# BTSHOL06: Content based routing

Objective

After completing this lab, you will be able to:

* Create a receive port and a receive location.
* Create send ports and define message filters.
* Start the send ports, enable the receive location, and test the configuration.
* Configure BizTalk group and host security settings.
* Create a custom send pipeline.
* Modify a send port to use a custom pipeline.
* Create a custom receive pipeline.
* Build and test the pipeline solution.

Scenario

At times, you may receive certain types of messages that do not require any detailed processing. Message routing provides a solution for forwarding messages to a specific send port, based solely on the contents of the message.

Northwind Traders wants to route customer orders to its supplier, Fabrikam, immediately whenever the order amount is equal to or less than $500. Orders greater than $500 require additional approval, and should be routed internally for additional processing.

Northwind Traders also requires that all business-to-business (B2B) messages exchanged with trading partners be secure. In this lab, you will configure two custom pipelines. First, you will configure a send pipeline that includes the S/MIME encoder component for encrypting all outbound messages. Next, you will configure a receive pipeline to decrypt all inbound messages from trading partners (for purposes of the lab you will just be signing using self-signed certificates, using trusted certificates would allow for encryption, but the steps are the same).

User Name: **Administrator**

Password: **pass@word1**

Estimated time to complete this lab: 60 minutes

In this lab, you will learn how to create both receive locations and send ports. You will also learn how to use message routing to create a subscription for a send port. In this example, you create a filter that checks the quantity and either forwards the message to one send port if the value is equal to or less than 500, or forwards it to another send port if the value is greater than 500.



Exercise 1  
Create a Receive Port and a Receive Location

In this exercise, you will open and modify an existing solution and create a receive port and a receive location for incoming messages.

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| Tasks | Detailed steps |
| 1. Open an existing solution.  Performing this step opens a predefined project that contains schemas (.xsd) and a map file (.btm). | 1. In Windows Explorer, open **C:\Labs\Lab 6\Start\NWBusinessSolution\NWBusinessSolution.sln**.   A predefined project opens in Solution Explorer. |
| 1. Build and deploy the project. | 1. In Solution Explorer, right-click **NWMessaging**, and then click **Build**. 2. Wait until you see **Build succeeded** in the lower left corner. (Warnings here may be ignored.) 3. Right-click **NWBusinessSolution** and select **Deploy Solution**. |
| 1. Create a receive port.  Performing this step creates a receive port for incoming messages and instructs BizTalk Server to use the NWCustomerOrder\_To\_ FKSupplierPO map to transform any message where the message’s schema matches the source schema of the map. | 1. From the **Start** menu, click **BizTalk Server Administration**. 2. In **BizTalk Administration Console**, expand **BizTalk Server 2016 Administration > BizTalk Group > Applications**, and then expand **Lab6**. 3. Right-click **Receive Ports**, then point to **New**, and then click **One-way Receive Port**. 4. In the **Receive Port Properties** dialog box, configure the port with the following properties (click for drop-down on **Inbound Maps**):      |  |  | | --- | --- | | Parameter | Value | | Name | rprtReceive | | Inbound Maps  Source Document | CustomerOrder [NWMessaging… |  1. Click **OK** to save changes. |

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| Tasks | Detailed steps |
| 1. Create a receive location.  Configuring the receive location provides the physical address and transport information for BizTalk Server to process inbound messages.   As an alternative to typing in the folder path, you can browse for the folder and select it using the Browse button. | 1. Right-click **Receive Locations**, point to **New**, and then click **One-way Receive Location**. 2. In the **Select a Receive Port** dialog box, select **rprtReceive** and the click **OK**. 3. Use the following properties for the receive location (to access **Receive Folder** and **File Mask**, click **Configure**):  |  |  | | --- | --- | | Parameter | Value | | Name | rlocReceiveFILE | | Transport Type | FILE | | Receive Folder | C:\Labs\Work\Lab 6\File Drop\Messaging\Receive | | File Mask | \*.xml | | Receive Handler | BizTalkServerApplication | | Receive Pipeline | XML Receive |      1. Click **OK** to save changes. |

Exercise 2  
Create Send Ports and Define Message Filters

In this exercise, you will create two send ports and define a filter for routing messages to a specific send port, based on the message contents. Outgoing customer orders with a total amount equal to or less than $500 will be sent to a send port that forwards the message immediately to the supplier. Customer orders with amounts greater than $500 require internal approval and will be sent to a different send port for further processing.

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| Tasks | Detailed steps |
| 1. Create the first send port.  Performing this step creates a file folder location to send the message to if the amount is less than or equal to 500.   The XML Transmit Pipeline is not used as there is no special processing that needs to occur on the XML messages being sent. | 1. In BizTalk Administration Console, right-click **Send Ports** under **Lab6**, then point to **New**, and then click **Static One-way Send Port**. 2. Create a static one-way port by using the following information (to access **Destination Folder** and **File Name**, click **Configure**; to set the filter parameter, click on **Filters** in the left menu):  |  |  | | --- | --- | | Parameter | Value | | Name | sprtPOSendOrderFILE | | Transport Type | FILE | | Destination Folder | C:\Labs\Work\Lab 6\File Drop\Messaging\SendOrder | | File Name | PurchaseOrder%MessageID%.xml | | Send Pipeline | Pass Thru Transmit | | Filter | NWMessaging.PropertySchema.TotalOrderAmount <=500 |  1. Click **OK** to save changes. |
| 1. Create the second send port.  Performing this step creates a file folder location to send the message to if the amount is greater than 500. | 1. Right-click **Send Ports**, then point to **New**, and then click **Static One-way Send Port**. 2. Create a static one-way port by using the following information (to access **Destination Folder** and **File Name**, press **Configure**; to set the filter parameter, click on **Filters** in the left menu):  |  |  | | --- | --- | | Parameter | Value | | Name | sprtPONeedsApprovalFILE | | | Transport Type | FILE | | | Destination Folder | C:\Labs\Work\Lab 6\File Drop\Messaging\NeedsApproval | | | File Name | PurchaseOrder%MessageID%.xml | | | Send Pipeline | Pass Thru Transmit | | | Filter | NWMessaging.PropertySchema.TotalOrderAmount > 500 | |  1. Click **OK** to save changes. |

Exercise 3

Start the Send Ports and Test the Configuration

In this exercise, you will start the send ports, enable the receive locations, and then test the scenario.

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| Tasks | Detailed steps |
| 1. Start the BizTalk Server application.   Starting the application will start all send ports and enable all receive locations, as well as start orchestrations. | 1. In BizTalk Administration Console, right-click **Lab6**, and then click **Start**. 2. In the **Start ‘Lab6’ Application** dialog box, click **Start**. |
| 1. Test the scenario.  The receive port might take a minute to activate and process the first document the first time you enable the location.  To see the total order amount, you may want to open the CustomerOrder1.xml and CustomerOrder2.xml files before moving them. | 1. In Windows Explorer, browse to **C:\Labs\Work\Lab 6\File Drop\Messaging**, and then use Notepad to open and view **CustomerOrder1.xml**.   Verify that the TotalOrderAmount is less than 500.   1. Close Notepad. 2. Copy **CustomerOrder1.xml** and paste it to **C:\Labs\Work\Lab 6\File Drop\Messaging\Receive**.   Do not move the file, because BizTalk Server processes it and then removes it from the …\Receive folder.   1. Browse to **C:\Labs\ Work\Lab 6\File Drop\Messaging\SendOrder** and verify that the order was routed correctly.   Because the amount is less than 500, the order is dropped into the …\SendOrder folder.   1. In Windows Explorer, browse to **C:\Labs\Work\Lab 6\File Drop\Messaging** and use Notepad to open and view CustomerOrder2xml.   Verify that the TotalOrderAmount is greater than 500.   1. Close Notepad. 2. Copy **CustomerOrder2.xml** and paste it to **C:\Labs\Work\Lab 6\File Drop\Messaging\Receive**. 3. Browse to **C:\Labs\Work\Lab 6\File Drop\Messaging\NeedsApproval** to verify that the order was routed correctly.   Because the amount is greater than 500, the order is dropped into the ...\NeedsApproval folder. |

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Exercise 4  
Configuring BizTalk Host and Group Security Settings

In this exercise, you will modify the BizTalk group and host properties to associate a signing certificate for decrypting inbound messages and encrypting outbound messages.

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| Tasks | Detailed steps |
| 1. Create the encryption certificate | 1. Open a Visual Studio 2015 command prompt (**Start menu >** **Open Developer Command Prompt for VS2015**). 2. Use makecert to create and put a certificate in the correct store:   **makecert -ss My -n CN=FabrikamTrusted fab.cer**   1. Use certmgr to place it into the right stores (this makes the cert trusted). Run the following commands.   **certmgr /add fab.cer /s /r localMachine root**  **certmgr /add fab.cer /s /r localMachine AddressBook**  **certmgr /add fab.cer root** |
| 1. Associate a certificate with a BizTalk host.  The thumbprint specifies which certificate (your private key) to use when decrypting inbound messages. | 1. In the BizTalk Administration Console, expand **Microsoft BizTalk Server 2016 Administration** > **BizTalk Group** > **Platform Settings**, and then click **Hosts.** 2. Right-click **BizTalkServerApplication**, and then click **Properties**. 3. In the **Host Properties** dialog box, click **Certificates**, and then click the **Browse** button. 4. In the **Select Certificate** dialog box, select the certificate issued to **FabrikamTrusted**, and then click **OK**. 5. Click **OK** to save changes. |
| 1. Associate a signing certificate with a BizTalk group.  The thumbprint specifies which certificate (your private key) to use when signing outbound messages. | 1. In the left pane, right-click **BizTalk Group**, and click **Properties**. 2. In the **Group Properties** dialog box, click **Certificate**, and then click the **Browse** button. 3. In the **Select Certificate** dialog box, select the certificate issued to **FabrikamTrusted** , and then click **OK**. 4. Click **OK**. |

Exercise 5  
Creating a Custom Send Pipeline

In this exercise, you will open the existing project and create a new pipeline. You will then add and configure the XML Assembler and MIME/SMIME pipeline components for this pipeline.

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| Tasks | Detailed steps |
| 1. Open the existing solution. | 1. If the solution isn’t open, open the solution from **C:\Labs\Lab 6\Start\NWBusinessSolution\NWBusinessSolution.sln**. |
| 1. Create a new pipeline.  This creates a new blank pipeline. | 1. In Solution Explorer, right-click the **NWMessaging** project, point to **Add**, and then click **New Item**. 2. In the **Add New Item** dialog box, click **Pipeline Files** in the Categories pane, and then in the Templates pane, click **Send Pipeline**. 3. In the **Name** box, type **SendEncryptedPurchaseOrder.btp** as the pipeline name. 4. Click **Add** to open the new pipeline in Pipeline Designer.   The new pipeline appears in Pipeline Designer. |
| 1. Configure the pipeline.  This sets the properties to enable signing of the outbound document. | 1. If the Toolbox is not docked on the left side, on the **View** menu, click **Toolbox**. 2. Drag the **MIME/SMIME** **encoder** component to the **Drop Here** box under the **Encode** stage. 3. Configure the **MIME/SMIME** **encoder** component properties as follows :  |  |  | | --- | --- | | Property | Value | | Check Revocation List | False | | Content transfer encoding | Base64 | | Enable encryption | False | | Send body part as attachment | True | | Signature type | NoSign | |

Exercise 6  
Building and Deploying the Pipeline Project

In this exercise, you will build and deploy the pipeline project.

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| Tasks | Detailed steps |
| 1. Build the pipeline project and deploy the assembly   *The project has been configured, on the deployment settings, to enable redeployment over an existing deployment. Bindings are retained when possible.* | 1. In Solution Explorer, right-click **NWMessaging**, and then click **Build**. 2. Wait until you see **Build succeeded** in the lower left corner. 3. Right-click **NWMessaging**, and then click **Deploy**. 4. View the Output window to verify that the project successfully compiled and deployed (warnings may be ignored). |
| 1. Restart the host instance.   The host instance must be restarted anytime a project is redeployed to make sure the new instances of the assemblies get loaded into memory.  Alternately, you can set a property on the deployment tab of the project properties to automatically restart the host when you deploy the project. | 1. In the BizTalk Server 2016 Administration Console, expand **Platform Settings**, and then click **Host Instances**. 2. Right-click **BizTalkServerApplication**, and then click **Restart**. 3. In the BizTalk Server 2016 Administration Console, expand **Applications**.Right-click on the **Applications** nodeand select **Refresh**. |

Exercise 7  
Modify Send and Receive Ports

In this exercise, you will modify the send port properties to associate the certificate and the send pipeline with the send order port. Then you will start the port.

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| Tasks | Detailed steps |
| 1. Modify the send port properties.  This associates the certificate and the send custom pipeline with this send port. | 1. In the BizTalk Server 2016 Administration Console, click on **Send Ports** (under Lab6), right-click **sprtPOSendOrderFILE** (on the right side of the screen), and then click on **Properties**. 2. Modify the **Port Properties** by using the following information. To modify the certificate, click on **Certificate** in the left panel, then click **Browse** to find the correct certificate.  |  |  | | --- | --- | | Parameter | Value | | Send… Certificate Name | "FabrikamTrusted." | | Send… Send Pipeline | SendEncryptedPurchaseOrder |  1. Click **OK**. |
| 1. Modify the receive port.  This modifies the receive port to use a map. | **a**. Expand **Receive Ports**,right-click **rprtReceive**, and then click **Properties**.   1. Modify the receive port by using the following information (if not already selected; click on **Inbound Maps** in left panel to access):  |  |  | | --- | --- | | Parameter | Value | | Inbound Maps | NWCustomerOrder\_To\_FKSupplierPO |  1. Click **OK**. |
| 1. Start the application. | 1. Right-click on the **Lab6** application and choose **Start** if it is available. Click **Start** again when prompted. |

Exercise 8  
Testing the Send Pipeline Solution

In this exercise, you will test your pipeline by viewing the document that has been signed after being processed.

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| Tasks | Detailed steps |
| 1. Test the scenario.  Because the amount is less than 500, the CustomerOrder1.xml message is processed by the subscribing SendOrder port, which uses the pipeline to sign the message. | 1. In Windows Explorer, browse to **C:\Labs\Work\Lab 6\File Drop\Messaging**, and then open **CustomerOrder1.xml** in **Notepad**.   Notice that the file is not signed or encrypted.   1. In Windows Explorer, copy both **CustomerOrder1.xml** and **CustomerOrder2.xml** to **C:\Labs\Work\Lab 6\File Drop\Messaging\Receive**. 2. Browse to **C:\Labs\Work\Lab 6\File Drop\Messaging\SendOrder**, and open the new file in **Notepad** to verify that the message has been signed (encryption could also be done when using trusted certificates). 3. Browse to **C:\Labs\Work\Lab 6\FileDrop\Messaging\NeedsApproval**, and verify that the new message has not been encrypted or signed. |

Exercise 9  
Creating a Custom Receive Pipeline

In this exercise, you will open the existing project and create a new pipeline. You will then add and configure the XML Disassembler and MIME/SMIME pipeline components for this pipeline.

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| Tasks | Detailed steps |
| 1. Create a new pipeline.  This creates a new blank pipeline that has a default set of components. | 1. In Visual Studio 2015, from the Solution Explorer, right-click the **NWMessaging** project, point to **Add**, and then click **New Item**. 2. In the **Add New Item** dialog box, in the Categories pane, click **Pipeline Files**, and thenin the Templates pane, click **Receive Pipeline**. 3. In the **Name** box, type **ReceiveEncryptedPurchaseOrder.btp** to name the pipeline. 4. Click **Add** to open the new pipeline in Pipeline Designer.   The new pipeline appears in Pipeline Designer. |
| 1. Add the  **XML Disassembler** component to the pipeline.  This sets properties of the pipeline to enable signature validation of inbound messages in this pipeline. | 1. From the Toolbox, drag the **XML Disassembler** component to the **Drop Here** box under the **Disassemble** stage in the **Pipeline Designer.** 2. Drag the **MIME/SMIME** **decoder** component to the **Drop Here** box under the **Decode** stage. 3. Configure the **MIME/SMIME** **decoder** component properties as follows:  |  |  | | --- | --- | | Property | Value | | Allow non MIME Message | False | | Check Revocation List | False | |

Exercise 10  
Building and Deploying the Receive Pipeline Project

In this exercise, you will build and deploy the pipeline project. You will then test your receive pipeline by viewing the document that has been decoded after being processed.

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| Tasks | Detailed steps |
| 1. Build the pipeline project and deploy the assembly. | 1. In the **BizTalk Server 2016 Administration Console**, expand Applications. 2. **Right-click** on **Lab6** and if Stop is a viable option, select **Stop**. (If **Stop** is grayed out, go to step G.) In the **Stop** dialog, select the radio button next to **Full Stop…**, and Press **Stop**. 3. In the **Solution Explorer**, right-click **NWMessaging** and then click **Build**. 4. Wait until you see **Build succeeded** in the lower left corner. 5. Right-click **NWMessaging**, and then click **Deploy**.   View the Output window to verify that the project successfully compiled and deployed. |
| 1. Restart the host instance.   The host instance must be restarted anytime a project is redeployed. | 1. In BizTalk Server 2016 Administration Console, expand **Platform Settings**, and then click **Host Instances**. 2. Right-click **BizTalkServerApplication**, and then click **Restart**. 3. In the BizTalk Server 2016 Administration Console, expand **Applications**.Right-click on the **Applications** nodeand select **Refresh**. |
| 1. Modify the receive location.  This modifies the receive location to use your new pipeline. | 1. In BizTalk Server 2016 Administration Console, expand **Applications**. 2. Expand the application named **Lab6**. 3. Click on **Receive Locations**, then right-click **rlocReceiveFILE** in the right panel, and then click **Properties**. 4. Modify the receive location by using the following information, then click **OK**:  |  |  | | --- | --- | | Parameter | Value | | Receive Pipeline | ReceiveEncryptedPurchaseOrder | |
| 1. Modify the filter on the send port.   Because the input document is no longer a CustomerOrder, the TotalCost property will not be promoted. Therefore, the routing decision has to be based on some other value. | 1. In BizTalk Server 2016 Administration Console, click on **Send Ports**, then right-click **sprtPOSendOrderFile** in the right panel, and click **Properties**. 2. Change the **Send pipeline** property to **PassThruTransmit**  |  |  |  | | --- | --- | --- | | Property | Operator | Value | | BTS.ReceivePortName | == | rprtReceive |  1. Modify the filter on the send port by deleting the existing condition and adding the following condition, then click **OK**: |
| 1. Start the application. | 1. Right-click the **Lab6** application, click on **Start** and select **Start** when prompted. |
| 1. Test the scenario.  Here the inbound message is encrypted and BizTalk Server decrypts it.  If you cannot find the output file, check the Event Log for possible errors. | 1. Use Windows Explorer to browse to **C:\Labs\Work\Lab 6\File Drop\Messaging**\**SendOrder** and then open file left there by the last step using **Notepad (**notIE**)**.   Notice that the file is signed.   1. Use Windows Explorer to copy and paste this file into **C:\Labs\Work\Lab 6\**File Drop\Messaging\Receive. 2. Browse to **C:\Labs\Work\Lab 6\**File Drop\Messaging\SendOrder, and use **Notepad** to verify that the most recent message has been decoded. |
| 1. Delete the application | 1. In BizTalk Server 2016 Administration Console, right click on the **Lab6** application and select **Stop**. 2. If the **Options** tab isn’t visible – click on the options button to expand the Stop Options tab. 3. Select the **Full Stop – Terminate Instances** radio button 4. Click **Stop**. 5. After the stopping progress is complete, right-click on the **Lab6** application again and select **Delete**. 6. Expand **Platform Settings > Host Instances** in the tree view, and select **BizTalkServerApplication** in the right-hand pane. Right-click and select **Restart**. |