

IBM WEBSPHERE ADAPTER 7.0 – LAB EXERCISE

FTP adapter - SFTP support lab

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What this exercise is about

The objective of this lab is to configure and test the adapter for FTP to work with a secure SSH server.

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 latest fixes
- Extract Labfiles70.zip to your C:\ (your root) drive
- Complete the lab '**Install and configure SSH server**' successfully to install freeSSHd server and generate key-pair using PuTTY key generator

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What you should be able to do

At the end of this lab you should be able to:

- Import FTP adapter RAR file into WebSphere Integration Developer
 - Use External Service wizard to configure inbound operation with the user name and password authentication for SSH
 - Deploy the inbound adapter application onto WebSphere Process Server and test the deployed application
 - Use External Service wizard to configure outbound operation with the public-key authentication for SSH
 - Deploy the outbound adapter application onto WebSphere Process Server and test the deployed application
 - Restore the server configuration
-

Introduction

SSH over FTP (SFTP) is a network protocol that provides a mechanism for file transfer over a reliable data stream. SFTP runs on a secure SSH channel on port 22 and encrypts all traffic using either user name and password authentication or public key authentication. Public key authentication uses a pair of computer generated keys, one public and one private.

Inbound scenario illustrates the use of user name and password authentication and outbound scenario illustrates the use of public key authentication.

Exercise instructions

Some instructions in this lab are Windows operating-system specific. If you plan on running the lab on an operating-system other than Windows, you will need to run the appropriate commands, and use appropriate files (.sh or .bat) for your operating system. The directory locations are specified in the lab instructions using symbolic references, as follows:

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Reference variable	Windows location	AIX® or UNIX® location
<WID_HOME>	C:\Program Files\IBM\WID70	
<WPS_HOME>	C:\<WID_HOME>\runtimes\bi_v70	
<FTPADAPTER_HOME>	<WID_HOME>\ResourceAdapters\FlatFile_7.0.0.0\deploy	
<LAB_FILES>	C:\Labfiles70	/tmp/Labfiles70
<WORKSPACE>	<LAB_FILES>\SFTP\workspace	
<LOCAL_EVENT>	<LAB_FILES>\SFTP\LocalEventDir	
<LOCAL_ARCHIVE>	<LAB_FILES>\SFTP\LocalArchiveDir	
<EVENT_DIR>	<LAB_FILES>\SFTPHome\EventDir	
<ARCHIVE_DIR>	<LAB_FILES>\SFTPHome\ArchiveDir	
<OUT_DIR>	<LAB_FILES>\SFTPHome\OutputDir	
<FTPFILES>	<LAB_FILES>\FTPFiles	
<TEMP>	C:\temp	/tmp

Windows users note: When directory locations are passed as parameters to a Java™ program such as EJBdeploy or wsadmin, it is necessary to 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 following table is related to where you are running the remote test environment:

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

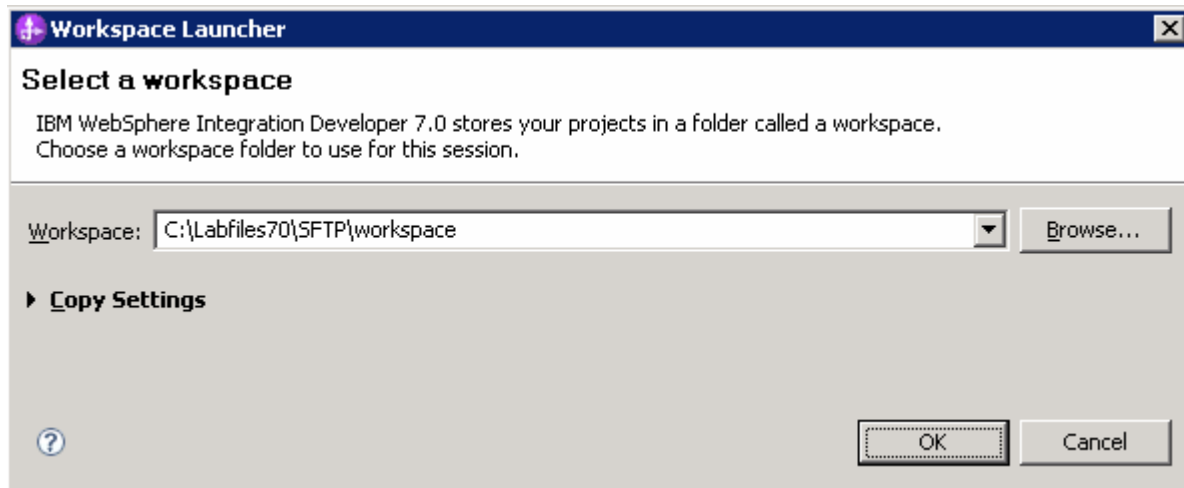
Instructions for using a remote testing environment, such as z/OS, AIX or Solaris, can be found at the end of this document, in the section [“Task: Adding remote server to WebSphere Integration Developer test environment”](#).


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Part 1: Initialize the workspace and prepare for the lab

In this part of the lab, you will start the WebSphere Integration Developer V7.0 with a new workspace and defined required WebSphere variables using the administrative console of WebSphere Process Server V7.0

- ___ 1. Extract the provided Labfiles70.zip to your C:\ (root) drive, if you have not already done so. This will create 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

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4. Follow the instructions of “**Define WebSphere variables**” lab to define the WebSphere variables listed in the table below, which are used later in this lab:

Note: In FlatFile adapter, you have to give directory values (Event directory, Archive directory, Output directory and so on, needed values in activation spec and managed connection factory) while running external service wizard. Presently these values can be changed in the module and re-deploy it (or) can be changed in deployed application from administration console. This is like hard coding the values of these properties. All local directory (including event and archive) properties in ActivationSpec can be filled with WebSphere environment variables. This way hard coding of directory paths for these properties can be avoided. From WebSphere Process Server V6.1, you can declare these values as environment variables and specify the environment variable name in the external service wizard. So when you deploy this application, the environment variable name is replaced with actual value and used by the adapter. This is very helpful if the values of these properties need to be changed.

Name	Value
SFTP_EVENT	/EventDir
SFTP_ARCHIVE	/ArchiveDir
SFTP_LOCAL_EVENT	C:\Labfiles70\SFTP\LocalEventDir
SFTP_LOCAL_ARCHIVE	C:\Labfiles70\SFTP\LocalArchiveDir
SFTP_OUT	/OutputDir

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1.1. Review new properties

This part of the lab will give you brief description of some the new properties that are not used in this lab.

- **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.

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Part 2: Inbound test using SSH user name and password authentication

During the inbound processing, the FTP adapter polls the event directory associated with SSH server for events at specified intervals. Each time a file is created or updated, the adapter tracks it as an event. When the adapter detects an event, it requests a copy of the file (which is saved to the local event directory), converts the file data into a business object and sends it to the consuming service.

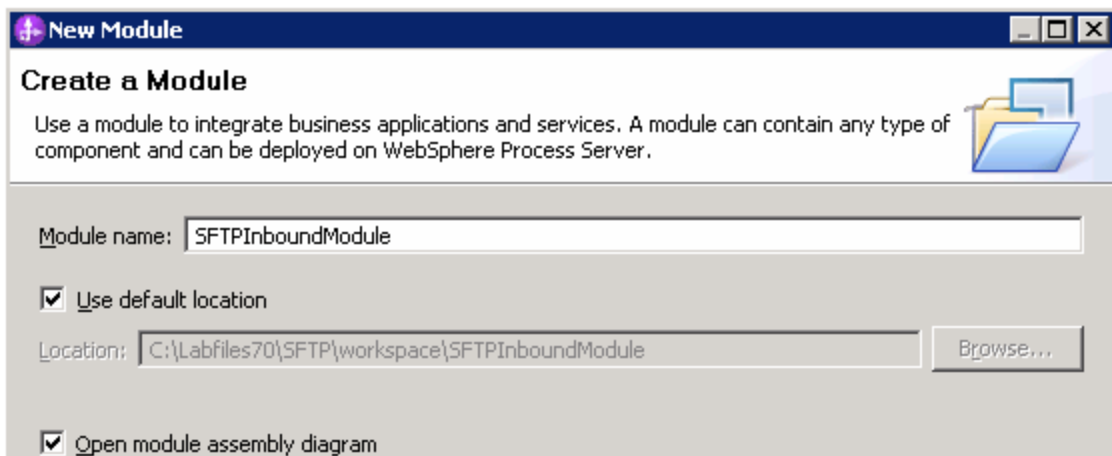
You should have already completed the lab '**Install and configure SSH server**' lab and created the user name and password in the SSH server to be used in adapter configuration to authenticate to that server.

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2.1. Configure inbound using the external service wizard

In this part of the lab you will use the new external service wizard to create and configure the function selector, data binding and other required artifacts to test the inbound processing. You will use user name and password authentication for SSH.

- ___ 1. Create the module: SFTPinboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **SFTPinboundModule** for the Module Name



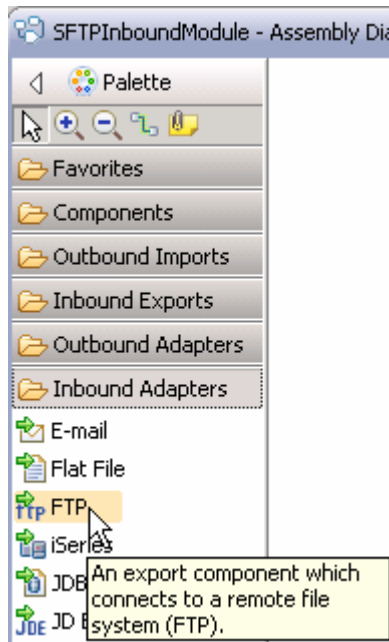
- ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**

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

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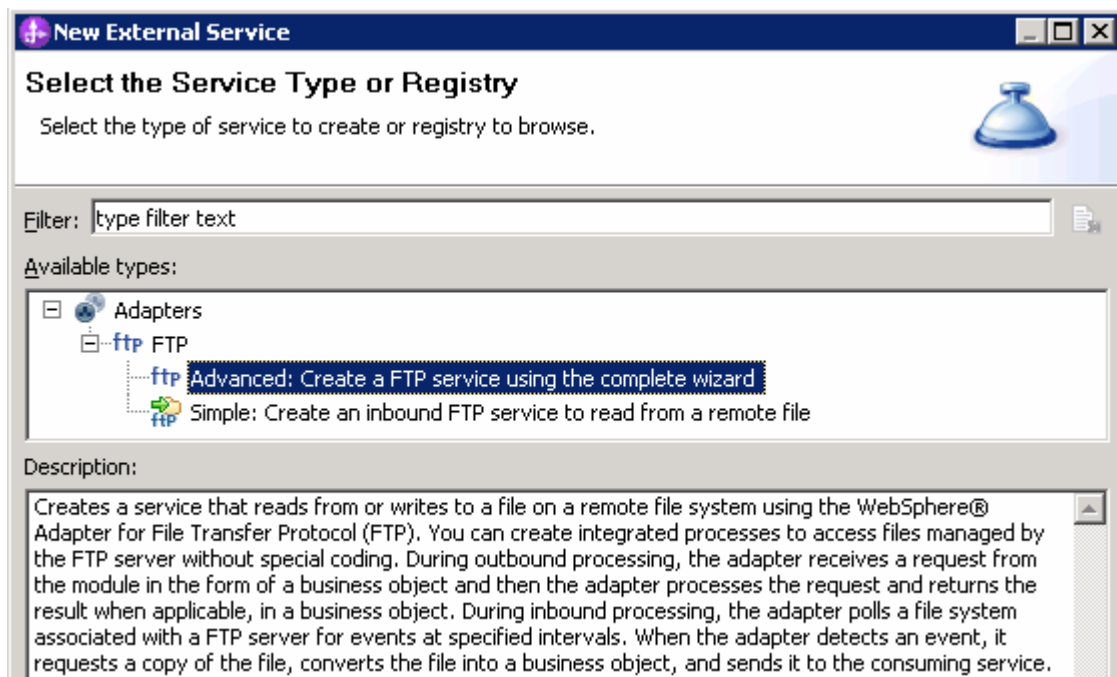
___ 2. To start External Service from the Palette:

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



___ b. Under Inbound Adapters, click the **FTP** and then click the empty canvas of the assembly diagram. The New FTP File 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**

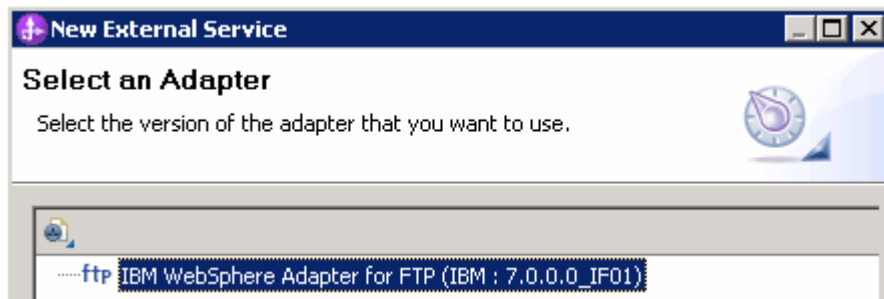
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Note: You can also start the External Service from the **File menu** option:

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**

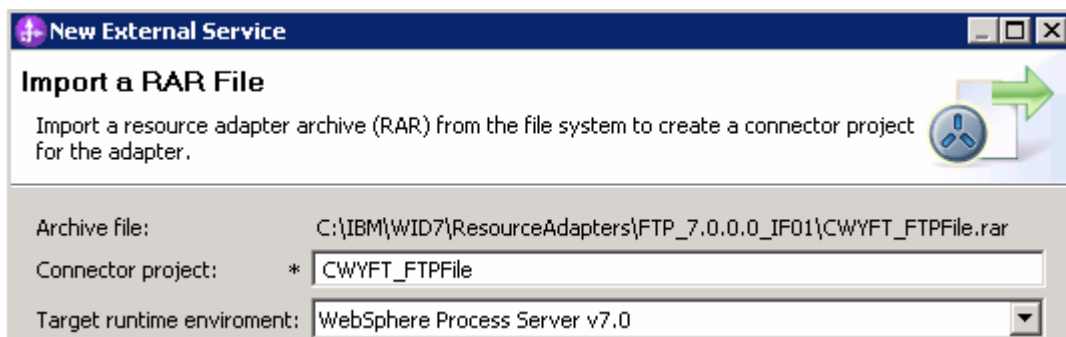
- ___ 4. On the Select an Adapter screen, select **IBM WebSphere Adapter for FTP (IBM : 7.0.0.0_IF01)** and click **Next**



- ___ 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>**

- ___ 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 **Inbound** and click **Next** to proceed to the next step.

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___ 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 SFTP Server),
for Ex: localhost

2) Remote directory: **\${SFTP_EVENT}**

Note: This is the directory from where adapter gets the event files

3) Local directory: **\${SFTP_LOCAL_EVENT}**

4) Protocol: **SFTP (Secure shell File Transfer Protocol)**

5) Port number: **22** (default is 21, but, when you change the protocol to SFTP, the port number automatically changes to 22)

The screenshot displays the configuration interface for the FTP system connection. The 'Deploy connector project' dropdown is set to 'With module for use by single application'. The 'Connection settings' dropdown is set to 'Use properties below'. Under 'Connection properties', the 'FTP system connection information' section is expanded. The 'Host name' field contains 'localhost'. The 'Remote directory' field contains '\${SFTP_EVENT}'. The 'Local directory' field contains '\${SFTP_LOCAL_EVENT}' and has a 'Browse...' button to its right. The 'Protocol' dropdown is set to 'SFTP (Secure shell File Transfer Protocol)'. The 'Port number' field contains '22'. Red arrows point to the dropdown menus for 'Deploy connector project', 'Protocol', and 'Port number', and red boxes highlight the 'localhost', '\${SFTP_EVENT}', and '\${SFTP_LOCAL_EVENT}' text entries.

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



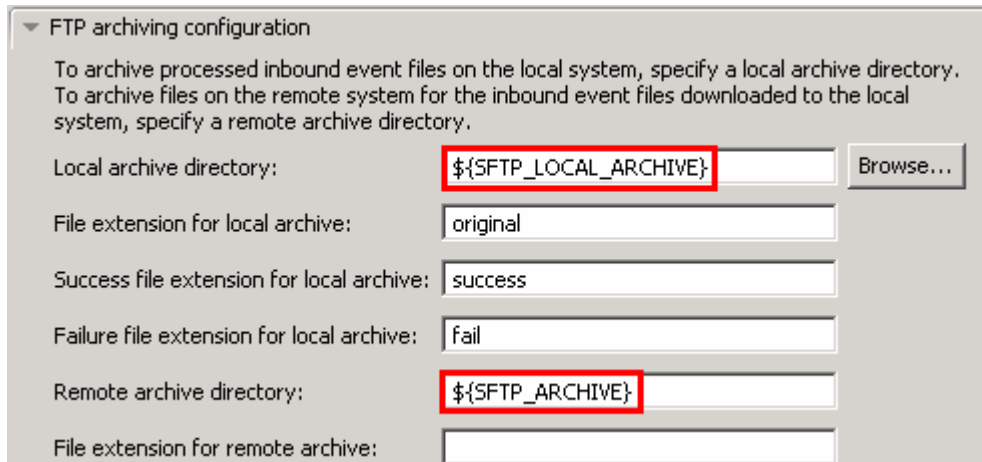
You can click each of the configurations and review the options available under it. For this lab, you will need only some of these properties.

__ d. Event persistence configuration: In this part of the lab, you will not use any JNDI instead use adapter's in-memory representation of event table to store all the necessary information

Note: The Event recovery data source (JNDI) name is **not mandatory** from V6.1. Now, the adapter can use **in-memory representation** of event table to store all the necessary information. Adapter uses this feature when event database information is not configured during inbound event polling. This feature will not support the capability of handling "Ensure once-only event delivery".

__ e. FTP archiving configuration:

- 1) Local Archive directory: **\${SFTP_LOCAL_ARCHIVE}**
- 2) Remote archive directory: **\${SFTP_ARCHIVE}**



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- __ f. Secure configuration: You will use the ‘Private key file’ and ‘Passphrase’ fields in “Part3: Outbound test using SSH public/private key authentication” of this lab

- __ g. For this lab, you are going to use the security properties from the activation specification.

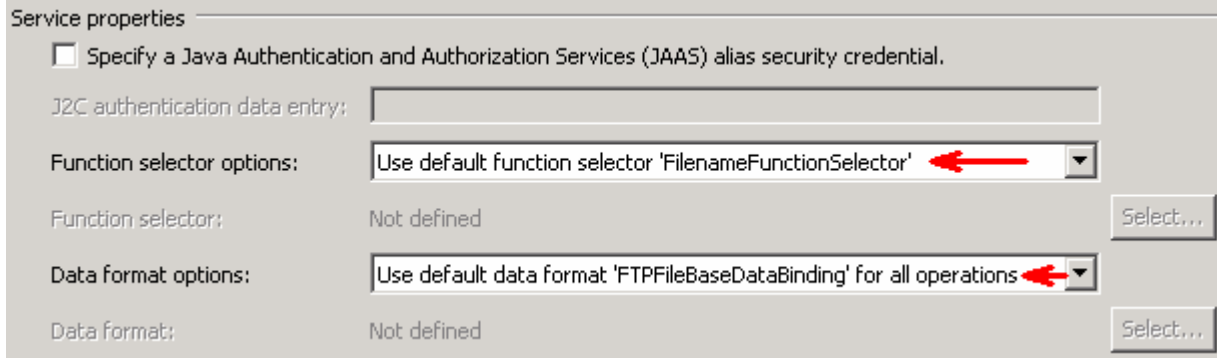
- 1) Select the radio button next to **Using security properties from the activation specification**

Note: Provide the user name and password created in the lab ‘Install and configure SSH server lab’.

- 2) User name: **username using which you connect to your SFTP server** (for Ex: **sftpuser1**)
- 3) Password: **password for the user to connect to your SFTP server (password)**

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- ___ 7. Under Service properties, for **Function selector options**, select **Use default function selector 'FilenameFunctionSelector'** from the drop down list
- ___ 8. For **Data format options**, select **Use default data binding 'FTPFileBaseDataBinding' for all operations** from the drop down list



- ___ 9. 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**

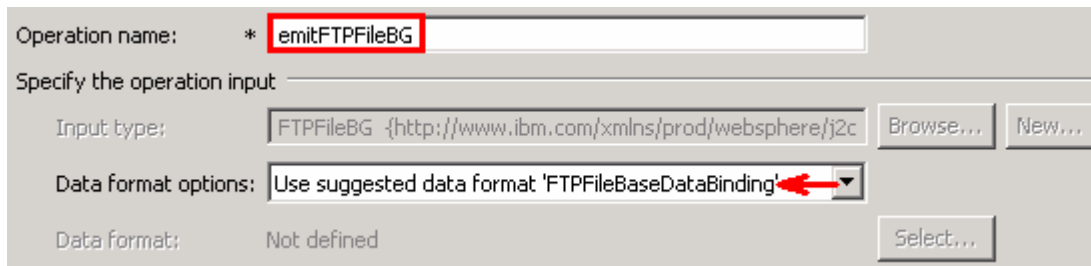
Define emitFTPFileBG operation:

- ___ 10. From the Operations screen, click **Add...**
 - ___ a. Add Operation window is opened. Select **Generic FTP business object with business graph** for the Data type and click **Next**



You are back to Operation window and because you have chosen the data type with business graph, the Input type is populated as **FTPFileBG**.

- ___ 11. For **Operation name**, enter any name, for Ex: **emitFTPFileBG**
- ___ 12. Accept the default selection, **Use suggested data format 'FTPFileBaseDataBinding'**, for **Data binding**



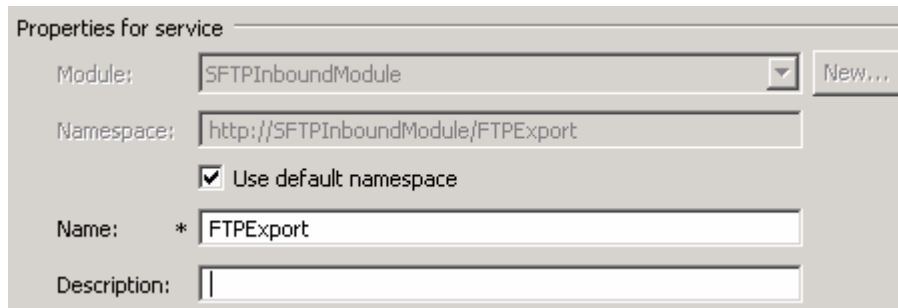
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__ a. Click **Finish**. The defined operation, **emitFTPFileBG**, is populated under Operations list



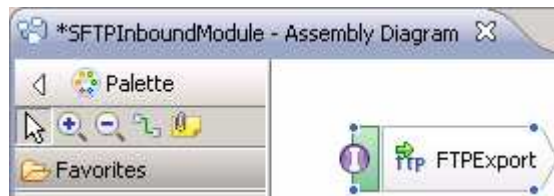
__ b. Click **Next** from Operations screen

___ 13. From Generate Service screen, accept the default value, **FTPEXport**, for **Name**



__ a. Click **Finish**

___ 14. The Assembly diagram for SFTPInboundModule is opened with an Export component, **FTPEXport**:





___ 15. Save (**Ctrl + S**) changes to your assembly diagram

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2.2. Add Java component

In this part of the lab, you will add a Java component and then wire the component to the existing Export interface.

- ___ 1. Open the assembly diagram for SFTPInboundModule (if it is already not open)
 - ___ a. From the business integration view, expand **SFTPInboundModule** and double click **Assembly diagram**
- ___ 2. Drop a Java component to onto the assembly diagram
 - ___ a. From the **Palette**, click **Components** to expand it
 - ___ b. Click **Java** and then click the empty space of FTPDefaultsInboundModule assembly diagram. This will place a new component, **Component1** on the assembly diagram.
- ___ 3. Wire the FTPEXport to the Component1
 - ___ a. Select the **wire** () icon from the Palette
 - ___ b. Click **FTPEXport** and then click **Component1** to wire them together
 - ___ c. Select **OK** for the Add Wire pop-up window:
 - ___ d. From the top of the Palette, click the **Selection Tool** icon () to get back to the normal cursor mode
 - ___ e. Right-click the empty space of the Assembly diagram and select **Arrange Contents Automatically** from the pop-up menu

Your assembly diagram for SFTPInboundModule will look like this:



- ___ f. Right-click **Component1** and select **Generate Implementation** from the pop-up menu
- ___ g. On the **Generate Implementation** panel, select **default package**, and click **OK**
- ___ h. **Component1Impl.java** is opened in Assembly editor. Scroll down to the method **emitFTPFileBG** that needs to be implemented and add this code under that method:


```
System.out.println("*****Reached Endpoint*****");
```
- ___ i. Save (**Ctrl + S**) and close Component1Impl.java
- ___ j. Save (**Ctrl + S**) and close Assembly diagram: SFTPInboundModule

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2.3. Test inbound scenario

In this part of the lab, you will use the WebSphere Process Server Test Environment to test the SCA application inbound processing.

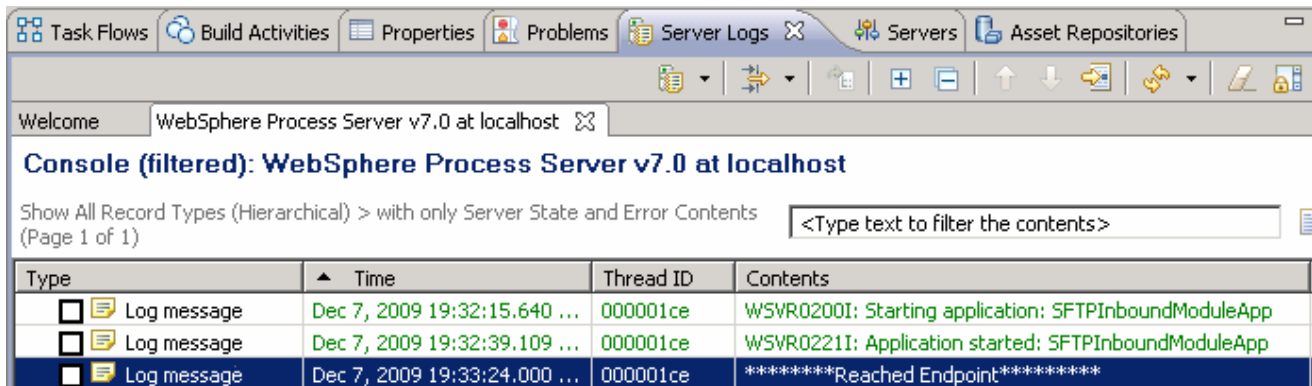
- ___ 1. Add the project to the WebSphere Test Environment server
 - ___ a. Right-click **WebSphere Process Server v7.0** under the Servers view and select **Add and remove projects...** from the pop-up menu
 - ___ b. From the Add and Remove Projects window, select **SFTPInboundModuleApp** under Available projects panel and click **Add >**
 - ___ c. You will now see the **SFTPInboundModuleApp** 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. Test the application by input files:

Note: For your convenience, three test files, **sample.txt**, **sample.txt1**, **sample.txt2** are placed in **<FTPFILES>**.

- ___ a. On the machine where the freeSSHd server is running, put **sample.txt** (or any of the three sample files) file in the **EventDir** under your SFTP server. The adapter will poll the copied file from the event directory and will transfer it to the archive directory

Verify the results:

- ___ b. No matter what type of file you put in Event directory, it will pass through the only existing method, **emitFTPFileBG**, and you should see this message in your **Server Logs** view (or SystemOut.log):



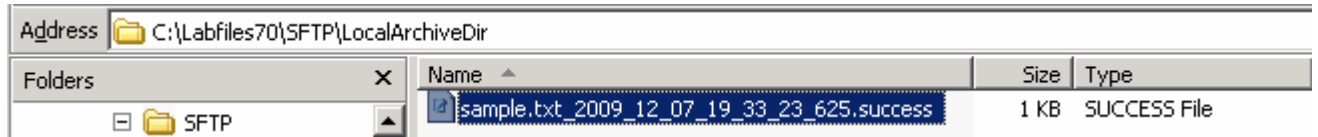
The screenshot shows the WebSphere Process Server v7.0 console with the following log messages:

Type	Time	Thread ID	Contents
Log message	Dec 7, 2009 19:32:15.640 ...	000001ce	WSVR0200I: Starting application: SFTPInboundModuleApp
Log message	Dec 7, 2009 19:32:39.109 ...	000001ce	WSVR0221I: Application started: SFTPInboundModuleApp
Log message	Dec 7, 2009 19:33:24.000 ...	000001ce	*****Reached Endpoint*****

- ___ c. Check the **<LOCAL_EVENT_DIR>** on your local machine. The file is quickly moved from this directory to the local archive directory
- ___ d. Check the **ArchiveDir** of your SFTP server which should contain the same file name appended with year, month, date, system time, and processed as you have given

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- ___ e. Check the **<LOCAL_ARCHIVE_DIR>** subdirectory which should contain an archive of the event file, with the same file name appended with year, month, date, system time, and **success**



- ___ 3. 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 **SFTPinboundModuleApp** 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

Part 3: Outbound test using SSH public/private key authentication

Public key authentication is one of the most secure methods used to authenticate when using a Secure Shell. Public key authentication uses a pair of computer generated keys, one public and one private. The public key can be distributed and resides in the SFTP server. The private key is unique to the user name and must not be shared.

The following properties are required to enable public key authentication:

Host name

Port number

User name

Private key

Passphrase is an optional property that is used to provide extra protection for the private key.

The adapter for FTP uses a JSch library to generate digital signatures, which are used during authentication. Digital signatures are used to simulate the security properties of a handwritten signature. The signature is received by the FTP server and authenticated using the public key.

The key-pair must be generated in the OpenSSH format and can be generated using any of the standard encryption algorithms. Generation of the key-pair using freeSSHd and PuTTY generator are explained in the lab **“Install and configure SSH server”**.

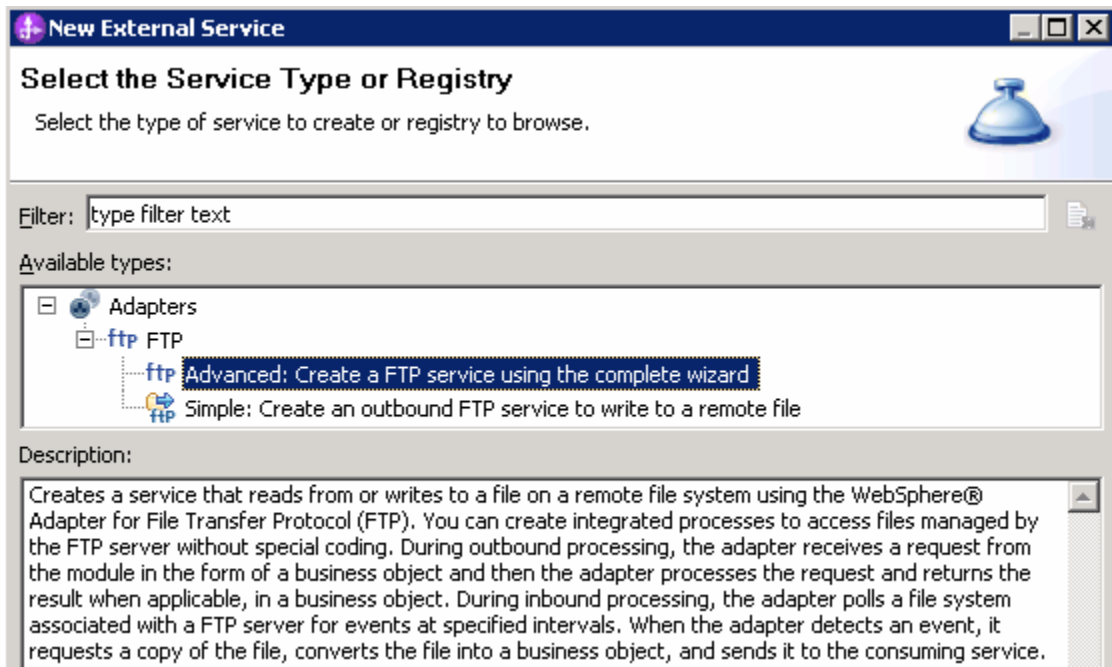
If both the Password (username and password authentication) and the Private key (public key authentication) values are specified in the external service wizard, the Private key property value takes precedence. The adapter then tries to authenticate to the server using public key authentication.

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3.1. Configure outbound using external service wizard

In this part of the lab you will use the new external service wizard to create and configure the data binding and other required artifacts to test the outbound processing. You will use user public key authentication for SSH.

- ___ 1. Create SFTPOutboundModule
 - ___ a. From the Business Integration window, right-click and select **New > Module**
 - ___ b. From the New Module window, enter **SFTPOutboundModule** for the Module Name
 - ___ c. Ensure that the box next to **Open module assembly diagram** is checked and then click **Finish**
- ___ 2. You will now see a new module, SFTPOutboundModule, created from your Business Integration window
- ___ 3. 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
- ___ 4. From the New External Service window, expand **Adapters > FTP** and select **Advanced: Create a FTP service using the complete wizard**



- ___ a. Click **Next**

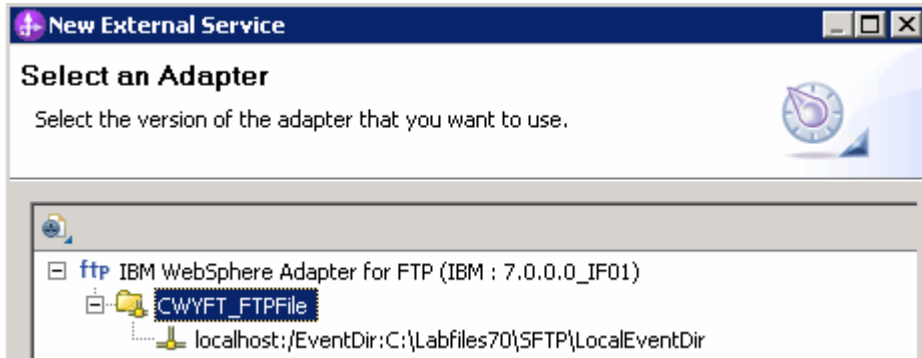
Note: You can also start the external service wizard from the **File menu** option:

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

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

- ___ 5. 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**

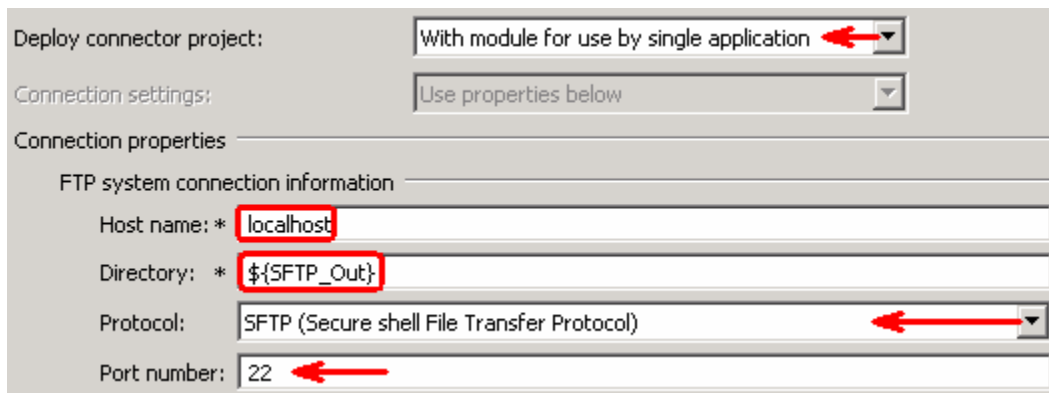
- ___ 6. Service Configuration Properties:

- ___ 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: localhost
- 2) Directory: **\${SFTP_OUT}**

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

- 3) Protocol: **SFTP – secure shell(SSH) file transfer protocol**
- 4) Port number: **22** (default is 21, but, when you change the protocol to SFTP, the port number automatically changes to 22)



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- __ c. Click **Advanced >>** to see the hidden advanced properties that can be configured:
- __ d. Click **Secure configuration**
 - 1) Private key file: Browse and select the **Private key** file that is generated in the pre requisite lab '**Install and configure SSH server**'
 - 2) Passphrase: **passphrase** (enter the Passphrase specified in the pre requisite lab '**Install and configure SSH server**' for that user while generating the key

Secure configuration

Enable remote server authentication for SFTP protocol

Host key file: Browse...

Private key file: C:\Labfiles70\SFTP\PrivateKey.ppk Browse...

Passphrase: *****

FTPS connection mode: Explicit

Data channel protection level: Private - Data is transferred in encrypted form

Keystore type: JKS

Truststore file: Browse...

Truststore password:

Keystore file: Browse...

Keystore password:

Key password:

- __ e. For this lab, you are going to use the security properties from the activation specification.
 - 1) Select the radio button next to **Using security properties from the activation specification**

Note: Provide the user name and password created in the lab 'Install and configure SSH server lab'.

- 2) User name: user you defined with public an private authentication in '**Install and configure SSH server lab**' - **sftpuser2**

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- 3) Password: **passphrase** (enter the Passphrase specified in the pre requisite lab ‘Install and configure SSH server’ for this user while generating the key

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 managed connection factory
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

Operation name: * createFTPFileBG

Specify the operation input

Input type: FTPFileBG {http://www.ibm.com/xmlns/prod/websphere/j2} Browse... New...

Data format options: Use suggested data format 'FTPFileBaseDataBinding' ←

Data format: Not defined Select...

Specify the operation output

Output type: CreateResponseBG {http://www.ibm.com/xmlns/prod/web} Browse... New...

Data format options: Use suggested data format 'FTPFileBaseDataBinding' ←

Data format: Not defined Select...

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

Operations:

createFTPFileBG ({http://www.ibm.com/xmlns/prod/websphere/j2ca/ftp/ftpfilebg}FTPFileBG) : Add...

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

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

Properties for service

Module: SFTPOutboundModule New...

Namespace: http://SFTPOutboundModule/FTPImport

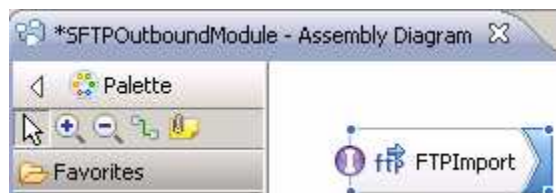
Use default namespace

Name: * FTPImport ←

Description:

- ___ a. Click **Finish**

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



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

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3.2. Test outbound scenario

In this part of the lab, you will use the WebSphere Process Server Test Environment to test the SCA application outbound processing for create operation.

- ___ 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 **SFTPOutboundModuleApp** under Available projects panel and click **Add >**
 - ___ c. You will now see the **SFTPOutboundModuleApp** 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 **SFTPOutboundModule** and select **Test > Test Module**
- ___ 3. The **SFTPOutboundModule_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: **sftpTest.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: SFTPOutboundModule

Component: FTPImport

Interface: FTPImport

Operation: createFTPFileBG ←

Initial request parameters:

Value editor XML editor

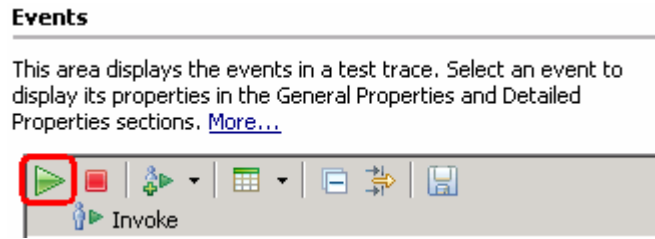
Name	Type	Value
createFTPFileBGInput	FTPFileBG	[ab]
verb	verb<string>	[ab] CREATE
FTPFile *	FTPFile	[ab]
DirectoryPath	string	[ab]
Filename	string	[ab] sftpTest.txt

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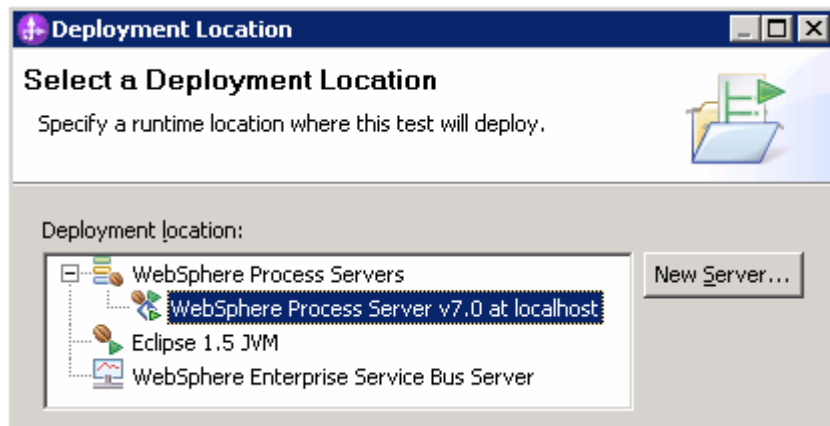
__ b. For **AsText** under **Content**, enter some test message, for Ex: **Testing ftp create operation**

Content	UnstructuredContent	lab
ContentType	string	lab
ObjectName	string	lab
AsText	string	lab Testing sftp create operation
AsBinary	hexBinary	lab 00

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



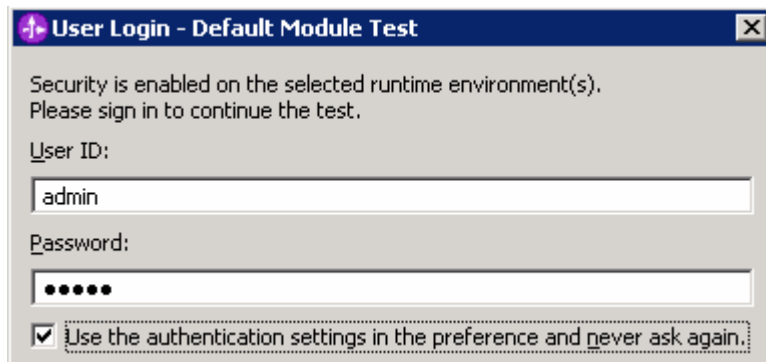
__ d. From Deployment Location window, select **WebSphere Process Servers > WebSphere Process Server v7.0**



__ e. Click **Finish**

__ f. 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



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- ___ g. 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: [SFTPOutboundModule](#)
 Component: [FTPImport](#)
 Interface: [FTPImport](#)
 Operation: [createFTPFileBG](#)

Return parameters:

Value Editor XML Source

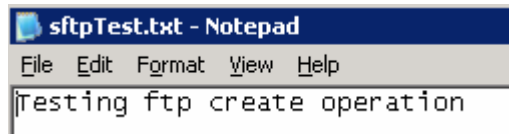
Name	Type	Value
createFTPFileBGOutput	CreateResponseBG	[ab]
verb	verb<string>	[ab]
CreateResponse *	CreateResponse	[ab]
Filename	string	[ab] sftpctest.txt

- ___ 5. Verify the created file and its contents

- ___ a. You will see a new file, **sftpTest.txt** created under **OutputDir** of your SFTP server



- ___ b. Open that file to see the content



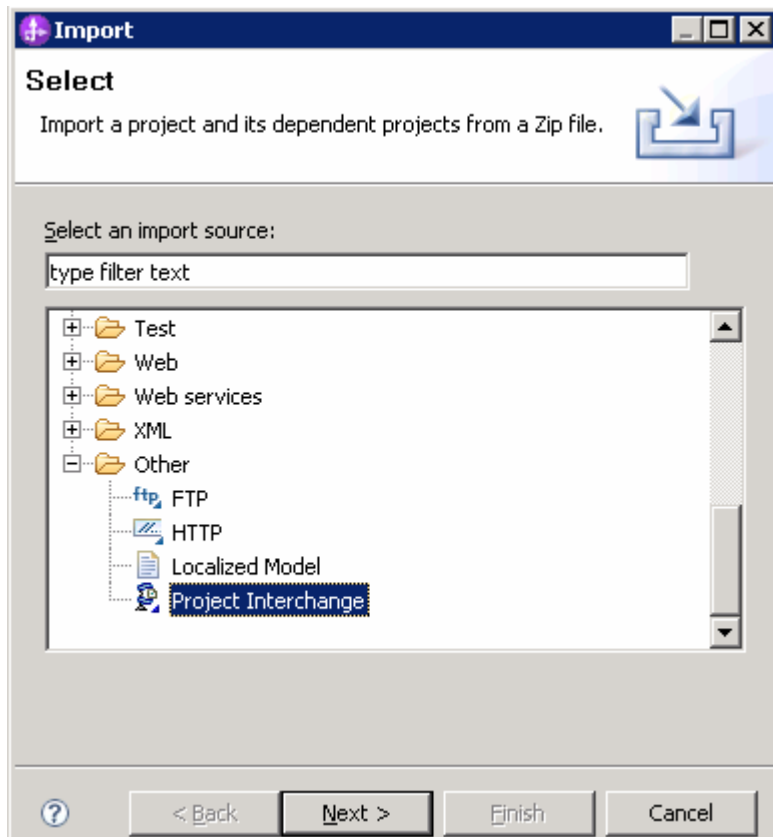
- ___ 6. Restore the Sever Configuration

- ___ 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 **SFTPOutboundModuleApp** 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

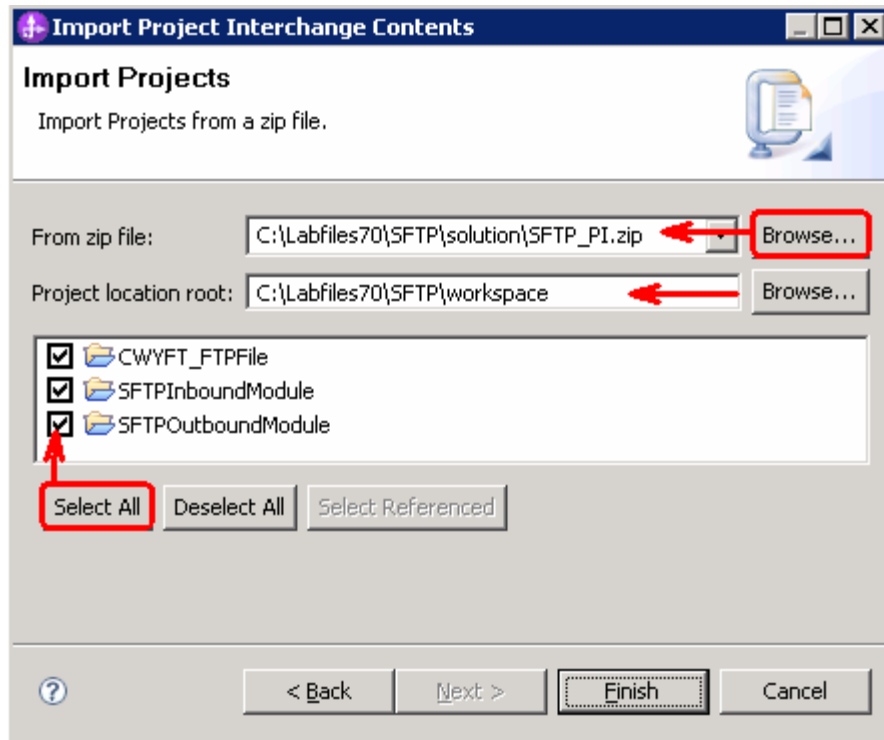
- ___ 1. Start WebSphere Integration Developer V7.0 with a new workspace
 - ___ a. Follow the instructions outlined in **Part 1** of this exercise
- ___ 2. Import the solution Project Interchange
 - ___ a. Import the project interchange file **SFTP_PI.zip** from **<LAB_FILES>\SFTP\solution** directory
 - ___ 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 **SFTP_PI.zip** in the **<LAB_FILES>\SFTP\solution** directory
- ___ e. Enter **<LAB_FILES>\SFTP\workspace** for the **Project location root**

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- ___ f. Click the **Select All** button. This will select all modules: **CWYFT_FTPFile**, **SFTPinboundModule**, and **SFTPOutboundModule**



- ___ g. Click **Finish**

- ___ 3. Continue with **Part 2.3** of this lab to test inbound using SSH user name and password authentication
- ___ 4. Continue with **Part 3.2** of this lab to test outbound using SSH public/private key authentication

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What you did in this exercise

In this lab, you started with importing the FTP Adapter RAR file into your WebSphere Integration Developer new workspace. Next, you made use of the External Service wizard available in WebSphere Integration Developer to specify configure inbound operation with the user name and password authentication. Then you deployed and tested the inbound adapter application using WebSphere Process Server runtime.

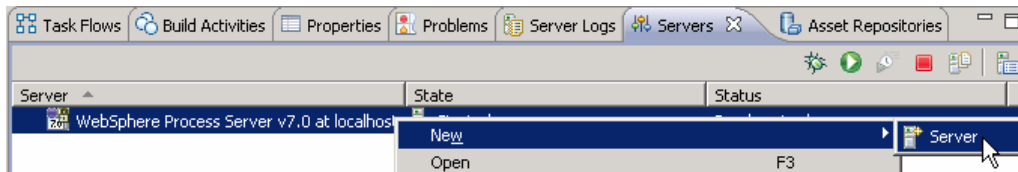
Next, you configured the outbound operation using External service wizard with the public key authentication for SSH and continued to deploy and test this outbound adapter application using WebSphere Process Server.

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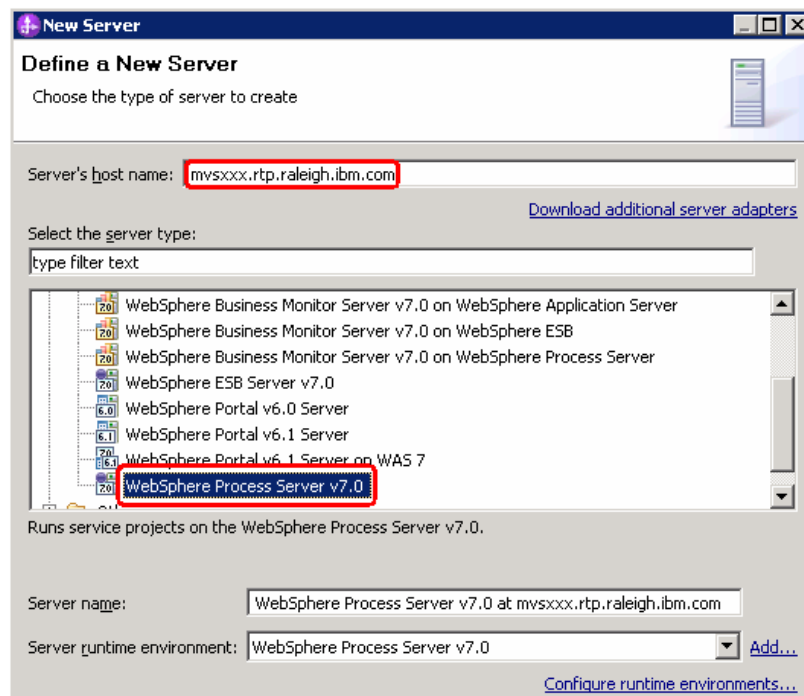
Task: Adding remote server to WebSphere Integration Developer test environment

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**.



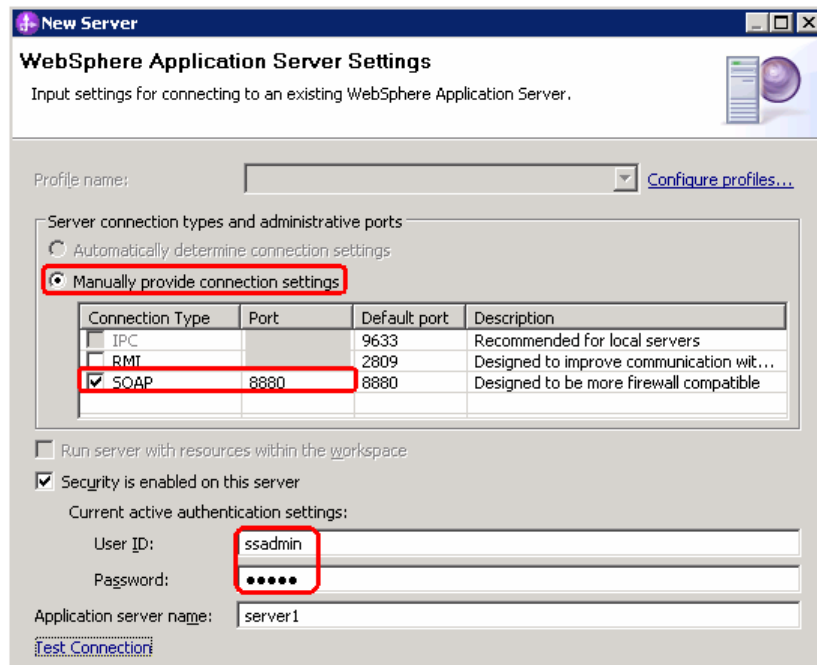
- ___ c. In the New Server dialog, specify the remote server's host name, **<HOSTNAME>**.
- ___ d. Ensure that the appropriate server type, **'WebSphere Process Server v7.0'** or **'WebSphere ESB Server v7.0'**, is highlighted in the server type list



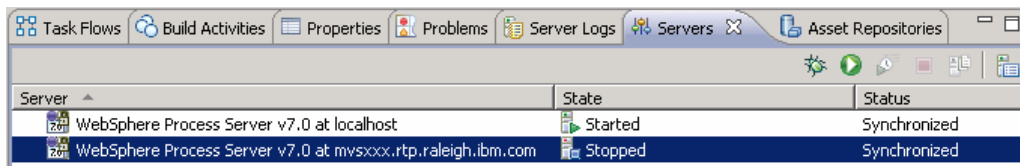
- ___ e. Click **Next**

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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
```