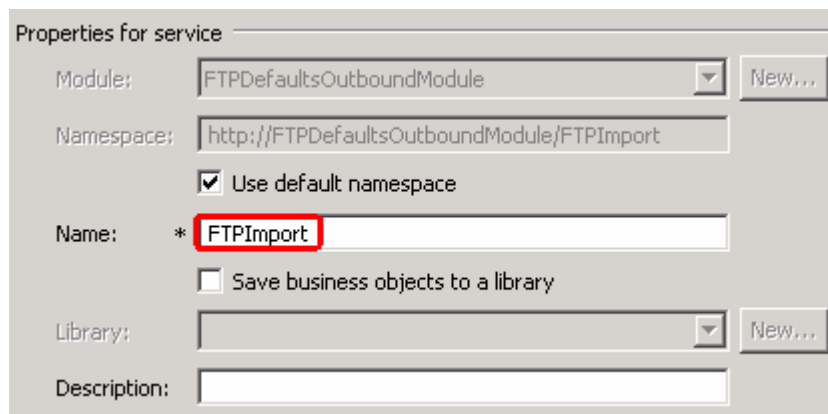


___ a. Click **Finish**. The above defined operation, **createFTPFileBG**, is populated under Operations list



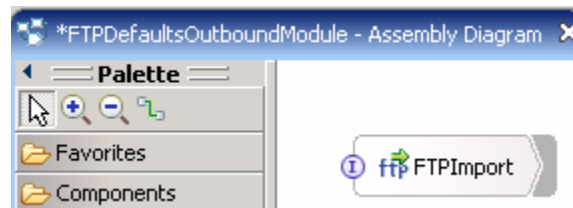
___ b. Click **Next** from Operations screen

___ 12. From Generate Service screen, accept the default value, **FTPImport**, for **Name**



___ a. Click **Finish**

___ 13. The Assembly diagram for FTPDefaultsOutboundModule is opened with an Import component, **FTPImport**:



___ 14. Save (**Ctrl + S**) changes to your assembly diagram

IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

5.2. Test all defaults scenario

In this part of the lab, you will use the WebSphere Process Server Test Environment to test the SCA application Outbound processing for the pass through scenario.

- ___ 1. Add the project to the WebSphere Test Environment server
 - ___ a. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. From the Add and Remove Projects window, select **FTPDefaultsOutboundModuleApp** under Available projects panel and click **Add >**
 - ___ c. You will now see the **FTPDefaultsOutboundModuleApp** added to the **Configured projects**
 - ___ d. Click **Finish** and wait until the project is being published onto the server. The server is started in Debug mode if it is not already started before
- ___ 2. Open the test client for the module
 - ___ a. From the Business Integration perspective, right-click on the **FTPDefaultsOutboundModule** and select **Test > Test Module**
- ___ 3. The **FTPDefaultsOutboundModule_Test** window is opened in the Assembly editor
- ___ 4. Under **Detailed Properties**, for the **Operation** field, select **createFTPFileBG** from the drop down menu

Fill out the fields for Initial request parameters:

- ___ a. For **Filename**, enter any name, for Ex: **DefaultsTest.txt**

► General Properties

▼ Detailed Properties

Configuration:	Default Module Test
Module:	FTPDefaultsOutboundModule
Component:	FTPImport
Interface:	FTPImport
Operation:	createFTPFileBG

Invoke export using binding

Initial request parameters

Name	Type	Value
createFTPFileBGInput	FTPFileBG	✓
verb	verb<string>	✓ CREATE
FTPFile	FTPFile	✓
DirectoryPath	string	✓
Filename	string	✓ DefaultsTest.txt
ChunkInfo	string	✓

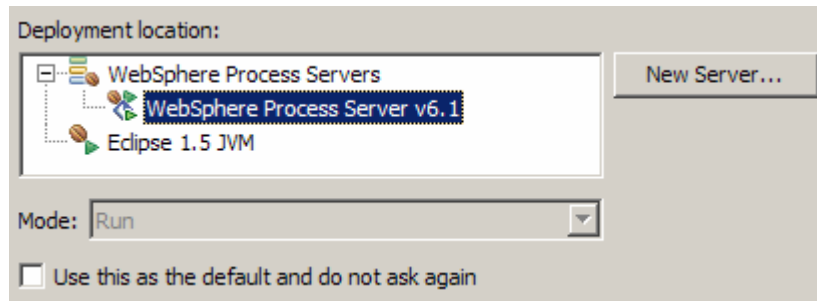
IBM WEBSHERE ADAPTER 6.1 – LAB EXERCISE

___ b. For **AsText** under **Content**, enter some test message, for Ex: **Testing Create operation for defaults scenario**

ArchiveDirectoryForRetrieve	string	✓
Content	UnstructuredContent	✓
ContentType	string	✓
ObjectName	string	✓
AsText	string	✓ Testing Create operation for defaults scenario
AsBinary	hexBinary	✓ 0

___ c. Click **Continue** button under Events

___ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**



___ e. You should see a window similar to this, which contains the data you just entered in the previous steps:

Events

- Invoke (FTPImport:createFTPFileBG)
- Invoke started
- Invoke (FTPImport:createFTPFileBG)
- Return (FTPImport:createFTPFileBG)**
- Invoke returned

General Properties

Detailed Properties

Module: [FTPDefaultsOutboundModule](#)

Component: [FTPImport](#)

Interface: [FTPImport](#)

Operation: [createFTPFileBG](#)

Return parameters:

Name	Type	Value
createFTPFileBGOut...	CreateResponseBG	✓
verb	verb<string>	✓
CreateResponse	CreateResponse	✓
Filename	string	✓ DefaultsTest.txt

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Part 6: Use ‘Create a service from a typical pattern’

In this part of the lab you will use the **typical pattern** option from the external service wizard to create and configure the Data Binding and other required artifacts to test the outbound scenario.

Based on your selection, the Binding resources (data binding) are created which you will review later in this part.

After running the external service wizard, you will continue to test the adapter.

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6.1. Configure outbound using ‘Create a service from a pattern (typical)’ option

In this part of the lab you will use the **typical pattern** from the external service feature to create and configure the Function Selector

- ___ 1. Create the module: FTPTypicalOutboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **FTPTypicalOutboundModule** for the Module Name
 - ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**

You will now see a new module, **FTPTypicalOutboundModule**, created from your Business Integration window and the Assembly diagram for the same module is opened in the Assembly Editor.

- ___ 2. Import required business objects
 - ___ a. Expand FTPTypicalOutboundModule (if not already expanded), right-click on **Data Types** and select **Import...** from the pop-up menu
 - ___ b. From the Import window, expand **General** and select **File System** and then click **Next**
 - ___ c. Enter From directory
 - 1) Click on **Browse...** next to **From directory**
 - 2) From the Import from directory window, select **<FTPFILES >** and click **OK**

Now, you will see FTPFiles folder added on the left side, and all the xsds and files under that folder on the right side.

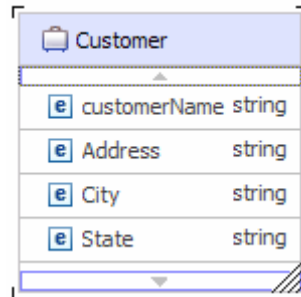
- ___ d. Select the box next to **Customer.xsd**
- ___ e. Ensure that the **FTPTypicalOutboundModule** is selected for Into folder
- ___ f. Click **Finish** from the Import window

The Business Integration window is updated with the imported business objects.

- ___ 3. Review imported business object:
 - ___ a. Expand **FTPTypicalOutboundModule > Data Types** and you will now see a new data type **Customer** and **Order** under it.

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___ b. Double-click on **Customer** review the fields inside the object:



___ c. After reviewing, close the Customer business object from the Assembly editor

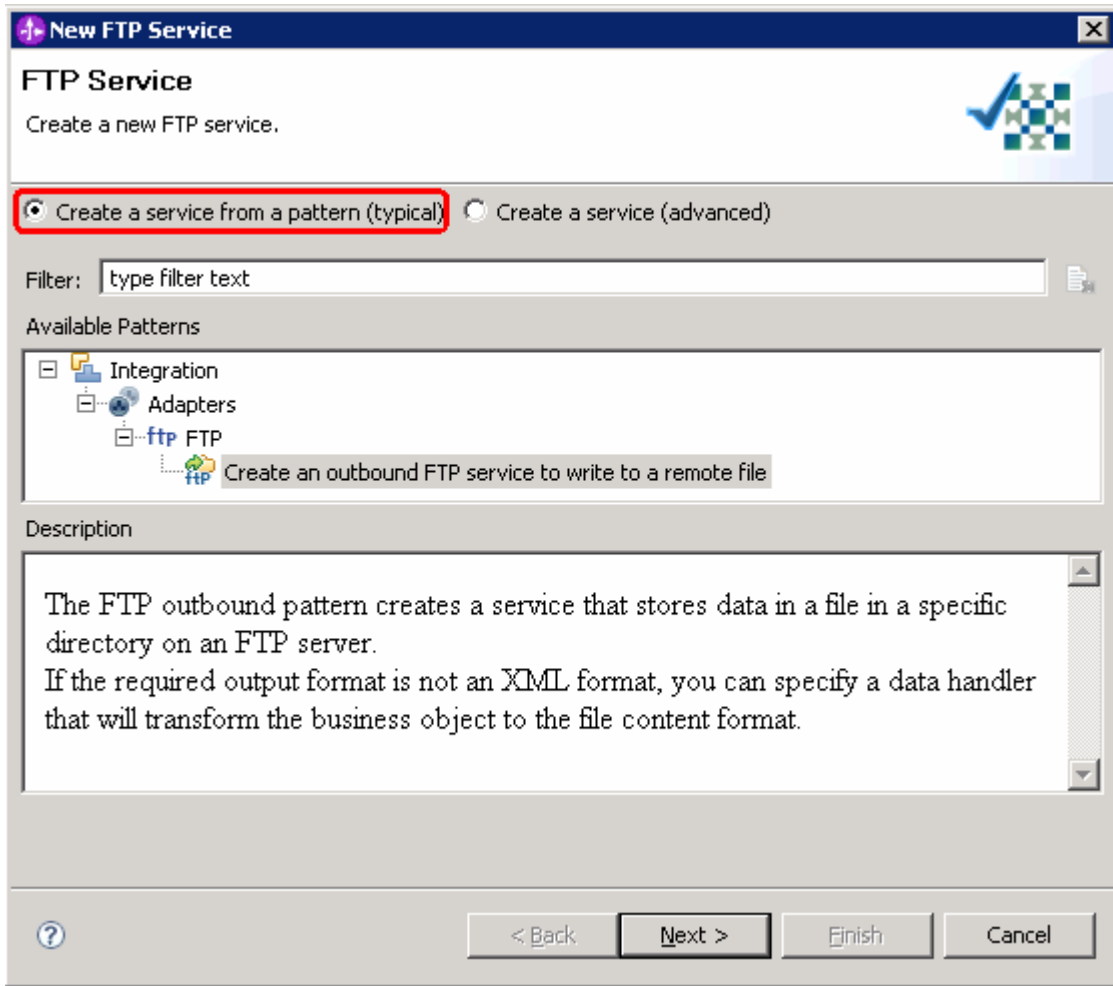
___ 4. To start the external service wizard from the Palette:

___ a. From the **Palette** on the left side of Assembly Diagram, click on **Outbound Adapters**:

___ 5. Under Outbound Adapters, click on the **FTP** and then click on the empty canvas of the assembly diagram. The New FTP Service wizard is opened

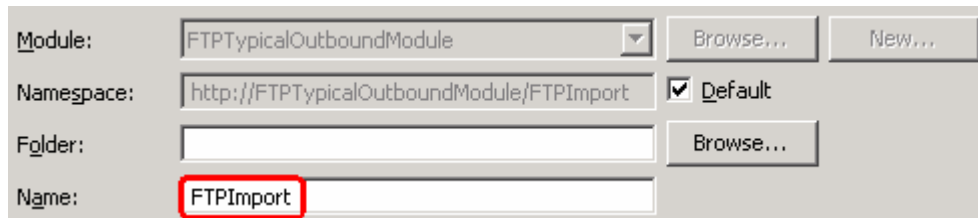
IBM WEBSPHERE ADAPTER 6.1 – LAB EXERCISE

- 6. From the FTP Service screen, accept the default selection of **Create a service from a pattern (typical)**



- a. Click **Next**

- 7. From the next **FTP service name** screen, for **Name**, accept the default value 'FTPImport' and click **Next**

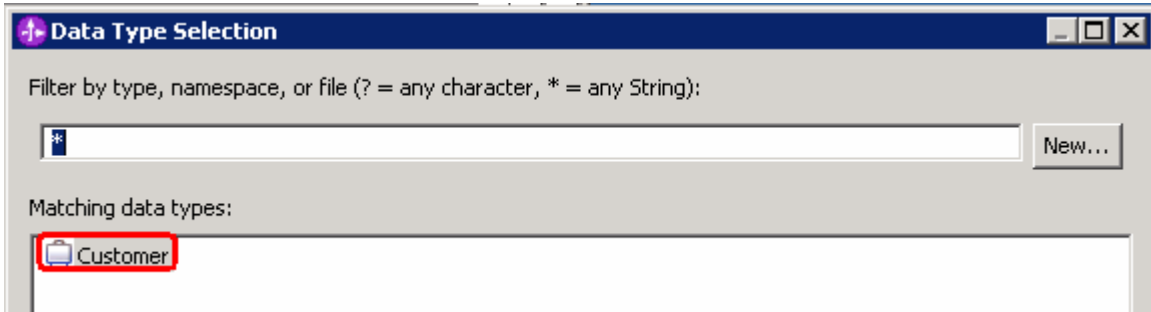


- 8. From the **Business object and FTP server credentials** screen, enter these:

- a. Click on **Browse...** next to **Business object** and a Data Type Selection window is opened

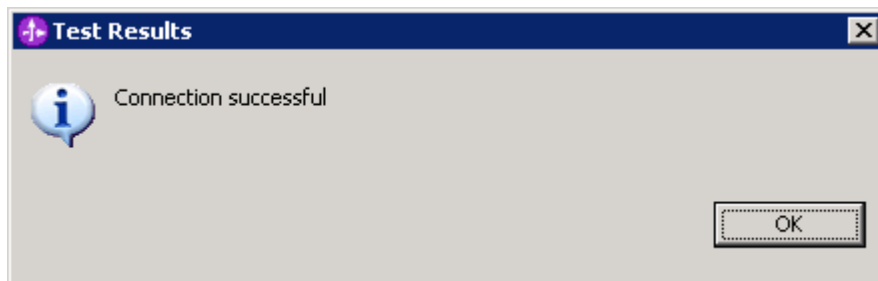
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__ b. Select **Customer** under Matching data types and click **OK**



__ c. For **FTP server host name**, enter **<FTP_Machine_Name>** (or IP Address of the machine that has FTP Server), for Ex: wsbeta181.austin.ibm.com

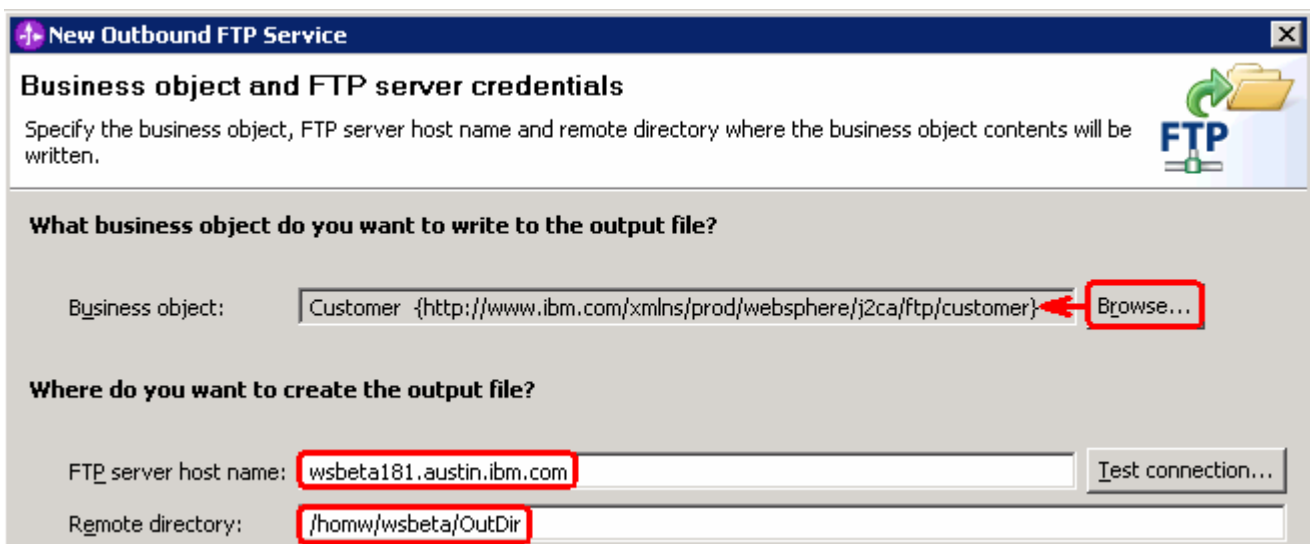
__ d. Click on **Test connection**, next to host name and you should get this pop-up window with success message:



__ e. Click **OK** from the above Test Results window

__ f. For **Remote directory**, enter **full path of the OutDir created on the machine where FTP server is existing** (for Ex: /home/wsbeta/OutDir)

__ g. Your Business object and directory screen should look like this:



__ h. Click **Next**

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- ___ 9. From 'FTP server security credential' screen, enter these:
- ___ a. Select the radio button next to **Using user name and password**
 - 1) User name: **username using which you connect to your FTP server** (for Ex: wsbeta)
 - 2) Password: **password for the above user to connect to your FTP server**

New Outbound FTP Service

FTP server security credential
Specify the FTP server security credential.

How do you want to specify the FTP server security credential?

Using an existing JAAS alias (recommended)
Java Authentication and Authorization Services (JAAS) alias is the recommended way for specifying security credentials.
J2C authentication data entry:

Using user name and password
The user name and password will not be encrypted and will be stored as plain text.

User name:

Password:

- ___ b. Click **Next**
- ___ 10. From Output file name screen, enter these:
- ___ a. Select the radio button next to Generate a file name with an appended sequence number
 - 1) Accept the default File name, **Customer.txt**
 - 2) For Directory, click on **Browse...** and navigate to select **<LOCAL_DIR>**
 - 3) Accept the default value **Customer.seq** for Sequence file name

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Note: If you select 'Generate a file name with and appended sequence number', the adapter will not generate the wrapper business object, instead uses the File name and Directory entered in this screen.

New Outbound FTP Service

Output file name
Specify the method for naming the output file.

How should the output file be named?

Generate a file name with an appended sequence number

File name:

Specify the sequence file that the adapter will create and use to store the sequence number

Directory:

Sequence file name:

Use FTP server to generate a file name

Use a wrapper business object to specify the output file name
Generated wrapper business object: CustomerWrapper

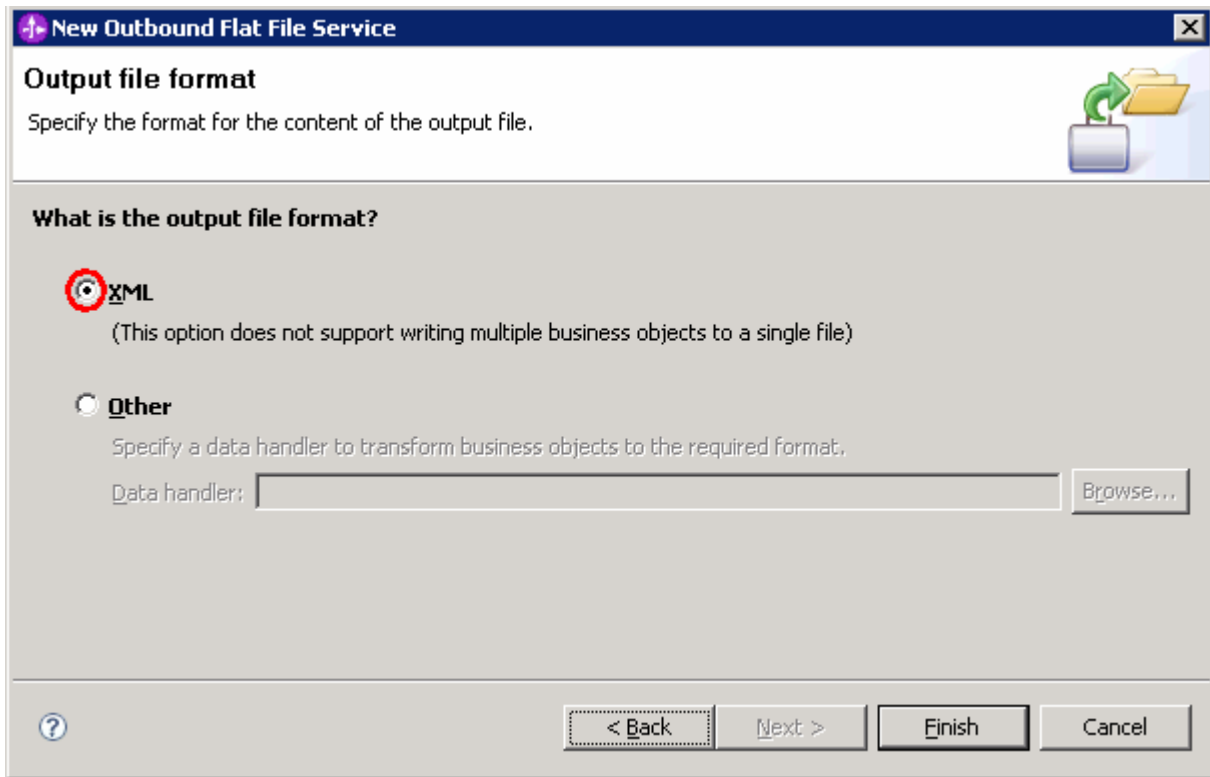
Add an append operation for writing multiple business objects to a single file

___ b. Click **Next**

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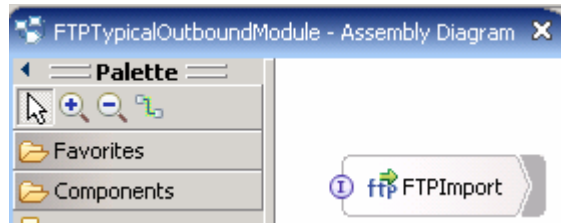
___ 11. From the Output file format screen, enter these:

___ a. Select the radio button next to **XML**



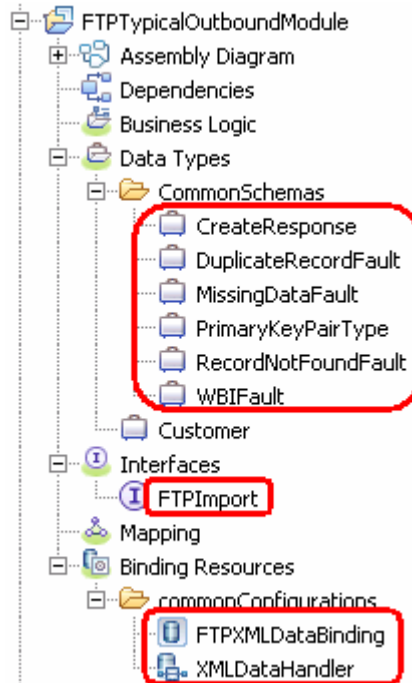
___ b. Click **Finish**

___ 12. Save (**Ctrl + S**) changes to your assembly diagram



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13. Review the FTPTypicalOutboundModule and the generated artifacts: The generated **Data Types**, **Interface**, Function selector (**XMLDataHandler**) and Data binding (**FTPXMLDataBinding**) under Configured Resources can be found under FTPTypicalOutboundModule. You can open each of these generated artifacts, business objects and review the properties inside.



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6.2. Test typical pattern scenario

In this part of the lab, you will use the WebSphere Process Server Test Environment to test the SCA application Outbound processing for the typical pattern with input file having single business object.

- ___ 1. Add the project to the WebSphere Test Environment server
 - ___ a. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. From the Add and Remove Projects window, select **FTPTypicalOutboundModuleApp** under Available projects panel and click **Add >**
 - ___ c. You will now see the **FTPTypicalOutboundModuleApp** added to the **Configured projects**
 - ___ d. Click **Finish** and wait until the project is being published onto the server. The server is started in Debug mode if it is not already started before

Wait for the project to be published to the server.

- ___ 2. Open the test client for the module
 - ___ a. From the Business Integration perspective, right-click on the **FTPTypicalOutboundModule** and select **Test > Test Module**
- ___ 3. The **FTPTypicalOutboundModule_Test** window is opened in the Assembly editor
- ___ 4. Under **Detailed Properties**:
 - ___ a. Note the value for Operation, **create**

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__ b. Fill out the fields for Initial request parameter:

- 1) CustomerName: ABC
- 2) Address: 11501 Burnet Rd
- 3) City: Austin
- 4) State: TX

► **General Properties**

▼ **Detailed Properties**

Configuration: Default Module Test

Module: FTPTypicalOutboundModule

Component: FTPImport

Interface: FTPImport

Operation: **create**

Invoke export using binding

Initial request parameters

Name	Type	Value
createInput	Customer	✓
CustomerName	string	✓ ABC
Address	string	✓ 11501 Burnet Rd
City	string	✓ Austin
State	string	✓ TX

__ c. Click **Continue** button under Events

__ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v6.1** and click **Finish**

__ e. You should see a window similar to this, which contains the data you just entered in the previous steps:

Events

- Invoke (FTPImport:create)
- Invoke started
- Invoke (FTPImport:create)
- Return (FTPImport:create)**
- Invoke returned

► **General Properties**

▼ **Detailed Properties**

Module: [FTPTypicalOutboundModule](#)

Component: [FTPImport](#)

Interface: [FTPImport](#)

Operation: [create](#)

Return parameters:

Name	Type	Value
createOutput	CreateResponse	✓
Filename	string	✓ Customer.1.txt

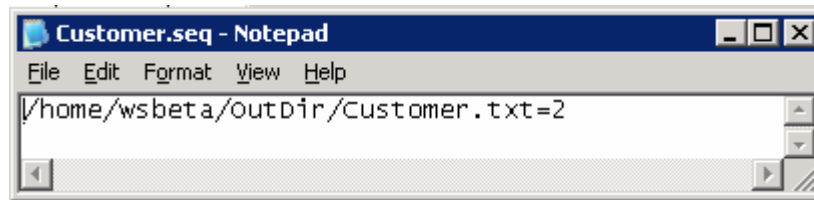
Note: Since you have specified a Sequence File name while running the external service wizard, the file name is created with '1' appended to it.

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- ___ 5. Verify the created file and its contents
- ___ a. Open Windows Explorer and browse to the subdirectory <OUT_DIR>
 - ___ b. You will see a new file, **Customer.1.txt** created under that directory. Open the file and you should see the content that was entered:

```
<?xml version="1.0" encoding="UTF-8"?>
<p:Customer xsi:type="b:Customer"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:p="http://www.ibm.com/xmlns/
prod/websphere/i2ca/ftp/customer">
  <CustomerName>ABC</CustomerName>
  <Address>11501 Burnet Rd</Address>
  <City>Austin</City>
  <State>TX</State>
</p:Customer>
~
~
~
~
~
```

- ___ 6. Now using windows explorer, navigate to <LOCAL_DIR> and you should see **Customer.seq** file created. Open this file using a note pad (or word pad) and you should see this content:



The adapters makes an entry in this Sequence file for each file created and if the same file is created again, then it updates the entry for that particular file by increasing the number at the end of that entry.

- ___ 7. Restore the Sever Configuration
- ___ a. Right-click on **WebSphere Process Server v6.1** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. Select **FTPTypicalOutboundModuleApp** under Configured projects and click < Remove
 - ___ c. Click **Finish** after you see the application moved to Available projects. Wait until the application is being unpublished

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What you did in this exercise

In this lab, you imported the FTP Adapter RAR file into your WebSphere Integration Developer workspace and integrated it into an SCA application that creates a file to the file system. Next, you made use of the external service wizard available in WebSphere Integration Developer to specify Activation Spec Properties, define Data binding, Data handler, and Operations which, after deploying onto the server, will generate Business Objects and other artifacts for different scenarios.

At the end of each part, you deployed and then tested the adapter application for these scenarios - pass-through test scenario (create, append, list, retrieve, ExecuteFTPScript Operations), content specific or non pass through test scenario (create, append, and retrieve operations), using all defaults (default data binding) scenario (create operation), and then finally using the typical pattern (create operation).

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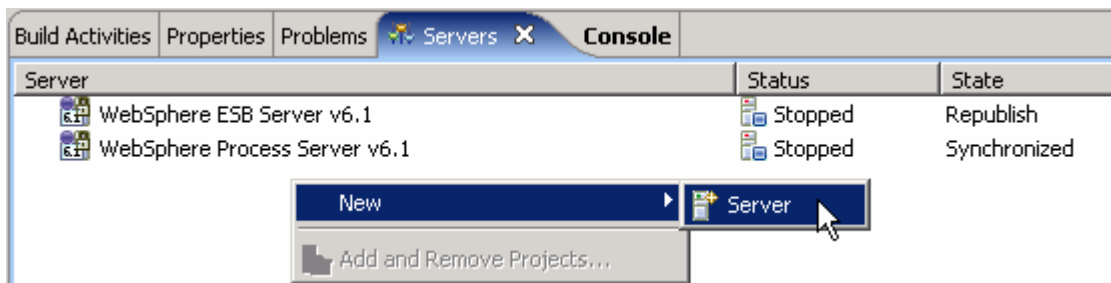
Task: Adding remote server to WebSphere Integration Developer test environment

This task describes how to add a remote server to the WebSphere Integration Developer test environment. This example uses a z/OS machine.

Create a new remote server.

___ 1. Right click on the background of the Servers view to access the pop-up menu.

___ a. Select **New > Server**

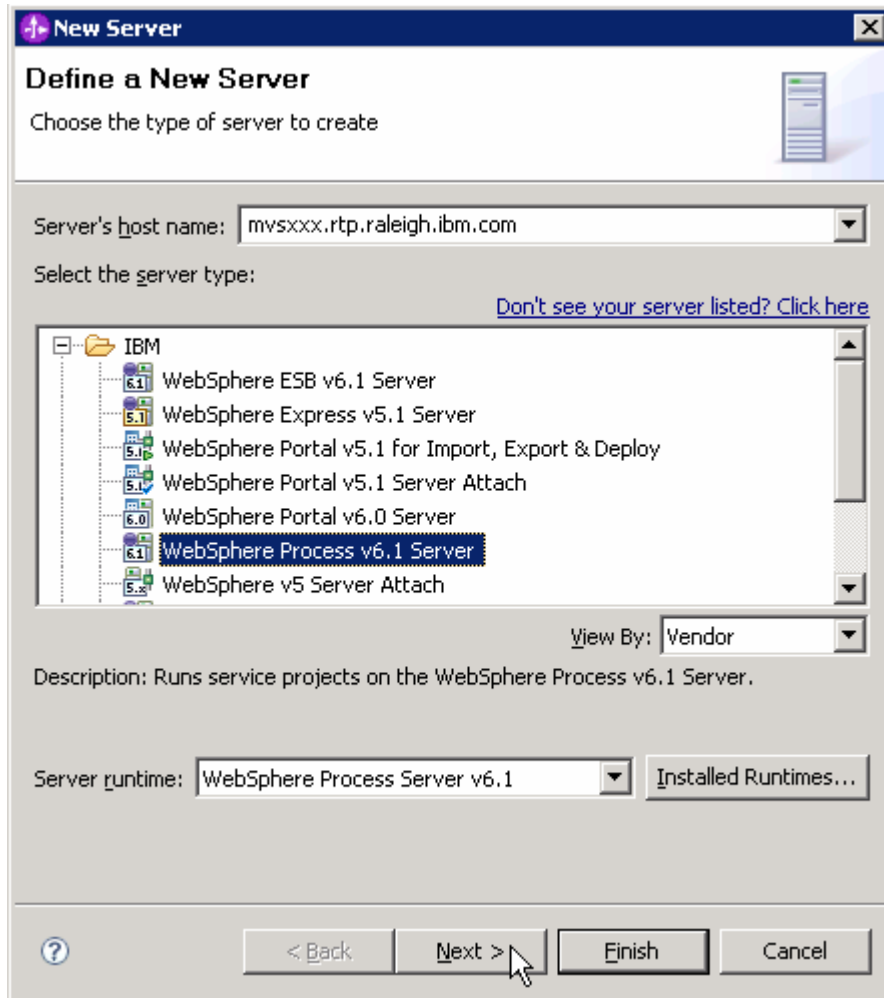


___ 2. Enter these from New Server window:

___ a. In the New Server dialog, specify the remote server's host name, **<HOSTNAME>**

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- ___ b. Ensure that the appropriate server type, **'WebSphere Process v6.1 Server'** or **'WebSphere ESB v6.1 Server'**, is highlighted in the server type list



- ___ c. Click **Next**.

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3. On the WebSphere Server Settings page, leave the radio button for **SOAP** selected, changing the **SOAP connector port** to the correct setting (<SOAP_PORT>). If security is on in your server, check the box for 'Security is enabled on this server' and input <USERID> for the user ID and <PASSWORD> for the password.

New Server

WebSphere Server Settings
Input settings for the new WebSphere server.

WebSphere profile name:

Server connection type and admin port

RMI (Designed to improve communication with the server)
ORB bootstrap port:

SOAP (Designed to be more firewall compatible)
SOAP connector port:

Run server with resources within the workspace

Security is enabled on this server

Current active authentication settings:

User ID:

Password:

Server name:

Server type

BASE, Express or unmanaged Network Deployment server

Network Deployment server

Network Deployment server name:

The server name is in the form of:
<cell name>/<node name>/<server name>
For example, localhost/localhost/server1. In a cluster environment,
the server name is in the form of:
<cell name>/<cluster name>

Click this button to detect the server type.

- a. Click **Finish**.

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- ___ 4. The new server should be seen in the Server view.

Server	Status	State
WebSphere ESB Server v6.1	Stopped	Republish
WebSphere Process Server v6.1	Stopped	Synchronized
WebSphere Process v6.1 Server @ mvsxxx.rtp.raleigh.ibm.com	Stopped	Republish

- ___ 5. Start the remote server if it is not already started.

Note: WebSphere Integration Developer V6.1 does not support starting remote servers from the Server View. So, you should start the remote server from the remote machine where the server is installed.

- ___ a. From a command prompt, telnet to the remote system if needed (for z/OS or i5/OS):

'telnet <HOSTNAME> <TELNET_PORT>'

user ID : <USERID>

password : <PASSWORD>

- ___ b. Navigate to the bin directory for the profile being used:

cd <WAS_HOME>/profiles/<PROFILE_NAME>/bin

- ___ c. Run the command file to start the server: **./startServer.sh <SERVER_NAME>**

- ___ d. Wait for status message indicating server has started:

```
ADMU3200I: Server launched. Waiting for initialization status
ADMU3000I: Server cllsr01 open for e-business; process id is 00000120000000002
```

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