

IBM WEBSPHERE ADAPTER 7.0 – 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

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Integration Developer, and integrate it with an SCA application that processes outbound requests to the file system.

Lab requirements

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

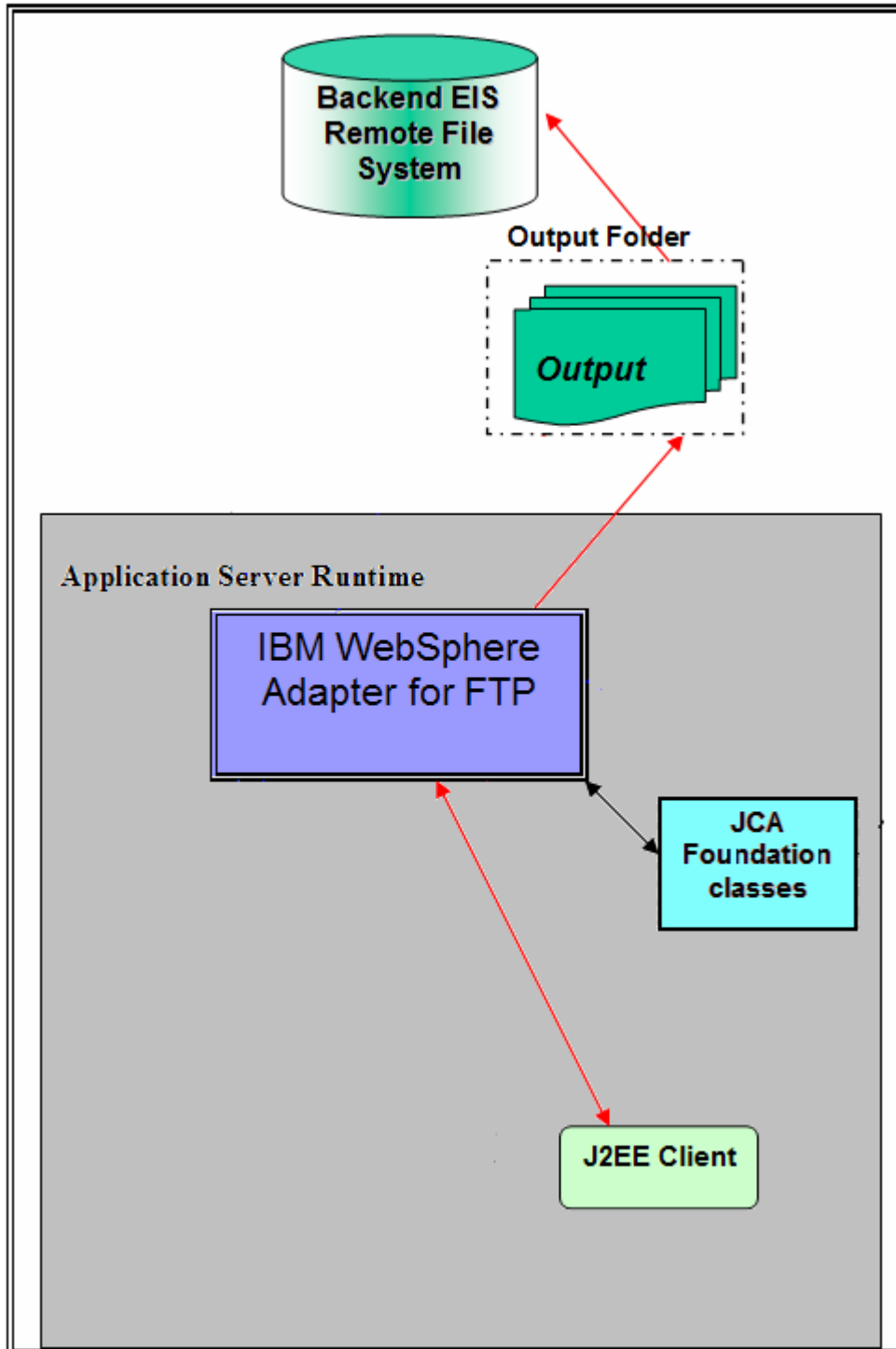
- WebSphere Integration Developer V7.0 installed and updated with latest fixes
- WebSphere Process Server V7.0 test environment installed and updated with latest fixes
- FTP server installed and configured
- Extract Labfiles70.zip to your C:\ (your root) drive

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\WID70	
<WPS_HOME>	C:\<WID_HOME>\runtimes\bi_v70	
<FTPADAPTER_HOME>	<WID_HOME>\ResourceAdapters\FTP_7.0.0.0\deploy	
<LAB_FILES>	C:\Labfiles70	/tmp/Labfiles70
<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:\Labfiles70\ with C:/Labfiles70/.

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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 table below 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	

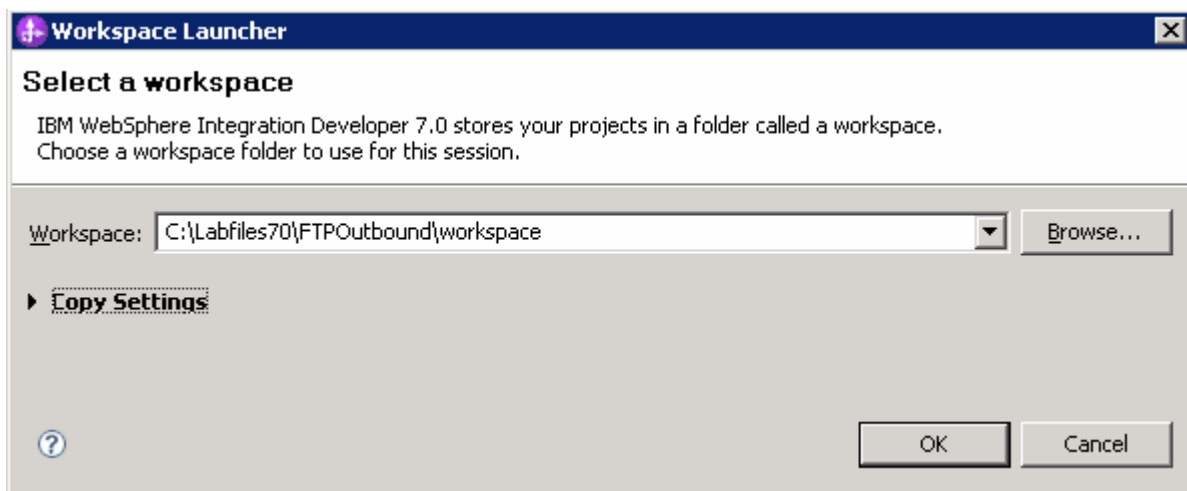
Instructions for using a remote testing environment, such as z/OS, AIX or Solaris, can be found at the end of this document, in the section [“Task: Adding remote server to WebSphere Integration Developer test environment”](#).


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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 V7.0 with a new workspace and extract the lab files to your local system.

- ___ 1. Extract the provided Labfiles70.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 V7.0 with a new workspace
 - ___ a. Select **Start > All Programs > IBM WebSphere Integration Developer > IBM WebSphere Integration Developer V7.0 > WebSphere Integration Developer V7.0**
 - ___ b. From the Workspace Launcher window, enter **<WORKSPACE>** for the Workspace field



- ___ 3. Click 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 of the properties that are used in this lab at various stages.

- **New in V7.0: FTPS Connection mode:** Specify the connection mode (Implicit or Explicit) to define the data protection level with which the data is transferred between the client and the server can be configured.
 - **Explicit** – In an explicit mode, the connection begins with an unencrypted FTP connection. When any sensitive information such as password needs to be sent, the client explicitly issues a request to switch to a secure FTP connection. After the successful SSL negotiation, a secure command channel is established between the client and the server. Explicit mode works with the default port 21 and is compliant with RFC 2228 commands. RFC 2228 specifies the mechanism for authenticating connections and confidential data transfer between the client and the server and this is referred as explicit mode. The AUTH command is used for specifying the security mechanism for the explicit mode. The client sends AUTH command (AUTH SSL/TLS) to the FTPS server and switches to a secure command connection.
 - **Implicit** – In an implicit mode, the communication between the client and server is setup immediately in secure mode. The text information exchanged between the client and server is in an encrypted form. The default port for implicit mode is 990.
- **New in V7.0: Data channel protection level:**
 - **Private** – Data is transferred in encrypted form: Select Private, if the data transfer between the Adapter and the FTPS server should be in an encrypted form
 - **Clear** – Data is transferred as clear text: Select Clear, if the data transfer between the Adapter and the FTPS server should be in clear text form

Note: The default value is set to **Private**

Note: Server authentication can be enabled while establishing a SSL connection. While using SSL, FTPS server sends its certificate to the FTP client for verification. The FTP client verifies the certificate to ascertain that it is communicating with the intended FTP server. To enable this verification process, the FTP server's certificate should be present in the client's trust store. Following three properties are used for this server authentication.

- **New in V7.0: Keystore type:** Specify type of the keystore
 - JKS
 - PKCS12

Note: Use keytool utility, if you want to import server's certificate into client's trust store. For example, enter the command `keytool -import -v -alias serverCert -file server.cert -keystore clientTrustStore` where `server.cert` is the certificate of the server and `clientTrustStore` is the trust store of the client. Ensure that the value of Keystore type property is same as the type used while creating the keystore.

- **New in V7.0: Truststore file*:** Specify the path of the truststore file that contains the certificates of the servers trusted by the adapter
- **New in V7.0: Truststore password:** Specify the password of the truststore. It is used to check the integrity of the truststore data. If the value is not specified, the integrity check is not performed. It is applicable only if the protocol value is set to FTP over SSL or FTP over TLS

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Note: Client authentication can be enabled while establishing a SSL connection. When using SSL/TLS, FTPS server requests for the client's certificate. The FTPS server verifies the certificate sent by the client to ascertain that it is communicating with the intended client. To enable this verification process, the FTPS server has to support client authentication and the client's certificate should be present at the server's trust store. At the client's end, client's keystore information has to be available for the exchange of the certificate to take place. Following three properties are used for this client authentication along with the Keystore type.

- **New in V7.0: Keystore file:** Specify the path of the keystore file. The keystore file will contain the private key entry of the FTPS client. It is also accompanied by a certificate chain for the corresponding public key
 - **New in V7.0: Keystore password:** Specify the password of the keystore. It is used to check the integrity of the keystore data. If the value is not specified, integrity check is not executed. It is applicable only if the protocol value is set to FTP over SSL or FTP over TLS
 - **New in V7.0: Key password:** Set the Key password to the password provided while creating the key in the keystore. This value is required to extract the certificate from the keystore while establishing a SSL connection.
-

Note: All these properties are applicable only if the protocol value is set to FTP over SSL or FTP over TLS

- **New In V7.0: Enable remote verification:** It checks whether the control and data connections are established with the same host (typically the machine from which you establish a connection to the FTP server). If not, the connection fails. By default, **Enable remote verification** check box is selected. This property is applicable to only FTP and FTPS protocols.
- **Sequence File:** For each request, the adapter increments the number in the sequence file and the input type takes the sequence number that is currently stored in the sequence file. Sequence numbers are not maintained separately for different input data types.

For compatibility with sequence files generated with previous versions of the adapter, where sequence numbers were maintained separately for different input data types, the adapter checks for all entries in the file that have the older format (<dirPath>/xyz.txt = 2, where xyz.txt is the file name and 2 is the sequence number to be used when the adapter receives another Create request on the same file). The adapter searches for all such sequence numbers for each input type and uses the highest sequence number as the sequence number for the next input type. The adapter then overwrites the entire file with the new (incremented) sequence number.

Important: Unless they are part of a cluster, two adapter instances should not access the same sequence file, because this can result in delayed processing of batch requests.

If the sequence file is deleted manually, the sequences are 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.

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- **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
- **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.

- **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.

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.

- **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.

- **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.

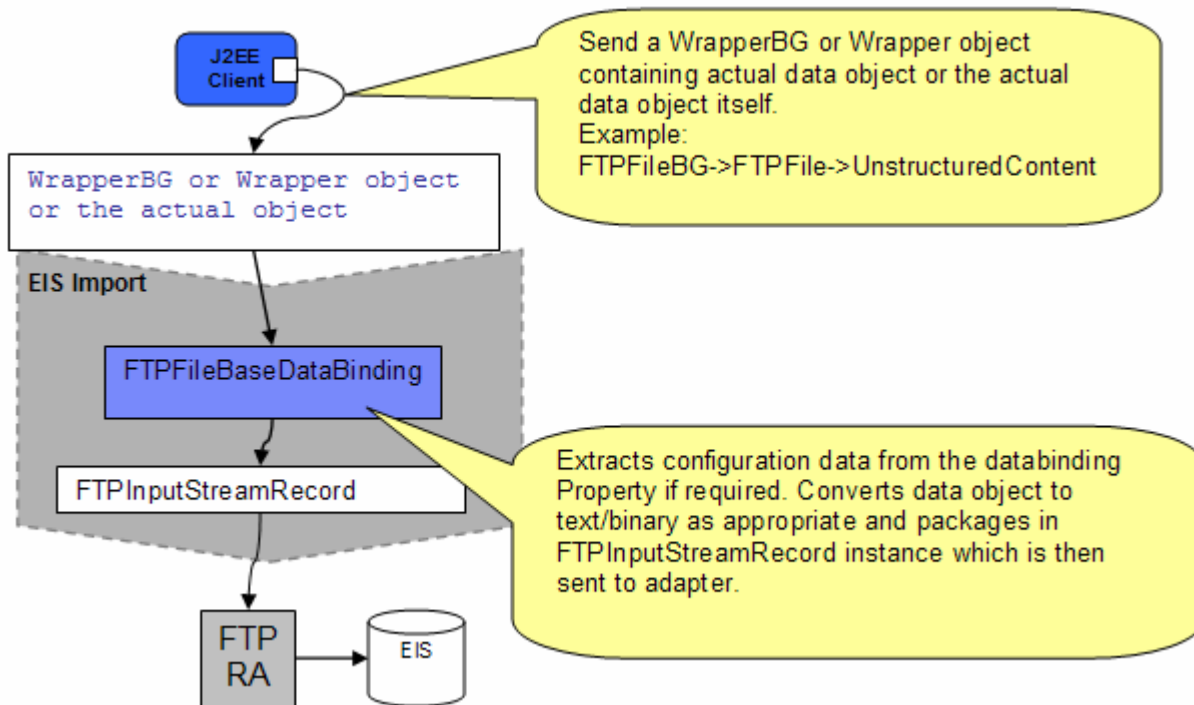
If splitFunctionClassName is set to com. ibm.j2ca.utils.filesplit.SplitBySize, then splitCriteria must contain a valid number which represents the size in bytes. If retrieved file size is greater than this value, it is split into chunks of this value and so many chunks are posted. If file size is less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

- **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.
- **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.

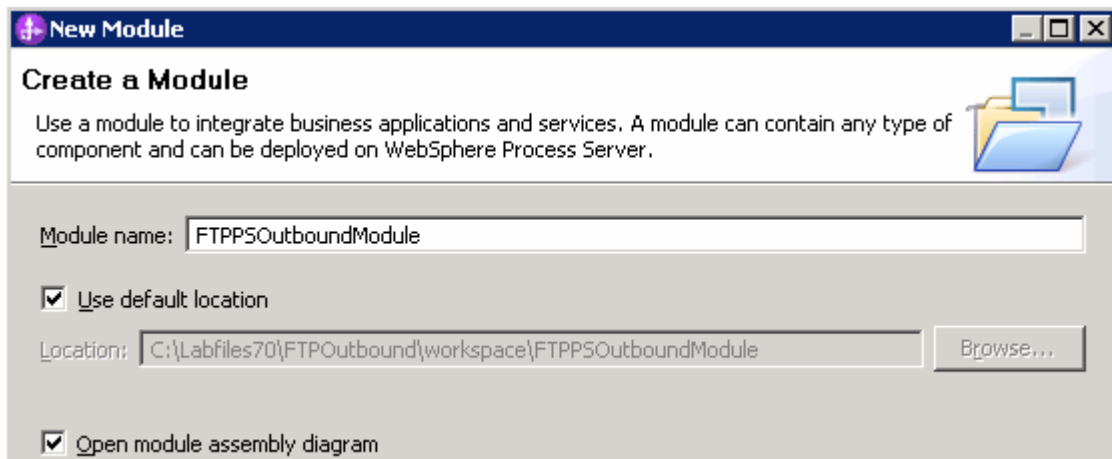
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3.1. Configure pass through using the external service wizard

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

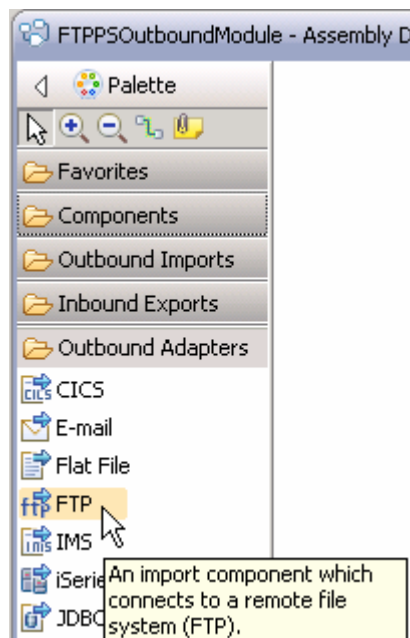
- ___ a. From the Business Integration window, right-click and select **New > Module**
- ___ b. From the New Module window, enter **FTPPSOutboundModule** for the Module Name
- ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**



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

___ 2. To start the external service from the Palette:

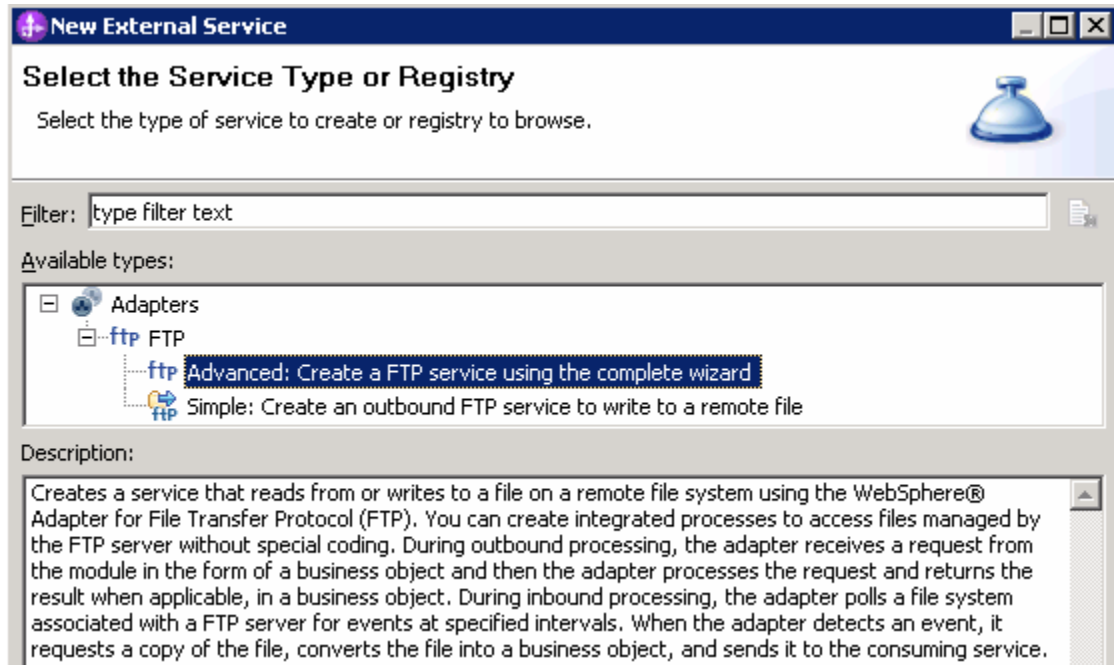
- ___ a. From the **Palette** on the left side of Assembly Diagram, click **Outbound Adapters**:



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

___ 3. From the New External Service window, expand **Adapters > FTP** and select **Advanced: Create a FTP service using the complete wizard**



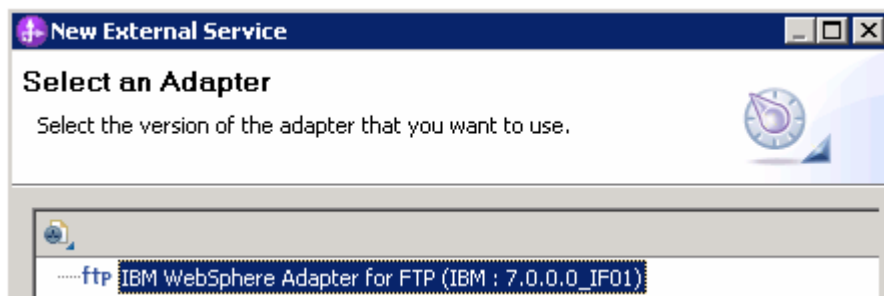
___ a. Click **Next**

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.

Select the **Adapters > FTP** and click **Next**

___ 4. On the Select an Adapter screen, select **IBM WebSphere Adapter for FTP (IBM : 7.0.0.0_IF01)** and click **Next**

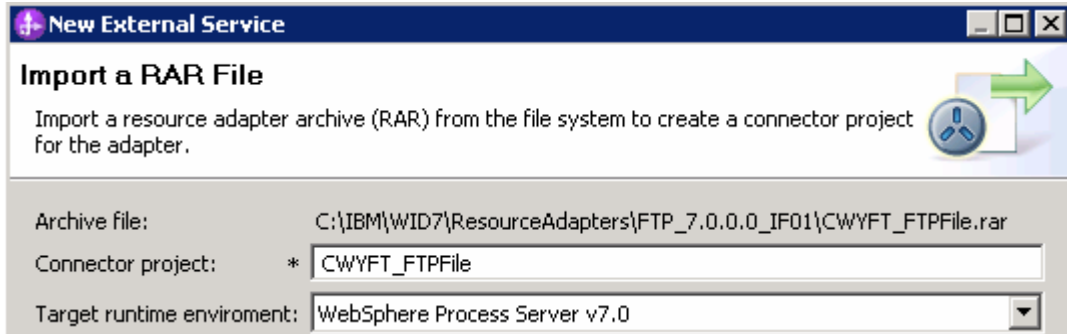


___ 5. Adapter Import screen:

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>**.

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- ___ 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 v7.0** is selected



- ___ d. Click **Next**

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. Alternatively, you can also replace the absolute directory path with WebSphere variables for the Event directory, Archive directory. Refer to '**FTP adapter – Processing COBOL copy book files lab**' for more details on this new feature introduced in V6.2.

- 3) Protocol: **FTP - file transfer protocol** (default)

Note: Refer to '**Install and configure SSH server**' for more details on **SFTP – secure shell(SSH) file transfer protocol**.

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

The screenshot shows the configuration interface for the FTP system connection. The 'Deploy connector project' is set to 'With module for use by single application'. The 'Connection settings' are set to 'Use properties below'. Under 'Connection properties', the 'FTP system connection information' section is expanded. The 'Host name' is 'wsbeta149.austin.ibm.com', the 'Directory' is '/root/Desktop/OutDir', the 'Protocol' is 'FTP (File Transfer Protocol)', and the 'Port number' is '21'. Red boxes highlight the host name and directory, and red arrows point to the protocol and port number.

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

The screenshot shows the 'Advanced' configuration panel. The panel is titled '<< Advanced' and contains several expandable sections: 'Additional configuration', 'Socks proxy server connection information', 'Second FTP system connection information', 'Secure configuration', 'Logging and tracing', and 'Bidi properties'. Each section has a right-pointing arrow next to it, indicating it can be expanded.

Note: Refer to Review Properties part of this lab for the detailed explanation of all the properties displayed in this screen.

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___ d. Click **Additional configuration**

- 1) Click **Browse...** next to **Sequence file** and enter any location. For ex: **<LABFILES>\FTPOutbound\SequenceFile.txt**. This file should already be created at the specified location

Additional configuration

Enable remote verification

Maximum retries on connection failure:

Connection retry interval (in milliseconds):

Encoding used by FTP server:

The staging directory is used to store files temporarily to avoid write conflicts.

Staging directory:

Default target file name:

To add sequence numbers to target file names, specify the location of a sequence file.

Sequence file:

Populate the fully qualified class name of the custom parser that is used to parse the "ls -l" output. This is used only when the "ls -l" output deviates from standard output.

Custom parser class name:

7. **Secure configuration:** Refer to the 'Install and configure SSH server lab' and 'FTP Adapter – SFTP support lab' for more details on how to use Private key file for SFTP server

Secure configuration

Enable remote server authentication for SFTP protocol

Host key file:

Private key file:

Passphrase:

FTPS connection mode:

Data channel protection level:

Keystore type:

Truststore file:

Truststore password:

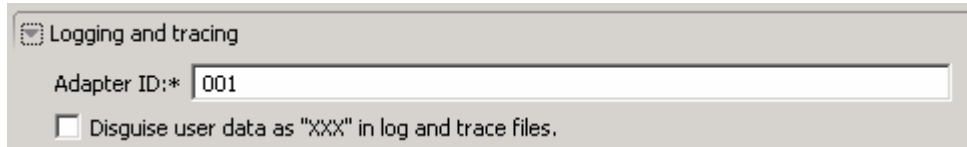
Keystore file:

Keystore password:

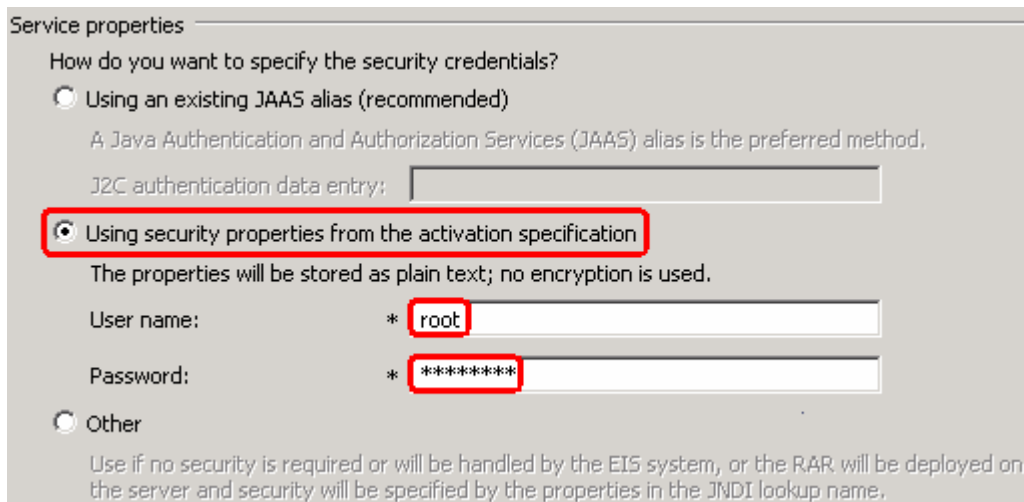
Key password:

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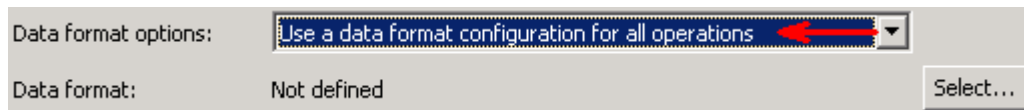
- ___ 8. **Logging and tracing:** Refer to the new lab ‘**Log and confidential trace lab**’ for more details on this new feature



- ___ 9. For this lab, you are going to use the security properties from the activation specification.
- ___ a. Select the check box next to **Using security properties from the activation specification**
 - ___ b. **User name:** username using which you connect to your FTP server (for Ex: **root**)
 - ___ c. **Password:** password for the user to connect to your FTP server

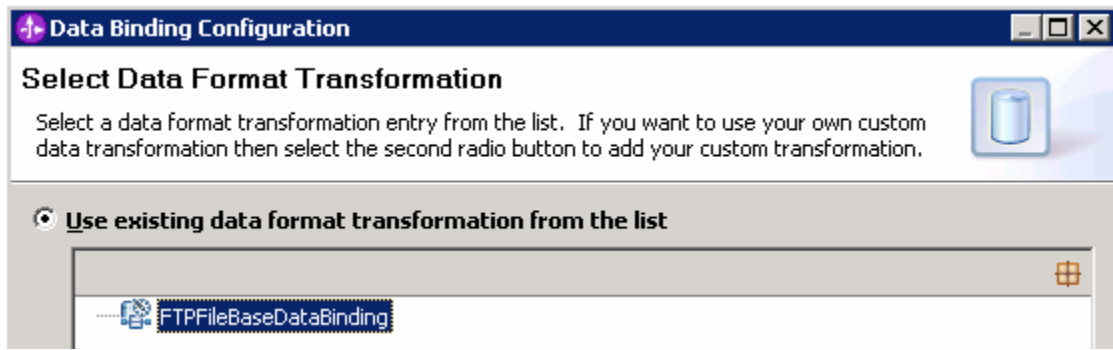


- ___ 10. You can define data binding in two places - service level (current screen of the external service wizard) or later at the method level (Operations screen of the external service wizard). In this lab, you will define data binding at the service level (from this screen)
- ___ a. From the dropdown menu next to Data format options, select ‘**Use a data binding configuration for all operations**’



- ___ b. Click **Select...** next to **Data format**. A Binding Resource Configuration window is opened
- ___ c. Select the radio button for ‘**Use existing data format transformation from the list**’ and then select **FTPFileBaseDataBinding**

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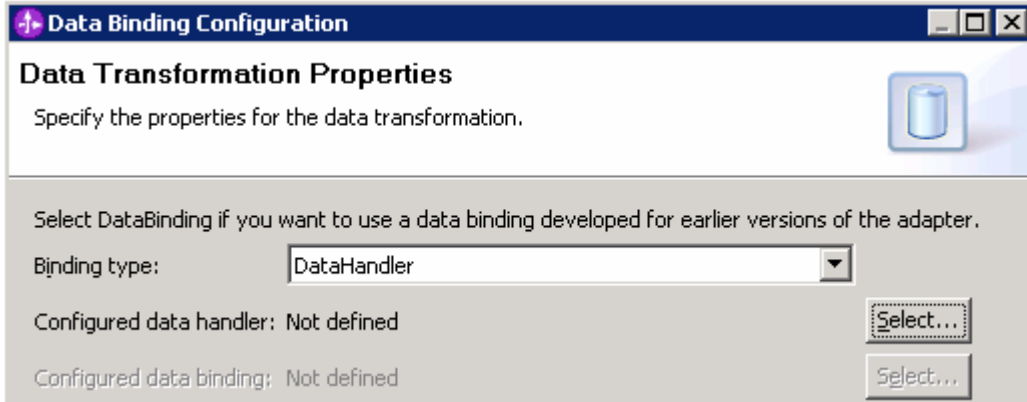


___ d. Click **Next**

Note: Data Handler Configuration: Since you are doing the pass through scenario, you do not need to configure any data handler.

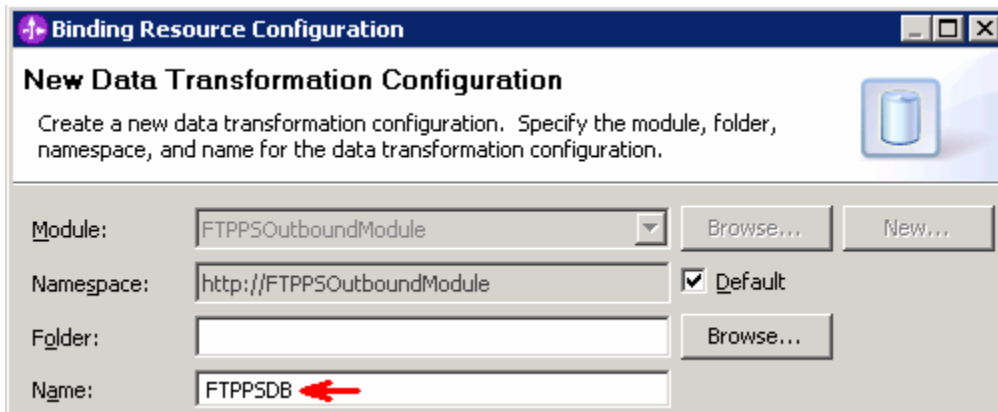
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__ e. Click **Next** from the Data Transformation Properties screen



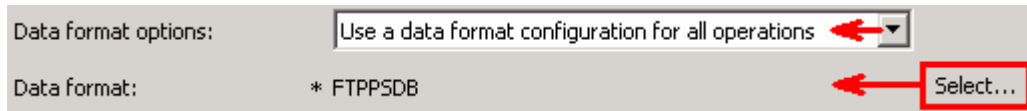
__ f. Note that the selected module is **FTPPSOutboundModule**

1) For the **Name**, enter **FTPPSDB**



2) Click **Finish**

__ g. Now the **FTPPSDB** should be displayed for Data binding configuration



___ 11. Check the box next to **Change the 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**

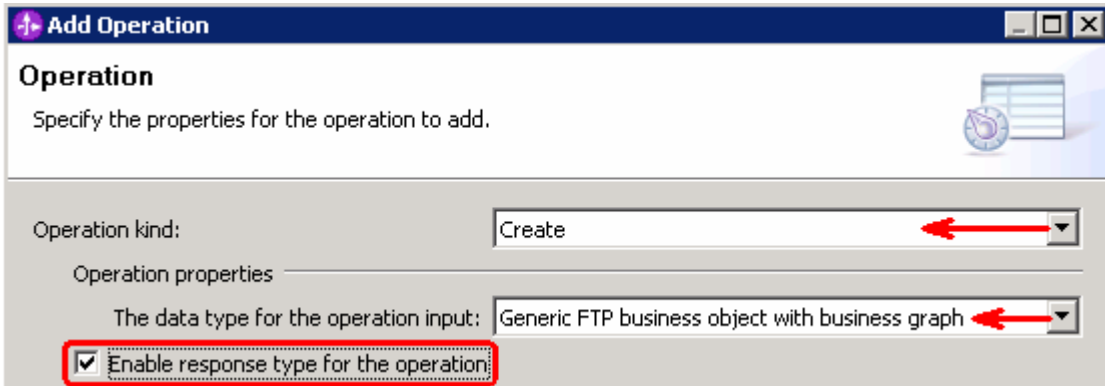
Define Operations: In this screen, you will add the required operations that is supported by the adapter functions on the remote file system

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.**

IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

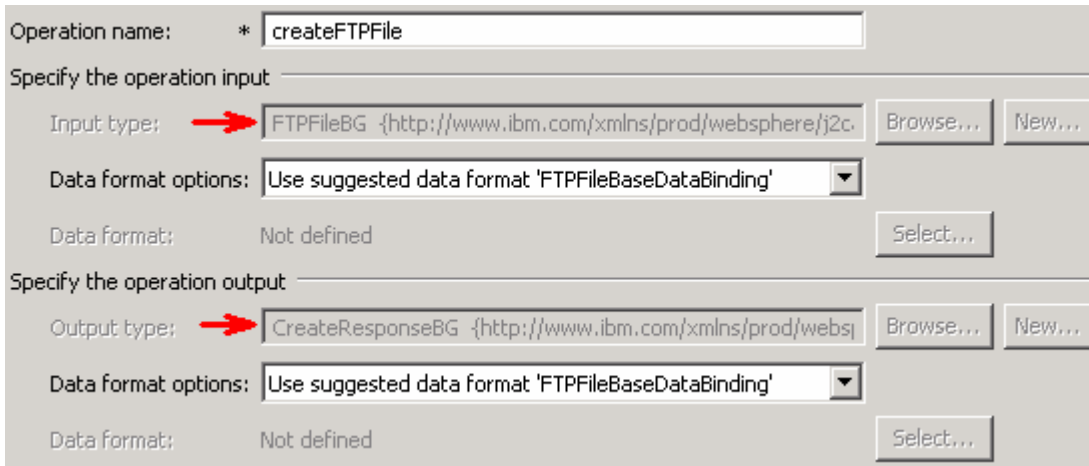
Define Operation: createFTPBG

- ___ 12. Click **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 **'Enable response type for the operation'**



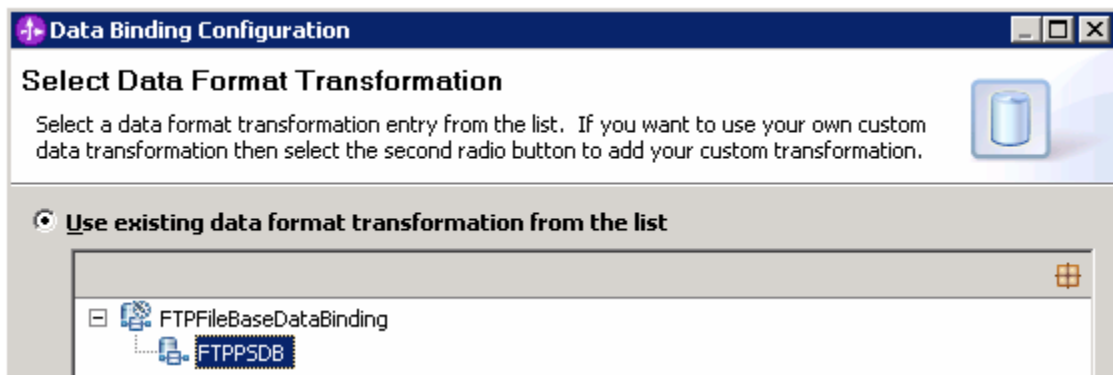
- ___ d. Click **Next**

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**



- ___ e. For Operation name, enter **createFTPBG**
- Define Data format for **input**:
 - ___ f. For **Data format options**, select **Use a data binding configuration** from the dropdown list
 - ___ g. Click **Select...** next to **Data format**. A Binding Resource Configuration window is opened
 - ___ h. Ensure that the radio button for 'Use existing data format transformation from the list' and then select **FTPFileBaseDataBinding > FTPPSDB**

IBM WEBSHERE ADAPTER 7.0 – LAB EXERCISE

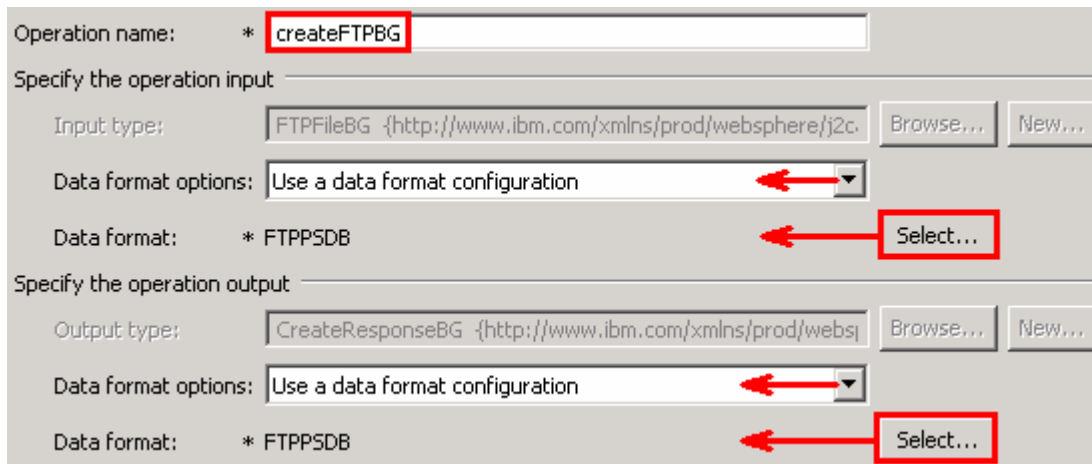


__ i. Click **Finish**

Define Data format for **output**:

__ j. Repeat the steps that you did to define the data format for input and select **FTPPSDB**

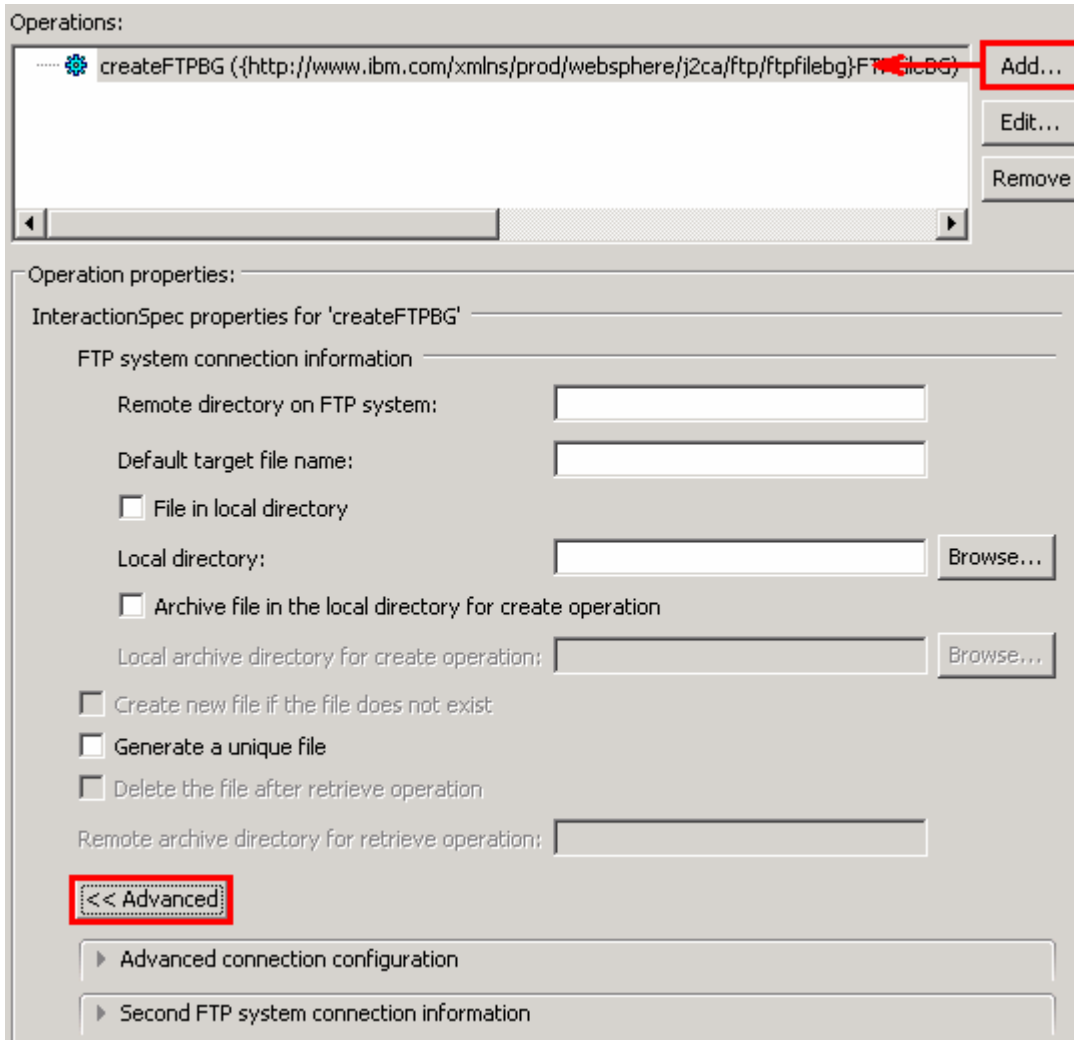
__ k. The Operation screen now should look like this:



__ l. Click **Finish** from the Add Operation window. The operation, createFTPBG, will now be displayed under Operations list

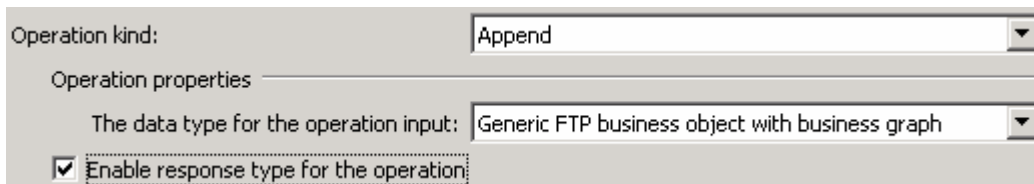
IBM WEBSHERE ADAPTER 7.0 – LAB EXERCISE

- ___ 13. You can click **Advanced >>** under 'InteractionSpec properties for createFTPBG' to review the properties available at Interaction spec level



Define Operation: appendFTPBG

- ___ 14. Click **Add...** to open Add Operation window
- ___ a. For **Operation kind**, select **Append** 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 '**Enable response type for the operation**'



- ___ d. Click **Next**

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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**

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

Define Data format for **input**:

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

__ g. Click **Select...** next to **Data format**. A Binding Resource Configuration window is opened.

__ h. Ensure that 'Use existing data transformation from the list', select **FTPFileBaseDataBinding > FTPPSDB** and click **Finish**

Define Data format for **output**:

__ i. Repeat the steps you did to define data binding for input and define **FTPPSDB** for output

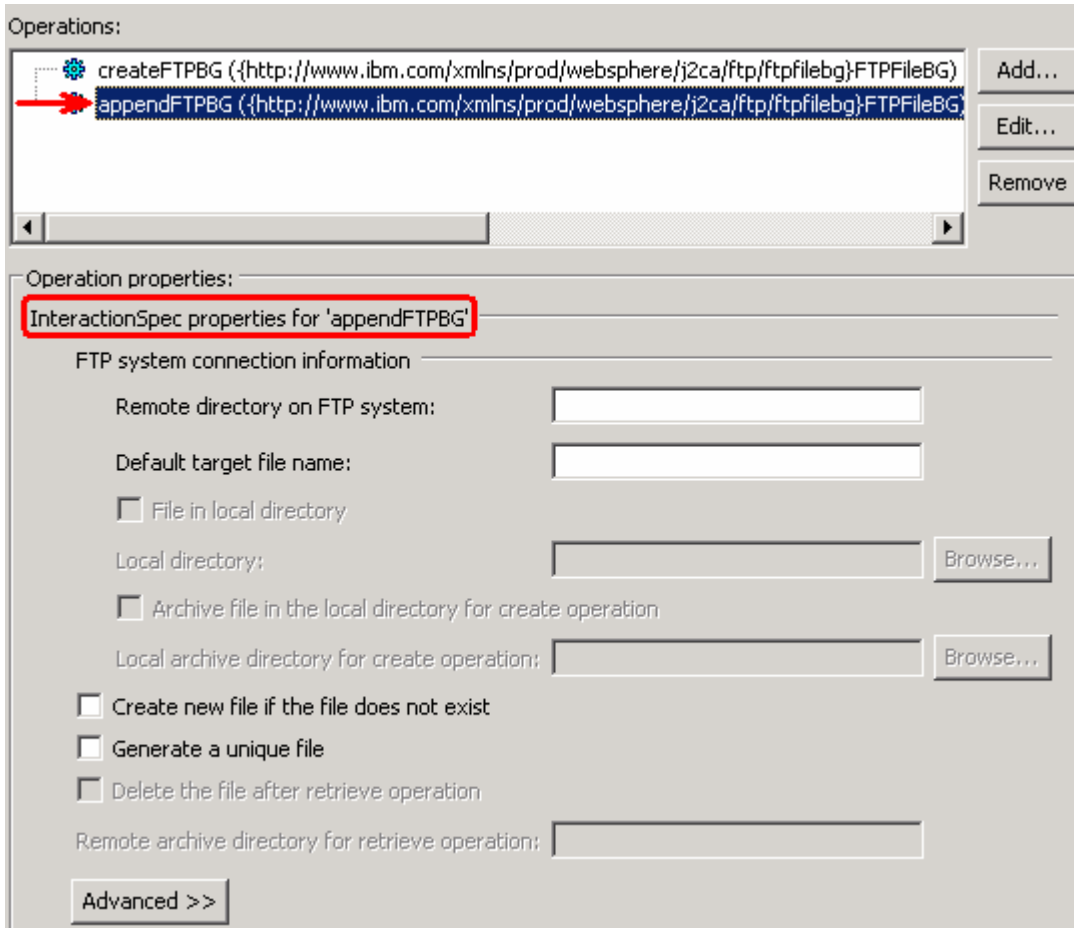
__ j. The Operation screen now should look like this:

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

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

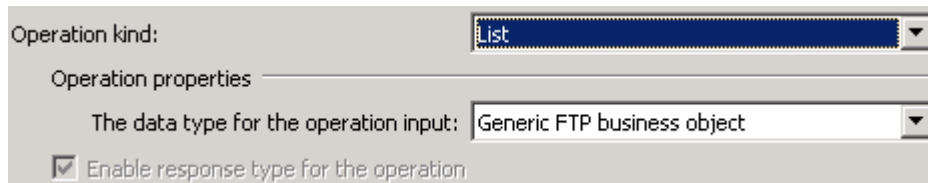
IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

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



Define Operation: listFTP

16. Click **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 '**Enable response type for the operation**' is selected by default



- d. Click **Next**

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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**

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

Define Data format for **input** and **output**:

__ f. Repeat the steps you did for Create or Append operation to define the data format and select **FTPPSDB** for both **input** and **output**

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

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

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

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

Define Operation: retrieveFTP

____ 17. For **Operation kind**, select **Retrieve** from the drop down list

__ a. For **Data type for operation**, select **Generic FTPFile business object** from the drop down list

IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

__ b. Note that the check box for **'Enable response type for the operation'** is selected by default

__ c. 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 FTPFile business object, the **Input type** is **FTPFile** and because the Output required is also selected, the **Output type** is **RetrieveResponseWrapper**. Also note that the Output type can be modified. But, for the pass through scenario, the output type is going to be the default, RetrieveResponseWrapper.

__ d. For Operation name, enter **retrieveFTP**

Define Data format for **input**:

__ e. Repeat the steps you did for Create or Append operation to define the data format and select **FTPPSDB** for both **input**

Define Data format for **output**:

__ f. Accept the default selection, **Use data format configuration 'FTPPSDB'**, from the drop down list

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

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

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

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

Define Operation: executeFTPScript

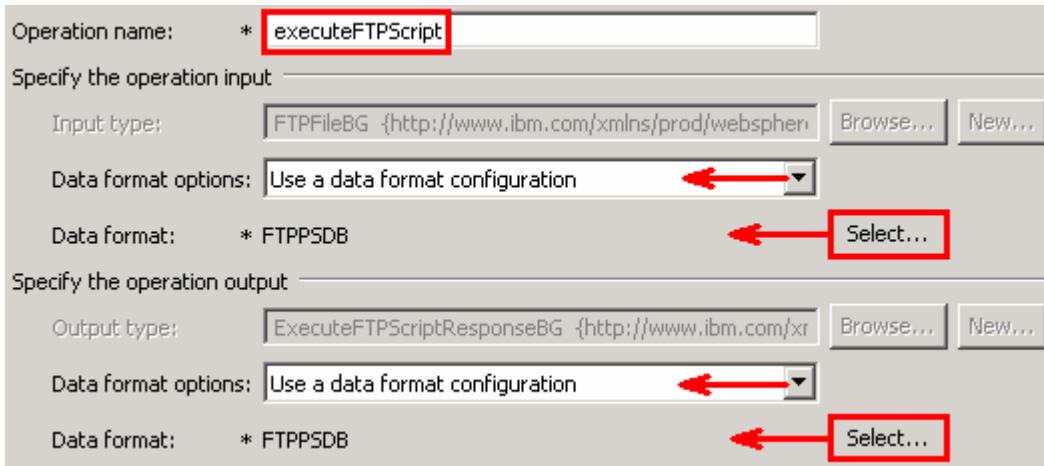
___ 19. Repeat steps under **'Define Operation: appendFTPBG'** (Step 14) of this part to with these inputs:

__ a. Operation kind (Step 14.a): **ExecuteFTPScript**

__ b. Operation name (Step 14.e): **executeFTPScript**

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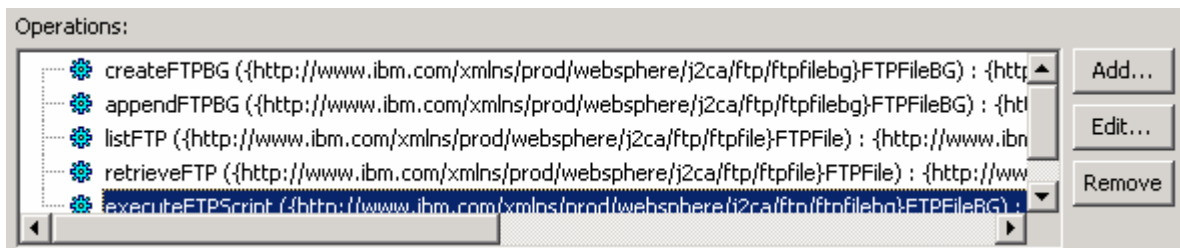
__ c. You should see this:



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

You have now defined four operations:

The operation, executeFTPScript, is now displayed under Operations list. So far, you have defined five operations:

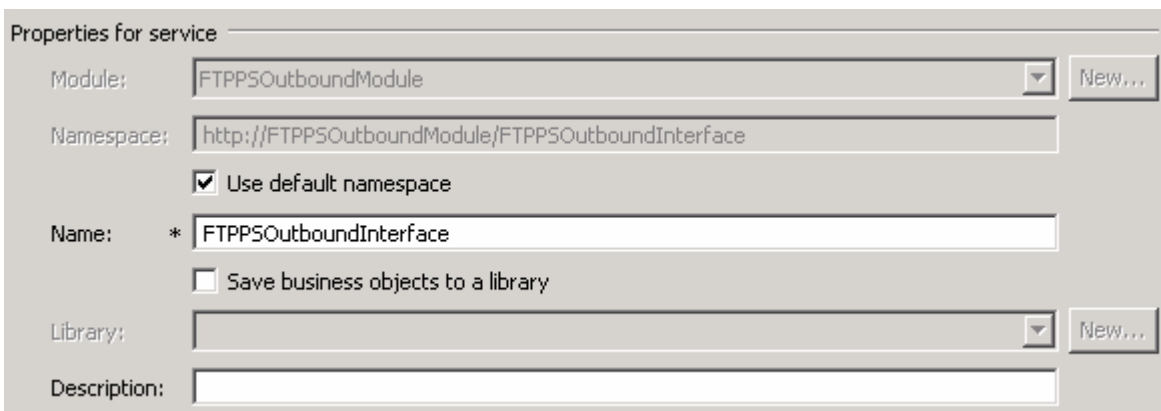


__ e. You can click **Advanced >>** under 'InteractionSpec properties for executeFTPScript' to review the properties available at Interaction spec level

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

___ 20. From the Generate Artifacts screen, enter these:

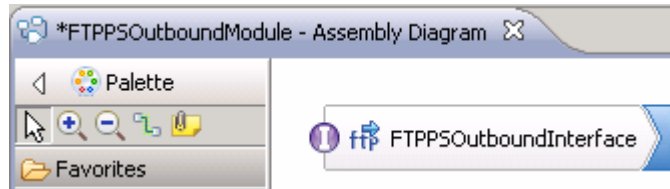
__ a. For **Name**, enter **FTPPSOutboundInterface**



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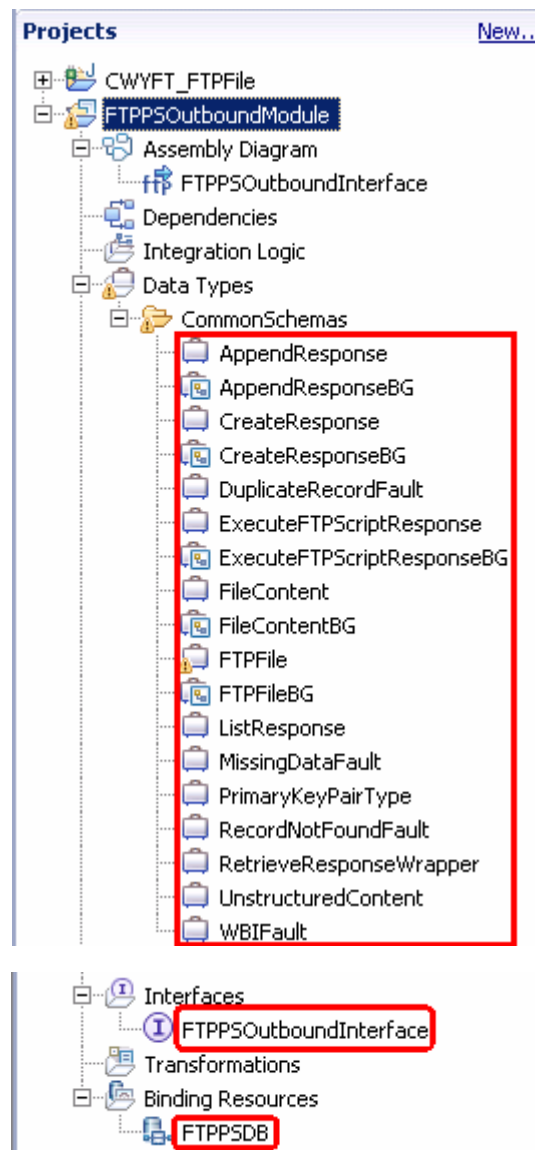
__ b. Click **Finish**

___ 21. 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

___ 22. 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.

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Review the created methods inside the interface:

- ___ a. From the Business Integration view, expand FTPPSOutboundModule > Interfaces and then double-click **FTPSPOutboundInterface** to open it
- ___ b. You should see these five operations:

The screenshot displays the 'Operations and their parameters' section of the FTPPSOutboundInterface. It lists five operations, each with a table of its parameters:

Name	Type
createFTPBG	
Input(s)	createFTPBGInput
Output(s)	createFTPBGOutput
Fault	MISSING_DATA
Fault	WBIFault
Fault	DUPLICATE_RECORD
Fault	RECORD_NOT_FOUND
appendFTPBG	
Input(s)	appendFTPBGInput
Output(s)	appendFTPBGOutput
Fault	MISSING_DATA
Fault	WBIFault
Fault	RECORD_NOT_FOUND
listFTP	
Input(s)	listFTPInput
Output(s)	listFTPOutput
Fault	MISSING_DATA
Fault	WBIFault
Fault	RECORD_NOT_FOUND
retrieveFTP	
Input(s)	retrieveFTPInput
Output(s)	retrieveFTPOutput
Fault	MISSING_DATA
Fault	WBIFault
Fault	RECORD_NOT_FOUND
executeFTPScript	
Input(s)	executeFTPScriptInput
Output(s)	executeFTPScriptOutput
Fault	MISSING_DATA
Fault	WBIFault
Fault	RECORD_NOT_FOUND

- ___ c. Close the interface, FTPPSOutboundInterface

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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 **WebSphere Process Server v7.0** 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 **WebSphere Process Server v7.0** 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 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

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

► **General Properties**

▼ **Detailed Properties**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

Configuration: Default Module Test

Module: FTTPSOutboundModule

Component: FTTPSOutboundInterface

Interface: FTTPSOutboundInterface

Operation: createFTPBG

Initial request parameters:

Value editor XML editor

Name	Type	Value
createFTPBGInput	FTPFileBG	lab
verb	verb<string>	lab CREATE
FTPFile *	FTPFile	lab
DirectoryPath	string	lab
Filename	string	lab PassThroughTest.txt
ChunkInfo	string	lab

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

Content	UnstructuredContent	lab
ContentType	string	lab
ObjectName	string	lab
AsText	string	lab Testing create operation for pass through
AsBinary	hexBinary	lab 00

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

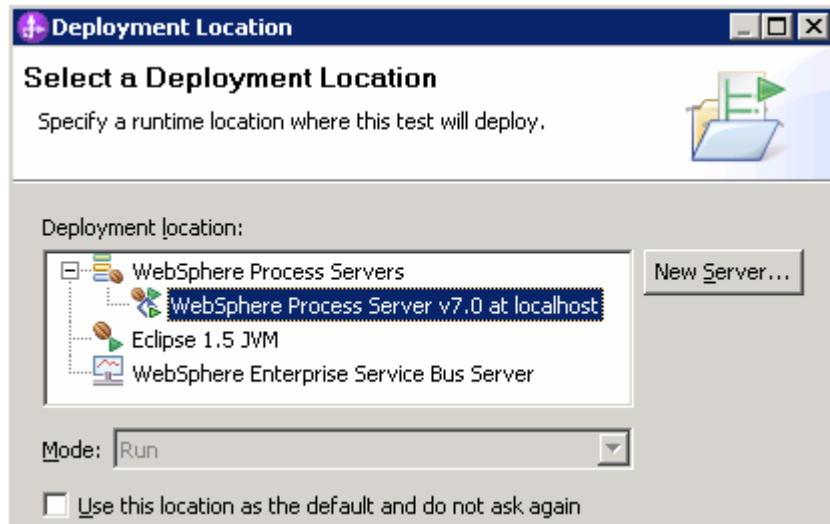
Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



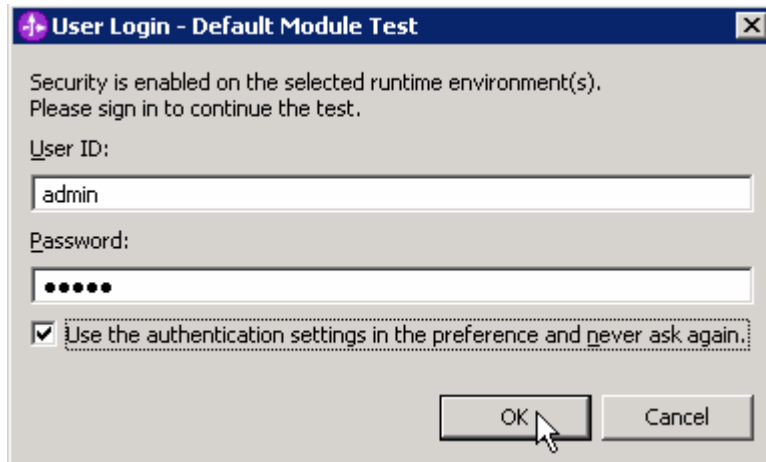
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- ___ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v7.0 at localhost** and click **Finish**



- ___ e. Provide Administrator User ID and Password

- 1) Optionally, select the box 'Use the authentication settings in the preference and never ask again' so that you do not have to enter the credentials next time when you start the test client



- ___ 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 IBM WebSphere Adapter GUI. On the left, the 'Events' pane displays a sequence of events: 'Invoke (FTPPSOutboundInterface:createFTPBG)', 'Invoke started', 'Invoke (FTPPSOutboundInterface:createFTPBG)', 'Return (FTPPSOutboundInterface:createFTPBG)', and 'Invoke returned'. The 'Return' event is selected. On the right, the 'General Properties' and 'Detailed Properties' panes are visible. The 'Detailed Properties' pane shows the following information:

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

Below this, the 'Return parameters' section is expanded to show a table:

Name	Type	Value
createFTPBGOutput	CreateResponseBG	[ab]
verb	verb <string>	[ab]
CreateResponse *	CreateResponse	[ab]
Filename	string	[ab] 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 a numeric entry in the file. Each time the file is created, the adapter increases the number by one.

Test Append operation.

___ 6. Click **Invoke** () 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:

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- ___ a. For **Filename**, enter **PassThroughTest.1.txt** (the file created during the Create operation)

► **General Properties**

▼ **Detailed Properties**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

<u>Configuration:</u>	Default Module Test
<u>Module:</u>	FTPPSOutboundModule
<u>Component:</u>	FTPPSOutboundInterface
<u>Interface:</u>	FTPPSOutboundInterface
<u>Operation:</u>	appendFTPBG

Initial request parameters:

Value editor XML editor

Name	Type	Value
verb	verb<string>	CREATE
FTPFile *	FTPFile	
DirectoryPath	string	
Filename	string	PassThroughTest.1.txt

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

Content	UnstructuredContent	[lab]
Content Type	string	[lab]
ObjectName	string	[lab]
AsText	string	[lab] Test message for append operation
AsBinary	hexBinary	[lab] 00

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

___ d. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

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

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)

General Properties

Detailed Properties

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

Return parameters:

Value Editor | XML Source

Name	Type	Value
appendFTPBGOutput	AppendResponseBG	[lab]
verb	verb<string>	[lab]
AppendResponse *	AppendResponse	[lab]
Filename	string	[lab] 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 **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:

General Properties
 Detailed Properties

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

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

- ___ c. Click **Continue** button under Events
- ___ d. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** 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

General Properties
 Detailed Properties

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

Return parameters:

Value Editor XML Source

Name	Type	Value
listFTPOutput	ListResponse	lab
ListOfFileNames	string[]	lab
ListOfFileNames[0]	string	lab PassThroughTest.1.txt

Test Retrieve operation:

- ___ 12. Click **Invoke** (Invoke icon) 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 **Filename**, enter **PassThroughTest.1.txt** (The file name should already exist for retrieve operation. PassThroughTest.1.txt was created in the previous test)
- ___ b. For **FileContentEncoding**, enter **ascii** so that the retrieved content is AsText
- ___ c. For **DeleteOnRetrieve**, change it to **true** from the drop down list
- ___ d. For **ArchiveDirectoryForDeleteOnRetrieve**, enter the full path of **RetrieveArchive** (this should already be created on your FTP server)

Name	Type	Value
retrieveFTPInput	FTPFile	lab
DirectoryPath	string	lab
Filename	string	lab PassThroughTest.1.txt
ChunkInfo	string	lab
FtpServerHostName	string	lab
FtpServerEventDirectory	string	lab
DataConnectionMode	string	lab
FileTransferType	string	lab
DataProtectionLevel	string	lab
SecondServerDirectory	string	lab
SecondServerUsername	string	lab
SecondServerPassword	string	lab
FileContentEncoding	string	lab ascii
IncludeEndBODelimiter	string	lab
FileInLocalDirectory	boolean	lab false
LocalDirectoryPath	string	lab
LocalArchivingEnabledForCreate	boolean	lab false
LocalArchiveDirForCreate	string	lab
StagingDirectory	string	lab
GenerateUniqueFile	boolean	lab false
CreateFileIfNotExists	boolean	lab false
ScriptFileParameters	string[]	lab
SplittingFunctionClassName	string	lab
SplitCriteria	string	lab
DeleteOnRetrieve	boolean	lab true
ArchiveDirectoryForRetrieve	string	lab /root/Desktop/RetrArchive
Content	Unstructured...	lab
ContentType	string	lab
ObjectName	string	lab
AsText	string	lab
AsBinary	hexBinary	lab 00

- ___ e. Click **Continue** button under Events
- ___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

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

Name	Type	Value
retrieveFTPOutput	RetrieveResponseWrapper	[ab]
Content	anyType[]	[ab]
Content[0]	FileContent	[ab]
Filename	string	[ab] PassThroughTest.1.txt
Content	UnstructuredContent	[ab]
ContentType	string	[ab] null
ObjectName	string	[ab] http://www.ibm.com/xmlns/prod/websphere/t2ca/ftp/retrieveresponsewrapper
AsText	string	[ab] Testing create operation for pass throughTest message for append operation
AsBinary	hexBinary	[ab]
SavedFileToLocalDirectory	boolean	[ab]

___ 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 with time stamp appended 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.

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 /root/Desktop
mkdir %2
cd %3
pwd
send %4 New1.txt
send %5 New2.txt
rename New1.txt New1_Renamed.txt
%6 New2.txt
cd /root/Desktop
```

%1 through %6 is 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]

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%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 **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**

► **General Properties**

▼ **Detailed Properties**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

Configuration: Default Module Test

Module: FTPPSOutboundModule






Component: FTPPSOutboundInterface

Interface: FTPPSOutboundInterface

Operation: executeFTPScript

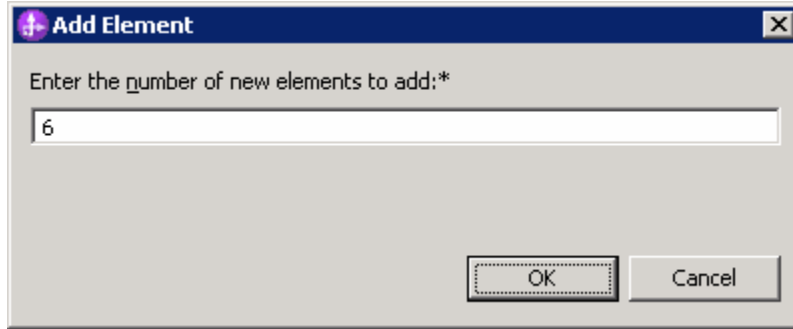
Initial request parameters:

Value editor XML editor

Name	Type	Value
executeFTPScriptInput	FTPFileBG	
verb	verb<string>	 CREATE
FTPFile *	FTPFile	
DirectoryPath	string	 C:\Labfiles70\FTPOutbound
Filename	string	 ScriptFile.txt

- ___ c. Add the required script file parameters
 - 1) Right-click **ScriptFileParameters** and then select **Add Elements** from the pop-up menu
 - 2) Enter **6** from the Add Element window and click **OK**

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___ 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:\Labfiles70\FTPOutbound\ScriptContent.txt**
- 5) ScriptFileParameters[4]: **C:\Labfiles70\FTPOutbound\ScriptContent.txt**
- 6) ScriptFileParameters[5]: **delete**

ScriptFileParameters	string[]	6
ScriptFileParameters[0]	string	pwd
ScriptFileParameters[1]	string	FTPScriptDir
ScriptFileParameters[2]	string	FTPScriptDir
ScriptFileParameters[3]	string	C:\Labfiles70\FTPOutbound\ScriptContent.txt
ScriptFileParameters[4]	string	C:\Labfiles70\FTPOutbound\ScriptContent.txt
ScriptFileParameters[5]	string	delete

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

___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

___ 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:

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Name	Type	Value
executeFTPScriptOutput	ExecuteFTPScriptResponseBG	lab
verb	verb <string>	lab
ExecuteFTPScriptResponse *	ExecuteFTPScriptResponse	lab
CommandTrace	string[]	lab
CommandTrace[0]	string	lab pwd:257 "/root/Desktop/OutDir"...
CommandTrace[1]	string	lab cd:250 Directory successfully changed....
CommandTrace[2]	string	lab mkdir:257 "/root/Desktop/FTPScriptDir" created...
CommandTrace[3]	string	lab cd:250 Directory successfully changed....
CommandTrace[4]	string	lab pwd:257 "/root/Desktop/FTPScriptDir"...
CommandTrace[5]	string	lab send:226 File receive OK....
CommandTrace[6]	string	lab send:226 File receive OK....
CommandTrace[7]	string	lab rename:250 Rename successful....
CommandTrace[8]	string	lab delete:250 Delete operation successful....
CommandTrace[9]	string	lab cd:250 Directory successfully changed....

- __ 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. Open it and verify the content added to this file:

```

This file contains content to test createFTPScript operation
~
~
~
~
"New1_Renamed.txt" 1 line --100%--

```


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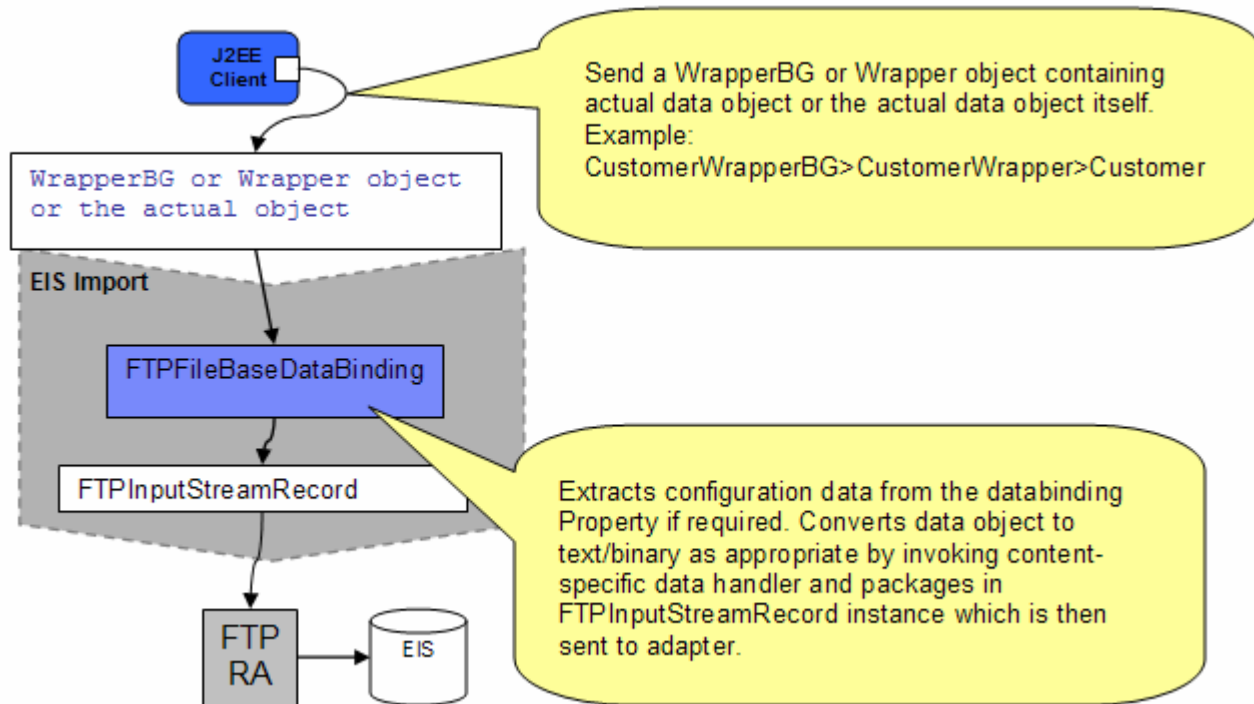
3.3. Restore Server Configuration

- ___ 1. Close the **FTPPSOutboundModule_Test** window and click **No** for the Save Resources window
- ___ 2. Right-click **WebSphere Process Server v7.0** 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

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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 Java EE 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.

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- 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

New in V7.0: Wrapper business objects for the business objects containing global elements are supported in this version. So, you can now pass the protocol specific information as part of each request.

- ___ a. Expand FTPCustomOutboundModule (if not already expanded), right-click **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 **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.

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

Customer	
<Click to filter...>	
e CustomerName	string
e Address	string
e City	string
e State	string

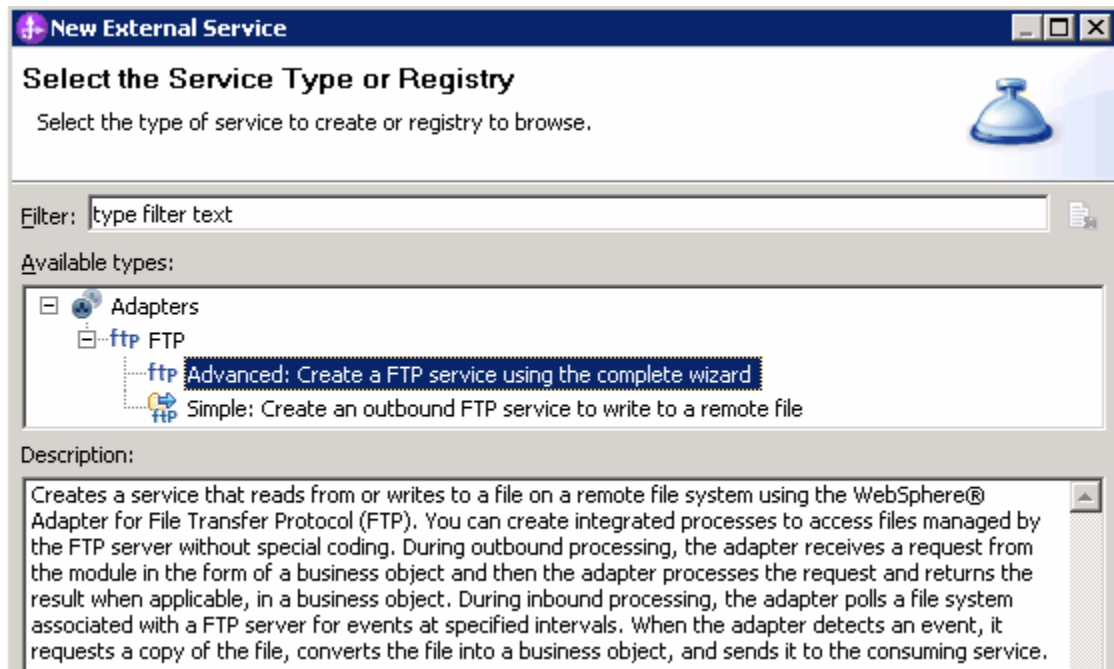
___ 4. After reviewing, close the Customer business object from the Assembly editor

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

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

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

___ 6. From the New External Service window, expand Adapters > FTP and select Advanced: Create a FTP service using the complete wizard



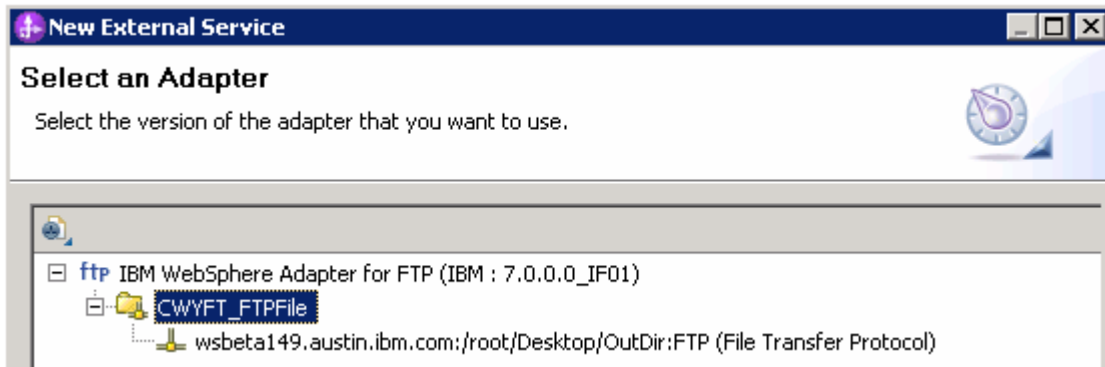
___ a. Click **Next**

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. Select **Adapters > FTP** and click **Next**

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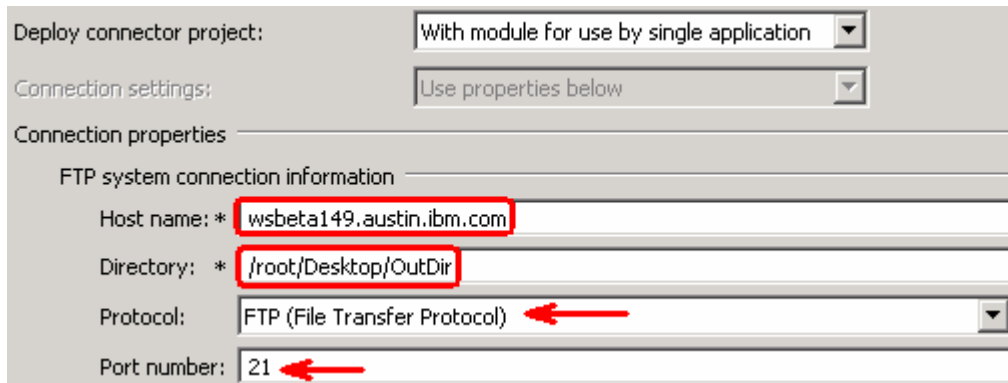
- ___ 7. On the Select an Adapter screen, select **IBM WebSphere Adapter for FTP (IBM : 7.0.0.0_IF01) > CWYFT_FTPFile** and click **Next**



- ___ 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.

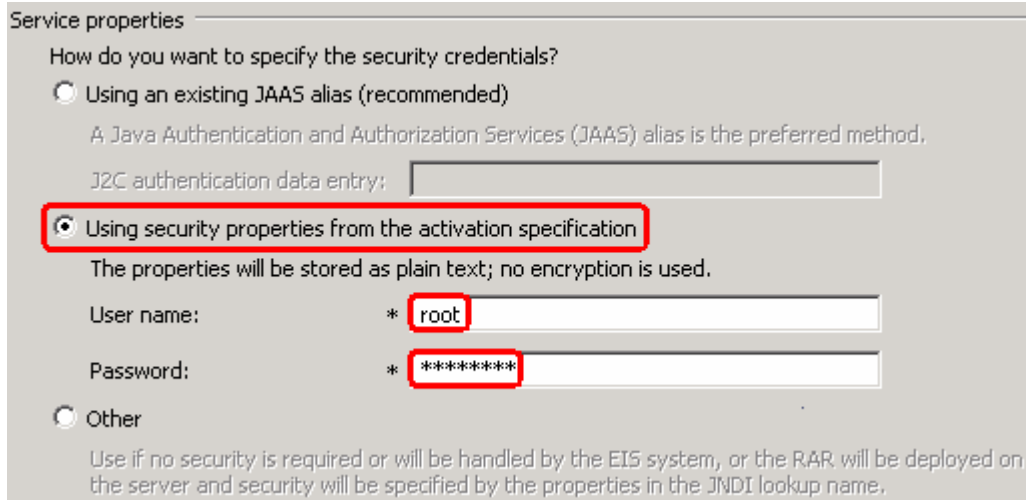
- 3) Protocol: **FTP – file transfer protocol** (default)
- 4) Port number: **21** (default)



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

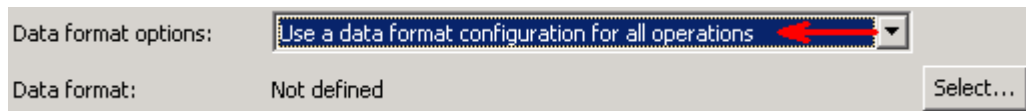
IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

- ___ 9. For this lab, you are going to use the security properties from the activation specification.
 - ___ a. Select the check box next to **Using security properties from the activation specification**
 - ___ b. **User name:** username using which you connect to your FTP server (for Ex: **root**)
 - ___ c. **Password:** password for the user to connect to your FTP server

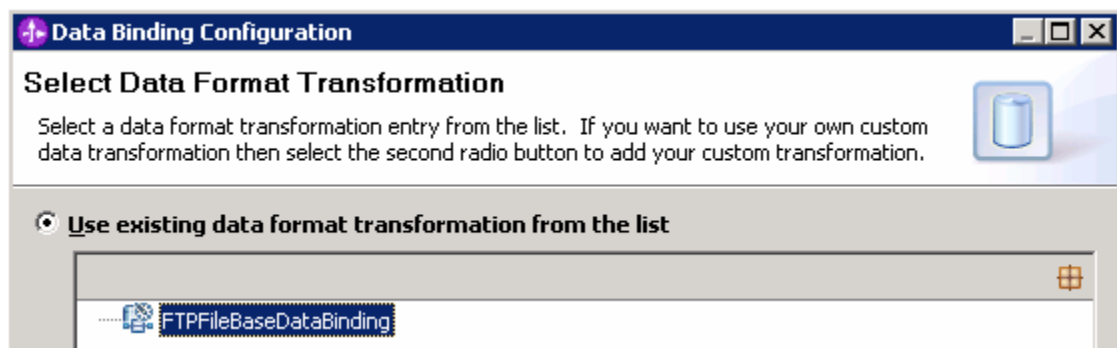


Data binding and Data handler configuration:

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



- ___ b. Click **Select...** next to **Data format**. A Binding Resource Configuration window is opened
- ___ c. Select the radio button for '**Use existing data format transformation from the list**' and then select **FTPFileBaseDataBinding**

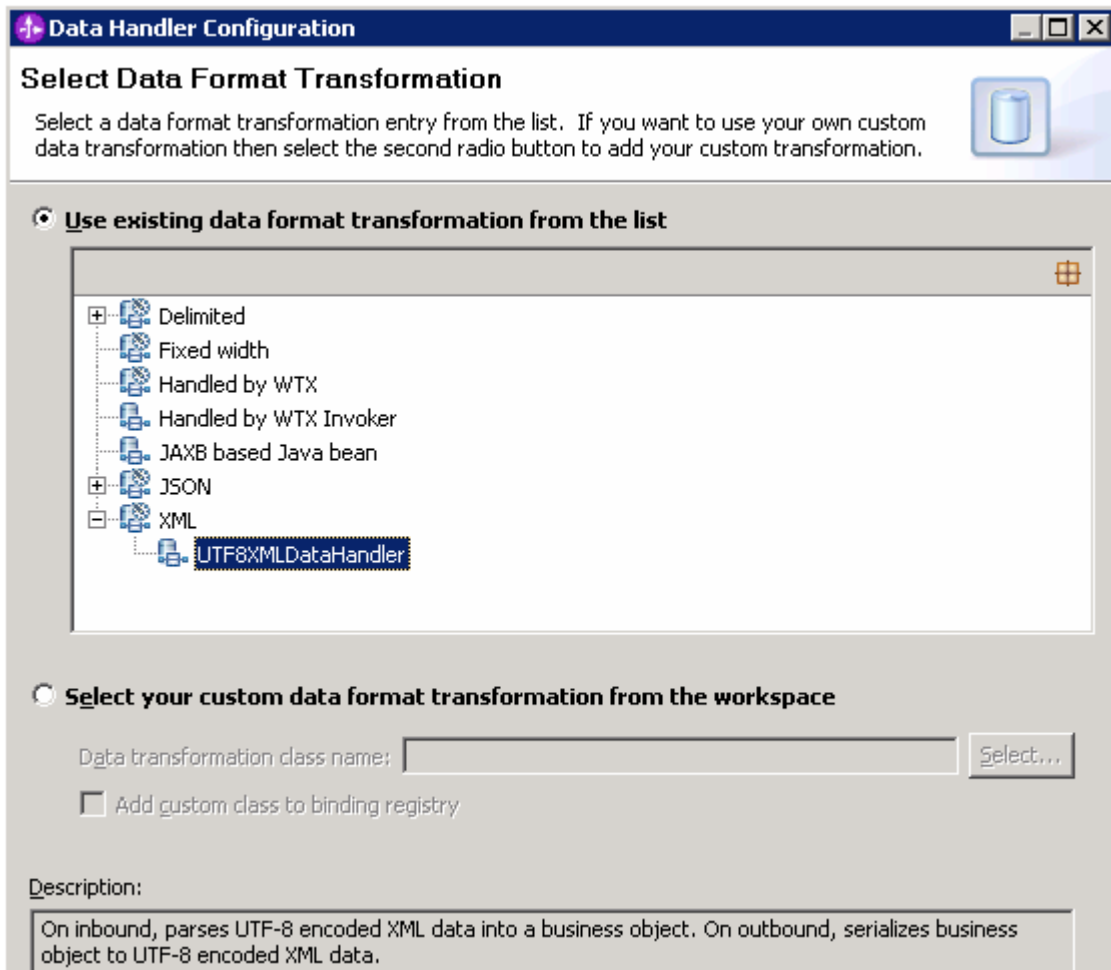


- ___ d. Click **Next**

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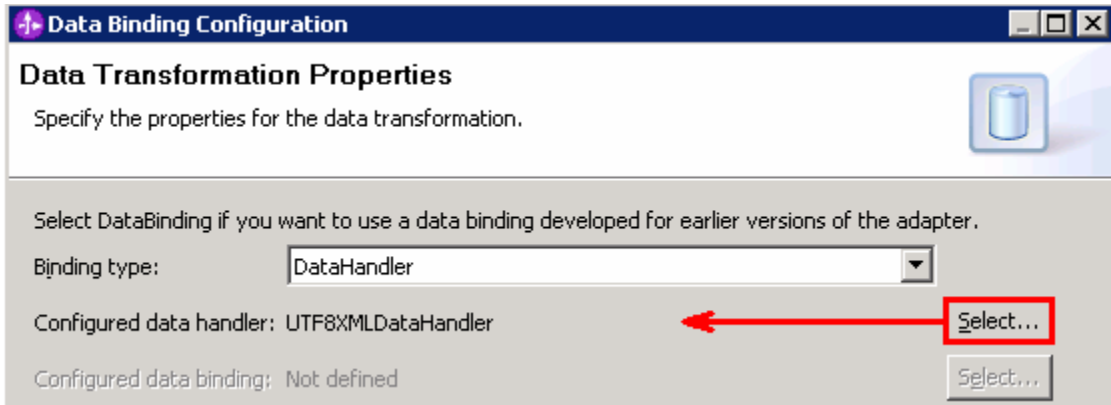
- ___ e. From Data Transformation Properties screen, click **Select...** next to **Configured data handler**. A Binding Resource Configuration window is opened for you to define the data handler
- ___ f. Select the radio button for '**Use existing data format transformation from the list**' and then select **XML > UTF8XMLDataHandler**

Note: UTF8XMLDataHandler listed under XML is the predefined data handler with UTF-8 as the encoding. You can also select XML and then select the encoding of your choice in the next screen to define a data handler of your choice.



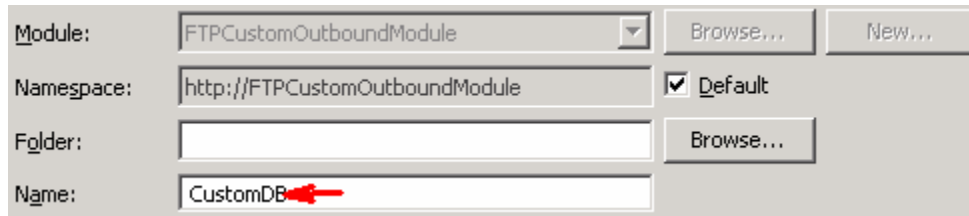
- ___ g. Click **Finish**
- ___ h. Back to 'Data Transformation Properties' screen, and the Configured data handler, **UTF8XMLDataHandler** is displayed defined in the previous steps

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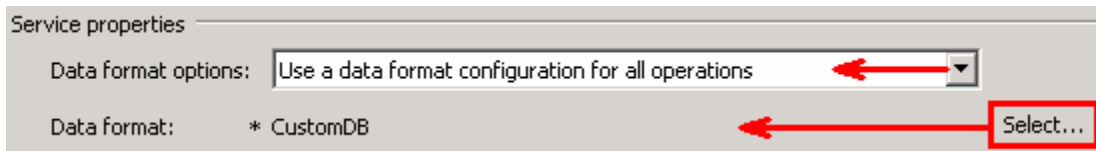
___ i. Click **Next**

___ j. Ensure that the module selected is **FTPCustomOutboundModule** and enter **CustomDB** for the Name of the data binding



___ k. Click **Finish**

___ l. Now the **CustomDB** should be displayed for **Data format**



___ 11. 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:

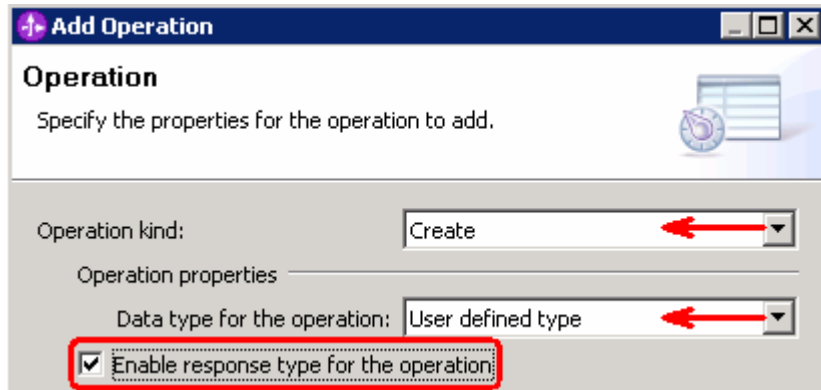
___ 12. Click **Add...** to open Add Operation window

___ 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

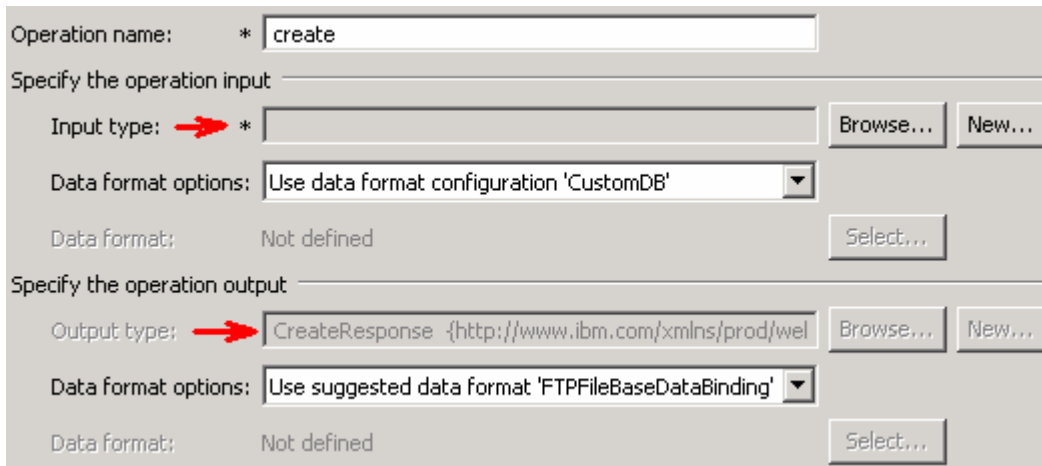
IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

__ c. Select the check box next to **Enable response type for the operation**



__ 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**

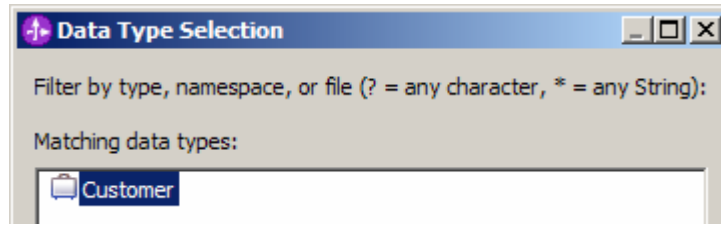


__ e. For Operation name, enter **createCustomFile**

__ 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 **Browse...** next to Data type
- 4) From the Data Type Selection window, select **Customer** under Matching data types:

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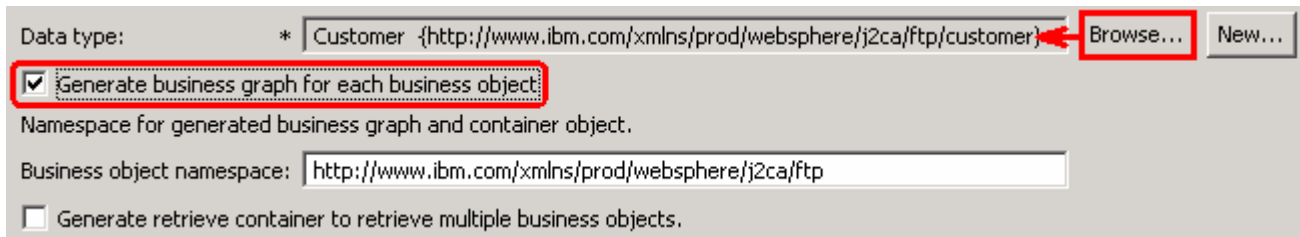


5) Click **OK**

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

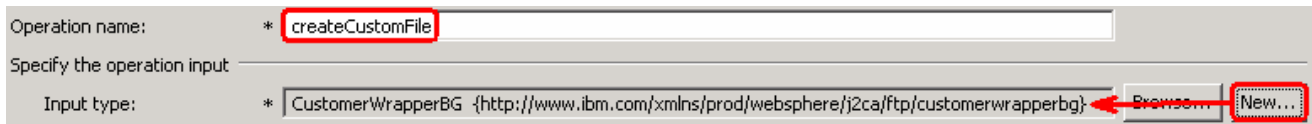
___ h. **Do not** check the box for '**Generate retrieve container to retrieve multiple business objects**'

Note: The 'Generate retrieve container to retrieve multiple business objects' is used only during outbound retrieve operation.



___ i. 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 format for **input**:

___ j. Accept the default Data format options selection, **Use data format configuration 'CustomDB'**

Next define the Data format for **output**:

___ k. For **Data binding**, select **Use a data binding configuration** from the dropdown list

___ l. Click **Select...** next to **Data format**. A Binding Resource Configuration window is opened

___ m. Ensure that the radio button for 'Use existing data format transformation from the list' and then select **FTPFileBaseDataBinding > CustomDB**

___ n. Click **Finish**

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

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Operation name: * **createCustomFile**

Specify the operation input

Input type: * CustomerWrapperBG {http://www.ibm.com/xmlns/prod/...} **Browse...** **New...**

Data format options: Use data format configuration 'CustomDB' **Select...**

Data format: Not defined **Select...**

Specify the operation output

Output type: CreateResponse {http://www.ibm.com/xmlns/prod/wel...} **Browse...** **New...**

Data format options: Use a data format configuration **Select...**

Data format: * CustomDB **Select...**

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

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

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

Operations:

- createCustomFile** ({http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/customerwrapperbg}C... **Add...**
- Edit...**
- Remove**

Operation properties:

InteractionSpec properties for 'createCustomFile'

FTP system connection information

Remote directory on FTP system:

Default target file name:

File in local directory

Local directory: **Browse...**

Archive file in the local directory for create operation

Local archive directory for create operation: **Browse...**

Create new file if the file does not exist

Generate a unique file

Delete the file after retrieve operation

Remote archive directory for retrieve operation:

<< Advanced

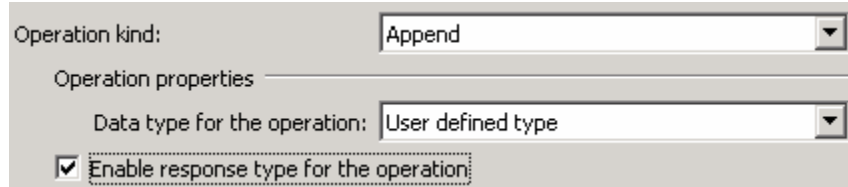
▶ Advanced connection configuration

▶ Second FTP system connection information

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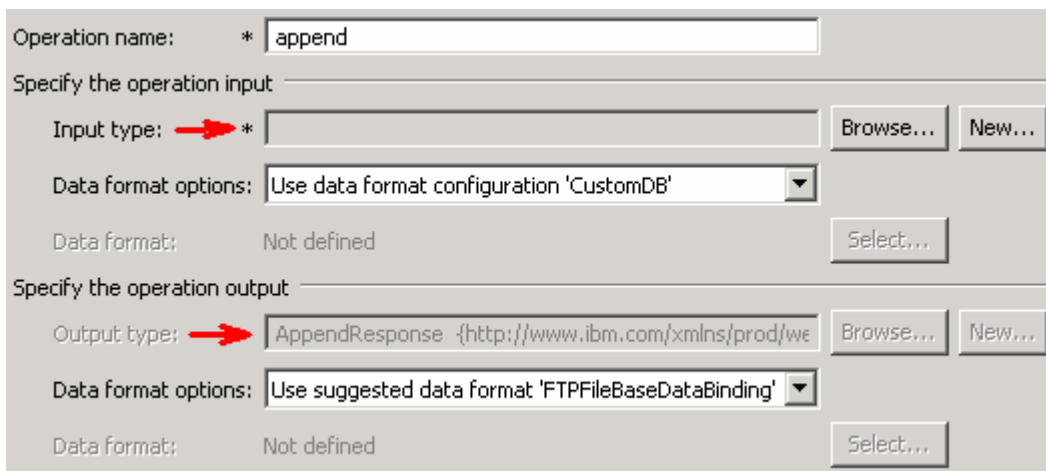
Add Operation: appendCustomFile:

- ___ 13. Click **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 **Enable response type for the operation**



- ___ d. Click **Next**

You are 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:



- ___ e. For Operation name, enter **appendCustomFile**
- ___ f. Define Input type:
 - 1) Under **Specify the operation input**, click **Browse...** next to **Input type**
 - 2) From the Data Type Selection window, select **CustomerWrapperBG** under Matching data types and click **OK**

Define Data format for **input**:

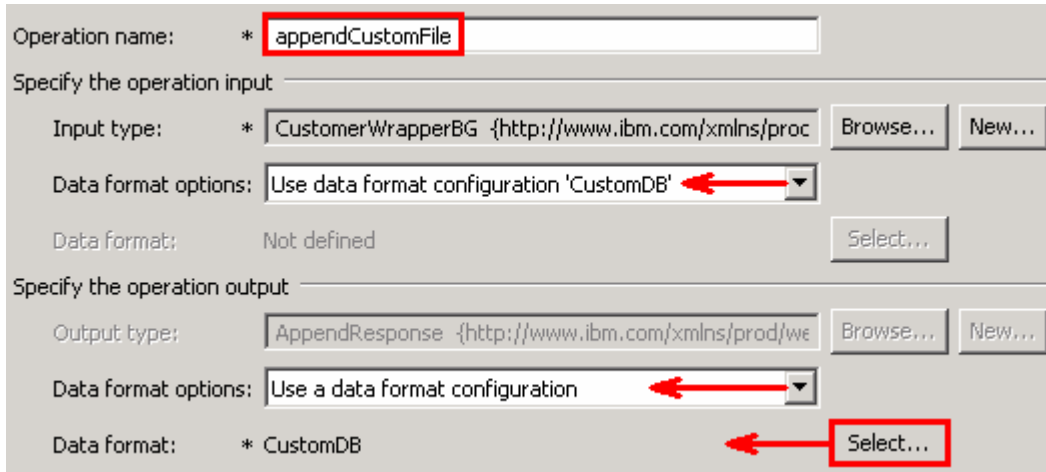
- ___ g. Accept the default Data format options selection, **Use data format configuration 'CustomDB'**

Define Data format for **output**:

- ___ h. Follow the instructions of defining data binding for createCustomFile and define **CustomDB**

- ___ i. You should now see this:

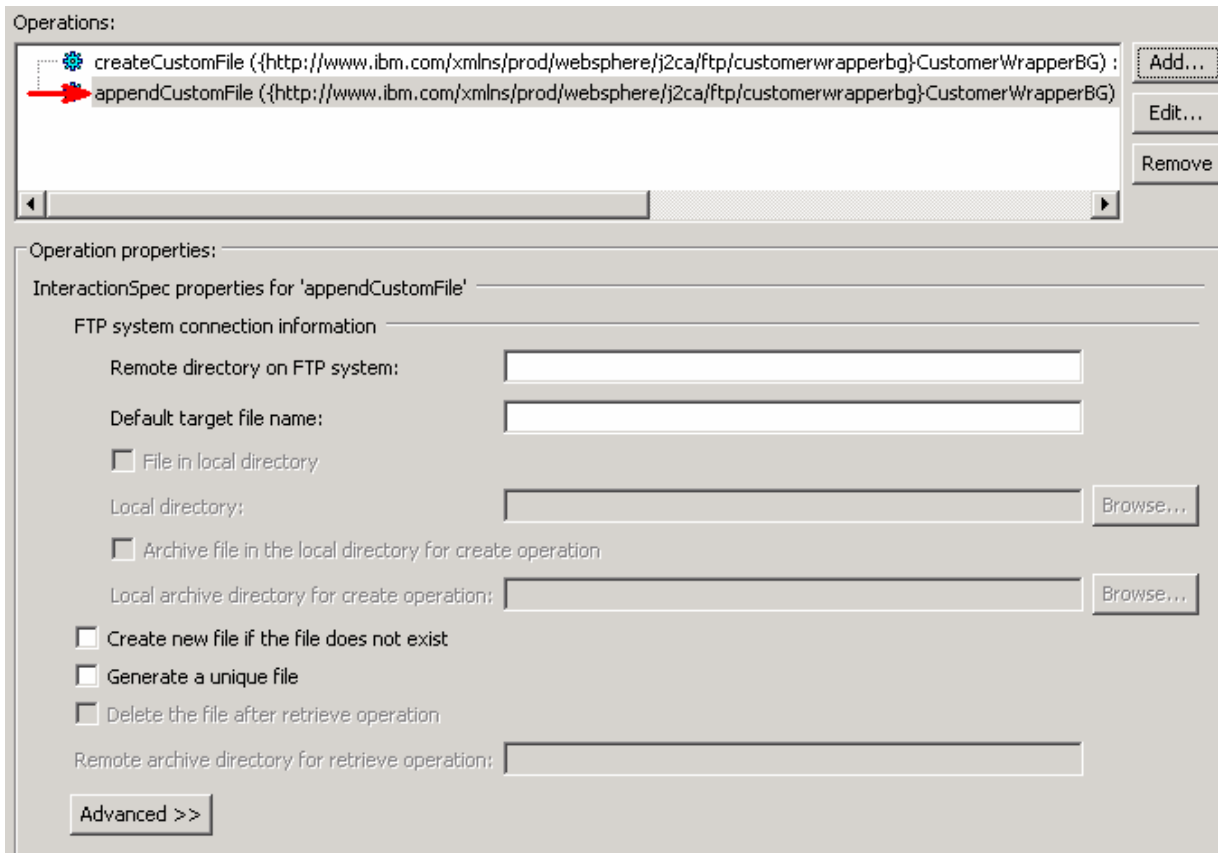
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___ j. Click **Finish** from Add Operation window

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

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



Add Operation: retrieveCustomFile

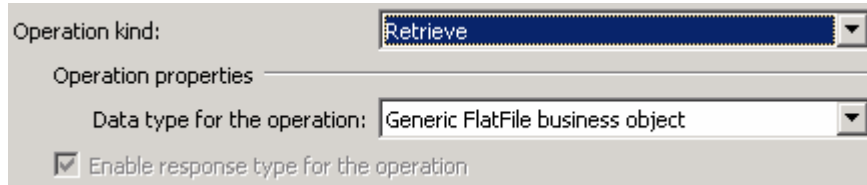
___ 14. Click **Add...** to open Add Operation window

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

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

__ c. Note that the box next to **Enable response type for the operation** is checked by default



Operation kind: Retrieve

Operation properties

Data type for the operation: Generic FlatFile business object

Enable response type for the operation

__ 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).

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

__ f. Define Data Binding type for **input**:

- 1) Follow the instructions of defining data binding for createCustomFile and select **CustomDB** for input data format

__ g. Define Data Binding type for **output**:

- 1) Accept the default Data format options selection, **Use data format configuration 'CustomDB'**

__ h. Define Output type:

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

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

__ j. **Check** the box for **'Generate retrieve container to retrieve multiple business objects'**

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Note: Selecting the **Generate retrieve container to retrieve multiple business objects** option creates **CustomerRetrieveWrapperBG**, which is used if there are multiple business object records in the file that the adapter is going to retrieve. For this lab, you are going to retrieve a Customer business object that has two customer records. You can also use the default 'RetrieveResponseWrapper' for this scenario.

___ k. Click **Finish**. You should see that the output type 'RetrieveResponseWrapper' is replaced with **CustomerRetrieveWrapperBG**

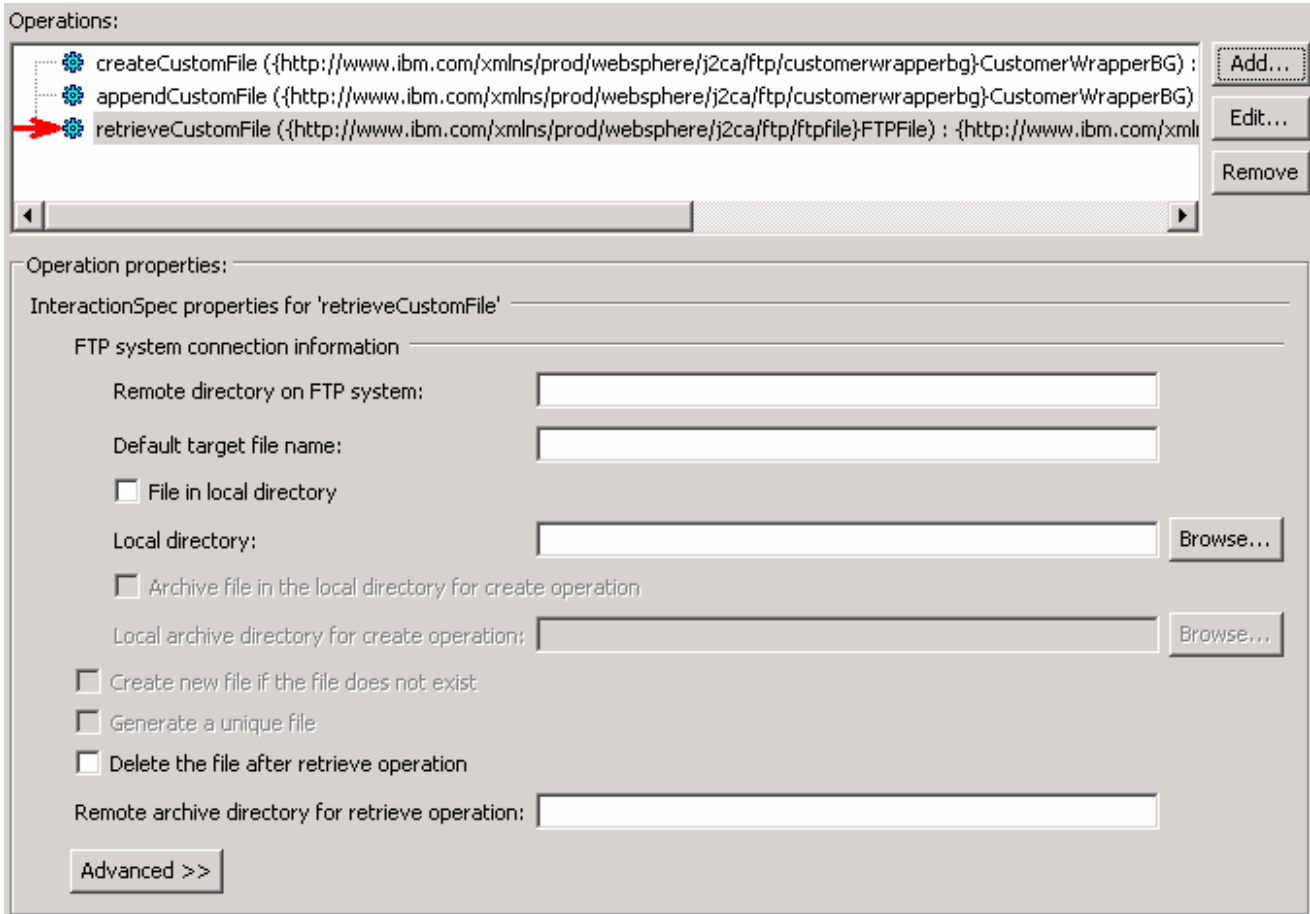
You should now see this:

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

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

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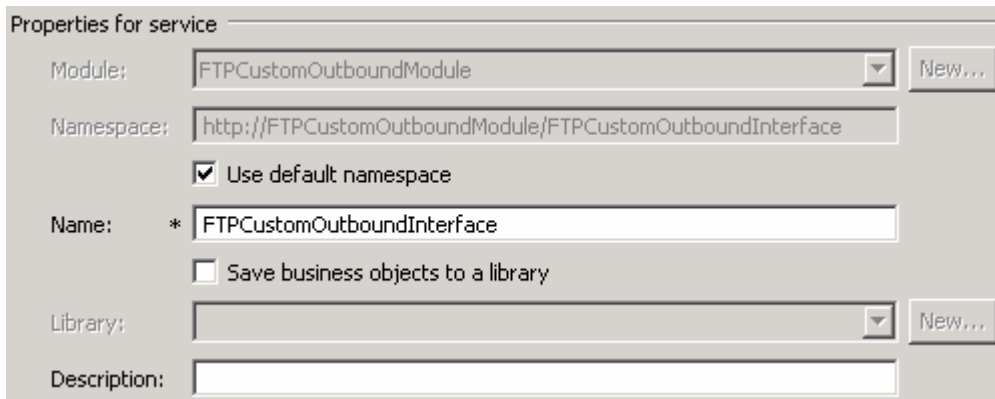
- ___ 15. You can click **Advanced >>** under 'InteractionSpec properties for retrieveCustomFile' to review the properties available at Interaction spec level



- ___ a. Click **Next** from the Operations window

- ___ 16. From the Generate Artifacts screen, enter these:

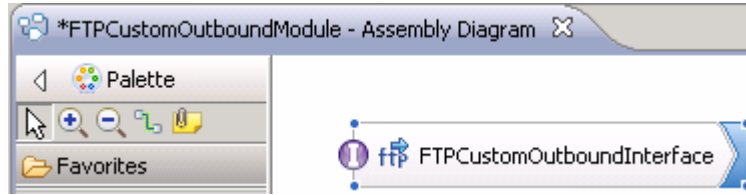
- ___ a. For **Name**, enter **FTPCustomOutboundInterface**



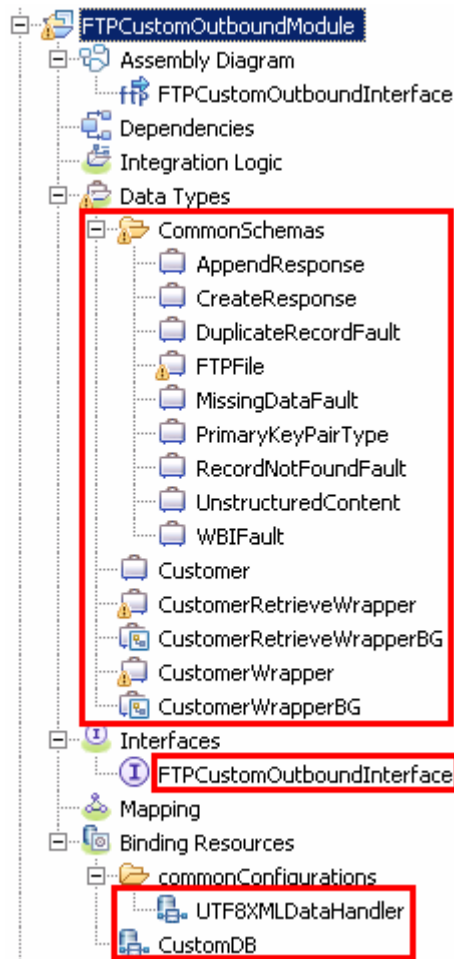
- ___ b. Click **Finish**

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- ___ 17. You will now see a new import component, **FTPCustomOutboundInterface** in the assembly diagram of FTPCustomOutboundModule



- ___ a. Save (**Ctrl+S**) your changes to the assembly diagram
- ___ 18. 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 **FTPCustomOutboundInterface** to open it

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__ b. You should see these three operations:

The screenshot shows the configuration and operations for the `FTPCustomOutboundInterface`. The interface is divided into two main sections: **Interface** and **Operations**.

Interface Configuration:

Name	FTPCustomOutboundInterface	Refactor name
Namespace	http://FTPCustomOutboundModule/FTPCustomOutboundInterface	Refactor namespace
Binding Style	document literal wrapped	Change binding style to document literal non-wrapped More...

Operations and their parameters:

	Name	Type
createCustomFile		
Inputs	createCustomFileInput	CustomerWrapperBG
Outputs	createCustomFileOutput	CreateResponse
Fault	MISSING_DATA	MissingDataFault
Fault	DUPLICATE_RECORD	DuplicateRecordFault
Fault	RECORD_NOT_FOUND	RecordNotFoundFault
appendCustomFile		
Inputs	appendCustomFileInput	CustomerWrapperBG
Outputs	appendCustomFileOutput	AppendResponse
Fault	MISSING_DATA	MissingDataFault
Fault	RECORD_NOT_FOUND	RecordNotFoundFault
retrieveCustomFile		
Inputs	retrieveCustomFileInput	FTPFile
Outputs	retrieveCustomFileOutput	CustomerRetrieveWrapperBG
Fault	MISSING_DATA	MissingDataFault
Fault	DUPLICATE_RECORD	DuplicateRecordFault
Fault	RECORD_NOT_FOUND	RecordNotFoundFault

__ 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 **WebSphere Process Server v7.0** 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 **WebSphere Process Server v7.0** 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 **FTPCustomOutboundModuleApp** 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 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. You do not need to provide the directory here if you had already specified during external service wizard
- ___ 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

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3) City: Austin

4) State: TX

► **General Properties**

▼ **Detailed Properties**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

Configuration: Default Module Test

Module: FTPCustomOutboundModule

Component: FTPCustomOutboundInterface

Interface: FTPCustomOutboundInterface

Operation: createCustomFile

Initial request parameters:

Value editor XML editor

Name	Type	Value
createCustomFileInput	CustomerWrapperBG	[ab]
verb	verb<string>	[ab] CREATE
CustomerWrapper *	CustomerWrapper	[ab]
DirectoryPath	string	[ab]
Filename	string	[ab] UserDefined.xml
ChunkInfo	string	[ab]
FtpServerHostName	string	[ab]

FileContentEncoding	string	[ab]
IncludeEndBODElimiter	string	[ab] #####
FileInLocalDirectory	boolean	[ab] false
LocalDirectoryPath	string	[ab]
LocalArchivingEnabledForCreate	boolean	[ab] false
LocalArchiveDirForCreate	string	[ab]
StagingDirectory	string	[ab]
GenerateUniqueFile	boolean	[ab] false
CreateFileIfNotExists	boolean	[ab] false
ScriptFileParameters	string[]	[ab]
SplittingFunctionClassName	string	[ab]
SplitCriteria	string	[ab]
DeleteOnRetrieve	boolean	[ab] false
ArchiveDirectoryForRetrieve	string	[ab]
Content	Customer	[ab]
CustomerName	string	[ab] ABC
Address	string	[ab] 11501 Burnet Rd
City	string	[ab] Austin
State	string	[ab] TX

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- ___ e. Click **Continue** button under Events
- ___ f. From Deployment Location window (if opened), select **WebSphere Process Servers > WebSphere Process Server v7.0 at localhost** and click **Finish**
- ___ g. Provide Administrator User ID and Password
 - 1) Optionally, select the box 'Use the authentication settings in the preference and never ask again' so that you do not have to enter the credentials next time when you start the test client
- ___ h. You should see a window similar to this, which contains the data you just entered in the previous steps:

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)

General Properties

Detailed Properties

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

Return parameters:

Value Editor | XML Source

Name	Type	Value
createCustomFileOutput	CreateResponse	tab
Filename	string	tab UserDefined.xml

- ___ 5. Verify the created file and its contents
 - ___ a. You will see a new file, **UserDefined.xml** created under OutDir on your FTP server. Open that file to see the content that was entered and ##### at the end of the file.

```

?xml version="1.0" encoding="UTF-8"?>
<p:Customer xsi:type="p:Customer" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:p="http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/customer">
  <CustomerName>ABC</CustomerName>
  <Address>11501 Burnet Rd</Address>
  <City>Austin</City>
  <State>78758</State>
</p:Customer>
#####
    
```

"UserDefined.xml" 8 lines --12%--

Test Append operation:

- ___ 6. Click **Invoke** (🟢) under Events to start a new event
- ___ 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 **#####**

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

- 1) Name: IBM
- 2) Address: 11901 RTP
- 3) City: Raleigh
- 4) State: NC

Name	Type	Value
[-] appendCustomFileInput	CustomerWrapperBG	[ab]
[-] verb	verb<string>	[ab] CREATE
[-] CustomerWrapper *	CustomerWrapper	[ab]
[-] DirectoryPath	string	[ab]
[-] Filename	string	[ab] UserDefined.xml
[-] ChunkInfo	string	[ab]
[-] FtpServerHostName	string	[ab]
[-] FtpServerEventDirectory	string	[ab]
[-] DataConnectionMode	string	[ab]
[-] FileTransferType	string	[ab]
[-] DataProtectionLevel	string	[ab]
[-] SecondServerDirectory	string	[ab]
[-] SecondServerUsername	string	[ab]
[-] SecondServerPassword	string	[ab]
[-] FileContentEncoding	string	[ab]
[-] IncludeEndBODelimiter	string	[ab] #####
[-] FileInLocalDirectory	boolean	[ab] false
[-] LocalDirectoryPath	string	[ab]
[-] LocalArchivingEnabledForCreate	boolean	[ab] false
[-] LocalArchiveDirForCreate	string	[ab]
[-] StagingDirectory	string	[ab]
[-] GenerateUniqueFile	boolean	[ab] false
[-] CreateFileIfNotExists	boolean	[ab] false
[-] ScriptFileParameters	string[]	[ab]
[-] SplittingFunctionClassName	string	[ab]
[-] SplitCriteria	string	[ab]
[-] DeleteOnRetrieve	boolean	[ab] false
[-] ArchiveDirectoryForRetrieve	string	[ab]
[-] Content	Customer	[ab]
[-] CustomerName	string	[ab] IBM
[-] Address	string	[ab] 11901 RTP
[-] City	string	[ab] Raleigh
[-] State	string	[ab] NC

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

___ f. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

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

The screenshot shows the IBM WebSphere Adapter 7.0 interface. On the left, the **Events** pane displays a list of events for the `FTPCustomOutboundInterface` module. The selected event is `Return (FTPCustomOutboundInterface:appendCustomFile)`. On the right, the **Detailed Properties** pane shows the following information:

- Module: `FTPCustomOutboundModule`
- Component: `FTPCustomOutboundInterface`
- Interface: `FTPCustomOutboundInterface`
- Operation: `appendCustomFile`
- Return parameters:

Name	Type	Value
appendCustomFileOutput	AppendResponse	ab
Filename	string	ab UserDefined.xml

- ___ 8. Verify the created file and its contents

- ___ a. Open the **UserDefined.xml** file under `OutDir` on your FTP server. You should see the content appended to the original content created during the create operation

```


?xml version="1.0" encoding="UTF-8"?
<p:Customer xsi:type="p:Customer" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:p="http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/customer">
  <CustomerName>ABC</CustomerName>
  <Address>11501 Burnet Rd</Address>
  <City>Austin</City>
  <State>78758</State>
</p:Customer>
#####?xml version="1.0" encoding="UTF-8"?
<p:Customer xsi:type="p:Customer" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:p="http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/customer">
  <CustomerName>IBM</CustomerName>
  <Address>11901 RTP</Address>
  <City>Raleigh</City>
  <State>NC</State>
</p:Customer>
#####
1,1 All
    
```

Test Retrieve operation: In Retrieve operation, the adapter retrieves the file and parses it based on the configured `SplittingFunctionClassName` and `SplitCriteria` properties.

If splitting needs to be done based on file size, then `splitFunctionClassName` should be `com.ibm.j2ca.utils.filesplit.SplitBySize` which does the splitting functionality based on size and `splitCriteria` should be a number (a number representing the size in bytes). If the actual event file size is greater than this value, it is split into chunks else it is sent as one BO).

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

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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.
This field is not required if you already specified the directory during external service wizard.
- ___ b. For **Filename**, enter **UserDefined.xml** (The file name should already exist for retrieve operation.
UserDefined.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.

- ___ d. For **splitFunctionClassName**, enter **com.ibm.j2ca.utils.filesplit.SplitByDelimiter**
- ___ e. For **splitCriteria**, enter **####**

Name	Type	Value
retrieveCustomFileInput	FTPFile	[ab]
DirectoryPath	string	[ab]
Filename	string	[ab] UserDefined.xml
ChunkInfo	string	[ab]
FtpServerHostName	string	[ab]
FtpServerEventDirectory	string	[ab]
DataConnectionMode	string	[ab]
FileTransferType	string	[ab]
DataProtectionLevel	string	[ab]
SecondServerDirectory	string	[ab]
SecondServerUsername	string	[ab]
SecondServerPassword	string	[ab]
FileContentEncoding	string	[ab]
IncludeEndBODelimiter	string	[ab]
FileInLocalDirectory	boolean	[ab] false
LocalDirectoryPath	string	[ab] C:\Labfiles70\FTPOutbound\LocalDir
LocalArchivingEnabledForCreate	boolean	[ab] false
LocalArchiveDirForCreate	string	[ab]
StagingDirectory	string	[ab]
GenerateUniqueFile	boolean	[ab] false
CreateFileIfNotExists	boolean	[ab] false
ScriptFileParameters	string[]	[ab]
SplittingFunctionClassName	string	[ab] com.ibm.j2ca.utils.filesplit.SplitByDelimiter
SplitCriteria	string	[ab] ####
DeleteOnRetrieve	boolean	[ab] false

- ___ f. Click **Continue** button under Events
- ___ g. From Deployment Location window (if opens), select **WebSphere Process Servers > WebSphere Process Server v7.0** 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:

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)

The Events pane shows a sequence of events for the FTPCustomOutboundInterface. The selected event is 'Retrieve Custom File', which includes sub-events for 'Invoke started', 'Invoke (FTPCustomOutboundInterface:retrieveCustomFile)', and 'Return (FTPCustomOutboundInterface:retrieveCustomFile)'.

General Properties

Detailed Properties

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

Return parameters:

Value Editor XML Source

Name	Type	Value
retrieveCustomFileOutput	CustomerRetrieveWrapperBG	[AB]
verb	verb <string>	[AB]
CustomerRetrieveWrapper *	CustomerRetrieveWrapper	[AB]
Content	Customer[]	[AB]
Content[0]	Customer	[AB]
CustomerName	string	[AB] ABC
Address	string	[AB] 11501 Burnet Rd
City	string	[AB] Austin
State	string	[AB] TX
Content[1]	Customer	[AB]
CustomerName	string	[AB] IBM
Address	string	[AB] 11901 RTP
City	string	[AB] Raleigh
State	string	[AB] NC

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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 **WebSphere Process Server v7.0** 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

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Part 5: Use default 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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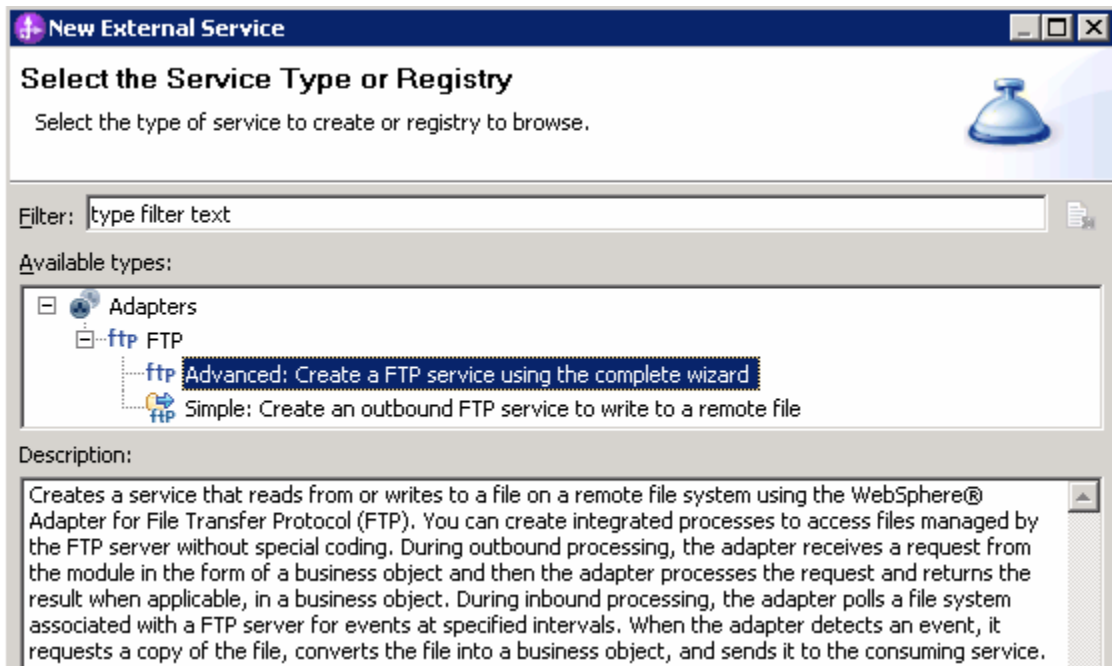
5.1. Configure outbound using data binding

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 **Outbound Adapters**:
 - ___ b. Under Outbound Adapters, click the **FTP** and then click the empty canvas of the assembly diagram. The New FTP Service wizard is opened
- ___ 3. From the New External Service window, expand **Adapters > FTP** and select **Advanced: Create a FTP service using the complete wizard**



- ___ 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. Select **Adapters > FTP** and click **Next**

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___ 4. On the Select an Adapter screen, expand **IBM WebSphere Adapter for FTP (IBM : 7.0.0.0_IF01)** 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)

Deploy connector project: With module for use by single application

Connection settings: Use properties below

Connection properties

FTP system connection information

Host name: * wsbeta149.austin.ibm.com

Directory: * /root/Desktop/OutDir

Protocol: FTP (File Transfer Protocol)

Port number: 21

___ c. Optionally, click **Advanced >>** to see the hidden advanced properties that can be configured

___ 6. For this lab, you are going to use the security properties from the activation specification.

___ a. Select the check box next to **Using security properties from the activation specification**

___ b. **User name:** username using which you connect to your FTP server (for Ex: **root**)

___ c. **Password:** password for the user to connect to your FTP server

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Service properties

How do you want to specify the security credentials?

Using an existing JAAS alias (recommended)
 A Java Authentication and Authorization Services (JAAS) alias is the preferred method.
 J2C authentication data entry:

Using security properties from the activation specification
 The properties will be stored as plain text; no encryption is used.

User name: *

Password: *

Other
 Use if no security is required or will be handled by the EIS system, or the RAR will be deployed on the server and security will be specified by the properties in the JNDI lookup name.

- ___ 7. For **Data format options**, select **Use default data binding 'FTPFileBaseDataBinding' for all operations** from the drop down list

Data format options:

Data format: Not defined

- ___ 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 **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 **Enable response type for the operation**

Operation kind:

Operation properties

The data type for the operation input:

Enable response type for the operation

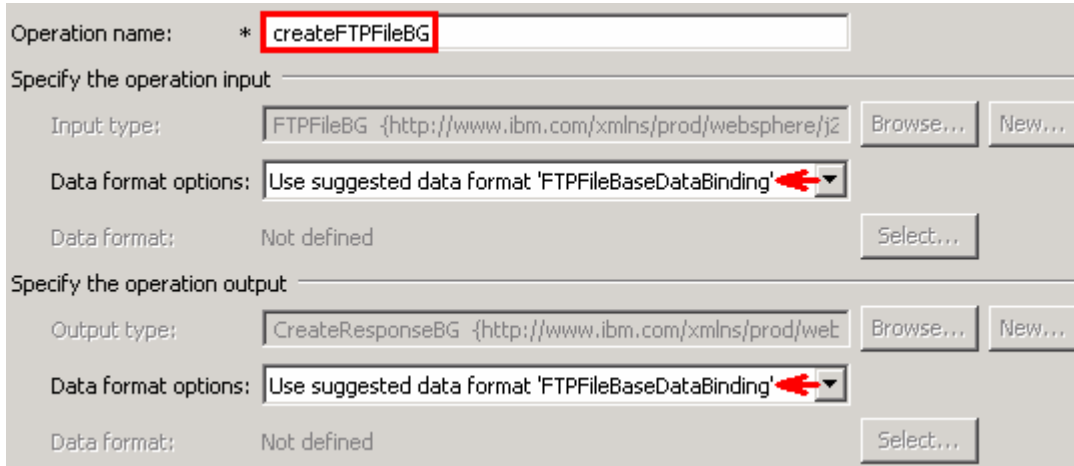
- ___ d. Click **Next**

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 format 'FTPFileBaseDataBinding'**, as **Data format** for both input and output

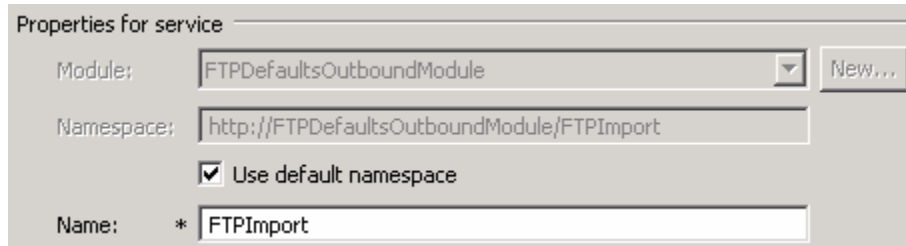


- ___ a. Click **Finish**. The defined operation, **createFTPFileBG**, is populated under Operations list



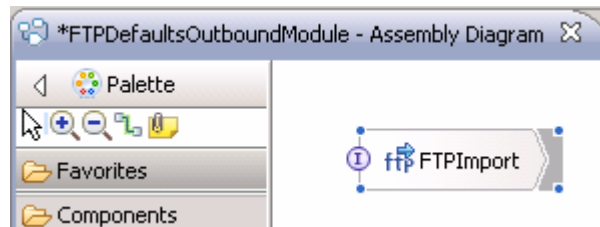
- ___ b. Click **Next** from Operations screen

- ___ 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

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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 **WebSphere Process Server v7.0** 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 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**

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► **General Properties**

▼ **Detailed Properties**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

Configuration: Default Module Test

Module: FTPDefaultsOutboundModule

Component: FTPImport

Interface: FTPImport

Operation: createFTPFileBG

Initial request parameters:

Value editor XML editor

Name	Type	Value
createFTPFileBGInput	FTPFileBG	[ab]
verb	verb<string>	[ab] CREATE
FTPFile *	FTPFile	[ab]
DirectoryPath	string	[ab]
Filename	string	[ab] DefaultsTest.txt

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

Content	UnstructuredContent	[ab]
ContentType	string	[ab]
ObjectName	string	[ab]
AsText	string	[ab] Testing Create operation for defaults scenari...
AsBinary	hexBinary	[ab] 00

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

___ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

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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

New in V7.0: Wrapper business objects for the business objects containing global elements are supported in this version. So, you can now pass the protocol specific information as part of each request.

- ___ a. Expand FTPTypicalOutboundModule (if not already expanded), right-click **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 **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 **Customer** review the fields inside the object:

Customer	
<Click to filter...>	
e CustomerName	string
e Address	string
e City	string
e State	string

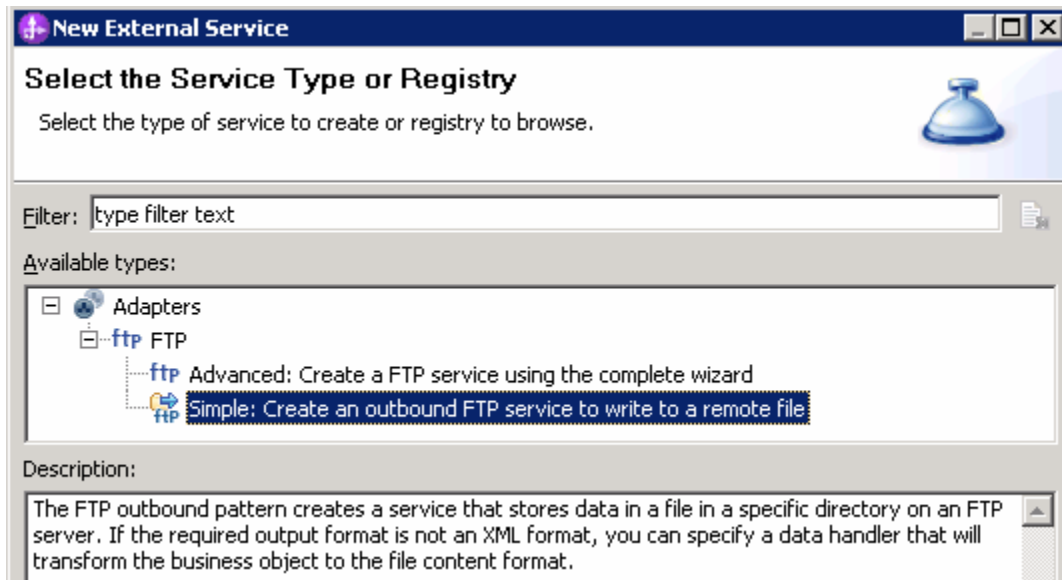
__ c. After reviewing, close the Customer business object from the Assembly editor

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

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

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

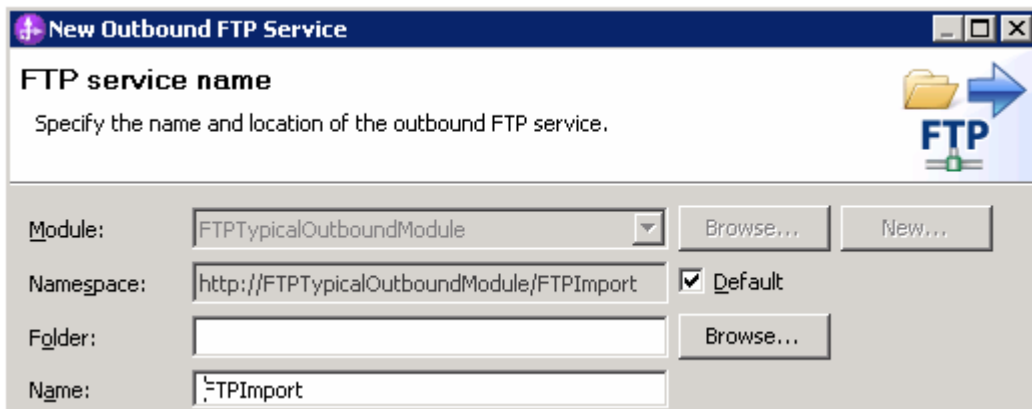
___ 6. From the New External Service window, expand **Adapters > FTP** and select **Simple: Create an inbound FTP service to read from a remote file**



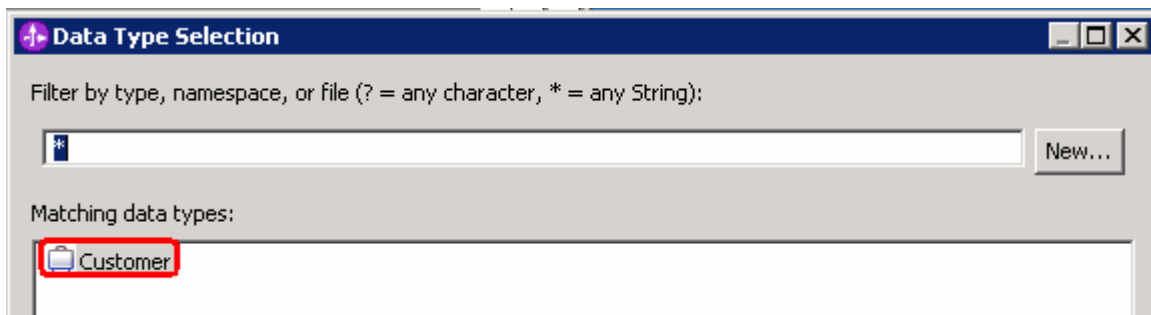
__ a. Click **Next**

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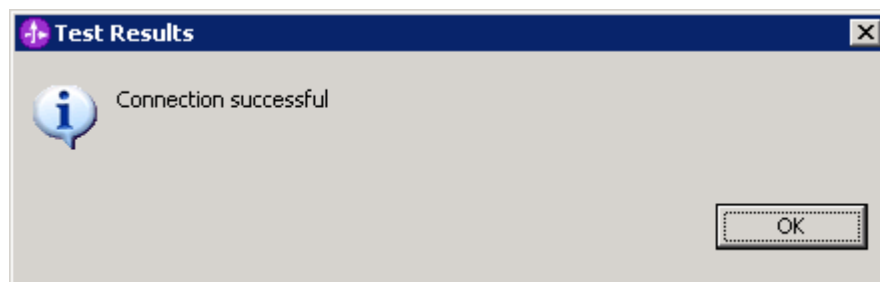
- ___ 7. From the next **FTP service name** screen, for **Name**, accept the default value '**FTPImport**' and click **Next**



- ___ 8. From the **Business object and FTP server credentials screen**, enter these:
- ___ a. Click **Browse...** next to **Business object** and a Data Type Selection window is opened
 - ___ 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 **Test connection**, next to host name and you should get this pop-up window with success message:



- ___ e. Click **OK** from the 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)

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

The screenshot shows a window titled "New Outbound FTP Service" with the subtitle "Business object and FTP server credentials". The main instruction is "Specify the business object, FTP server host name and remote directory where the business object contents will be written." Below this, there are two sections:

- What business object do you want to write to the output file?**
Business object:
- Where do you want to create the output file?**
FTP server host name:
Remote directory:

___ h. Click **Next**

___ 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 user to connect to your FTP server**

The screenshot shows a window titled "New Outbound FTP Service" with the subtitle "FTP server security credential". The main instruction is "Specify the FTP server security credential." Below this, there are two sections:

- 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:

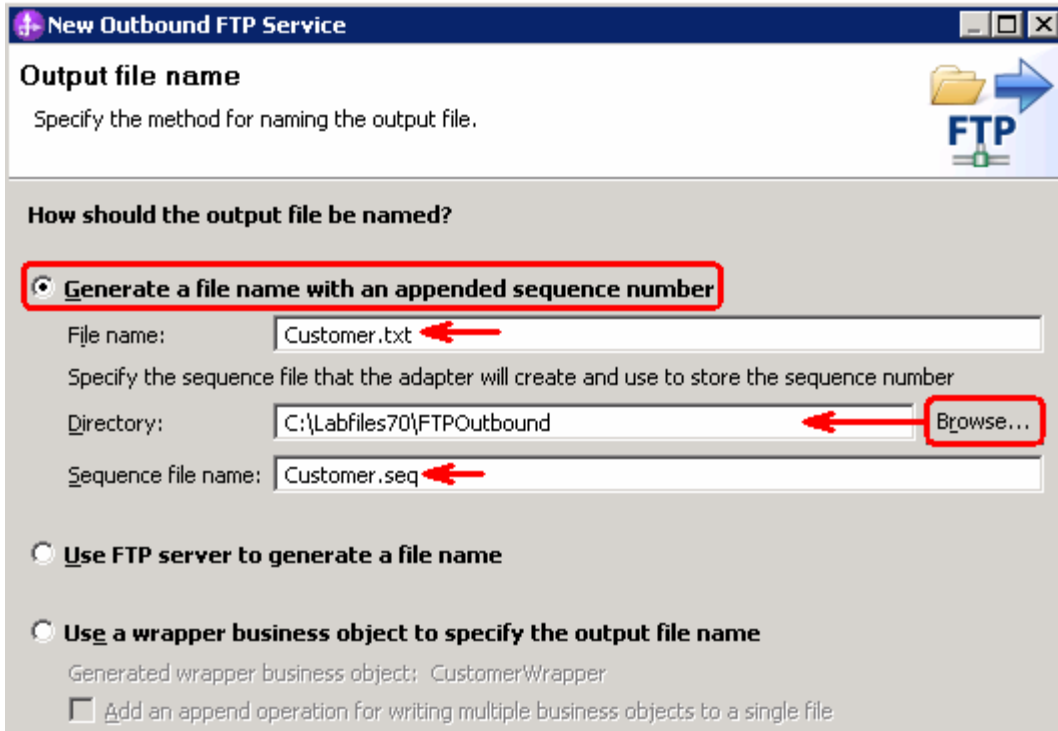
___ b. Click **Next**

___ 10. From Output file name screen, enter these:

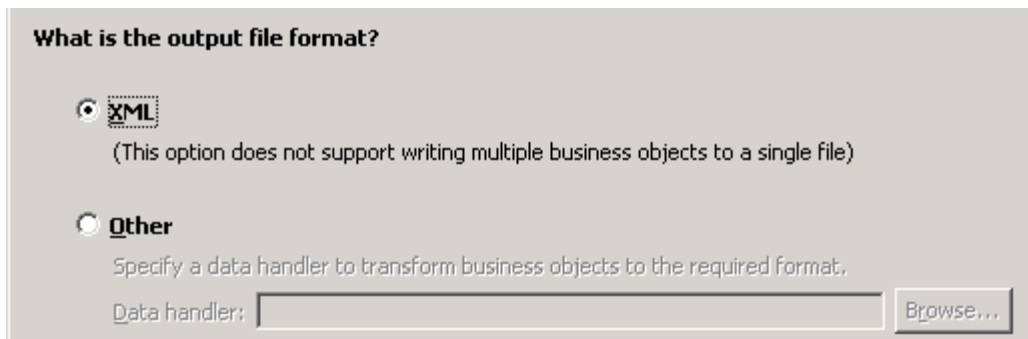
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- ___ a. Select the radio button next to Generate a file name with an appended sequence number
 - 1) Accept the default File name, **Customer.txt**
 - 2) For Directory, click **Browse...** and navigate to select **<LOCAL_DIR>**
 - 3) Accept the default value **Customer.seq** for Sequence file name

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.



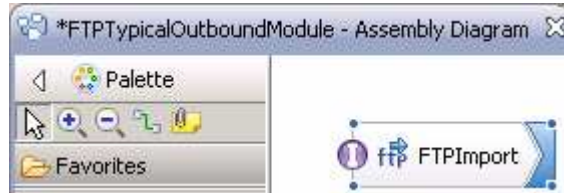
- ___ b. Click **Next**
- ___ 11. From the Output file format screen, enter these:
 - ___ a. Select the radio button next to **XML**



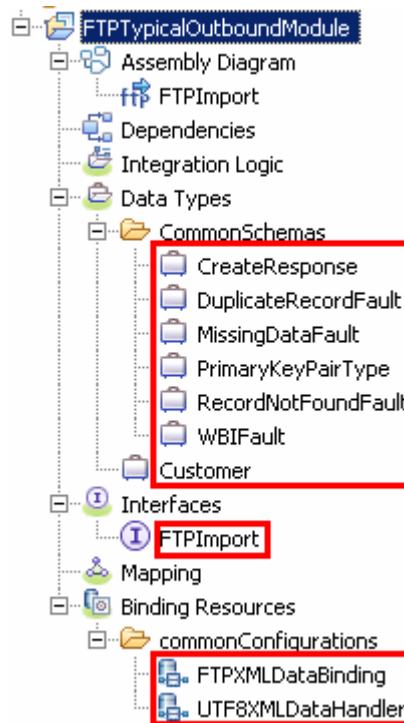
- ___ b. Click **Finish**

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



- ___ 13. Review the FTPTypicalOutboundModule and the generated artifacts: The generated **Data Types**, **Interface**, Data handler (**UTF8XMLDataHandler**) 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 **WebSphere Process Server v7.0** 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 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**

Specify the component, interface, operation, and input parameter values for the Invoke event, then click the Continue icon in the Events area to run the test. [More...](#)

Configuration:	Default Module Test
Module:	FTPTypicalOutboundModule
Component:	FTPImport
Interface:	FTPImport
Operation:	create

Initial request parameters:

Value editor XML editor

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

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

___ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v7.0** and click **Finish**

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

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)

General Properties

Detailed Properties

Module: [FTPTypicalOutboundModule](#)
 Component: [FTPImport](#)
 Interface: [FTPImport](#)
 Operation: [create](#)

Return parameters:

Value Editor XML Source

Name	Type	Value
createOutput	CreateResponse	Lab
Filename	string	Lab 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.

- ___ 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:

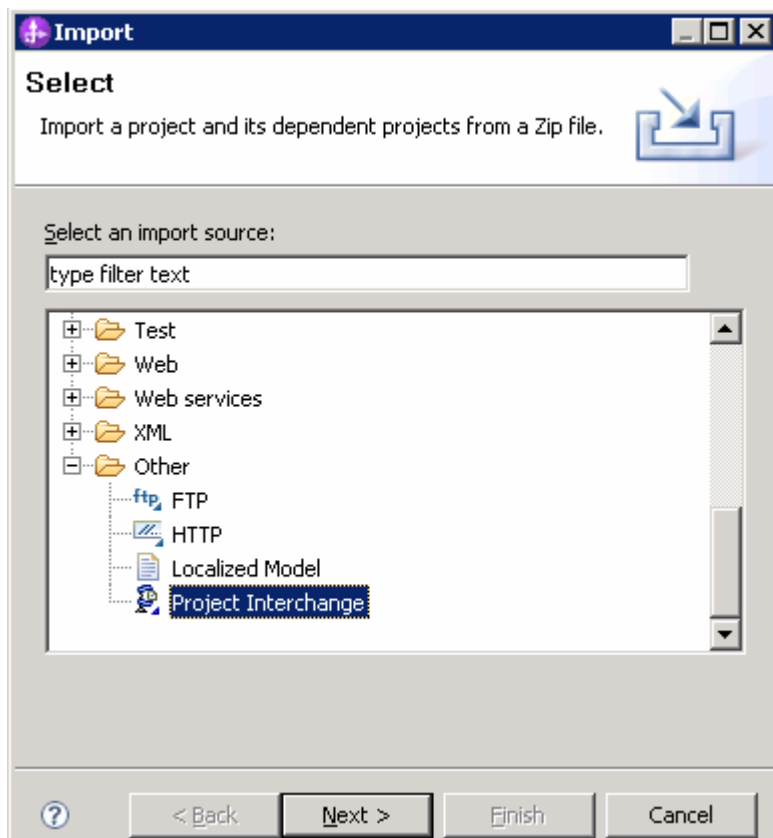
```
<?xml version="1.0" encoding="UTF-8"?>
<p:Customer xsi:type="b:Customer"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:p="http://www.ibm.com/xmlns/prod/websphere/i2ca/ftp/customer">
  <CustomerName>ABC</CustomerName>
  <Address>11501 Burnet Rd</Address>
  <City>Austin</City>
  <State>TX</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 a number (2) entered in that file. The adapter increases the number by one, each time a file is created in this directory.
- ___ 7. Restore the Sever Configuration
- ___ a. Right-click **WebSphere Process Server v7.0** 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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Solution instructions

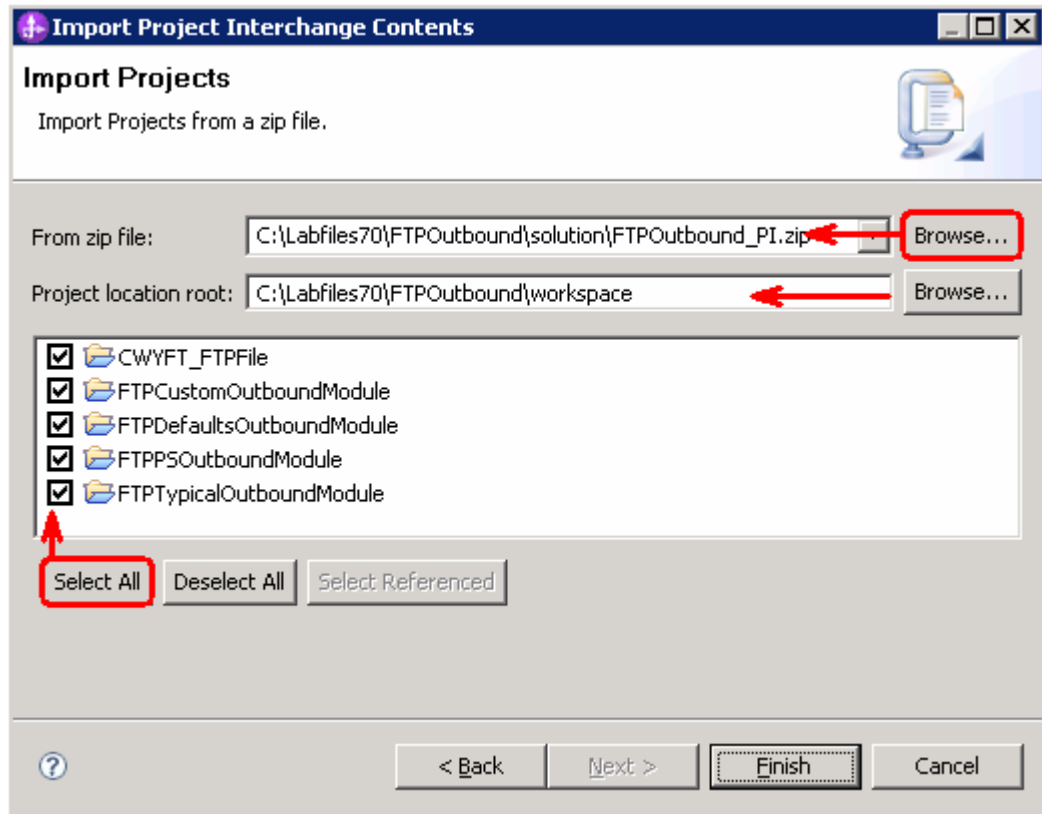
- ___ 1. Start WebSphere Integration Developer V7.0 with a new workspace
 - ___ a. Follow the instructions outlined in **Part 1** of this exercise
- ___ 2. Import the solution Project Interchange
 - ___ a. Import the project interchange file **FTPOutbound_Pi.zip** from **<LAB_FILES>\FTPOutbound\solution** directory
 - ___ b. Select **File → Import** from the menu
 - ___ c. Select **Other → Project Interchange** in the **Import** dialog and click **Next**



- ___ d. For the **From zip file**, click on the **Browse** button and select the **FTPOutbound_Pi.zip** in the **<LAB_FILES>>\ FTPOutbound\solution** directory
- ___ e. Enter **<LAB_FILES>\FTPOutbound\workspace** for the **Project location root**

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- ___ f. Click the **Select All** button. This will select all modules: **CWYFT_FTPFile**, **FTPCustomOutboundModule**, **FTPDefaultsOutboundModule**, **FTPPSOutboundModule**, and **FTPTypicalOutboundModule**



- ___ g. Click **Finish**

- ___ 3. Test outbound pass through scenario: Continue with **Part 3.2** of this lab
- ___ 4. Test outbound non pass through scenario: Continue with **Part 4.2** of this lab
- ___ 5. Test outbound scenario with default data binding and data handler: Continue with **Part 5.2** of this lab
- ___ 6. Test outbound scenario using typical pattern: Continue with **Part 6.2** of this lab

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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.

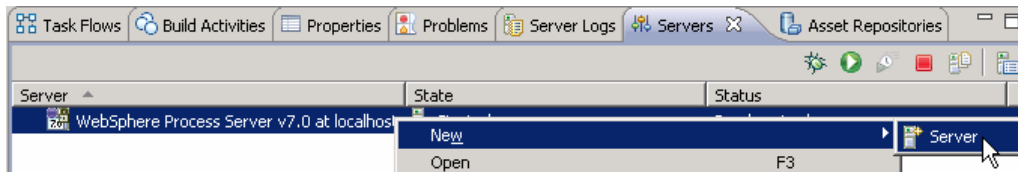
At the end of each part, you deployed and then tested the adapter application for these scenarios - pass-through test scenario (create, append, list, retrieve, ExecuteFTPScript Operations), content specific or non pass through test scenario (create, append, and retrieve operations), using all defaults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

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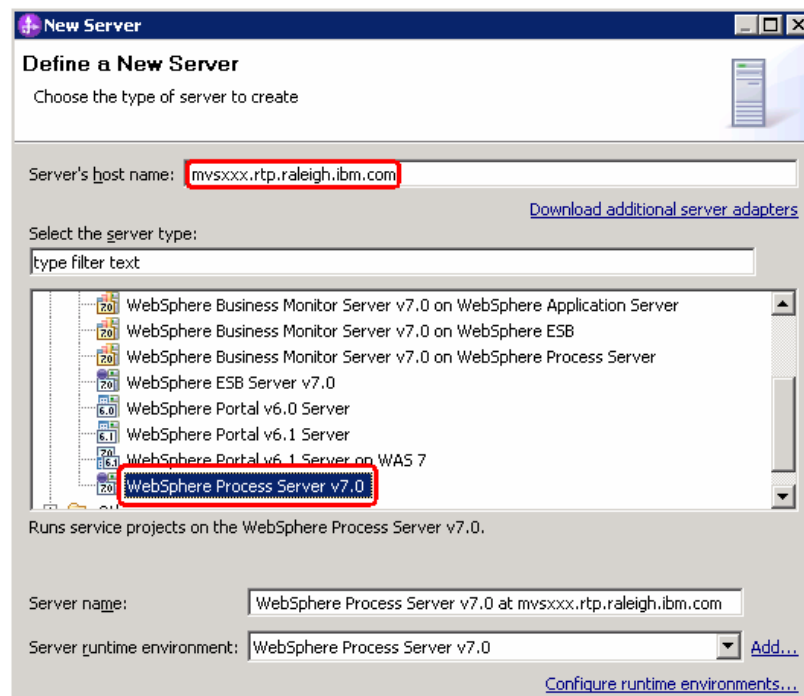
Task: Adding remote server to WebSphere Integration Developer test environment

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

- ___ 1. Define a new remote server to WebSphere Integration Developer.
 - ___ a. Right click the background of the Servers view to access the pop-up menu.
 - ___ b. Select **New → Server**.



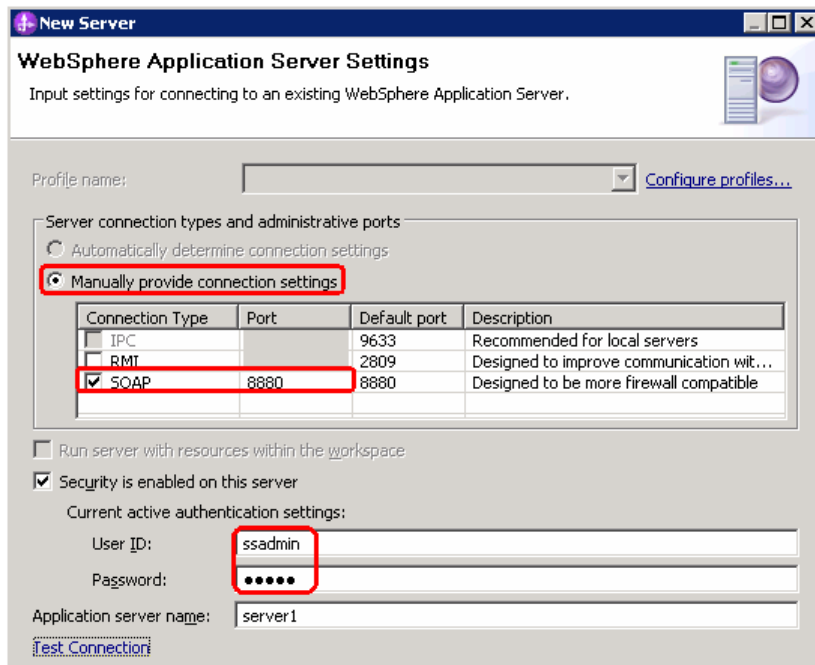
- ___ c. In the New Server dialog, specify the remote server's host name, **<HOSTNAME>**.
- ___ d. Ensure that the appropriate server type, **'WebSphere Process Server v7.0'** or **'WebSphere ESB Server v7.0'**, is highlighted in the server type list



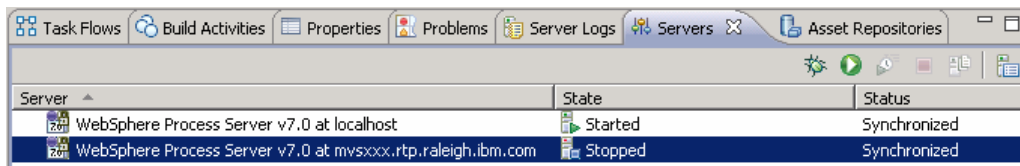
- ___ e. Click **Next**

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- ___ f. On the WebSphere Server Settings page, leave the radio button for **Manually provide connection settings** selected, and select the box for SOAP
- ___ g. Enter the correct setting (<SOAP_PORT>) for **Port** column
- ___ h. If security is enabled on your server, select the box for ‘**Security is enabled on this server**’ and enter <USERID> for the user ID and <PASSWORD> for the password.



- ___ i. Click **Finish**.
- ___ j. The new server should be seen in the Server view.



- ___ 2. Start the remote server if it is not already started. WebSphere Integration Developer does not support starting remote servers from the Server view.
- ___ a. From a command prompt, telnet to the remote system if needed:

'telnet <HOSTNAME> <TELNET_PORT>'

User ID : <USERID>

Password : <PASSWORD>

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__ 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 sssr01 open for e-business; process id is 0000012000000002
```