

# Integrated

Microsoft Dynamics® AX

## Application Integration Framework (AIF) BizTalk adapter configuration for data exchange

White Paper

Instructions to configure the AIF BizTalk adapter for data exchange in Microsoft Dynamics AX 2009.

Date: December 2008

<http://www.microsoft.com/dynamics/ax/>



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## Introduction

This document provides instructions to configure Application Integration Framework (AIF) for data exchange using the BizTalk adapter. The document also provides a brief overview of AIF.

AIF enables companies to integrate Microsoft Dynamics AX and communicate with external business processes and partners through the exchange of XML over various transport media. AIF enables both business-to-business and application-to-application integration scenarios. AIF provides a programming model, tools, and infrastructure support for XML-based integration of application functionality and data with Microsoft Dynamics AX. AIF enables Microsoft Dynamics AX to expose its functionality via services and documents based on the Windows Communication Foundation (WCF). AIF also enables Microsoft Dynamics AX to consume functionality exposed by external applications through Web services.

## Audience

This white paper is designed for BizTalk developers and Microsoft Dynamics AX system administrators who are responsible for installing, configuring, and troubleshooting integration with external systems using AIF.

## Prerequisites

To benefit from this white paper, you should have knowledge in the following areas:

- Enterprise application integration (EAI), business-to-business (B2B) and application-to-application (A2A) concepts and technologies.
- Microsoft Dynamics AX Application Integration Framework (AIF) setup and configuration.
- Microsoft BizTalk Server 2006 R2 administration, including troubleshooting BizTalk applications.
- BizTalk Server application development.
- Microsoft Visual Studio 2005.
- XML schema of the documents exchanged.

You also need to have a test environment set up to follow the hands-on instructions. The test environment is covered in a later section of this document.

For information about configuration and maintenance of AIF, see the [Server and Database Administration Guide](#). For information about AIF for software developers, see "[Integrating Other Applications with Microsoft Dynamics AX](#)" in the [Microsoft Dynamics AX SDK Help](#).

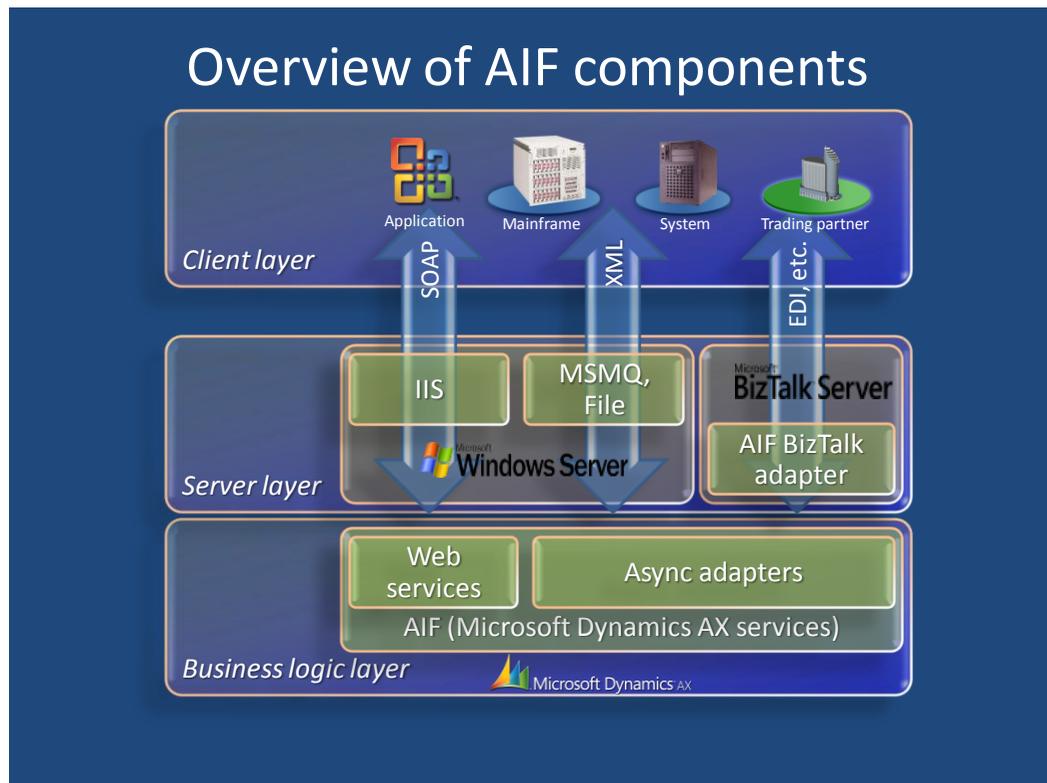
## System requirements

Before installing the Microsoft Dynamics AX BizTalk Adapter, be sure that your system meets or exceeds the [minimum hardware and software requirements](#).

## Overview of Application Integration Framework (AIF)

AIF provides an extensible framework that allows you to expose Microsoft Dynamics AX business logic or exchange data with other applications. In AIF, data is exchanged with external systems through business logic exposed as services. This model provides the ability to expose any X++ class as a service. This service can be called from X++ or from an external system. As part of this programming model, a set of services is included with Microsoft Dynamics AX that is based on documents such as a sales order or a customer.

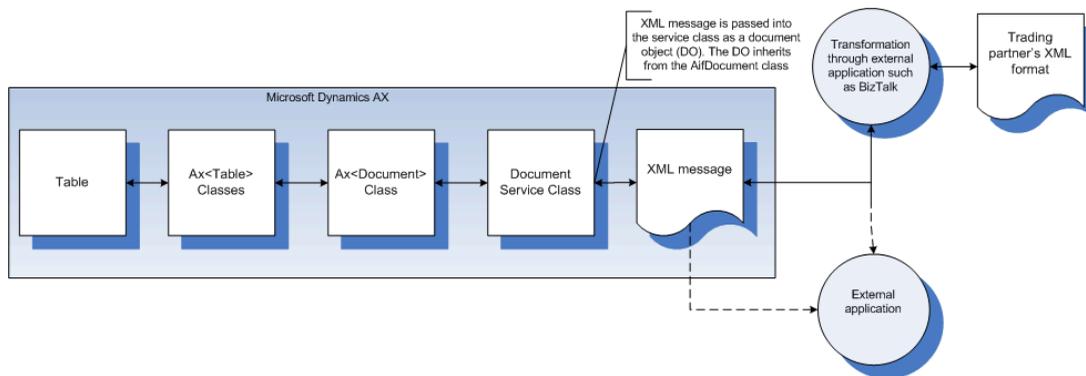
AIF enables the integration of Microsoft Dynamics AX through Web services, Microsoft Message Queuing (MSMQ), the file system (using a directory), or BizTalk Server as shown in the following diagram.



**Figure 1.** Overview of the AIF components.

With Microsoft Dynamics AX 2009, AIF introduces document services, a new abstraction for encapsulating business logic. Document services can be consumed directly from within the Microsoft Dynamics AX application (X++) or be published for consumption by external service clients through transport adapters or WCF services.

The following diagram provides a high-level overview of the AIF document services classes.



**Figure 2.** Flow chart describing Microsoft Dynamics AX document services.

The document services consist of three primary components:

1. **Document service classes:** In Microsoft Dynamics AX, document services enable you to exchange data with external systems by sending and receiving data in XML documents. These documents represent business objects such as a customer, a vendor, a sales order, and so on. The AIF document services are designed to be extensible. Developers can create their own document services with the AIF Document Service Wizard or customize the services that ship with Microsoft Dynamics AX.

You can use the document services to enable enterprise application integration scenarios with Web services and a variety of transports, including the following:

- File system
- Microsoft Message Queuing (MSMQ)
- BizTalk Server

2. **Axd <Document> classes (also known as Axd classes):** The document service classes call functionality in the Axd<Document> classes. The Axd<Document> classes contain the business logic for modeled entities. For example, the AxdCustomer class contains the logic for creating, updating, and deleting customers and related information.
3. **Ax <Table> classes:** The Axd<Document> classes use the Ax<Table> classes to manipulate data in the database. The diagram in the preceding section illustrates how the Axd<Document> and Ax<Table> classes interact in a document exchange.

The Ax<Table> classes are a further abstraction of a table and encapsulate the business logic associated with creation and modification of records in the database table.

## Terminology

This section explains the concepts used in the AIF. The AIF concepts may or may not match with the description of similar concepts in other products such as BizTalk Server.

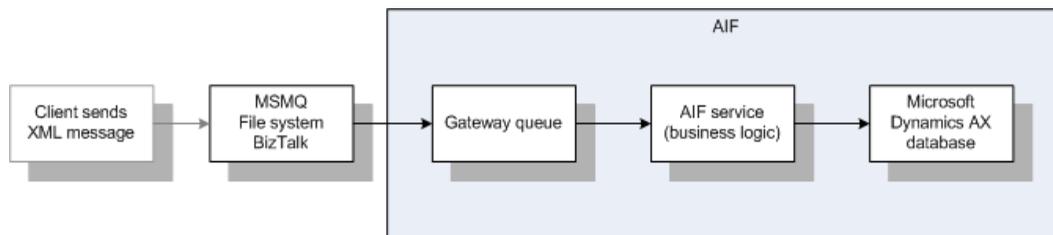
Term	Description
adapter	A software component that enables message exchange using a specific transport. In AIF, an adapter means a transport adapter.
business document	An XML data representation of an integration interaction.
channel	A named entity used to specify where and how to send and receive messages. A channel specifies an adapter with its associated configuration information and transport address.
document services	In Microsoft Dynamics AX 2009, a new services model was introduced in AIF. This model provides the ability to expose any class as a service that can be called from X++ or from an external system.
endpoint	A company or entity that participates in a business-to-business (B2B) or application-to-application (A2A) data exchange. An endpoint can be an in-house independent system, in the case of A2A.
endpoint action policy	Determines which actions are valid for a particular endpoint. An action is bound to an endpoint using an endpoint action policy.
gateway queue	Provides temporary storage for documents while they wait for processing. Inbound messages are placed in a gateway queue by an inbound transport adapter. Outbound messages wait in a gateway queue until an outbound transport adapter picks it up for sending.
message	An individual unit of data transported between endpoint locations. A message consists of a document plus a header containing information about the transfer.
document class	An X++ class (prefixed with Axd) with methods that perform actions on documents.
pipeline processor	The pipeline processor enables transformations of the inbound/outbound XML before/after the Microsoft Dynamics AX document class acts on the document. Components are provided in the base Microsoft Dynamics AX system for data value substitution and XSLT document transformations.
Web services	A unit of application logic that provides data and services to other applications that clients invoke by using the Simple Object Access Protocol (SOAP) over the Hypertext Transfer Protocol (HTTP).  Web services can perform functions ranging from simple requests to complicated business processes.

## Inbound and outbound message exchange

This section describes processing flow for inbound and outbound messages.

### Inbound message processing

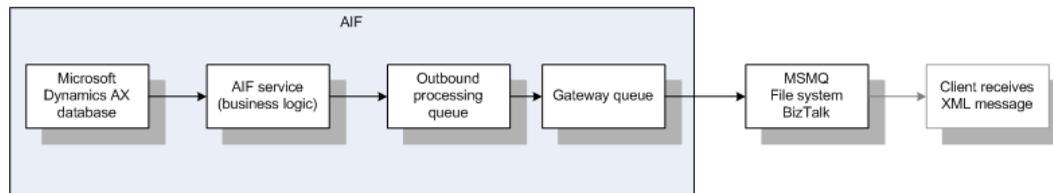
An external system sends a message through a transport adapter such as Microsoft Message Queuing (MSMQ), the file system, or BizTalk Server adapter. The AIF gateway receive service polls for messages and then brings them into the gateway queue. The AIF inbound processing service takes the messages from the gateway queue. Next, the business logic in the AIF document service processes the message and interacts with the database. The response message is then placed in the gateway queue. The gateway send service sends the response message using an outbound transport adapter. The following diagram shows a high level overview of the processing flow for an inbound message.



**Figure 3.** The conceptual message path for an inbound message.

### Outbound message processing

The AIF outbound processing service processes send requests using the document services and places the outbound messages in the gateway queue. The AIF gateway send service then reads the messages from the gateway queue and sends them out using a transport adapter. These transport adapters include Microsoft Message Queuing (MSMQ), the file system, or BizTalk Server adapter. The external system then receives the message from the appropriate transport. The following diagram shows a high level overview of the processing flow for an outbound message.



**Figure 4.** The conceptual message path for an outbound message.

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## Synchronous and asynchronous message processing

AIF supports both synchronous and asynchronous data exchanges. Both the synchronous and asynchronous data exchanges have different requirements for installation and configuration. Understanding the types of exchanges that are available allows you to better match the functionality in AIF with your data transfer and infrastructure requirements.

### Adapter-based exchange

Document exchanges that use transport adapters in Microsoft Dynamics AX do not require the installation of Microsoft Internet Information Services (IIS). These include:

- Microsoft Message Queuing (MSMQ)
- File system
- BizTalk Server

MSMQ and file system transport adapters only support the asynchronous mode of data exchange. The BizTalk adapter supports synchronous and asynchronous modes of data exchange.

In the synchronous mode, BizTalk bypasses the gateway queues and communicates directly with AIF. Messages sent to AIF bypass the gateway queues in AIF and go directly to the document services. Similarly, the responses from the services bypass the AIF gateway queues and go directly to BizTalk Server. In this mode, BizTalk sends a message to AIF and waits to receive a response.

In the asynchronous mode, the communication between BizTalk and AIF is done through the gateway queues. Messages going into AIF are sent to the gateway queue in AIF. When the batch jobs run, AIF retrieves the messages from the gateway queue. AIF places responses to BizTalk Server in the AIF gateway queue. In this mode, BizTalk Server does not wait for a response from AIF. Therefore, the asynchronous mode requires you to set up and use correlation in BizTalk to relate a response with its original message.

### Web services-based exchange

You can use Web services for synchronous document exchanges. Web services require the installation and configuration of IIS. The Microsoft Dynamics AX system administrator generates the Web services from the Microsoft Dynamics AX business logic so that developers with limited Web experience can easily create their own Web services.

## Performance considerations

Deciding when to use asynchronous or synchronous processing depends on your message volume and particular data transfer scenarios. If you have a high volume of messages being exchanged between AIF and BizTalk, you may want to implement your exchanges asynchronously. Asynchronous exchanges provide more control (via batch jobs and other configurations) over the load placed on Microsoft Dynamics AX for processing documents. Synchronous exchanges place immediate load on Microsoft Dynamics AX, thereby requiring more system resources. If you need an immediate response from a user-initiated request, you may want to use the synchronous mode.

You need to carefully determine the workload generated by your integration activities and the resulting load placed on the system. The performance considerations of integration using AIF are beyond the scope of this document. For more information, see the [Server and Database Administration Guide](#). Microsoft Dynamics AX 2009 introduces a new batch framework. The batch framework has been significantly enhanced to provide a truly asynchronous (non-interactive) server-based batch processing environment that is also capable of processing multiple tasks within a job across multiple Application Object Server (AOS) instances. The Microsoft Dynamics AX 2009 batch framework provides the capability of server-bound batches without the need for an interactive client. You can configure your AIF document exchange to take advantage of the parallelism offered by this

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new batch framework. For more information on the batch framework, see the [Microsoft Dynamics AX 2009 Implementation Guide](#). For more information about configuration of batch jobs and parallel processing of inbound messages, see [Server and Database Administration Guide](#).

This document details how to set up and configure the AIF BizTalk adapter for data exchange. For more information on set up and configuration of MSMQ, file system, and Web services, see “Configuring document exchanges with adapters” topic in the [Server and Database Administration Guide](#).

## Scenario Walkthrough

This section details the document exchange between AIF and BizTalk Server using a synchronous mode and an asynchronous mode. The walkthrough covers two scenarios: creating a sales order in AIF based on an XML document from BizTalk Server and sending a purchase order from AIF to BizTalk.

The following actions occur when you send an XML document from BizTalk to AIF to create a sales order.

1. To represent another system, application or partner providing new sales, you place a sales order in an inbound file folder. In general, the format of this sales order can be EDI or another non-AIF format; for the purpose of this scenario it is an AIF sales order (XML). This is a manual step in the walkthrough. However, you may have an automated process placing the sales order in the production environment. For more information on AIF messages and actions, see [AIF messages](#) topic on MSDN.
2. BizTalk Server monitors the file folder and sends the sales order to AIF. In synchronous mode, BizTalk Server will bypass the AIF gateway queues and go directly to the AIF document services. In asynchronous mode, BizTalk Server will communicate with the AIF gateway queues.
3. The Dynamics AX application processes the sales order and returns an entity key (sales order number) to BizTalk. The BizTalk application then sends the entity key to the outbound file folder.
4. You test the sales order to confirm valid test results.

The following actions occur when you send a purchase order from AIF to BizTalk Server.

1. You post an open purchase order and then choose the option to send the purchase order electronically.
2. AIF sends the purchase order to BizTalk Server. BizTalk Server places the purchase order in the file folder that you configured as the output folder.
3. You test the purchase order to confirm valid results.

The next sections of this white paper provide step-by-step instructions and code to configure and test the document exchange. You can use this walkthrough to develop an understanding of how different components interact in this process and test the results of the exchange. The objective of this document is limited to providing a hands-on experience with configuring the data exchange using the BizTalk adapter.

## Before you begin

Consider the following points before you begin:

- **The test environment:** This walkthrough uses the Dynamics AX 2009 Pre-sales Demonstration Toolkit that is available for download at [PartnerSource](#). PartnerSource is a secure portal that is available to partners who focus on Microsoft Dynamics and related business products. This Pre-sales Demonstration Toolkit includes two Virtual PC images. The first image, VPC 1, uses a server name of AX-SRV-01 and the second image, VPC 2, uses a server name of AX-SRV-03. This walkthrough uses VPC 2. However, in order for you to follow the instructions in the walkthrough, you need to download and install VPC 1 and VPC 2 or have a similar test environment set up.

**Note:** If VPC 2 prompts you to reinstall Visual Studio, you will need to reinstall Visual Studio 2005 Professional edition on the image.

- **Setting up your own test environment:** If you create your own test environment for this walkthrough, it should include the following components. For installation instructions, see the [Microsoft Dynamics AX Installation Guide](#).
  - Microsoft Dynamics AX 2009 base components with Application Integration Framework (AIF).
  - Microsoft BizTalk Server 2006 R2, Standard or Enterprise edition.
  - Microsoft Visual Studio 2005 Professional edition.
  - AIF BizTalk adapter installed on the BizTalk Server host.
- **Assumption:** All the references to folder path and program navigation are based on the test environment set up in VPC 2.
- **Login ID:** You need to know the login ID for various services, steps, or users. In some cases, you will also need to know the password. The test environment uses **contoso\administrator** as the user ID for all of the following steps or services. The services or steps listed below are explained in later sections.
  - The domain administrator account and password.
  - The domain account and password used for the Business Connector proxy account.
  - The domain account used for Dynamics AX Object Server and BizTalk services.
  - The domain account and password for the Admin user in the Dynamics AX 2009 application.

**Note:** Using the same account for various services and users is a deviation from security best practices and is done for ease of learning and troubleshooting. In a production environment, follow the documented best practices for Microsoft Dynamics AX, BizTalk Server, and Visual Studio.

- **Navigation in Windows:** Navigation to frequently mentioned tools and programs is as follows:
  - BizTalk Server 2006 administration console: **Start > All Programs > Microsoft BizTalk Server 2006 > BizTalk Server Administration.**
  - Microsoft Dynamics AX 2009 configuration: **Start > Administrative Tools > Microsoft Dynamics AX 2009 Configuration.**
  - Microsoft Dynamics AX 2009 server configuration: **Start > Administrative Tools > Microsoft Dynamics AX 2009 Server Configuration.**
  - Viewing and managing services: **Start > Administrative Tools > Services.**
  - Event Viewer: **Start > Administrative Tools > Event Viewer.**
  - Microsoft Dynamics AX 2009 client: **Start > All Programs > Microsoft Dynamics AX 2009 > Microsoft Dynamics AX 2009.**
- **Navigation in the Microsoft Dynamics AX client:** Navigation to frequently mentioned tools and forms is as follows:

- AIF configuration: **Basic > Setup > Application Integration Framework.**
- AIF queue manager, exceptions, or document history: **Basic > Periodic > Application Integration Framework.**
- Batch jobs and tasks: **Basic > Inquiries > Batch job.**
- Sales order: **Accounts receivable > Common Forms > Sales Order Details.**
- Purchase order: **Accounts payable > Places > Purchase Orders.**

## Step-by-step instructions

You need to complete a number of tasks for successful processing and testing of document exchange using the AIF adapter. This walkthrough provides step-by-step instructions for the following tasks in the following sections.

- [Check prerequisites for the Microsoft Dynamics AX application](#)
- [Set up the Business Connector proxy](#)
- [Install the AIF BizTalk adapter](#)
- [Set up AIF configuration for the BizTalk adapter](#)
- [Build and deploy the Visual Studio project](#)
- [Configure orchestration in BizTalk Server](#)
- [Configure AIF batch job and tasks](#)
- [Test the asynchronous orchestration](#)
- [Test the synchronous orchestration](#)
- [Test the orchestration to send purchase orders](#)
- [Troubleshooting](#)

## Check prerequisites for the Microsoft Dynamics AX application

The following prerequisites must be in place before undertaking the procedures in this white paper. For more information and step-by-step instructions, see the [Microsoft Dynamics AX Installation Guide](#).

1. You must have Microsoft Dynamics AX deployed and configured with the base and AIF components. A base system includes a database, Application Object Server (AOS), application files, and at least one client. The AOS server with AIF installed is referred to here as the application integration server.
2. You require a Microsoft Active Directory directory service configured in native mode. You will need a domain account for the Business Connector proxy.
3. Set up the Business Connector proxy.

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## Set up the Business Connector proxy

The Business Connector proxy is a Microsoft Windows domain account used by external applications to connect to Microsoft Dynamics AX. The Business Connector proxy provides the “act-on-behalf-of” functionality for external user connections. The Business Connector proxy account should not be set up as a Microsoft Dynamics AX user account. If you have already set up the Business Connector proxy account, you do not need to set it up again.

Use the following steps to set up a Business Connector proxy:

1. Have the domain administrator create a unique user in Active Directory using the format `domain\username`. This domain account should have the following characteristics:
  - The user cannot have the same name as an existing Microsoft Dynamics AX user.
  - The password does not expire.
  - No interactive logon rights are granted.
2. Associate the proxy account with Business Connector in Microsoft Dynamics AX. This step adds the proxy account to the Microsoft Dynamics AX database. Storing the proxy account in the database ensures that multiple AOS instances can use the same proxy account.
3. Launch the Microsoft Dynamics AX Windows client.
4. Launch the **System service accounts** form (**Administration > Setup > Security > System service accounts**).
5. In the **Business Connector Proxy** group, enter values for the following fields:
  - Set **Alias** = Administrator.
  - Set **Network domain** = contoso.com.
6. Click **OK** to save and close the form.

## Install the AIF BizTalk adapter

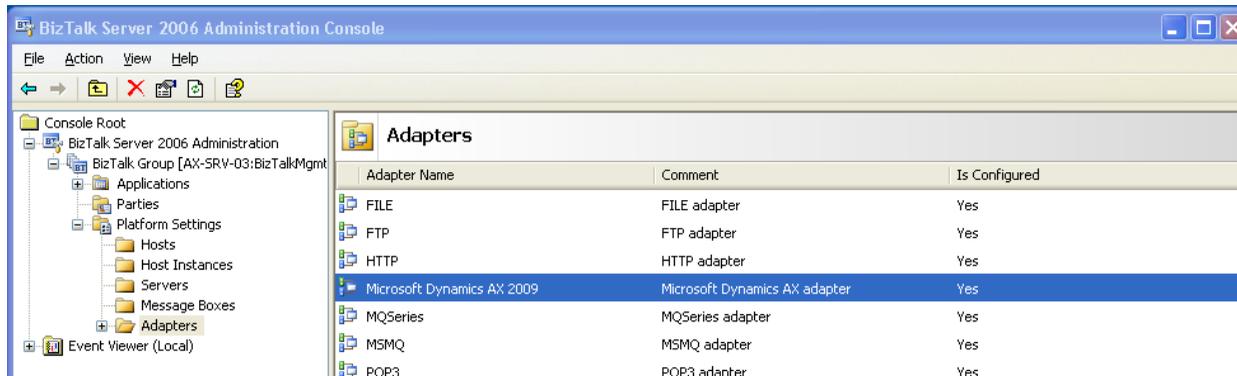
**Prerequisites:** The server where you install the AIF BizTalk adapter is called the application integration gateway. The application integration gateway must have Microsoft BizTalk Server 2006 R2 installed and configured before you install the AIF BizTalk adapter. Although not a prerequisite for installing the AIF BizTalk adapter, you will need Visual Studio 2005 to create a BizTalk application. You can install BizTalk Server and Visual Studio on the Application Object Server (AOS) server for development purposes. We recommend that you install BizTalk Server on a dedicated server in the production environment for improved performance. Ensure that you are logged on with an account that is a member of the Administrators group on the computer on which you are running the setup. For more information, see the [Microsoft Dynamics AX Installation Guide](#).

Use the following steps to install the AIF BizTalk adapter.

1. Launch the Microsoft Dynamics AX 2009 Setup program.
2. Step through the initial wizard pages.
3. On the **Modify Microsoft Dynamics AX installation** page, select **Add or Modify components**. Click **Next**.
4. On the **Add or modify components** page, select **BizTalk Adapter**. Click **Next**.

**Note:** These components are already installed on VPC 2. Therefore, if you are using VPC 2, your options for the .NET Business Connector and BizTalk adapter will appear disabled.
5. Click **Install**.
6. Click **Finish** when the installation is done.

7. Now make sure that the AIF BizTalk adapter has been installed and configured successfully.
8. Launch the BizTalk Server 2006 administration console (**Start > All Programs > Microsoft BizTalk Server 2006 > BizTalk Server Administration**).
  1. In the navigation tree in the left pane, expand BizTalk Server 2006 Administration > BizTalk Group > Platform Settings. Click Adapters.
  2. In the right pane, confirm that the **Microsoft Dynamics AX 2009** appears in the **Adapters list** and the value of the **Is Configured** field is **Yes**, as shown in the following screen shot.

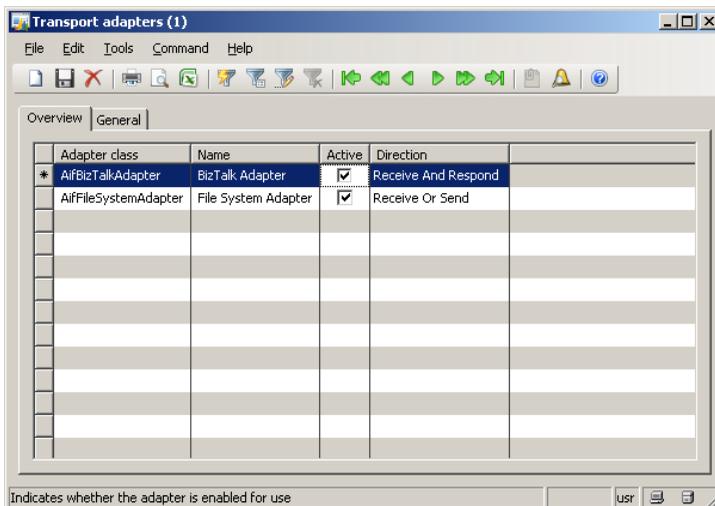


## Set up AIF configuration for the BizTalk adapter

This section provides step-by-step instruction for configuration of AIF for the BizTalk adapter.

### Configure transport adapters

1. Launch the Microsoft Dynamics AX client.
2. Click **Basic > Setup > Application Integration Framework > Transport adapters**.
3. Under the **File** menu, click **New** to create a new record.
4. In the **Adapter class** field, either select **AifBizTalkAdapter** from the list or enter **AifBizTalkAdapter**. This form scans for transport adapter class and presents you with a list. The scanning process will take some time.
5. Check the **Active** box, as shown in the screen shot.





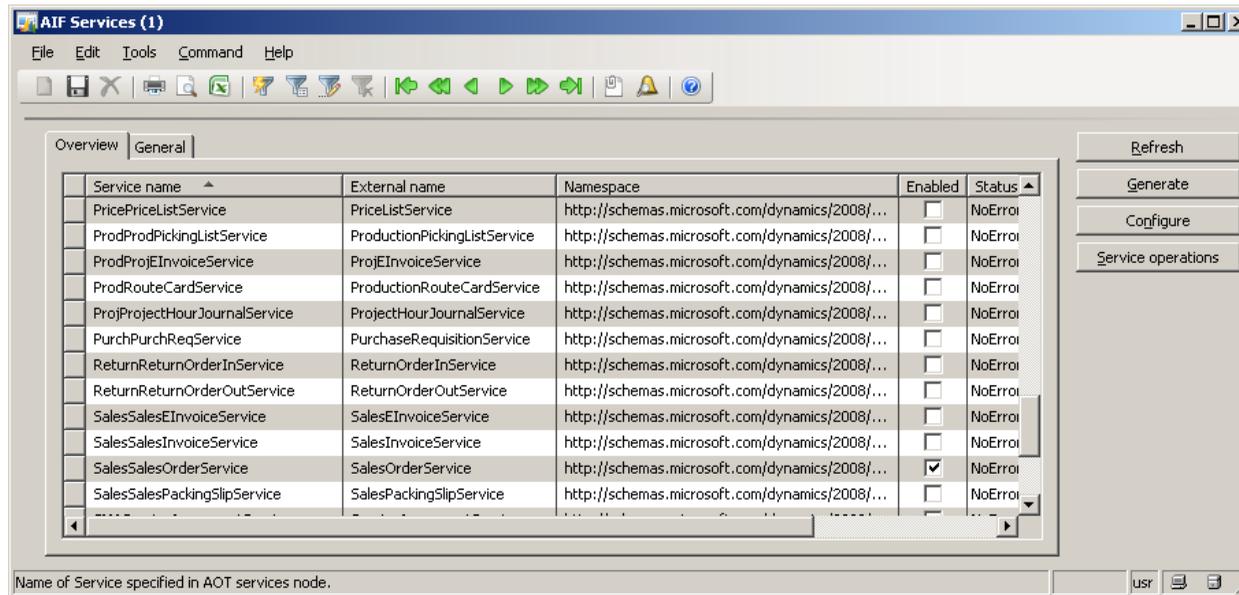
4. Save the form and then click **Configure** button. This will launch the **BizTalk Adapter configuration** form as shown.

Server name
*

5. The **BizTalk Adapter configuration** form requires the name of the host where BizTalk Server is installed. Every BizTalk Server instance that will connect to this channel, including production servers and desktop development machines, must be listed on this form. Microsoft Dynamics AX will allow connections to this channel only from BizTalk Server instances that are listed here. These BizTalk Server instances do not have to be configured in the same BizTalk Server group. Enter AX-SRV-03 in the **Server Name** field.
6. Save and close the BizTalk Adapter configuration form.
7. Save and close the **Channels form**.

## Configure services

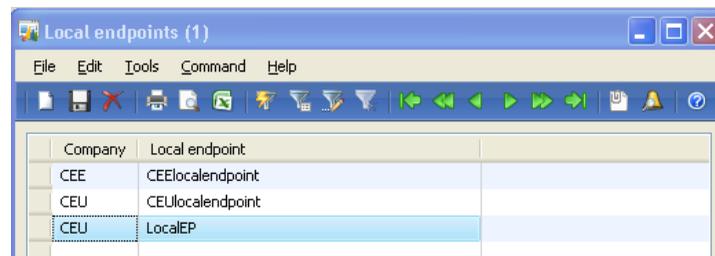
1. Click **Basic > Setup > Application Integration Framework > Services**.
2. Navigate to **SalesSalesOrderService** and check the **Enabled** field. If the service is already enabled, do nothing. This form does not have any services when opened for the first time in a new installation. In that case, click the **Refresh** button to list all the existing services, as shown.



3. Save and close the form.

## Configure local endpoints

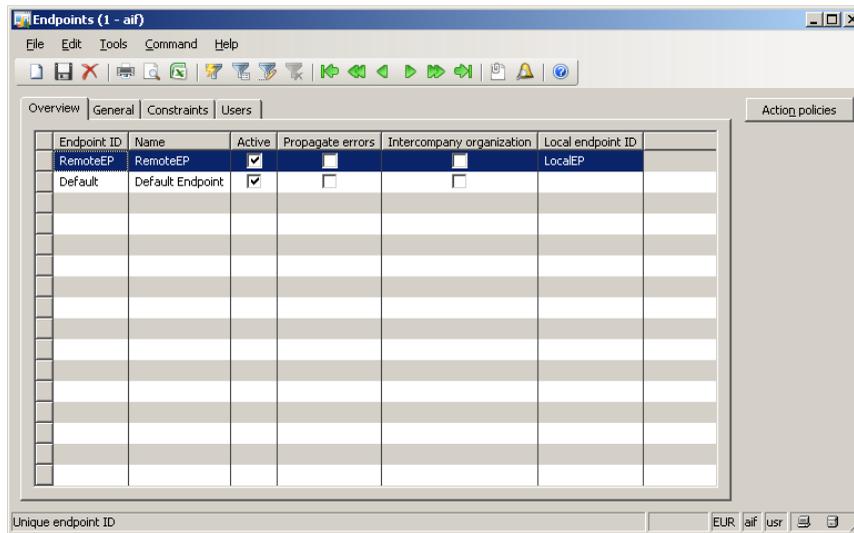
1. Click **Basic > Setup > Application Integration Framework > Local endpoints**.
2. Create a new record.
3. Enter values for the following fields, as shown in the following screen shot:
  - Set **Company** = **CEU** (from the list).
  - Set **Local endpoint** = LocalEP.



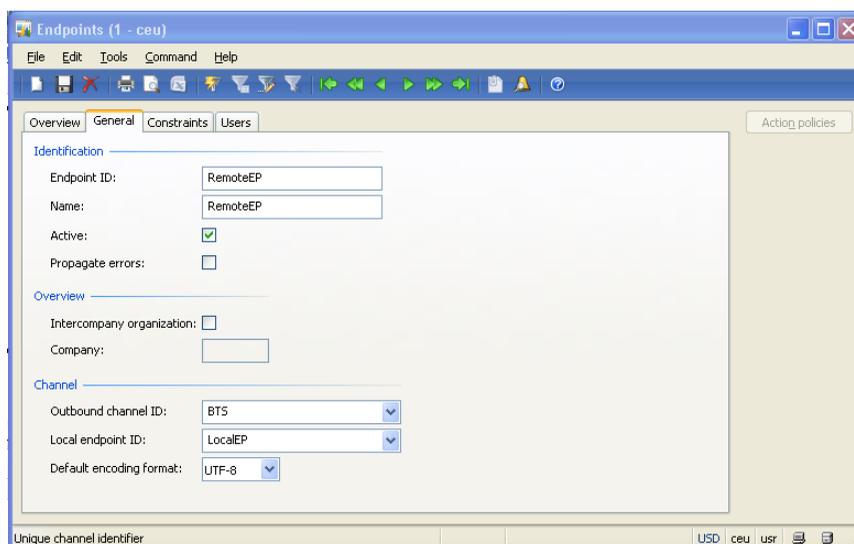
4. Save and close the form.

## Configure endpoints

1. Click **Basic > Setup > Application Integration Framework > Endpoints**.
2. Create a new record.
3. Enter values for the following fields:
  - Set **Endpoint ID** = RemoteEP.
  - Set **Name** = RemoteEP.
4. Click the **Constraints** tab and check **No Constraints**. This setting is fine for the walkthrough, but you need to carefully consider and apply constraints for production environments.
5. Click the **Overview** tab and check the **Active** field as shown.



6. Click the **General** tab. In the **Local Endpoint ID** field, select **LocalEP** from the list. In the **Outbound channel ID** field, select **BTS** from the list. Check the **Propagate errors** field, if you need to propagate detailed exception information to BizTalk Server.



7. On the **Users** tab, create a new record.

1. Enter values for the following fields:

- Set **User Type** = User (from the list).
- Set **Application user or group** = Admin (from the list).

**Note:** This record represents the login identity for the AIF adapter on whose behalf actions will be taken. In a real-world implementation, you should not use the Admin user.

2. Save the form. Click **Action policies** button as shown. This will launch the **Endpoint Action Policies** form.

User type	Application user or group	Name
User	Admin	Administrator

Trusted intermediaries

Use trusted intermediary:

User type	Application user or group	Name
This grid is empty.		

8. On the **Endpoint Action Policies** form:

1. Insert a new record and enter values for the following fields:

- Set **Action ID** = SalesSalesOrderService.create (from the list).
- Set **Status** = Enabled (from the list).

2. Save the form.

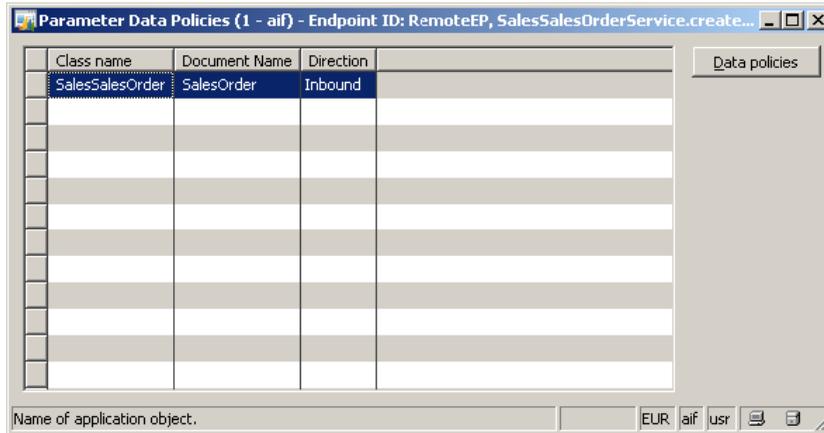
**Note:** You must save the form before you can continue with the next step.

3. Click **Data policies** button to launch the **Parameter Data Policies** form.

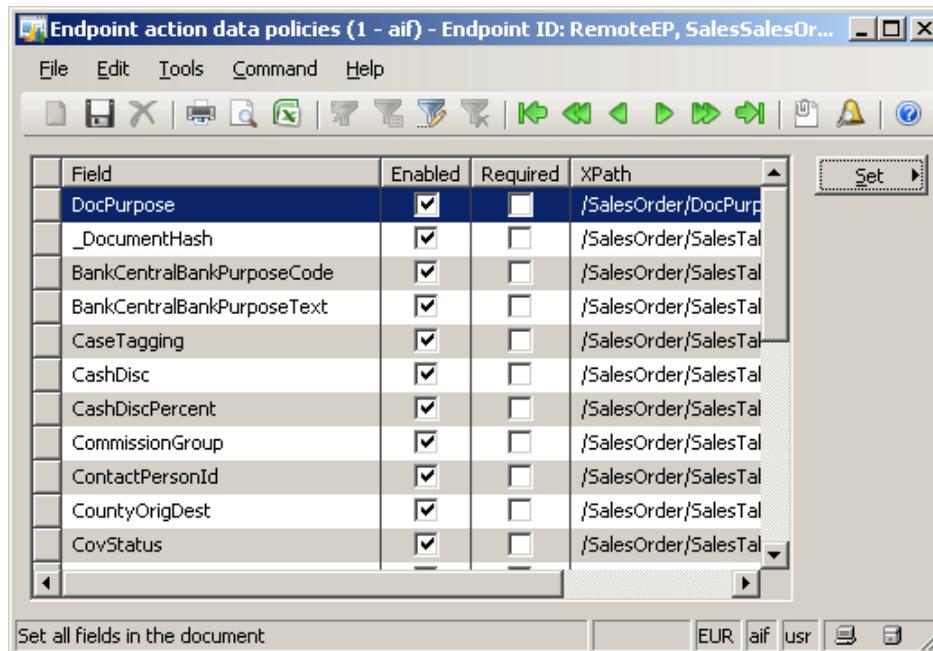
Action ID	Is default policy	Status	External identifier override	Class name	Logging mode
SalesSalesOrderService.create	<input type="checkbox"/>	Enabled		SalesSalesOrderService	Log Original

Configure the data policies for the operation

- On the **Parameter Data Policies** form, click the **Data policies** button.

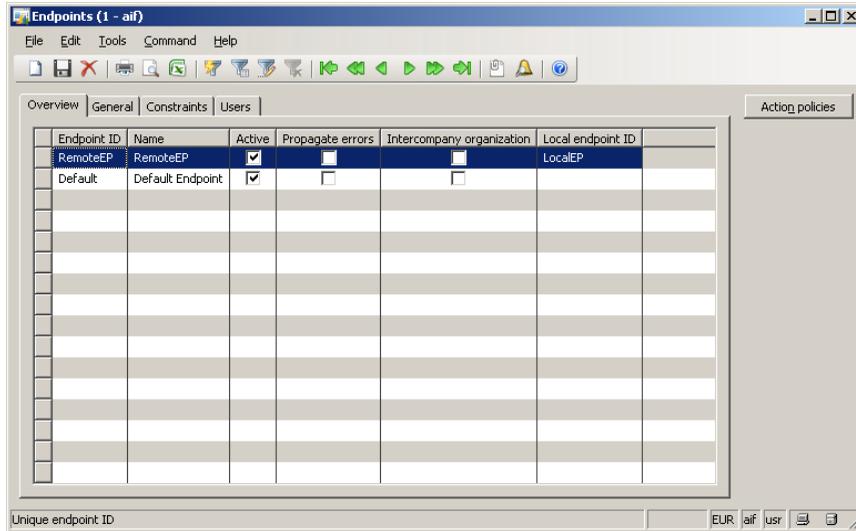


- On the **Endpoint action data policies** form, click **Set** button and then click **Enable all**. This action will enable all the fields on this form. Optionally, you can click the **Required** column heading to sort the fields and see all the required fields. You need to understand the schema of the document that you are exchanging.



9. This step enables the purchase requisition service that is used to read the selected purchase order that is then sent electronically from Microsoft Dynamics AX to an external system.

1. On the **Endpoint** form, click the **Overview** tab. Select **RemoteEP** and click **Action policies**.



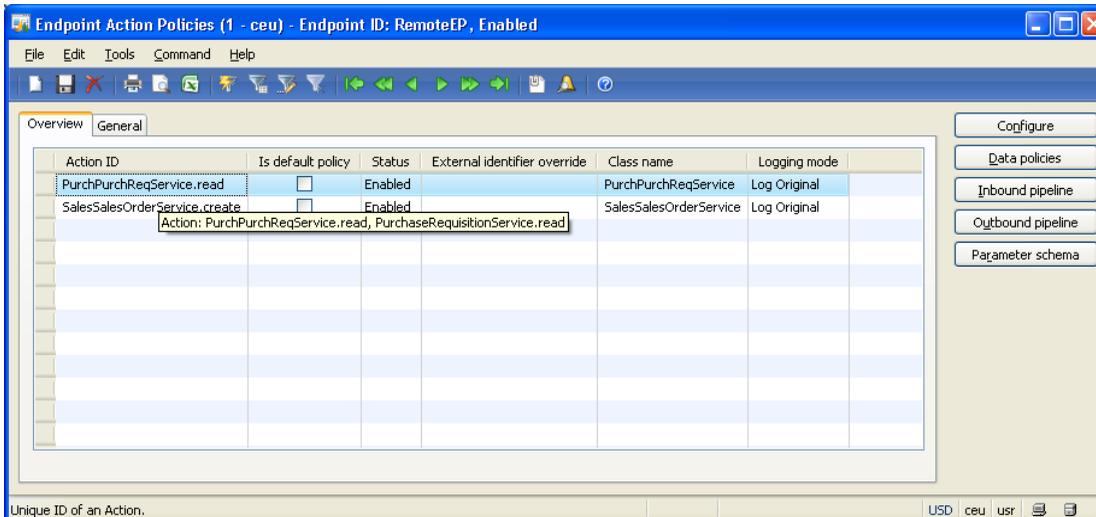
2. On the **Endpoint Action Policies** form, insert a new record and enter values for the following fields:

- Set **Action ID** = PurchPurchReqService.read (from the list).
- Set **Status** = Enabled (from the list).

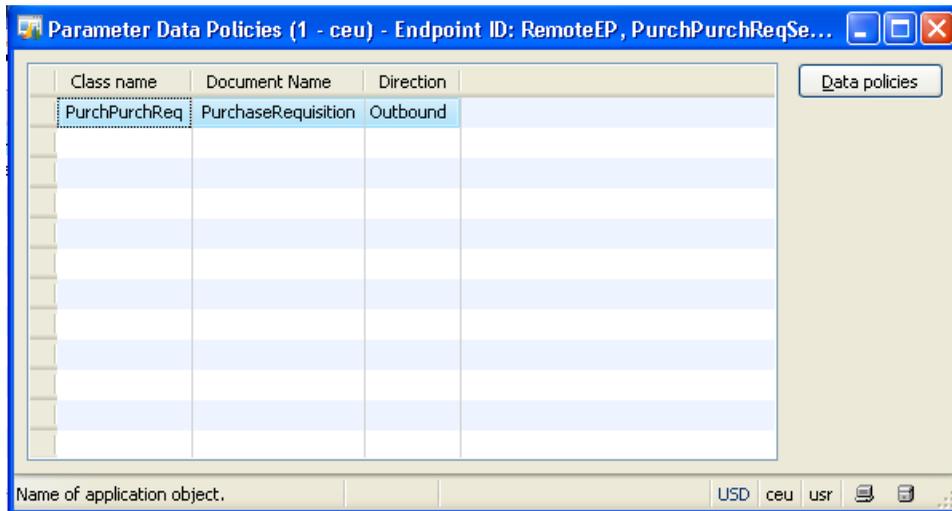
3. Save the form.

**Note:** You must save the form before you can continue with the next step.

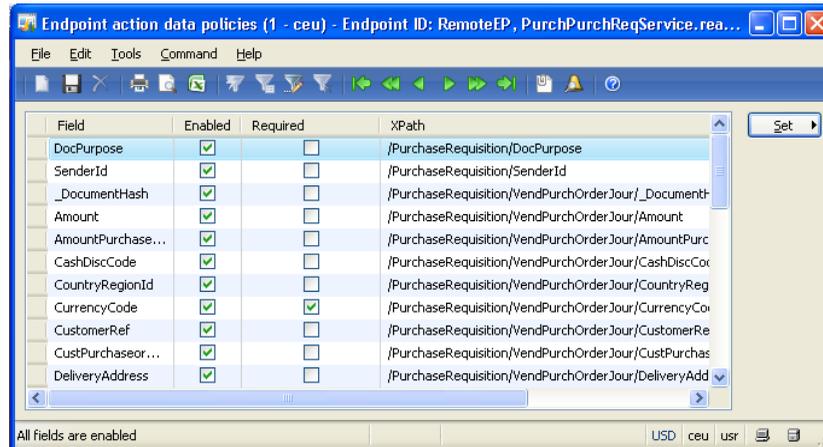
4. Click the **Data policies** button. This will launch the **Parameter Data Policies** form.



- On the **Parameter Data Policies** form, click the **Data policies** button. This will launch the **Endpoint action data policies** form.



- On the **Endpoint action data policies** form, click the **Set** button and then click **Enable all**. This action will enable all the fields on this form. Optionally, you can click the **Required** column heading to sort the fields and see all the required fields. You need to understand the schema of the document that you are exchanging.



- Save and close all forms.

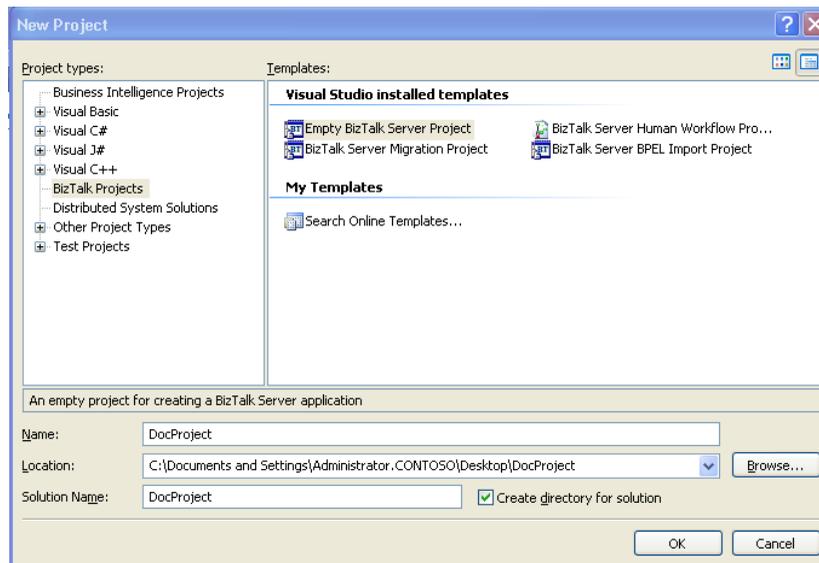
## Build and deploy the Visual Studio project

This section provides step-by-step instructions to create and deploy a Visual Studio project for creating the orchestrations for data exchange using synchronous and asynchronous modes.

### Create a BizTalk project and add references

Launch Microsoft Visual Studio 2005. Create a new BizTalk project as shown in the following steps:

1. Click **File > New > Project ...** to launch the **New Project** window.
2. Select **Empty BizTalk Server Project**.
3. Enter values for the following fields:
  - Set **Name** = DocProject.
  - Set **Location** = Desktop \ DocProject.
  - The **New Project** window should look like the screenshot below.



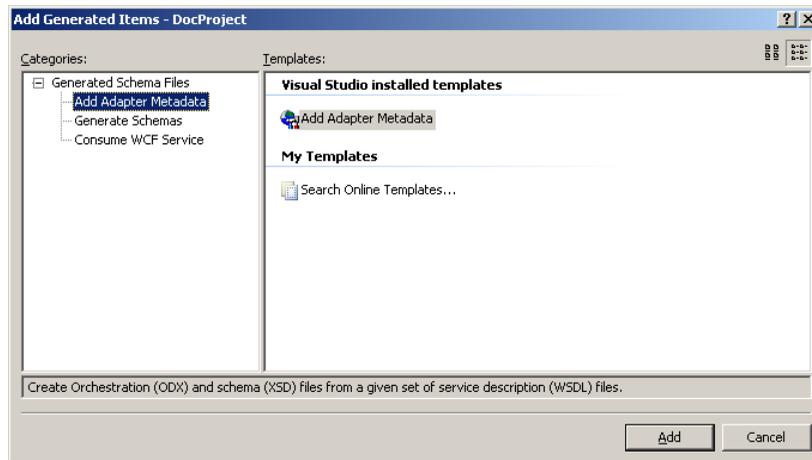
4. Click **OK**.

## Create a sales order in asynchronous mode

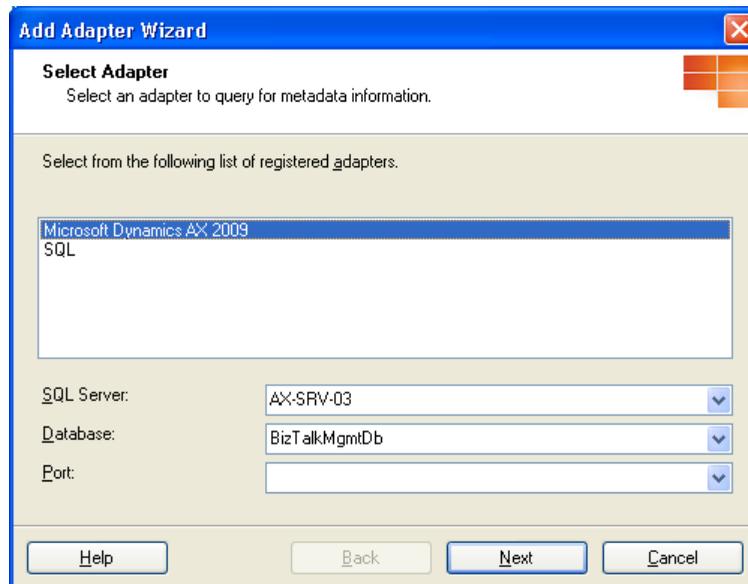
This section provides step-by-step instructions to create and configure the orchestration for the creation of a sales order in asynchronous mode.

### Add the adapter metadata

1. Right-click DocProject in the **Solution Explorer** pane and select **Add > Add Generated Items**. Select **Add Adapter Metadata** and click **Add** button.



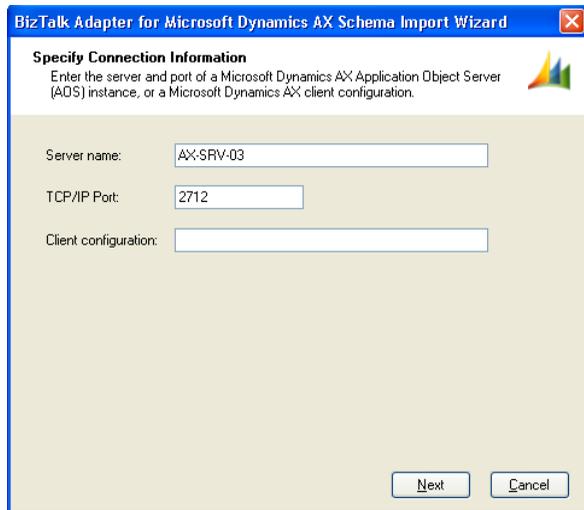
2. When the **Add Adapter Wizard** opens, select **Microsoft Dynamics AX 2009**. Enter these field values:
  - Set **SQL Server** = AX-SRV-03.
  - Set **Database** = BizTalkMgmtDb.
3. Click **Next**.



4. In the **BizTalk Adapter for Microsoft Dynamics AX Schema Import Wizard**, enter values for **Server Name** and **TCP/IP Port**. The server name refers to the Application Object Server (AOS) and the port refers to the port being used by the AOS. The port is usually set to 2712. You can look at the Microsoft Dynamics AX 2009 Server Configuration utility to obtain the server name and TCP/IP port. For more information, see the [Server and Database Administration Guide](#).

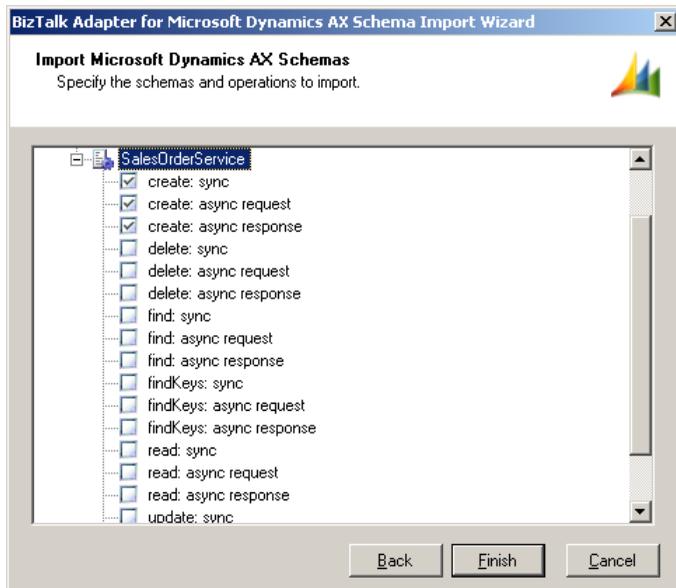
1. For this walkthrough, enter the following values:

- Set **Server name** = AX-SRV-03.
- Set **TCP/IP Port** = 2712.



2. Click **Next**.

5. Expand **SalesOrderService** and check **create: sync**, **create: async request**, and **create: async response** as shown in the following screen shot. (When implementing a synchronous interchange with AIF later in this document, we will use the **create: sync** operation.)



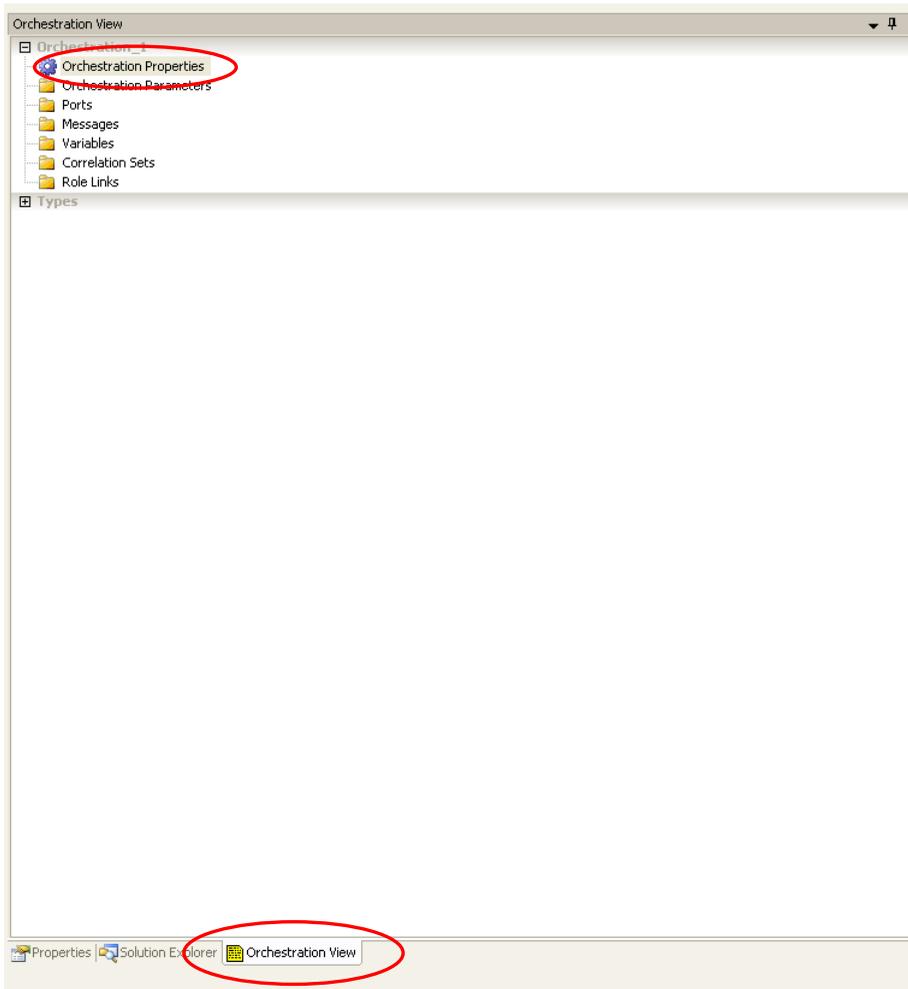
6. Click **Finish**.

7. In the **Solution Explorer** pane, right-click the **References** node, select **Add references** and then click the **Browse** tab. Add Microsoft.Dynamics.BizTalk.Adapter.Schemas.dll from C:\Program Files\Microsoft Dynamics AX\50\Client\ Bin.

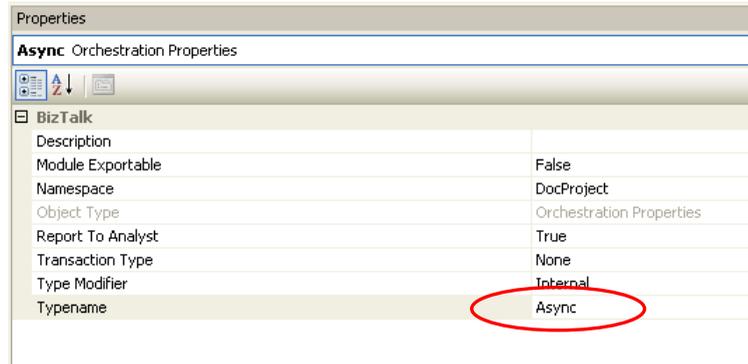
### Rename the orchestration

Rename the orchestration to provide a meaningful name for the orchestration as shown in the following steps.

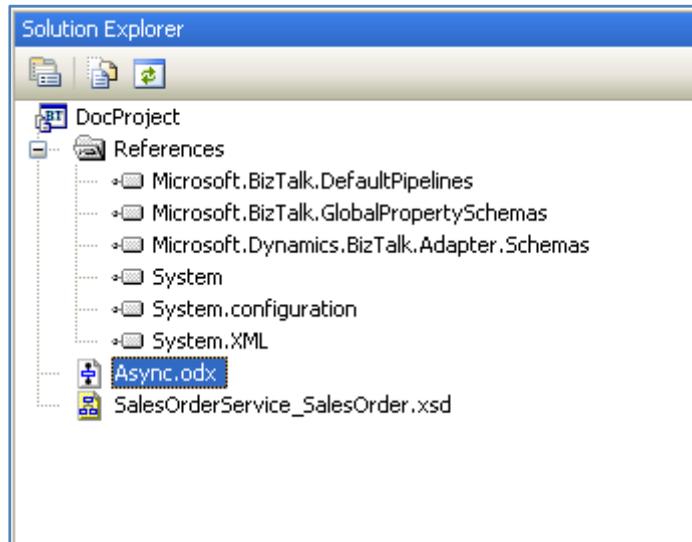
1. In the **Solution Explorer** pane, right-click **BizTalk Orchestration.odx**, and rename it to **Async.odx**.
2. Double-click Async.odx. Select **Orchestration View** window. Right-click **Orchestration Properties**.



3. Select the **Properties** tab. In the **Typename** field, enter Async.



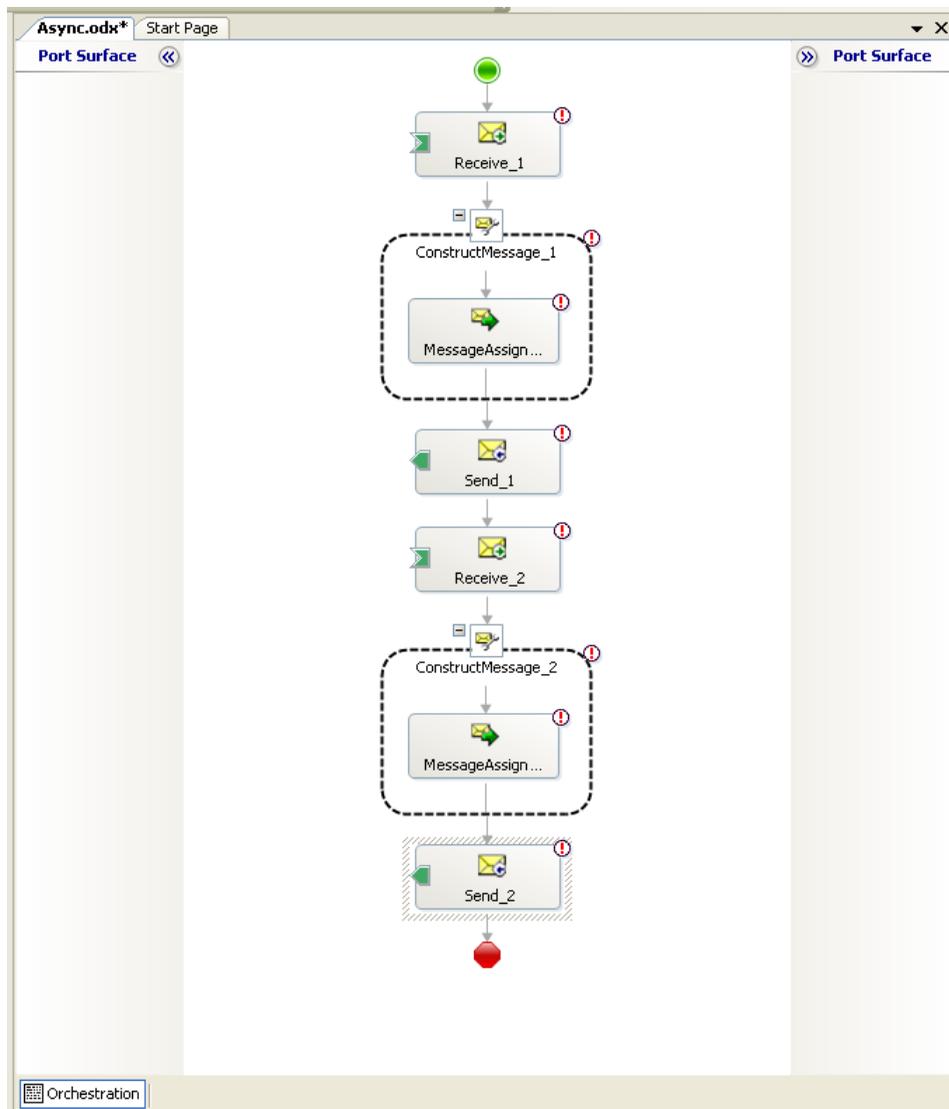
4. The **Solution Explorer** should now look similar to the following screenshot.



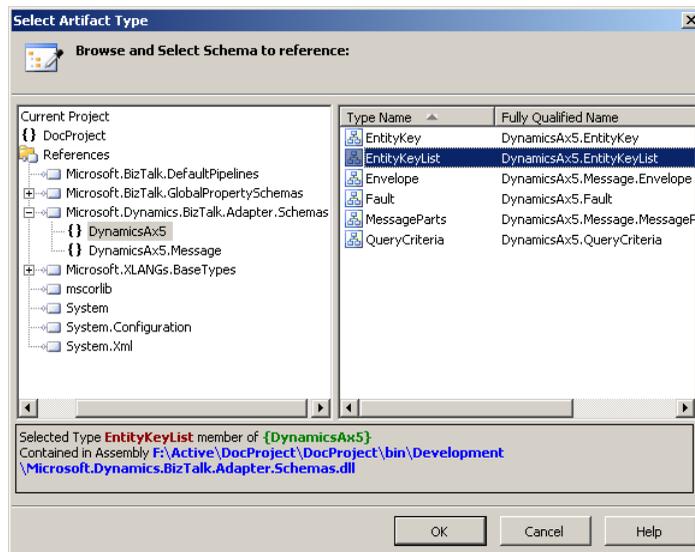
## Add shapes to the orchestration.

In this section, we will add shapes to the orchestration.

1. Open **Async.odx**. You can double-click **Async.odx** in the **Solution Explorer** pane to open it. Using the **Toolbox**, add the following shapes:
  1. Receive
  2. Message Assignment
  3. Send
  4. Receive
  5. Message Assignment
  6. Send

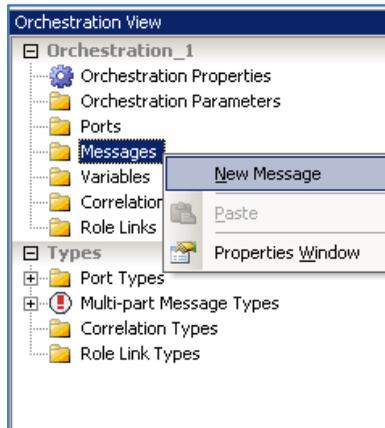


2. Select **Orchestration View**. Expand **Types > Multi-part Message Types > SalesOrderService\_create\_Response**. Right-click **ReturnValue** and select **Properties Window**.
  1. In the **Properties** window, click the **Type** field. Expand **Schemas**, then select **<Select from Referenced Assembly...>** from the list.
  2. On the **Select Artifact Type** window, select **EntityKeyList** from **Dynamics.Ax5** as shown in the following screen shot.



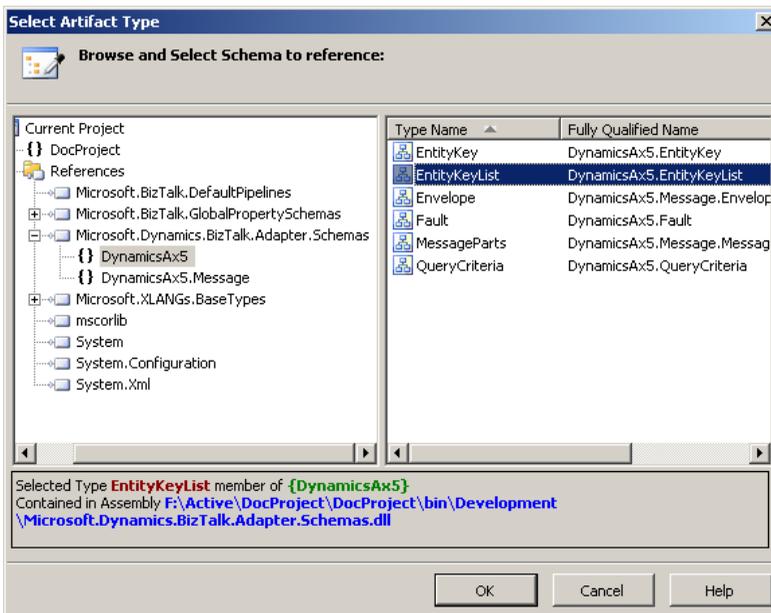
### Create messages and set properties

1. In this section, you will create four messages and set their properties. Click **Orchestration View** tab. Right-click **Messages** and click **New Message**.



2. Right-click **Message\_1**, the newly created message, and select **Properties Window**.
3. Set the properties for this message as follows:
  - Set **Identifier** = Message\_AsyncIn.
  - To set **MessageType**, expand **Schemas**, then select **DocProject.SalesOrderService\_SalesOrder** from the list.
4. In **Orchestration View**, create the second message and set the properties for this message as follows:

- Set **Identifier** = Message\_AsyncBtsToDyn.
  - To set **MessageType**, expand **Multi-part message Types**, then select **DocProject.SalesOrderService\_create\_Request** from the list.
5. Create the third message. Set the property values as follows:
- Set **Identifier** = Message\_AsyncDynToBts.
  - To set **MessageType**, expand **Multi-part Message Types**, then select **<Select from referenced assembly...>** from the list. Select **DocProject.SalesOrderService\_create\_Response** from the list.
6. Create the fourth message. Set the property values as follows:
- Set Identifier = Message\_AsyncOut.
  - To set **MessageType**, expand **Schemas**, then select **<Select from referenced assembly...>** from the list. Expand **Microsoft.Dynamics.Biztalk.Adapter.Schema** and select **DynamicsAx5**. Select **EntityKeyList** as shown in the following screen shot.

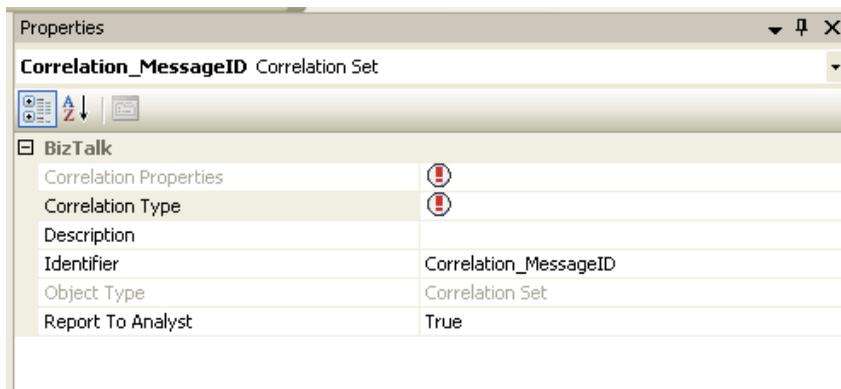


## Create correlation sets and correlation type

This section provides step-by-step instructions for creating correlation sets and correlation type. AIF uses the AIF outbound gateway queue to send responses to BizTalk Server. These messages are sent asynchronously. Therefore, you must use correlation in BizTalk Server to relate a response to its original message.

**Note:** you need the correlation sets only for the asynchronous orchestration.

1. In the **Orchestration View** pane, right-click **Correlation Sets**, then select **New Correlation Set**. Set properties for **Correlation\_1** as follows:
  - Set **Identifier** = Correlation\_MessageID.
  - Set **Correlation Type** = <Create new Correlation Type> (from the list).



2. Your **Orchestration View** will now look similar to the following screenshot.

The screenshot shows the BizTalk Orchestration View interface. The tree view is organized as follows:

- Orchestration View
  - Orchestration\_1
    - Orchestration Properties
    - Orchestration Parameters
    - Ports
    - Messages
      - Message\_AsyncIn
      - Message\_BtsToDyn
      - Message\_DynToBts
      - Message\_AsyncOut
    - Variables
    - Correlation Sets
      - Correlation\_MessageID
    - Role Links
  - Types
    - Port Types
      - AsyncRequest
      - AsyncResponse
      - SalesOrderService\_AsyncRequest
      - SalesOrderService\_AsyncResponse
      - SalesOrderService\_Sync
      - SyncRequestResponse
    - Multi-part Message Types
    - Correlation Types
      - CorrelationType\_1
    - Role Link Types

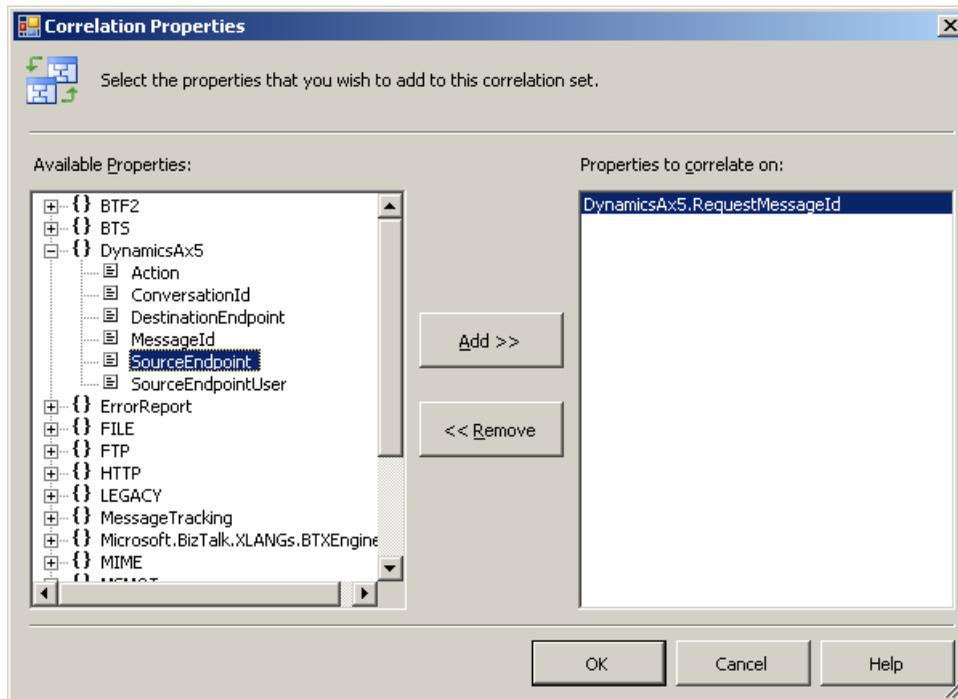
The Properties window for **CorrelationType\_1** is shown below:

BizTalk	
Correlation Properties	!
Description	
Identifier	CorrelationType_MessageId
Object Type	Correlation Type
Report To Analyst	True
Type Modifier	Internal

3. Expand **Types**, then **Correlation Types**. Right-click **CorrelationType\_1** and click **Properties Window**.

1. Set the properties as shown in the following steps.

- Set **Identifier** = CorrelationType\_MessageID.
- In the **Correlation Properties** field, click **ellipses**. In the **Correlation Properties** window, expand **DynamicsAX5**. Select **RequestMessageId** and click **Add** button. Your screen should look similar to the following screen shot. AIF sets the **RequestMessageId** property in a response message to the value of the original MessageId in the inbound request message. As a MessageID is a globally unique identifier (GUID), the **RequestMessageId** alone makes a unique correlation property for asynchronous processing.



2. Click **OK**.

## Configure shapes

This section provides instructions to configure the shapes in the orchestration.

1. Select **Orchestration View**.
2. Right-click the shape **Receive\_1** and select **Properties Window**. Set property values as follows:
  - Set **Activate** = True.
  - Set **Message** = Message\_AsyncIn.
3. Right-click the shape **ConstructMessage\_1** and set properties as follows:
  - **Messages Constructed** = **Message\_AsyncBtsToDyn**. You need to set this value before using the code in the next step to avoid a syntax error in the code.
  - Double-click **MessageAssignment\_1** within shape **ConstructMessage\_1**. Copy or type the following code into the **BizTalk Expression Editor**. Note that the code makes references to the local and remote endpoints. We created these endpoints earlier using the AIF configuration forms in the Microsoft Dynamics AX application. Make sure the same values entered in the

code are also entered on the AIF configuration forms. In this case, we have already used the AIF configuration forms to create a local endpoint called LocalEP and a remote endpoint called RemoteEP. You do not need the following code if the XML message contains a header with the required information.

```
Message_AsyncBtsToDyn._salesSalesOrder = Message_AsyncIn;
Message_AsyncBtsToDyn(DynamicsAx5.DestinationEndpoint) = "LocalEP";
Message_AsyncBtsToDyn(DynamicsAx5.SourceEndpoint) = "RemoteEP";
Message_AsyncBtsToDyn(DynamicsAx5.Action) =
"http://schemas.microsoft.com/dynamics/2008/01/services/SalesOrderService/create";
Message_AsyncBtsToDyn(DynamicsAx5.MessageId) = System.String.Format("{0:B}",
System.Guid.NewGuid());
// The following line provides the ability to correlate the response message from AIF.
// AIF uses the inbound MessageId as the outbound RequestMessageId in the response.
Message_AsyncBtsToDyn(DynamicsAx5.RequestMessageId) =
Message_AsyncBtsToDyn(DynamicsAx5.MessageId);
```

4. Set property values of shape **Send\_1** as follows:

- Set **Message** = Message\_AsyncBtsToDyn.
- Set **Initializing Correlation Sets** = Correlation\_MessageID

5. Set property values of shape **Receive\_2** as follows:

- Set **Message** = Message\_AsyncDynToBts.
- Set **Following Correlation Sets** = Correlation\_MessageID.

6. Set property values of shape **ConstructMessage\_2** as follows:

1. Set **Messages Constructed** = Message\_AsyncOut.
2. Double-click **MessageAssignment\_2** within the **ConstructMessage\_2** shape. Copy or type the following code into the **BizTalk Expression Editor**.

```
Message_AsyncOut = Message_AsyncDynToBts.ReturnValue;
```

7. Set property values of shape **Send\_2** as follows:

- Set **Message** = Message\_AsyncOut.

## Configure operations for the shapes

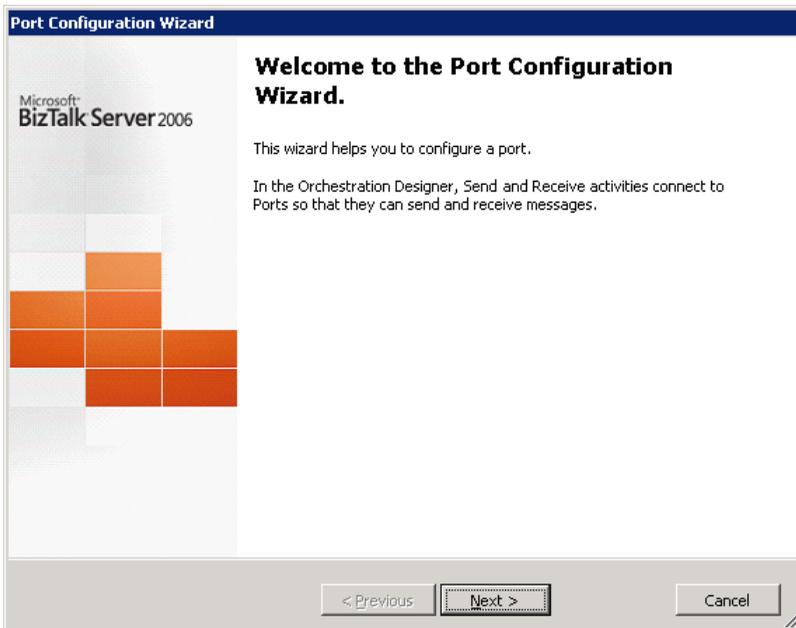
In this section, we will configure operations for the shapes in our orchestration.

### Configure operations for shape **Receive\_1**

1. Click the exclamation icon on shape **Receive\_1**. Click the dialog box to create a new port.



2. Click **Next**.



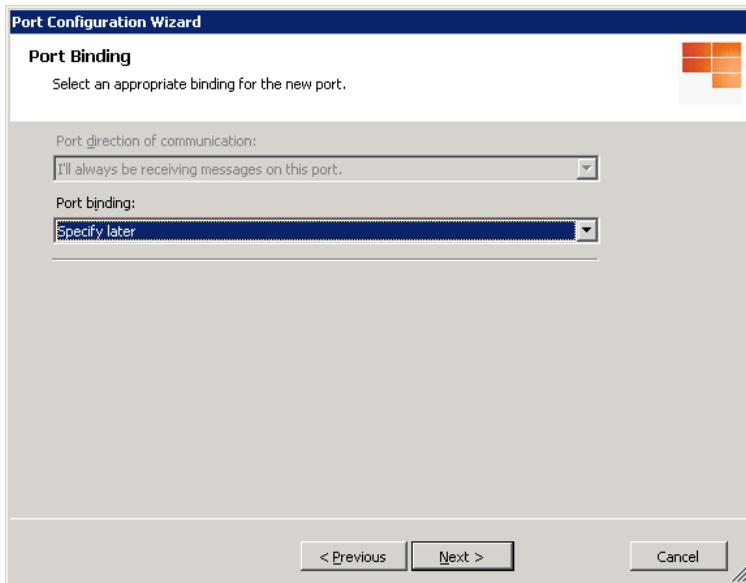
3. In the field, enter Port\_AsyncXmlIn. Click **Next**.

The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Port Properties' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Port Properties' is displayed, followed by the instruction 'Enter the required properties for the new port.' A text input field labeled 'Name:' contains the text 'Port\_AsyncXmlIn'. At the bottom of the dialog, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

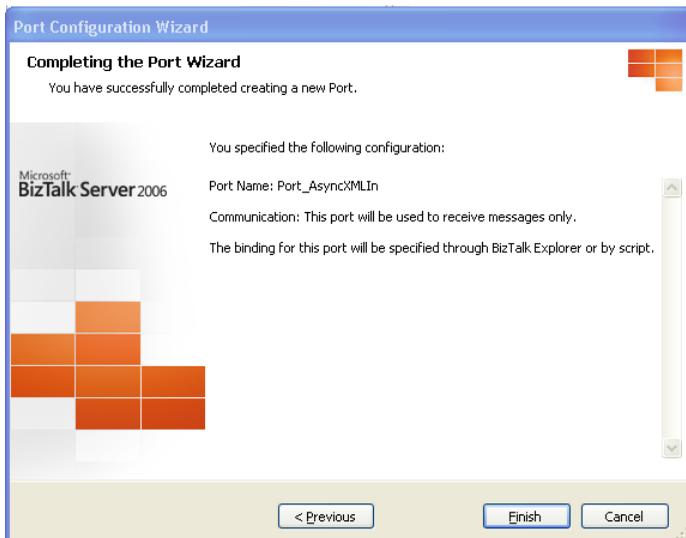
4. Set the properties as follows and then click **Next**:
  1. Set **Port Type Name** = PortType\_AsyncXmlIn.
  2. Make sure all the radio buttons default to the same settings as shown in the following screen shot.

The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Select a Port Type' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Select a Port Type' is displayed, followed by the instruction 'A Port Type defines the set of operations that are permitted on the port.' Underneath, it says 'Select the port type to be used for this port:'. There are two radio button options: 'Create a new Port Type' (which is selected) and 'Use an existing Port Type'. Below these options is a text input field labeled 'Port Type Name:' containing the text 'PortType\_AsyncXmlIn'. Further down, there are two more sections: 'Communication Pattern:' with radio buttons for 'One-Way' (selected), 'Request-Response', and 'Access Restrictions:' with radio buttons for 'Private - limited to the containing module', 'Internal - limited to this project' (selected), and 'Public - no limit'. At the bottom of the dialog, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

- On the following wizard page, leave the **Port binding** set to "Specify later." The wizard will automatically set the binding when it connects the receive shape to this new port. Click **Next**.



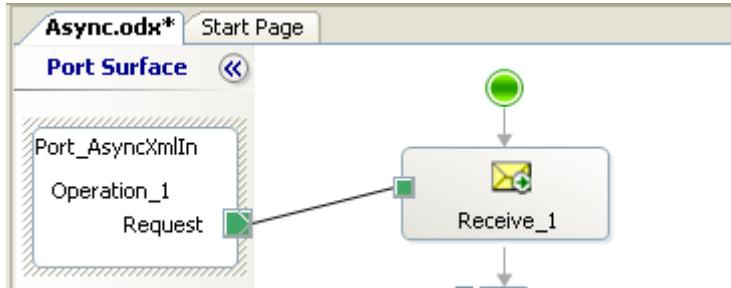
- Click **Finish**.



- At this message, click **OK**.



8. Port and shape connection should look like the following screen shot.

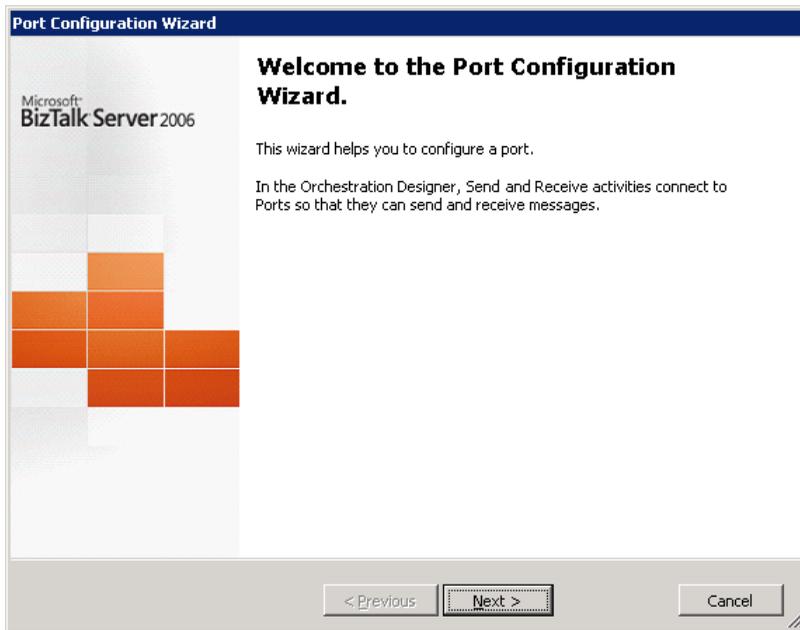


### Configure operations for shape **Send\_1**

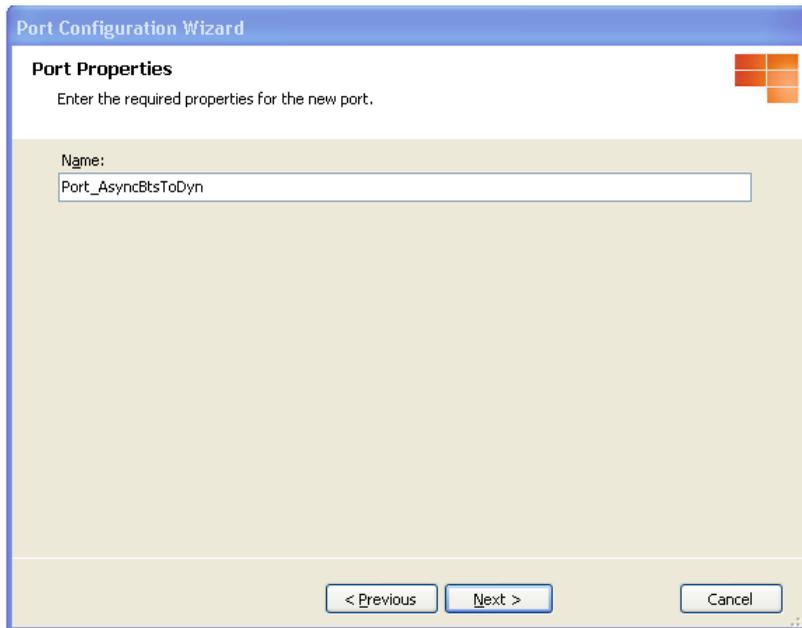
1. Click the exclamation icon on shape **Send\_1**. Click the dialog box to create a new port.



2. In the **Port Configuration Wizard**, click **Next**.

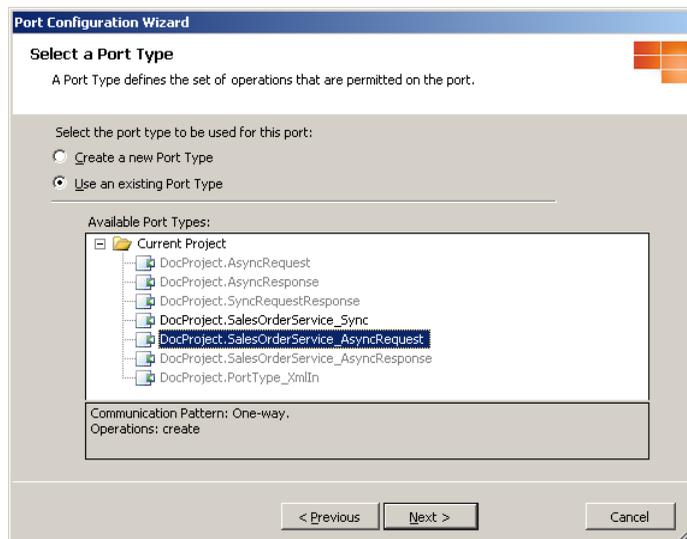


3. Set **Name** to Port\_AsyncBtsToDyn and click **Next**.

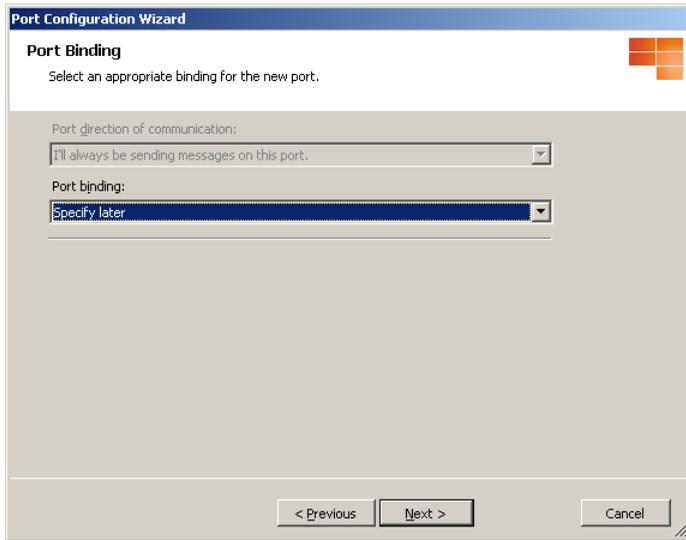


4. Set the property values as follows and then click **Next**.

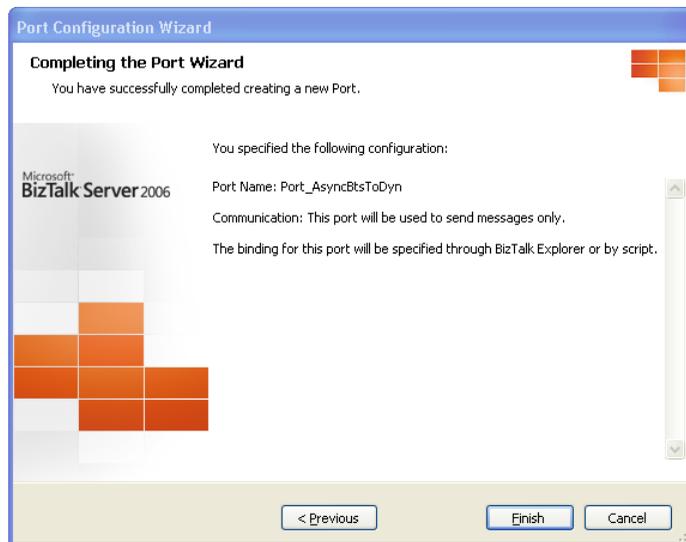
- Select **Use an Existing Port Type**.
- Select **SalesOrderService\_AsyncRequest**.



5. Click **Next**.



6. Click **Finish**.



7. At this message, click **OK**.



8. Port and shape connection should look like the following screen shot.



### Set Operations for shape **Receive\_2**

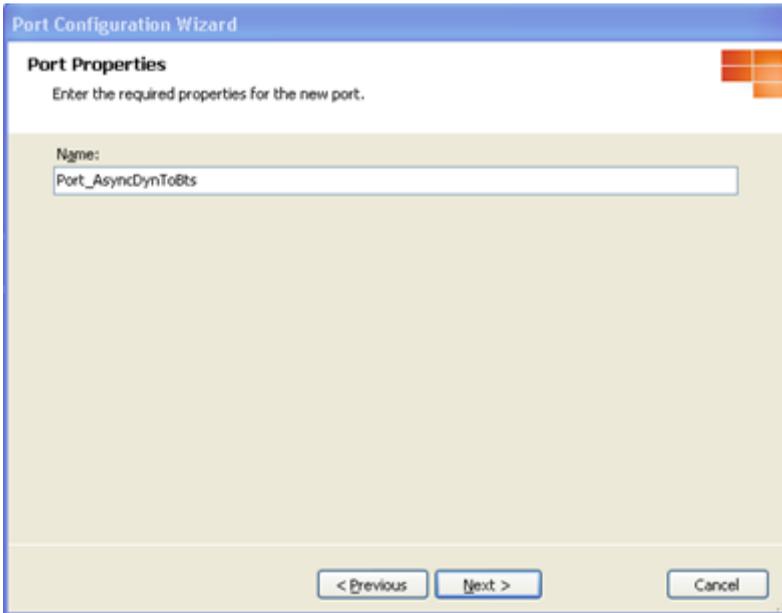
1. Click the exclamation icon on shape **Receive\_2**. Click the dialog box to create a new port.



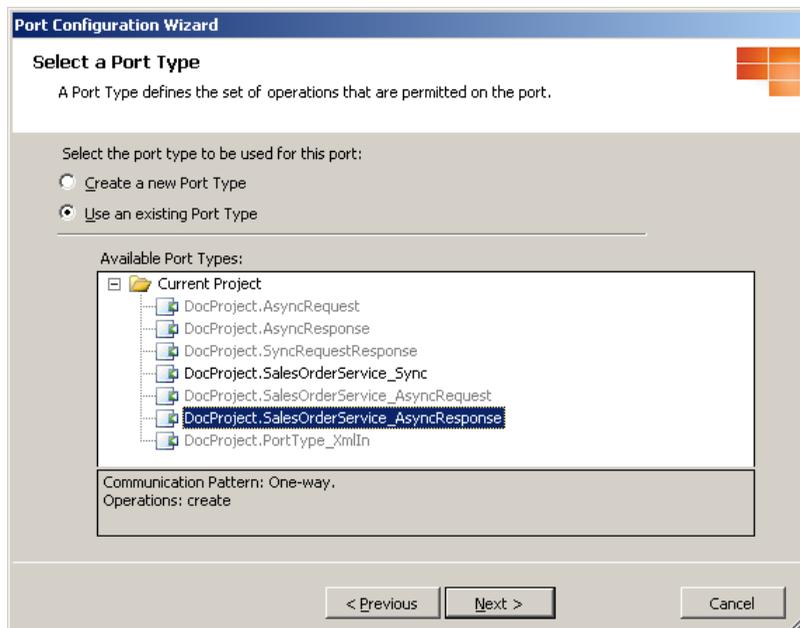
2. In the **Port Configuration Wizard**, click **Next**.



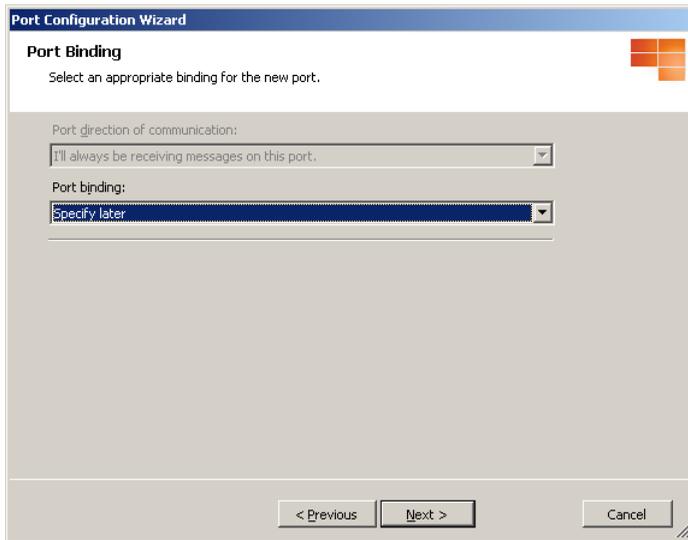
3. Set the **Name** to Port\_AsyncDynToBts. Click **Next**.



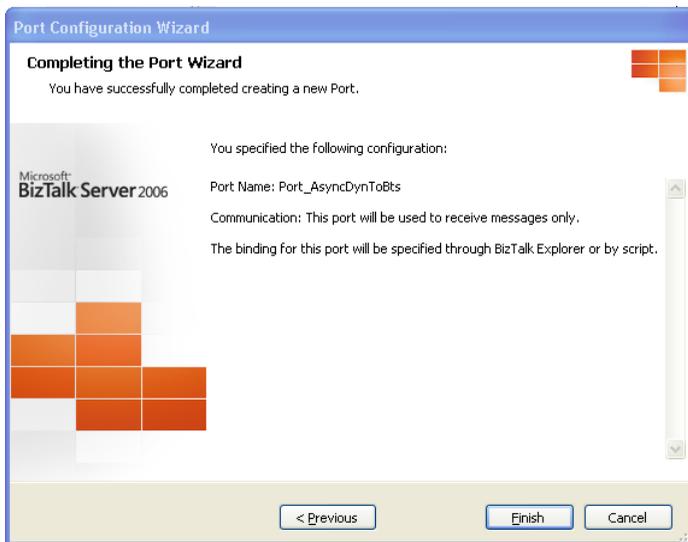
4. Set the following property values and then click **Next**.
  - Select **Use an Existing Port Type**.
  - Select **SalesOrderService\_AsyncResponse**.



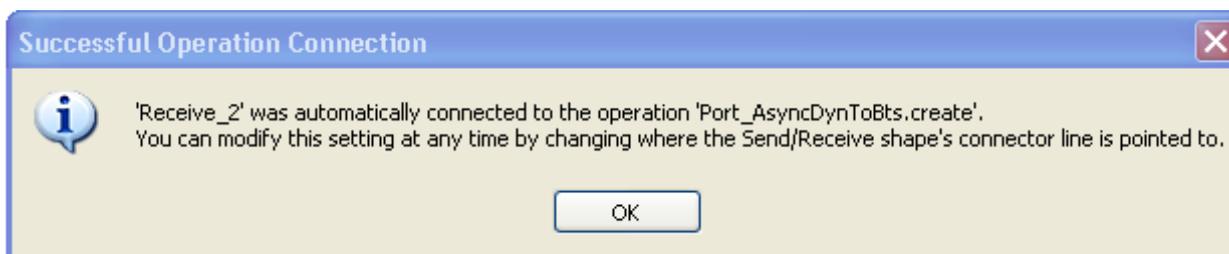
5. Click **Next**.



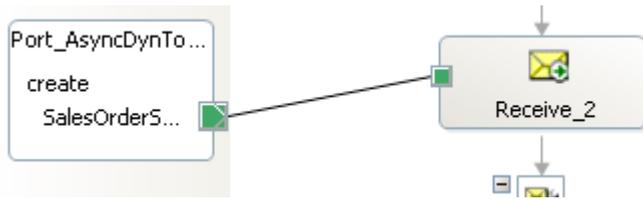
6. Click **Finish**.



7. At this message, click **OK**.



- The port and share connection should look like the following screen shot.

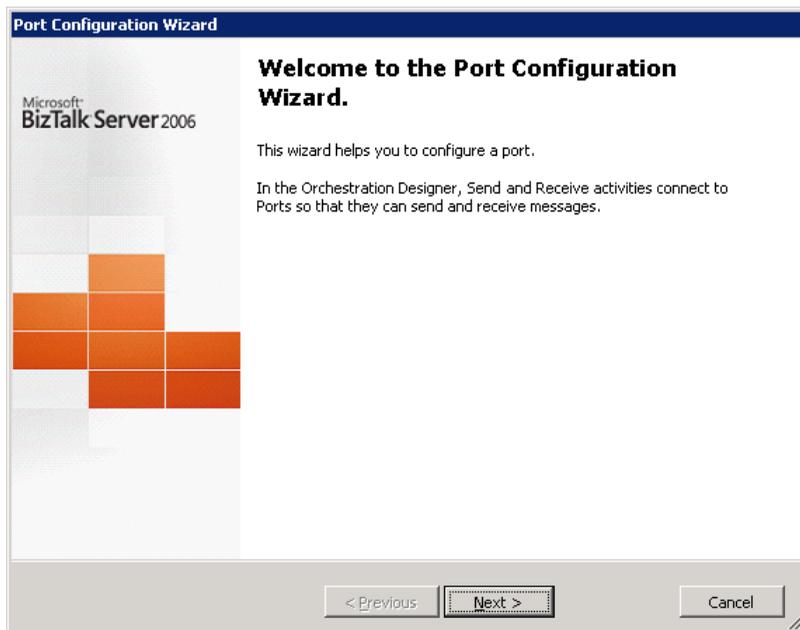


### Set operations for shape Send\_2

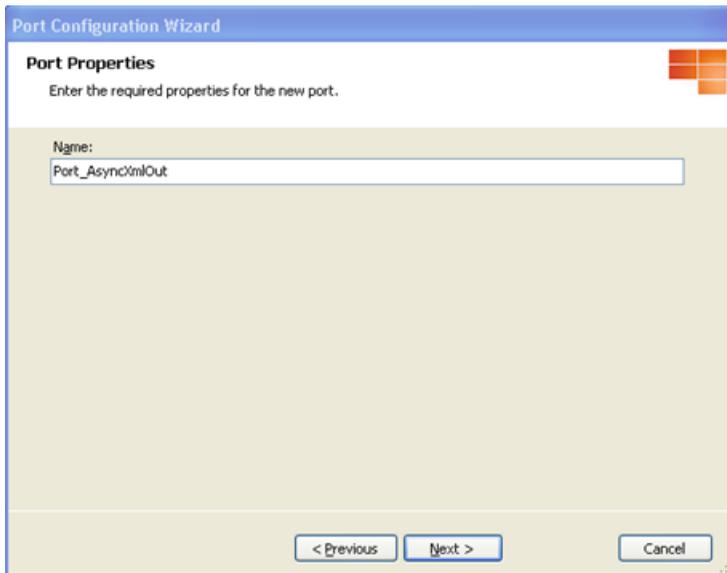
- Click the exclamation icon on shape **Send\_2**. Click the dialog box to create a new port.



- Click **Next**.

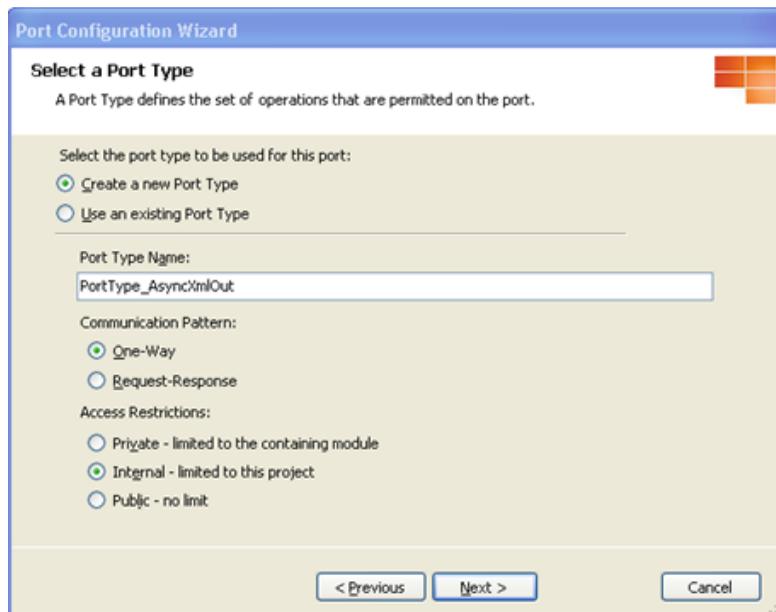


3. Set the **Name** to Port\_AsyncXmlOut and click **Next**.



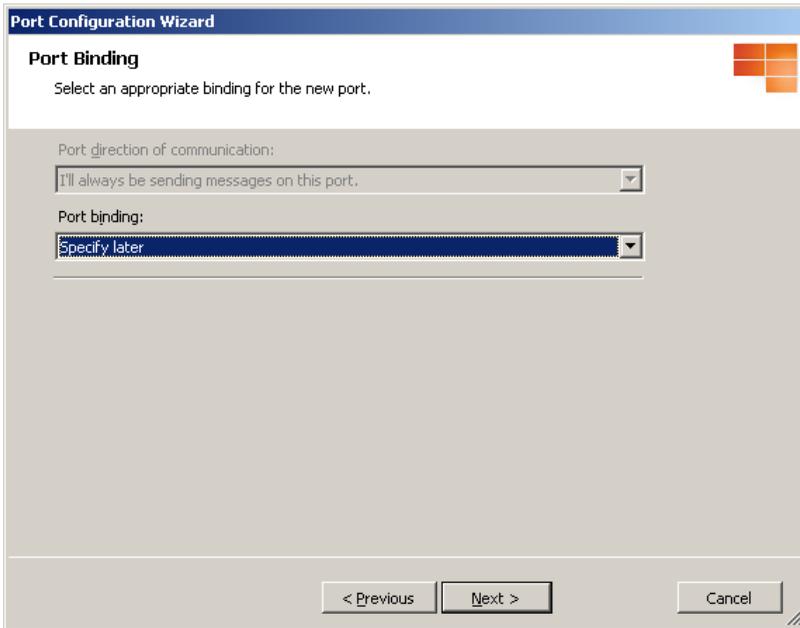
The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Port Properties' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Port Properties' is displayed, followed by the instruction 'Enter the required properties for the new port.' A text input field labeled 'Name:' contains the text 'Port\_AsyncXmlOut'. At the bottom of the dialog, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

4. Set the property values as follows and then click **Next**.
  1. Select **Create a new Port Type**.
  2. **Port Type Name** = PortType\_AsyncXmlOut.

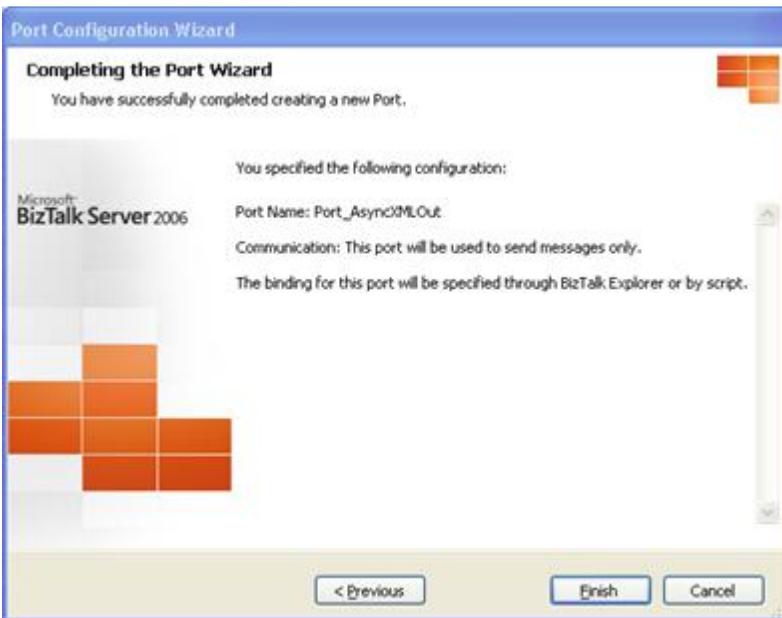


The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Select a Port Type' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Select a Port Type' is displayed, followed by the instruction 'A Port Type defines the set of operations that are permitted on the port.' There are two radio button options: 'Create a new Port Type' (which is selected) and 'Use an existing Port Type'. Below these options is a text input field labeled 'Port Type Name:' containing the text 'PortType\_AsyncXmlOut'. There are two more sections: 'Communication Pattern:' with radio buttons for 'One-Way' (selected) and 'Request-Response'; and 'Access Restrictions:' with radio buttons for 'Private - limited to the containing module', 'Internal - limited to this project' (selected), and 'Public - no limit'. At the bottom of the dialog, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

5. Click **Next**.



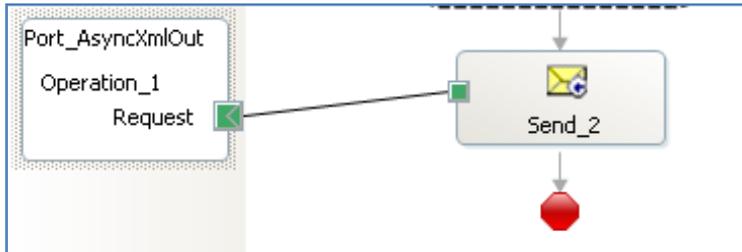
6. Click **Finish**.



- At this message, click **OK**.



- The port and shape connection should look like the following screen shot.



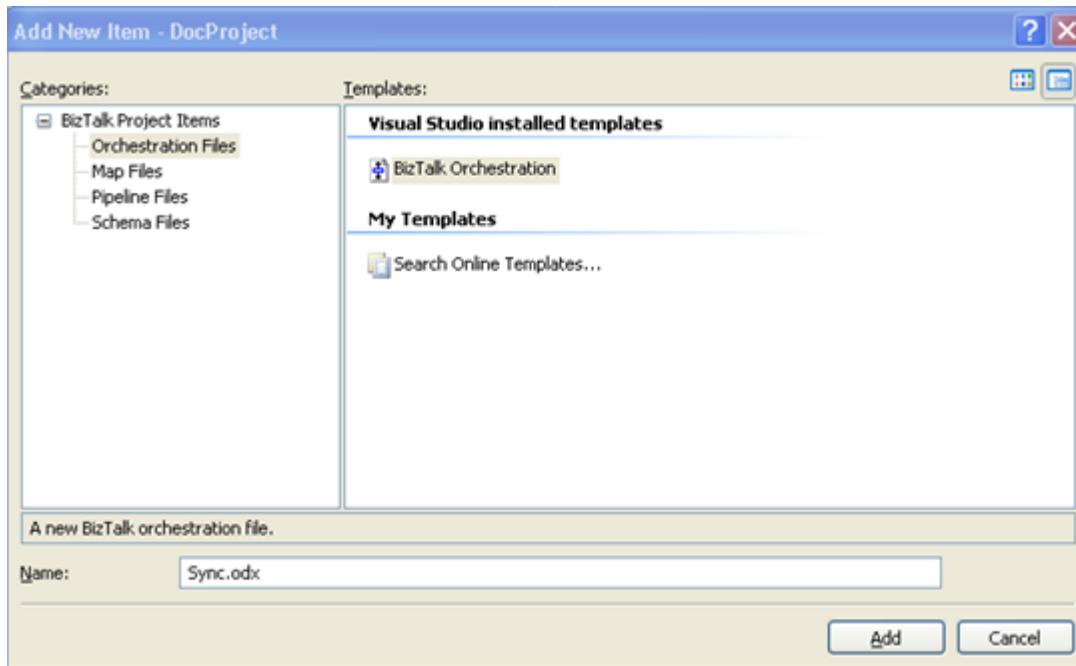
- Save the orchestration at this point.

## Create a sales order in synchronous mode

This section provides step-by-step instructions to add an orchestration to create a sales order in synchronous mode. These procedures assume that you have already completed the instructions in the preceding section to create a project called DocProject.

### Add a BizTalk orchestration

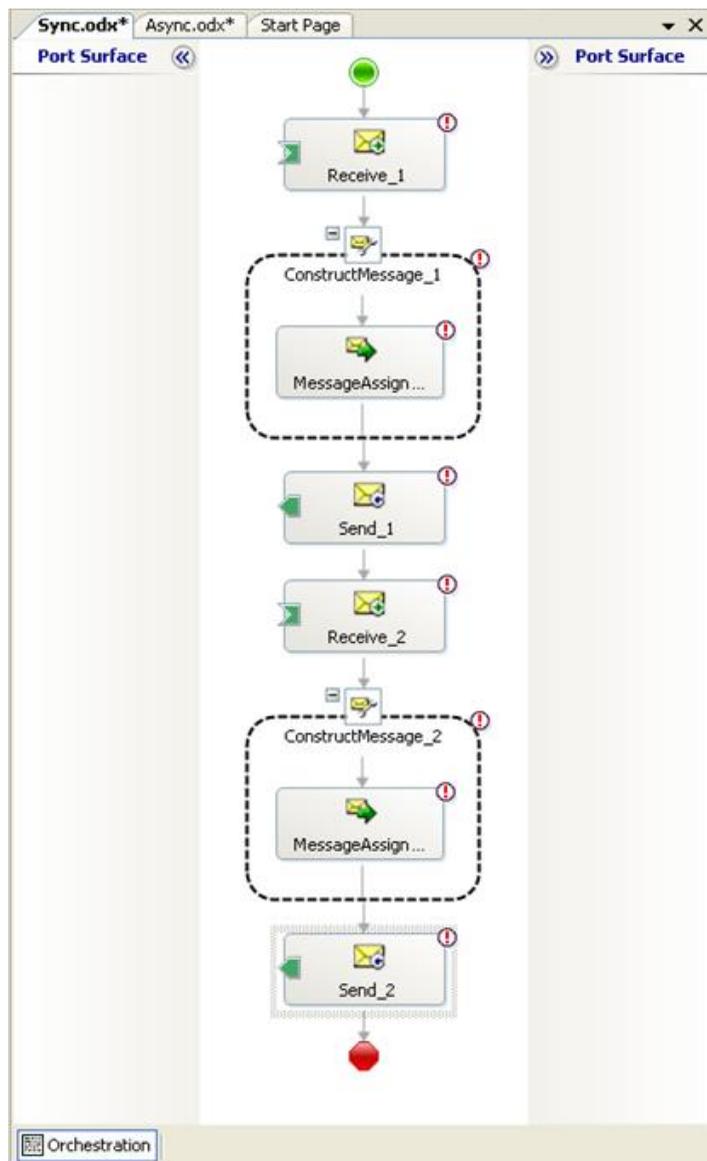
Right-click **DocProject** in the **Solution Explorer** pane and select **Add > New Item > BizTalk Orchestration**. Set the Name to **Sync.odx**. Click **Add**.



### Add shapes to the orchestration.

Open **Sync.odx**. Using the **Toolbox**, add the following shapes.

1. Receive Shape
2. Message Assignment
3. Send Shape
4. Receive Shape
5. Message Assignment
6. Send Shape



## Create messages and set properties

In this section, you will create four messages and set their properties. You can refer to the diagrams of screen shots in the preceding section for visual navigation.

1. Click **Orchestration View** tab. Right-click **Messages** and select **New Message**. Set the message properties as follows:
  - Set **Identifier** = Message\_SyncIn.
  - To set **MessageType**, expand **Schemas**, then select **DocProject.SalesOrderService\_SalesOrder** from the list.
2. Create the second message and set properties as follows:
  - **Identifier** = Message\_SyncBtsToDyn.
  - To set **Message Type**, expand **Multi- part Message Types**, then select **DocProject.SalesOrderService\_create\_Request** from the list.
3. Create the third message and set properties as follows:
  - **Identifier** = Message\_SyncDynToBts.
  - To set **Message Type**, expand **Multi-part Message Types**, then select **DocProject.SalesOrderService\_create\_Response** from the list.
4. Create the fourth message and set properties as follows:
  - Set **Identifier** = Message\_SyncOut.
  - To set **Message Type**, expand **Schemas**, then select **<Select from referenced assembly...>**. In the **Select Artifact Type** window, expand **Microsoft.Dynamics.Biztalk.Adapter.Schemas** and select **DynamicsAx5**. Select **EntityKeyList**.

## Configure shapes

This section provides instructions to configure the shapes that we added earlier to the orchestration. You can refer to the diagrams of screen shots in the preceding section for visual navigation.

1. Click shape **Receive\_1** and set properties as follows:
  - Set **Activate** = True(from the list).
  - Set **Message** = Message\_SyncIn.
2. Click shape **ConstructMessage\_1** and set properties as follows:
  1. Set **Messages Constructed**, Message\_SyncBtsToDyn (from the list). Make sure you set this property before using the code in the next step to avoid getting syntax errors.
  2. Double-click **MessageAssignment\_1** within the shape and copy or type the following code into the **BizTalk Expression Editor**.

```
Message_SyncBtsToDyn._salesSalesOrder = Message_SyncIn;
Message_SyncBtsToDyn(DynamicsAx5.DestinationEndpoint) = "LocalEP";
Message_SyncBtsToDyn(DynamicsAx5.SourceEndpoint) = "RemoteEP";
Message_SyncBtsToDyn(DynamicsAx5.Action) =
"http://schemas.microsoft.com/dynamics/2008/01/services/SalesOrderService/create";
Message_SyncBtsToDyn(DynamicsAx5.MessageId) = System.String.Format("{0:B}",
System.Guid.NewGuid());
```
3. Click shape **Send\_1** and set properties as follows:
  - Set **Message** = Message\_SyncBtsToDyn.
4. Click shape **Receive\_2** and set properties as follows:

- Set **Message** = Message\_SyncDynToBts.
5. Click shape **ConstructMessage\_2** and set properties as follows:
    1. Set **Messages Constructed** = Message\_SyncOut.
    2. Double-click **MessageAssignment\_2** within the shape and type or copy the following code into the **BizTalk Expression Editor**:

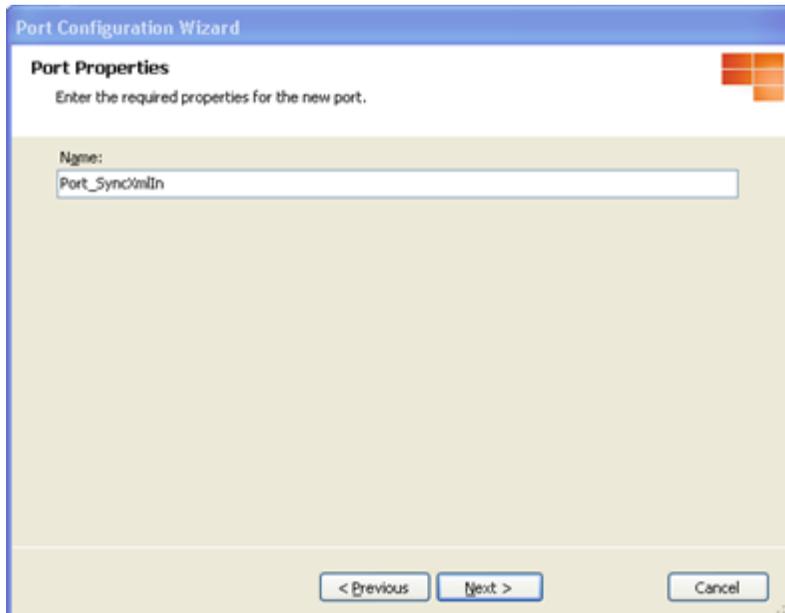
```
Message_SyncOut = Message_SyncDynToBts.ReturnValue;
```
  6. Click shape **Send\_2** and set properties as follows:
    - Set **Message** = Message\_SyncOut.

### Configure operations for the shapes

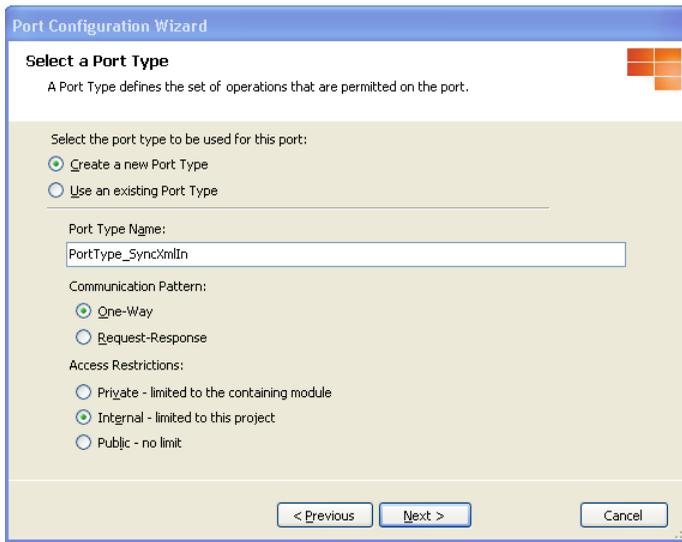
In this section, we will configure operations for the shapes in our orchestration. This section only provides relevant diagrams of screen shots. You can refer to the diagrams of screen shots in the preceding section for detailed visual navigation.

### Configure operations for shape Receive\_1

1. Click the exclamation icon on the shape **Receive\_1**. Click the dialog box to create a new port.
2. Click **Next** in the Welcome to the **Port Configuration Wizard** window.
3. Set **Name** = Port\_SyncXmlIn, and click **Next**.

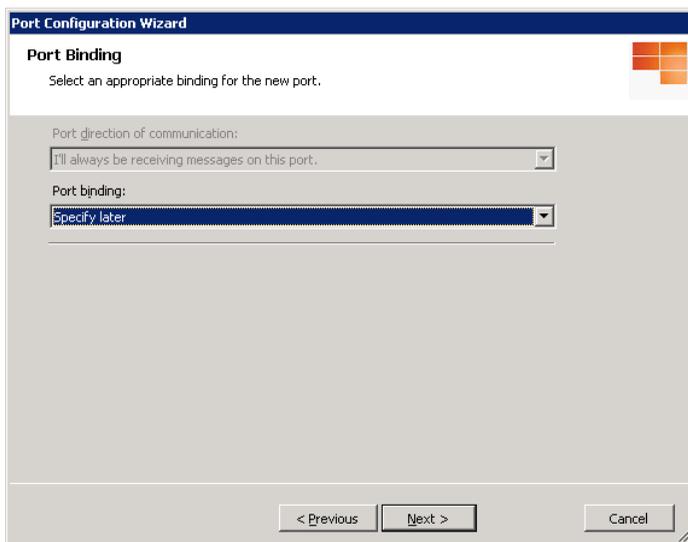


4. Select **Create a New Port Type**. Set the **Port Type Name** to PortyType\_SyncXmlIn. Click **Next**.



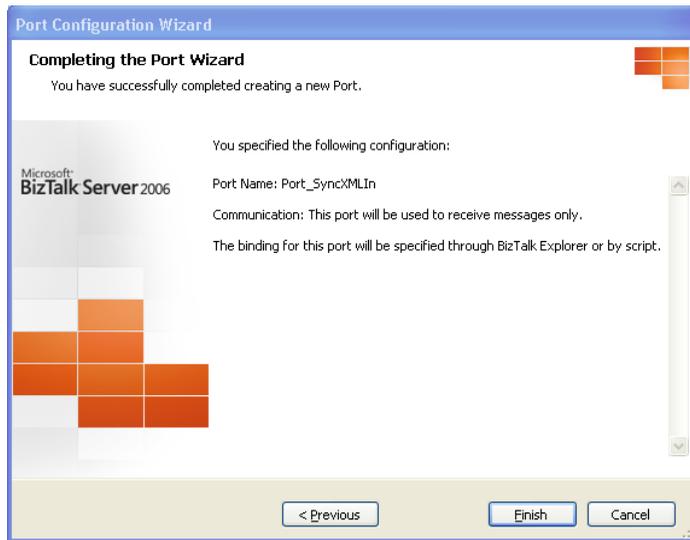
The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Select a Port Type' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Select a Port Type' is followed by a sub-instruction: 'A Port Type defines the set of operations that are permitted on the port.' There are two radio button options: 'Create a new Port Type' (which is selected) and 'Use an existing Port Type'. Below these options is a text field for 'Port Type Name' containing the text 'PortType\_SyncXmlIn'. Underneath is the 'Communication Pattern' section with three radio button options: 'One-Way' (selected), 'Request-Response', and 'Access Restrictions'. The 'Access Restrictions' section has three radio button options: 'Private - limited to the containing module', 'Internal - limited to this project' (selected), and 'Public - no limit'. At the bottom of the dialog are three buttons: '< Previous', 'Next >', and 'Cancel'.

5. On the following wizard page, leave the **Port binding** set to **Specify later**. The wizard will automatically set the binding when it connects the receive shape to this new port. Click **Next**.

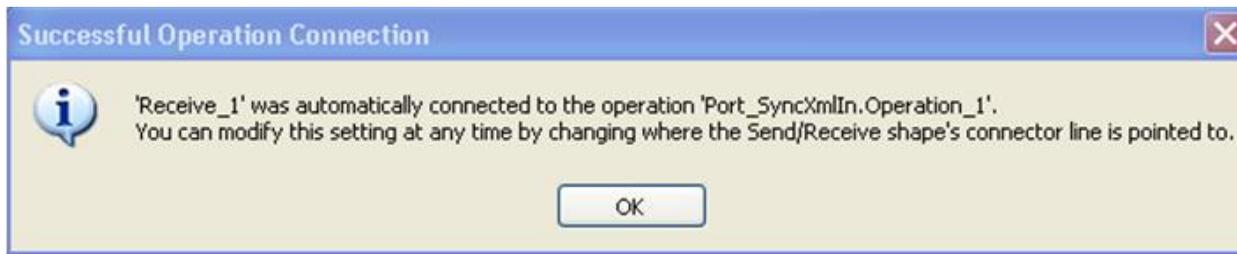


The screenshot shows the 'Port Configuration Wizard' dialog box, specifically the 'Port Binding' step. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Port Binding' is followed by a sub-instruction: 'Select an appropriate binding for the new port.' There are two dropdown menus. The first is labeled 'Port direction of communication:' and has the text 'I'll always be receiving messages on this port.' The second is labeled 'Port binding:' and has the text 'Specify later'. At the bottom of the dialog are three buttons: '< Previous', 'Next >', and 'Cancel'.

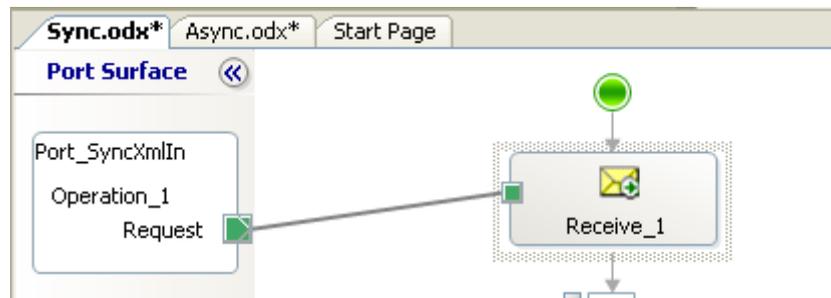
6. Click **Finish**



7. At this message, click **OK**.

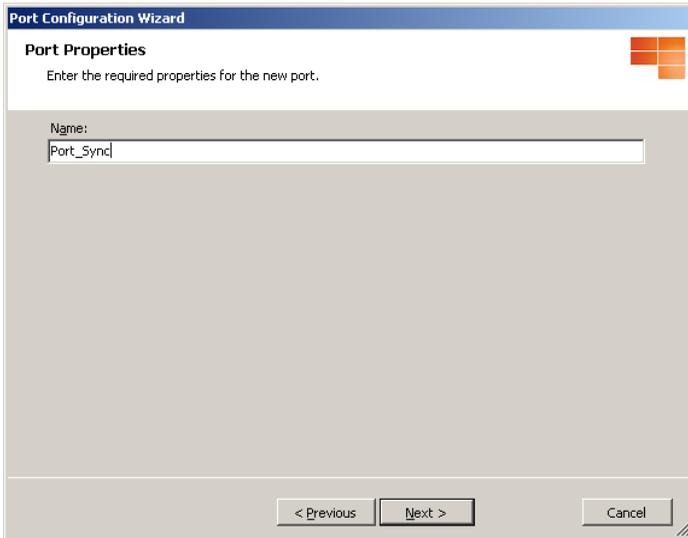


8. Port and shape relationship should look like the following screen shot.

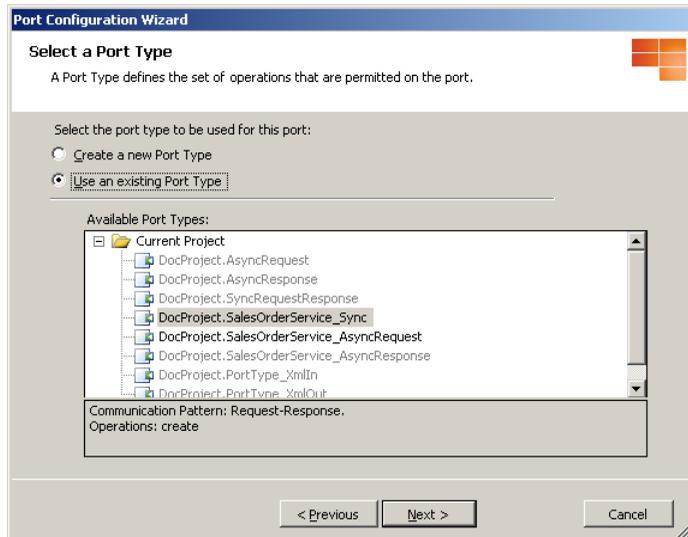


## Configure operations for shape **Send\_1**

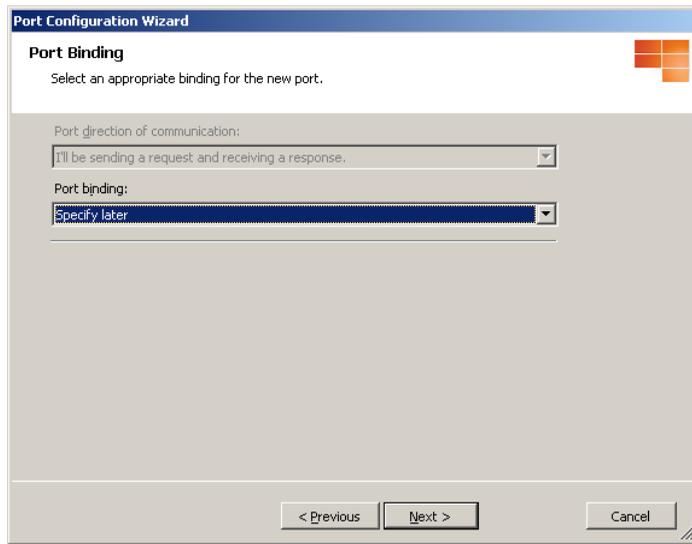
1. Click the exclamation icon for shape **Send\_1**. Click the dialog box to create a new port.
2. Click **Next** in the **Welcome to the Port Configuration Wizard** window.
3. Set the **Name** to Port\_Sync as shown in the following screen shot and click **Next**.



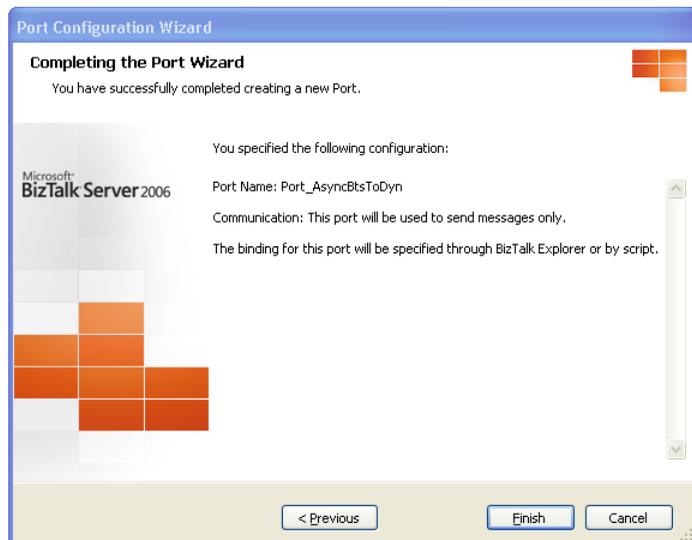
4. In the **Select a Port Type** window:
  1. Select **Use an Existing Port Type**.
  2. Select **SalesOrderService\_Sync**.
  3. Click **Next**.



5. Click **Next**.



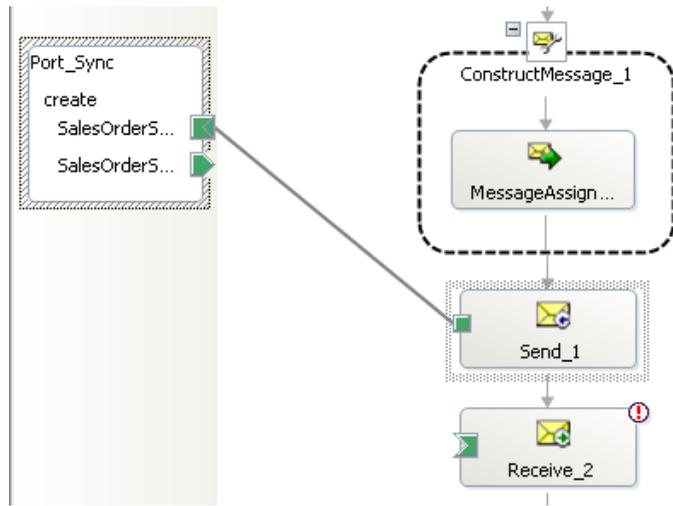
6. Click **Finish**.



7. At this message, click **OK**.

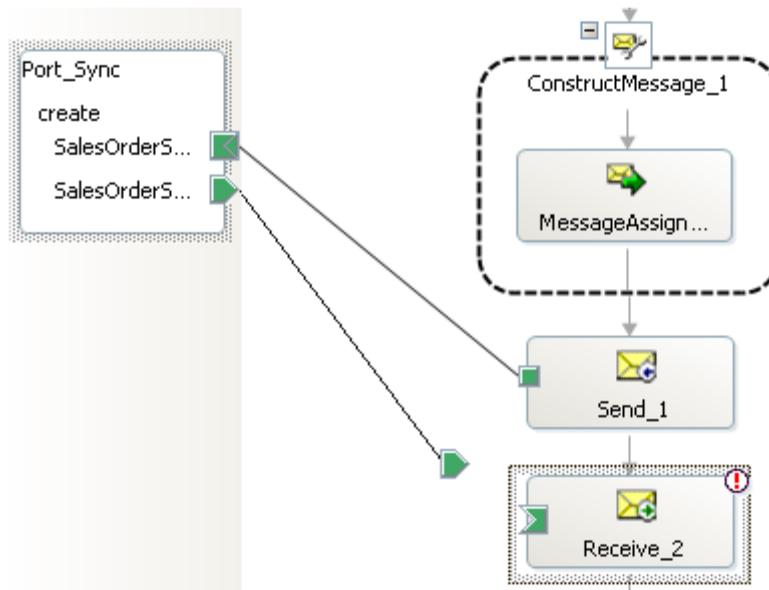


8. Port and shape relationship should look like the following screen shot.

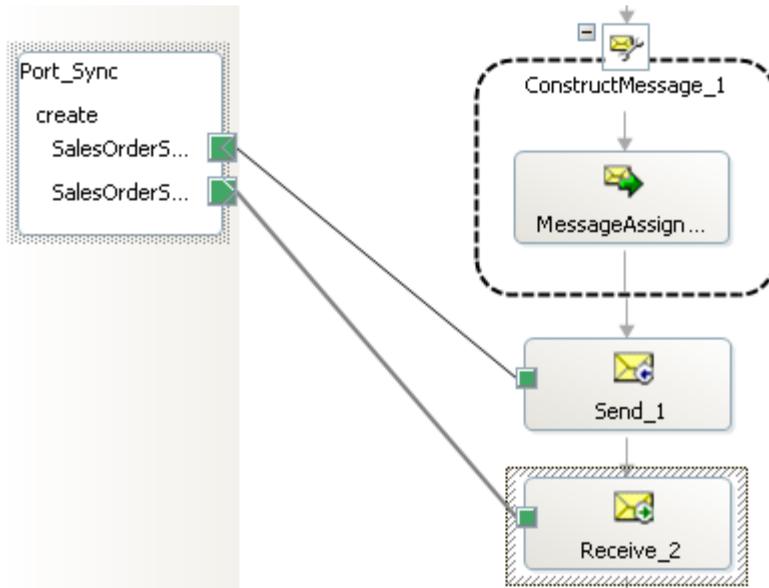


### Configure operations for shape Receive\_2

1. Connect **Receive\_2** shape with **Port\_Sync** by dragging the arrow in Visual Studio.

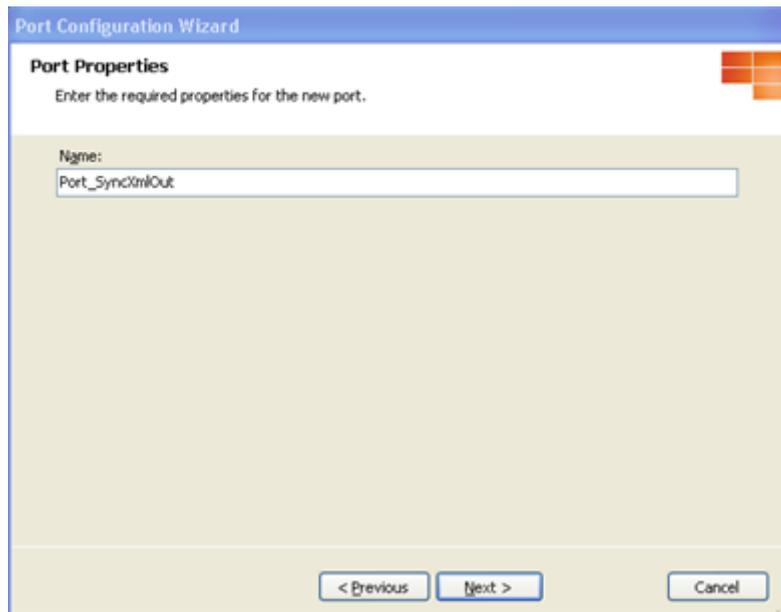


- Your orchestration should look like the following screen shot.



### Configure operations for shape Send\_2

- Set operations for shape **Send\_2**.
- Click the exclamation icon for shape **Send\_2**. Click the dialog box to create a new port.
- Click **Next** in the **Welcome to the Port Configuration Wizard** window.
- Set **Name** to Port\_SyncXmlOut in the **Port Properties** window and click **Next**.



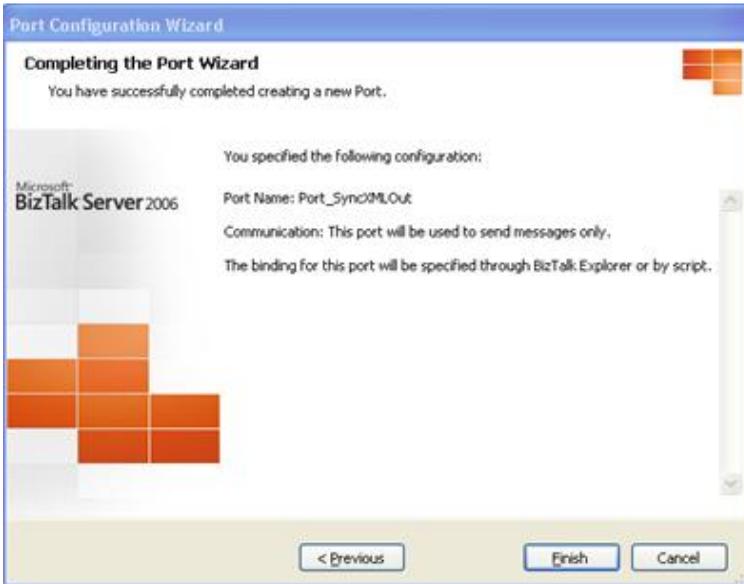
5. In the **Select a Port Type** window:
  1. Select **Create a new Port Type**.
  2. Set **Port Type Name** to PortType\_SyncXmlOut.
  3. Click **Next**.

The screenshot shows the 'Select a Port Type' dialog box. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Select a Port Type' is followed by a sub-header 'A Port Type defines the set of operations that are permitted on the port.' There are two radio buttons: 'Create a new Port Type' (selected) and 'Use an existing Port Type'. Below this is a text box for 'Port Type Name' containing 'PortType\_SyncXmlOut'. There are three sections of radio buttons: 'Communication Pattern' with 'One-Way' selected, 'Request-Response', and 'Access Restrictions' with 'Internal - limited to this project' selected, and 'Private - limited to the containing module', and 'Public - no limit'. At the bottom are three buttons: '< Previous', 'Next >', and 'Cancel'.

6. Click **Next**.

The screenshot shows the 'Port Binding' dialog box. The title bar reads 'Port Configuration Wizard'. Below the title bar, the text 'Port Binding' is followed by a sub-header 'Select an appropriate binding for the new port.' There are two dropdown menus: 'Port direction of communication:' with the value 'I'll always be sending messages on this port.' and 'Port binding:' with the value 'Specify later'. At the bottom are three buttons: '< Previous', 'Next >', and 'Cancel'.

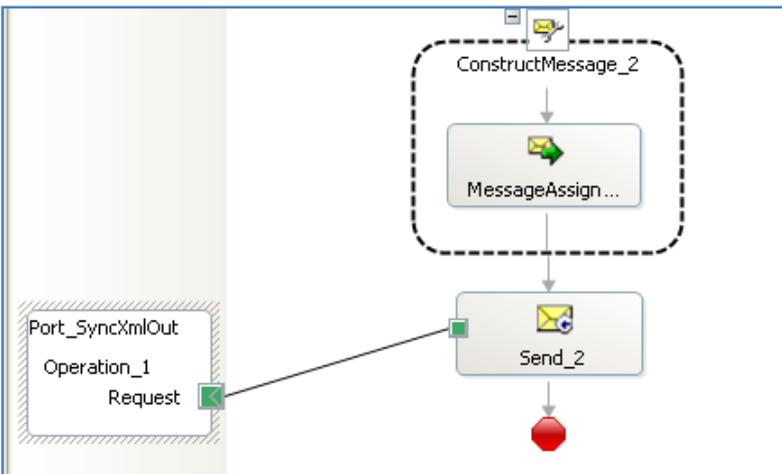
7. Click **Finish**.



8. At this message, click **OK**.



9. Port and shape relationship should look like the following screen shot.



10. Save the project.

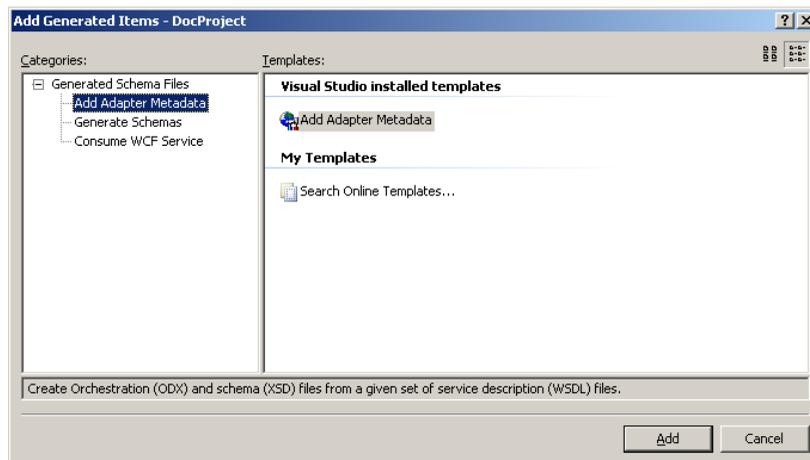
## Send a purchase order from AIF

This section provides step-by-step instructions to add an orchestration to send a purchase order from AIF to BizTalk Server in an asynchronous mode. This is a one way send from the AIF to BizTalk Server. Therefore, this asynchronous orchestration does not use a correlation set.

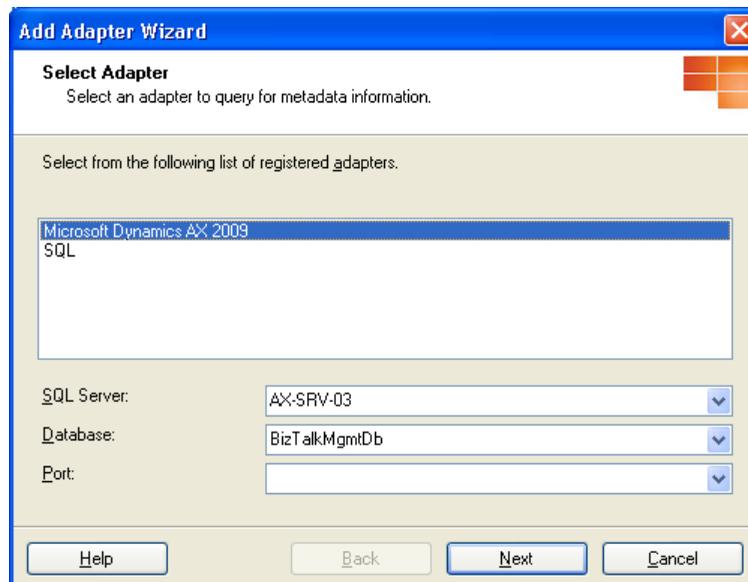
### Add the adapter metadata

In this section, we will add an orchestration to the project. This step assumes that you have already completed the instructions in the preceding section to create a project called DocProject.

1. Right-click DocProject in the **Solution Explorer** pane and select **Add > Add Generated Items**. Select **Add Adapter Metadata** and click **Add** button.



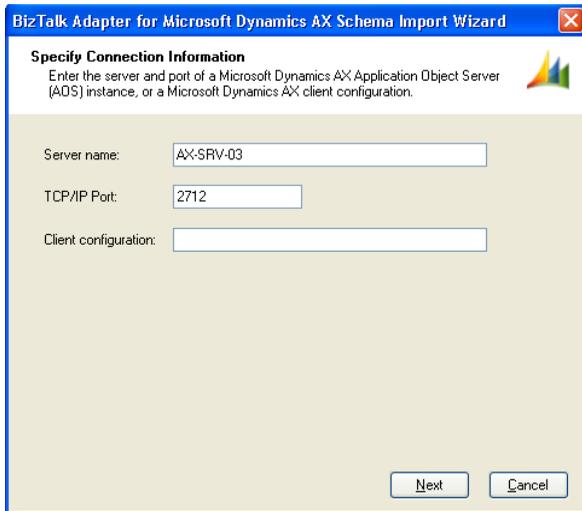
2. Select **Microsoft Dynamics AX 2009**. Confirm the values for the following fields and click **Next**.
  - Set **SQL Server** = AX-SRV-03.
  - Set **Database** = BizTalkMgmtDb.



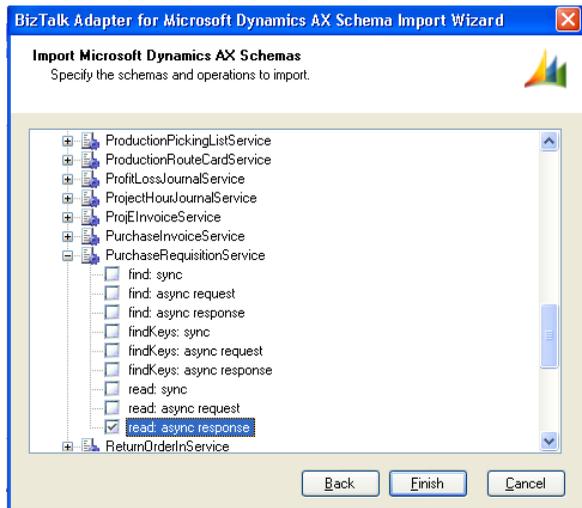
3. Enter **Server Name** and **TCP/IP Port**. The server name refers to the Application Object Server (AOS) and the port refers to the port being used by the AOS. The port is usually set to 2712. You can look at the Microsoft Dynamics AX 2009 **Server Configuration utility** to obtain the server name and TCP/IP port. For more information, see [Server and Database Administration Guide](#).

Enter values for the following fields and click **Next**.

- Set **Server name** = AX-SRV-03.
- Set **TCP/IP Port** = 2712.



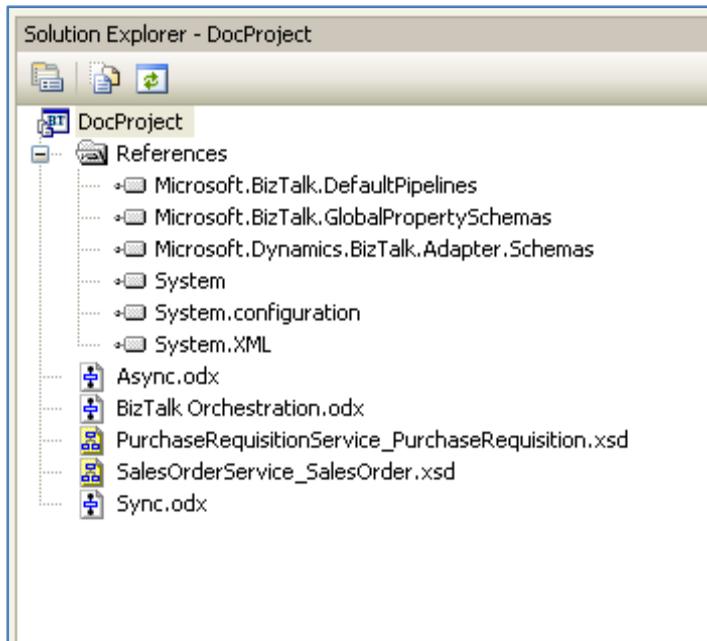
4. Expand **PurchaseRequisitionService** and check **read: async response** as shown in the following screen shot.



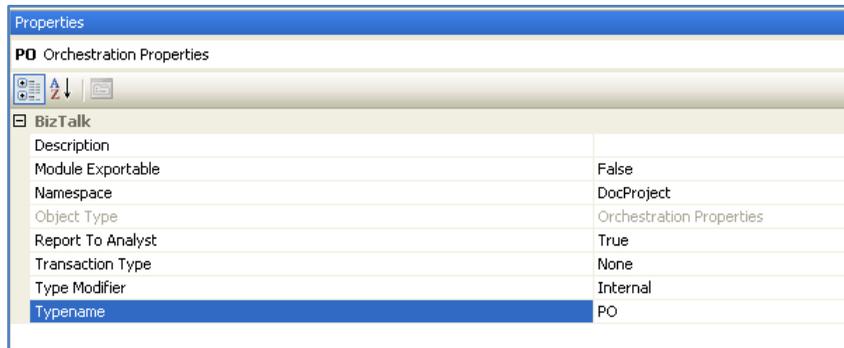
5. Click **Finish**.

**Note:** This is a one-way send from AIF to BizTalk Server. Therefore, the read request operation is not required.

- Your project will now look like the following screen shot with the newly added BizTalk Orchestration.odx and the PurchaseRequisitionService\_PurchaseRequisition.xsd files.

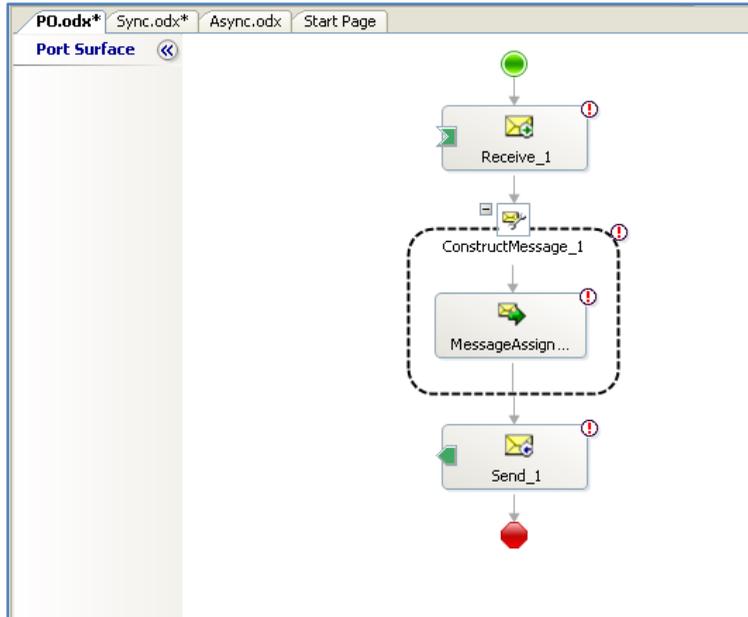


- Right-click **BizTalk Orchestration.odx** and rename it to **PO.odx**. Double-click **PO.odx**. Select **Orchestration View**. Right-click **Orchestration Properties** and select **Properties Window**. In the **Typename** field, enter "PO" as shown in the following screen shot.



## Add shapes to the orchestration.

1. Open **PO.odx**. Using the **Toolbox**, add the following shapes.
  1. Receive
  2. Message Assignment
  3. Send



2. Select **Orchestration View**. Expand **Types**, then **Multi-part Message Types**, then **PurchaseRequisitionService\_read\_Response**. Right-click **ReturnValue** and select **Properties Window**. In the **Properties** window, confirm that the **Type** field defaults to **DocProject.PurchaseRequisitionService\_PurchaseRequisition**.

## Create messages and set properties

In this section, you will create two messages and set their properties. You can refer to the diagrams of screen shots in the preceding section for visual navigation.

1. On the **Orchestration View** tab, right-click **Messages** and select **New Message**. Set the message properties as follows:
  - Set **Identifier** = Message\_POInToBts.
  - To set **MessageType**, expand **Multi- part Message Types**, the select **DocProject.PurchaseRequisitionService\_read\_Response** from the list.
2. Create the second message and set properties as follows:
  - Set **Identifier** = Message\_POOutToFile.
  - To set **Message Type**, expand **Schemas**, then select **DocProject.PurchaseRequisitionService\_PurchaseRequisition** from the list.

## Configure shapes

This section provides instructions to configure the shapes that we added earlier to the orchestration. You can refer to the diagrams of screen shots in the preceding section for visual navigation.

1. Click shape **Receive\_1** and set properties as follows.
  - Set **Activate** = Select **True** from the list.
  - Set **Message** = Message\_POInToBts.
2. Click Shape **ConstructMessage\_1** and set properties as follows.
  1. To set **Messages Constructed**, select **Message\_POOutToFile** from the list. Make sure you set this property before using the code in the next step to avoid getting syntax errors.
  2. Double-click **MessageAssignment\_1** within the shape and copy or type the following code into the **BizTalk Expression Editor**:

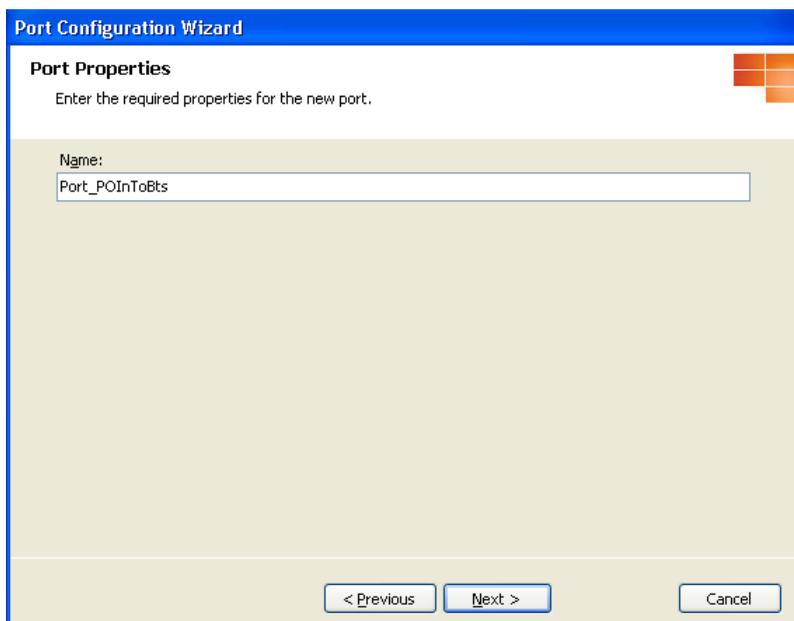
```
Message_POOutToFile = Message_POInToBts.ReturnValue;
```
3. Click shape **Send\_1** and set properties as follows:
  - Set **Message** = Message\_POOutToFile.

## Configure operations for the shapes

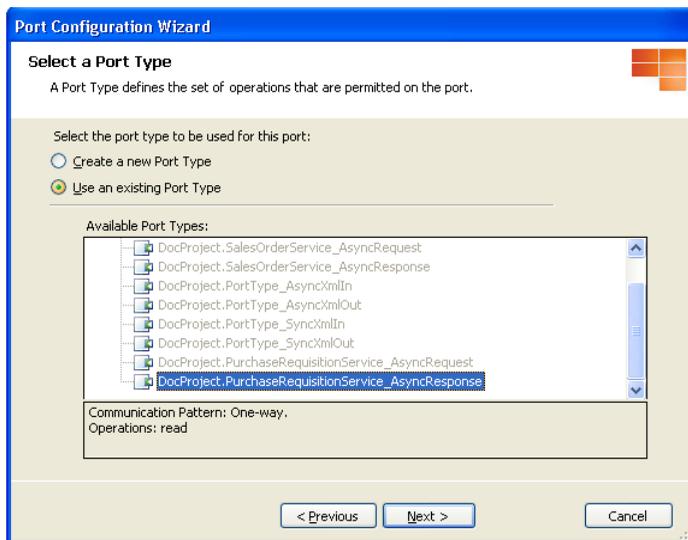
In this section, we will configure operations for the shapes in our orchestration. This section provides only relevant diagrams of screen shots. You can refer to the diagrams of screen shots in the preceding section for detailed visual navigation.

### Configure operations for shape Receive\_1

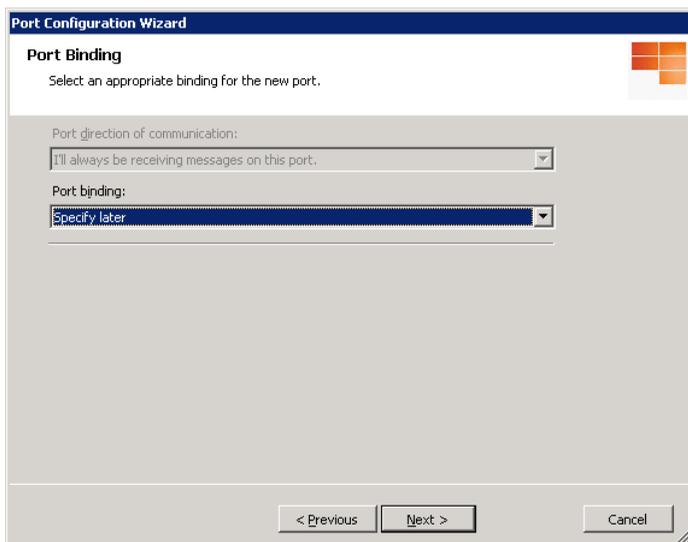
1. Click the exclamation icon on the shape **Receive\_1**. Click the dialog box to create a new port.
2. Click **Next** in the Welcome to the **Port Configuration Wizard** window.
3. Set **Name** = Port\_POInToBts and click **Next**.



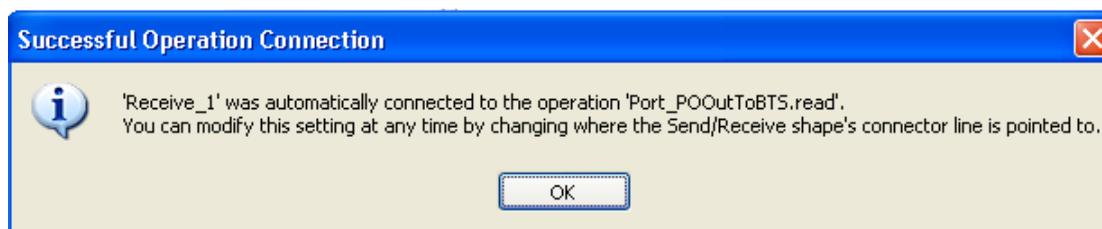
4. Select **Use an existing Port Type**. Set the **Port Type** to **DocProject.PurchaseRequisitionService\_AsyncResponse**. Click **Next**.



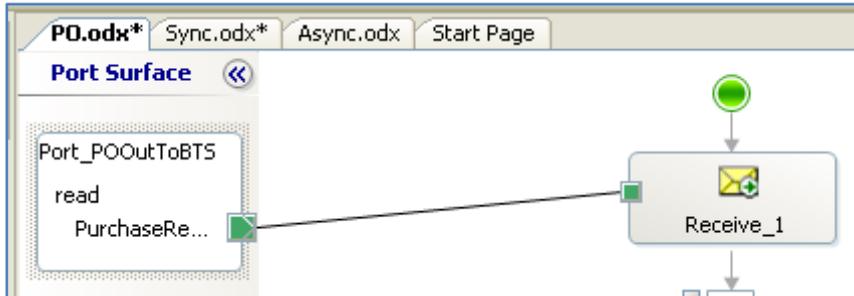
5. In the following wizard page, leave the **Port binding** set to **Specify later**. The wizard will automatically set the binding when it connects the receive shape to this new port. Click **Next**.



6. Click **Finish** in the **Port Configuration Wizard** window.
7. At this message, click **OK**.

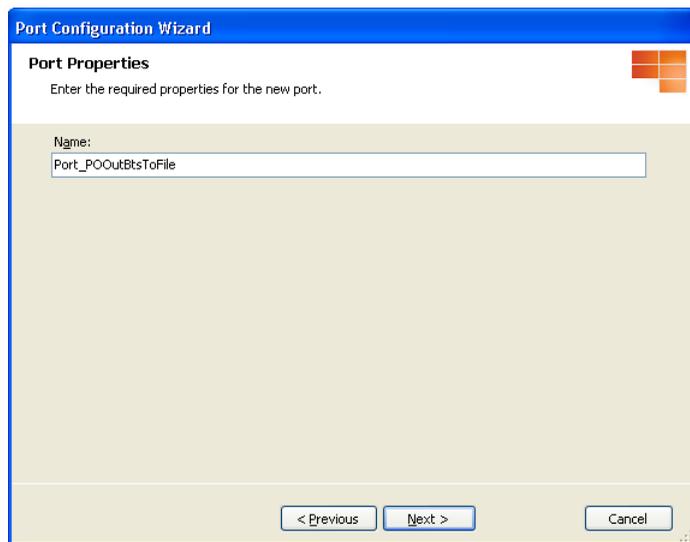


8. Port and shape relationship should look like the following screen shot.

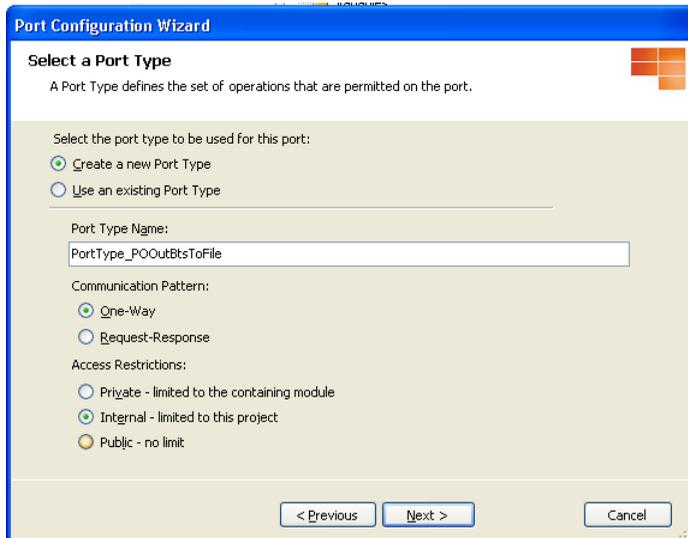


### Configure operations for shape **Send\_1**

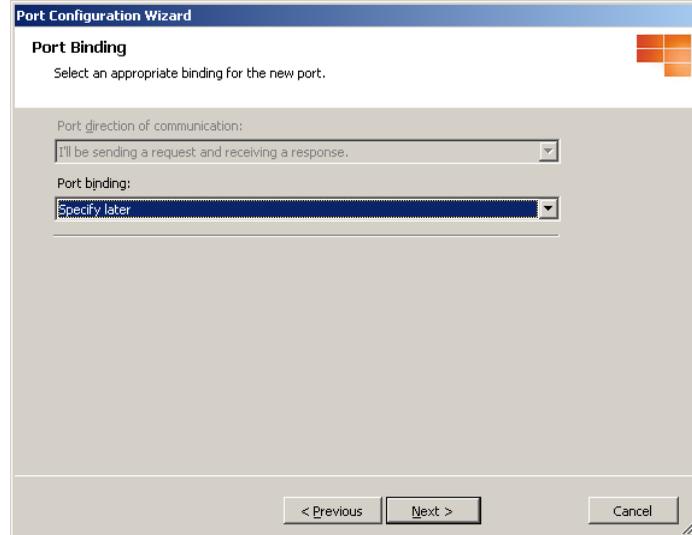
1. Click the exclamation icon for shape **Send\_1**. Click the dialog box to create a new port.
2. Click **Next** on the **Welcome to the Port Configuration Wizard** window.
3. Set the **Name** to Port\_POOutBtsToFile as shown in the following screen shot and click **Next**.



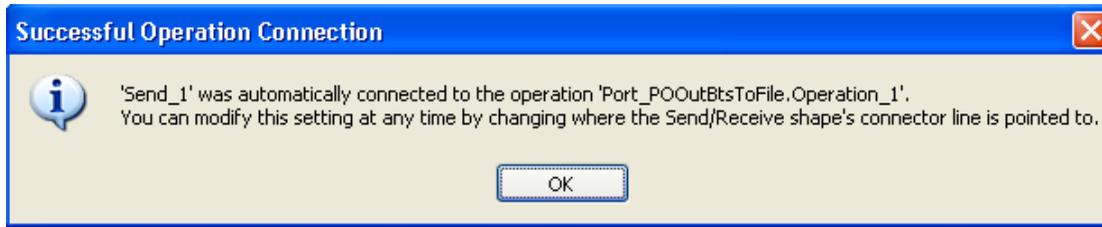
4. In the **Select a Port Type** window:
  1. Select Create a new Port Type.
  2. Set **Port Type Name** = PortType\_POOutBtsToFile.
  3. Click **Next**.



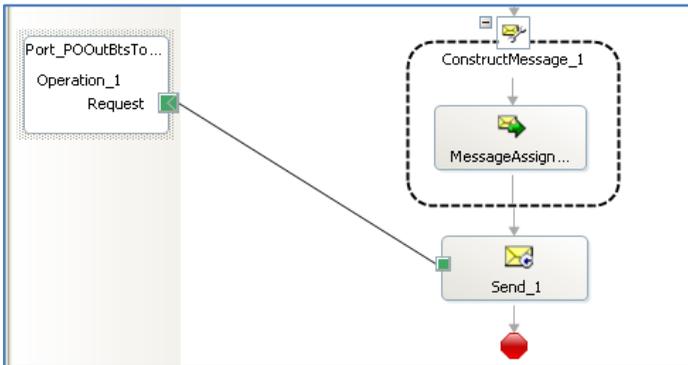
5. Click **Next**.



6. Click **Finish** in the **Port Configuration Wizard** window.
7. At this message, click **OK**.



8. Port and shape relationship should look like the following screen shot.



9. Save the project at this point.

## Create a strong name key

You will need to create and assign a strong name key to compile the project.

1. Start a command prompt and navigate to C:\Program Files\Microsoft Visual Studio 8\SDK\v2.0\Bin.
2. Type **sn -k "c:\TestKey.snk"**. Make sure you get a message that your key pair was written as shown in the following screen shot.

```

C:\WINDOWS\system32\cmd.exe
C:\Program Files\Microsoft Visual Studio 8\SDK\v2.0\Bin>sn -k C:\TestKey.snk
Microsoft (R) .NET Framework Strong Name Utility Version 2.0.50727.42
Copyright (c) Microsoft Corporation. All rights reserved.
Key pair written to C:\TestKey.snk
C:\Program Files\Microsoft Visual Studio 8\SDK\v2.0\Bin>

```

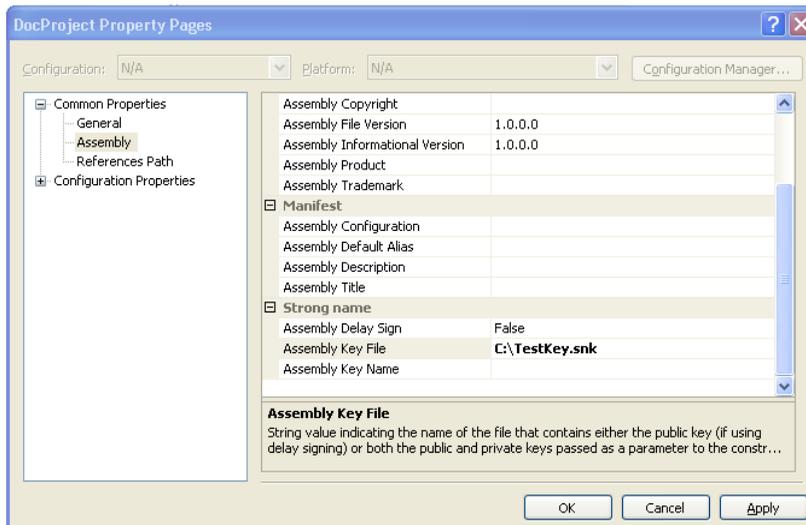
## Build and deploy the Visual Studio project

We are now ready to build the Visual Studio project and deploy it to the BizTalk Server.

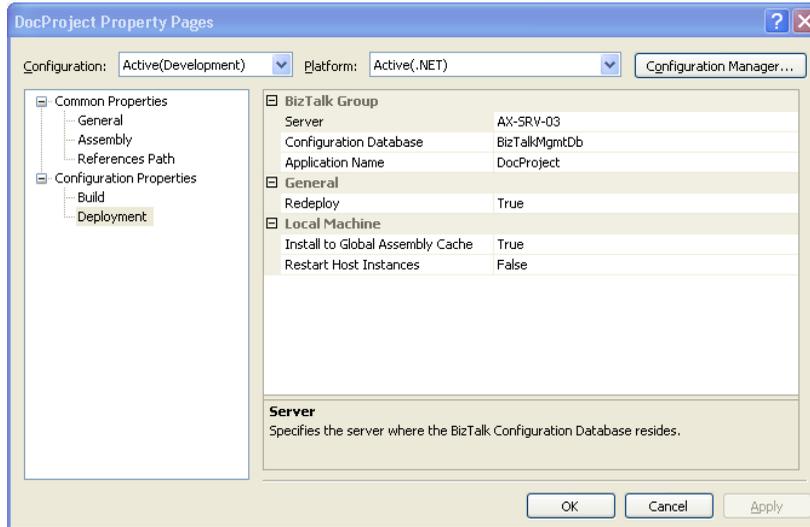
1. In Visual Studio 2005 navigate to **Project > DocProject Properties**.



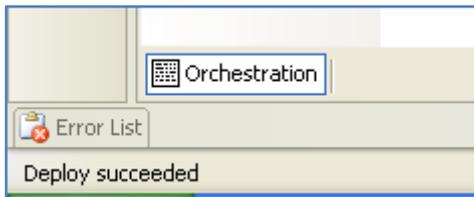
2. Expand **Common Properties** and click **Assembly**. Locate **Assembly Key File**. Navigate to the location of the strong name key file that was created in the preceding section and select the file. You should see the strong name key file as shown in the following screen shot.



3. Expand **Configuration Properties** and click **Deployment**. Set the following property values:
  - Set **Server** = AX-SRV-03.
  - Set **Application Name** = DocProject. The value you set in this field will be used as the BizTalk application.
4. Click **Apply** and then click **OK**.



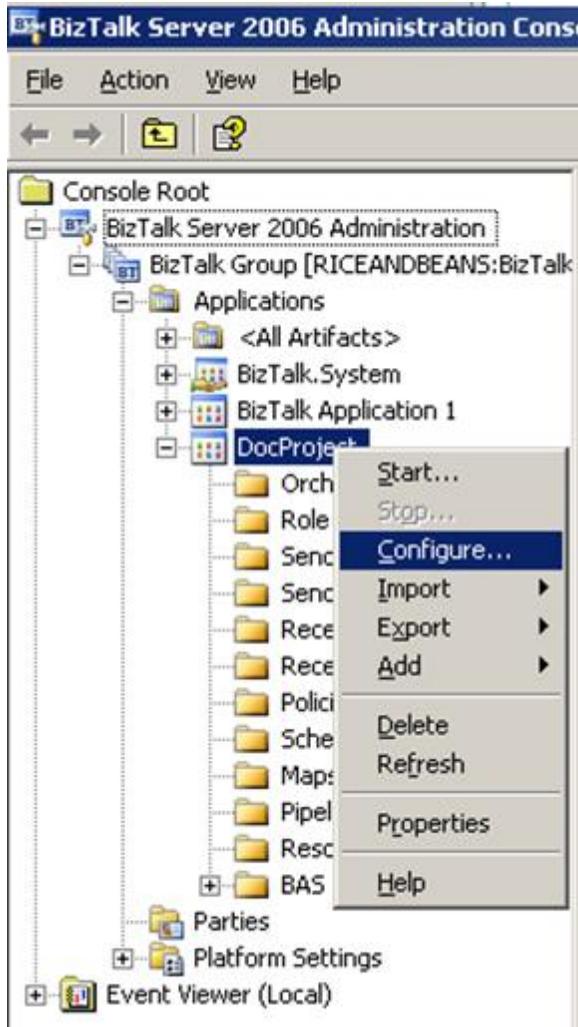
5. Right-click **DocProject** in the **Solution Explorer** pane.
  1. Click **Deploy**.
  2. Check the status bar to confirm that the deployment is successful.



## Configure orchestration in BizTalk Server

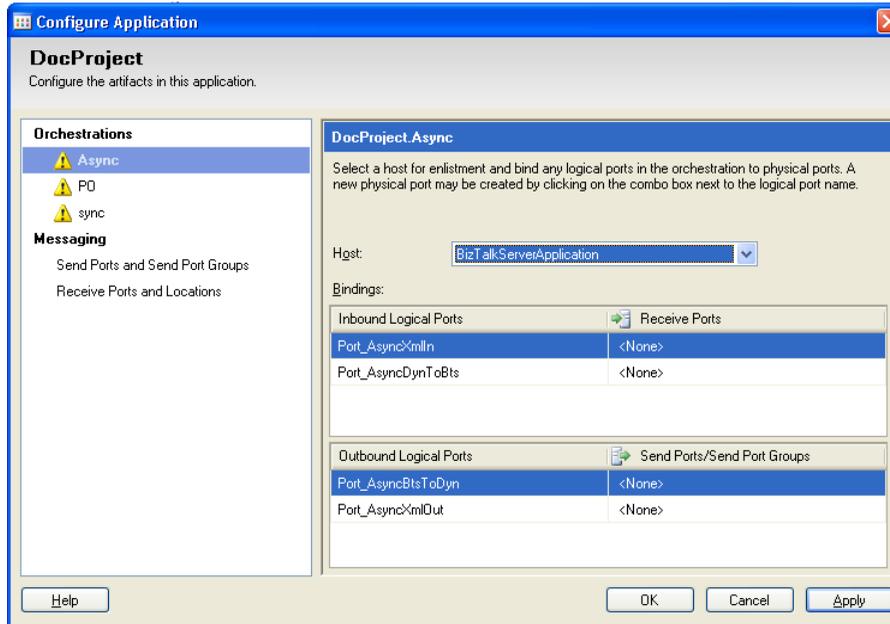
This section provides instructions to configure the asynchronous and synchronous orchestrations in BizTalk Server administration console. To begin:

1. Launch the **BizTalk Server 2006 Administration Console**. If the administrative console is already launched, you need to right-click the BizTalk group and click **Refresh**.
2. Navigate to **DocProject** by expanding parent nodes as shown in the following screen shot. Right-click **DocProject** and select **Configure**.



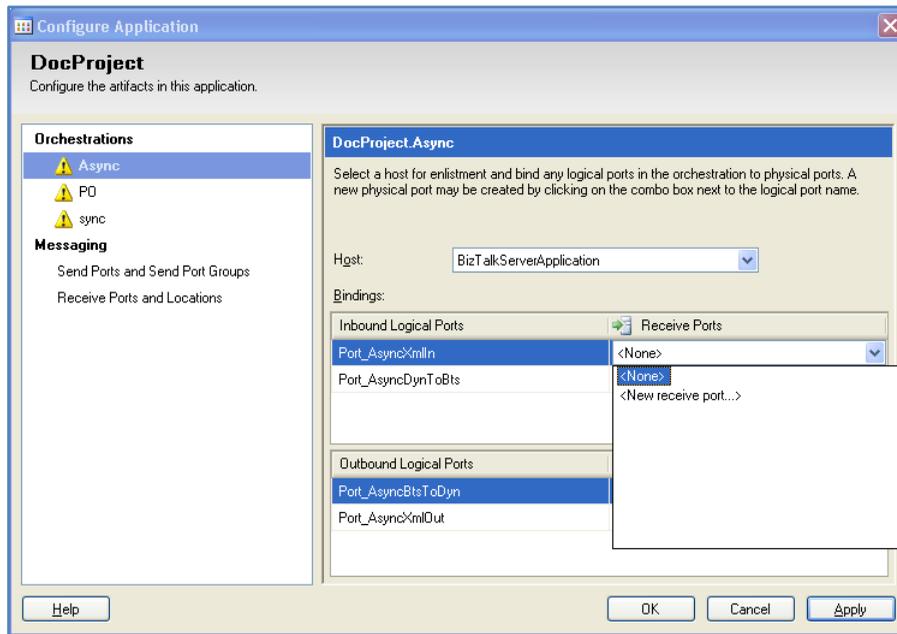
## Configure the asynchronous orchestration (Async.odx)

1. Click **Async**. This is the **Async.odx** orchestration in the Visual Studio 2005 project.
2. In the **Host** field, select **BizTalk Server Application** from the list.

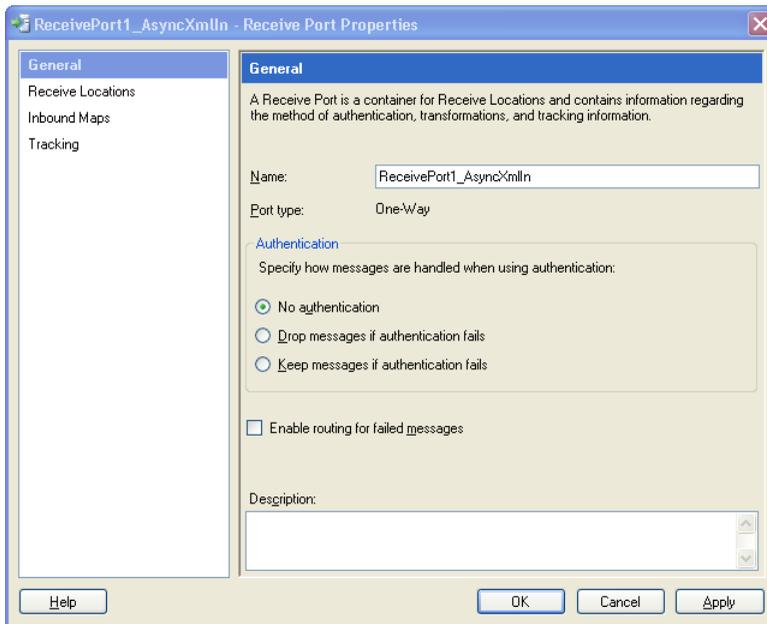


## Configure receive port Port\_AsyncXmlIn

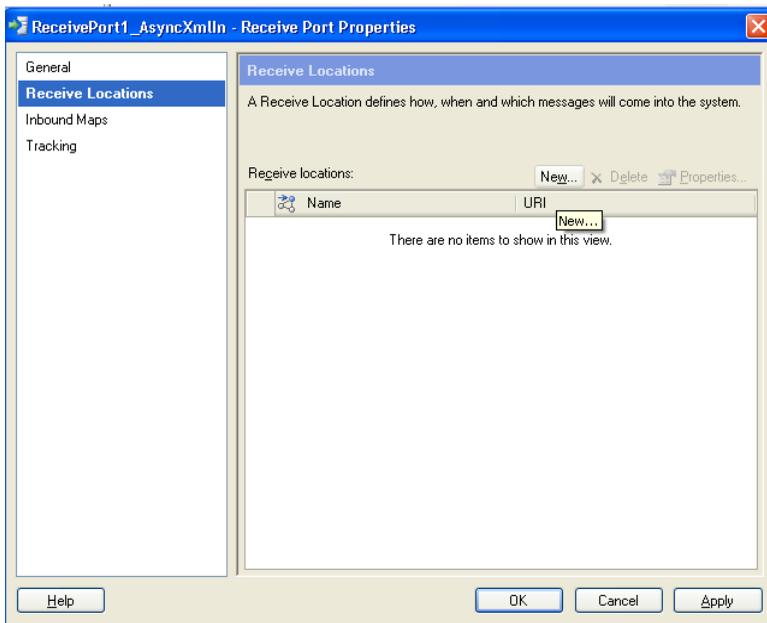
1. Click **<None>** in the **Port\_AsyncXmlIn** field and select **<New Receive Port...>** from the list.



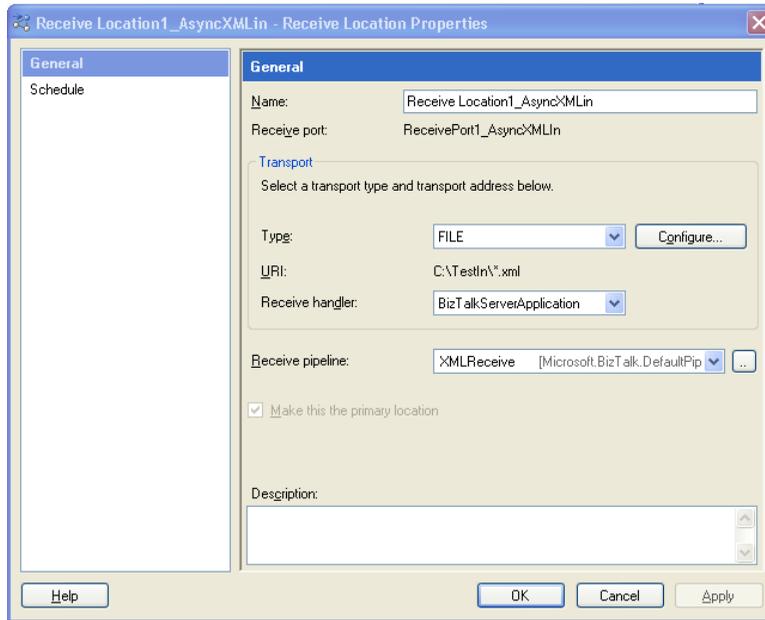
- In the **Receive Port Properties** window, set the **Name** to ReceivePort1\_AsyncXmlIn and then click **Receive Locations**.



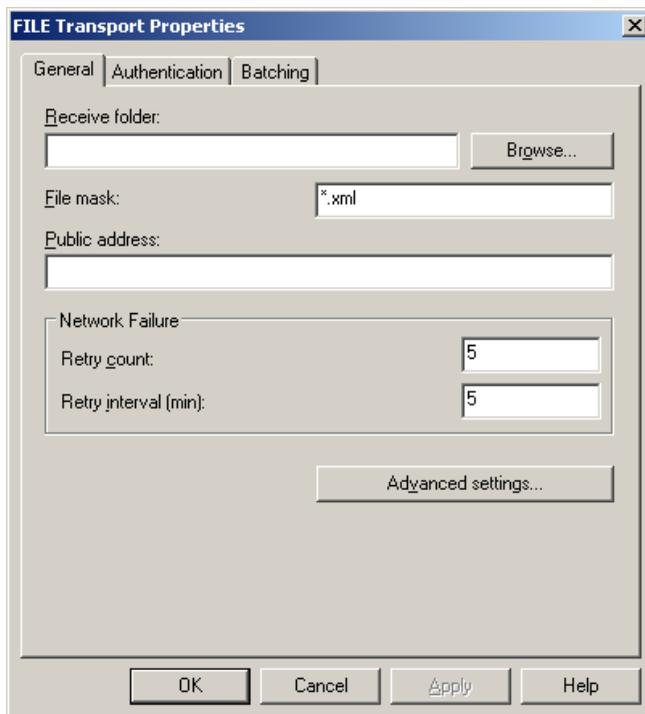
- In the **Receive Locations** pane, click **New**.



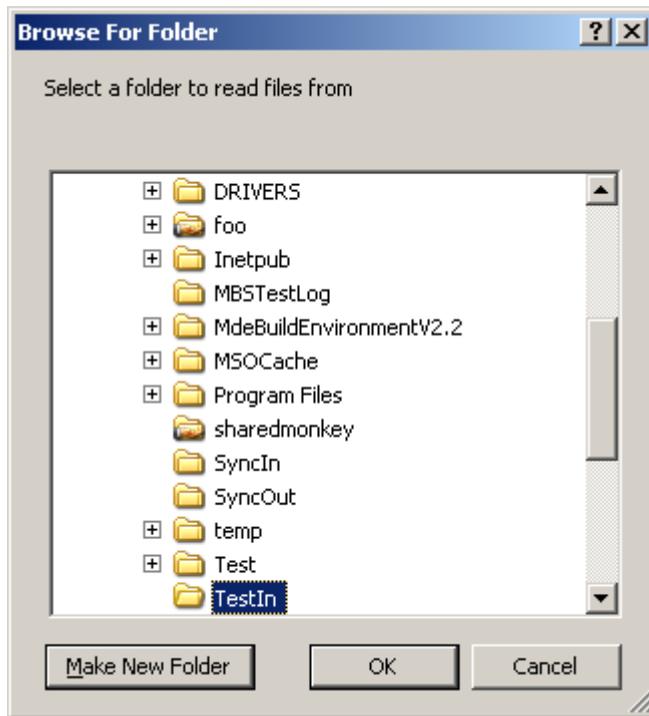
4. Set properties as follows:
  1. Set **Name** = ReceiveLocation1\_AsyncXmlIn.
  2. Set **Type** = File (from the list) and click **Configure**.



3. In the **File Transport Properties** window, click **Browse**.



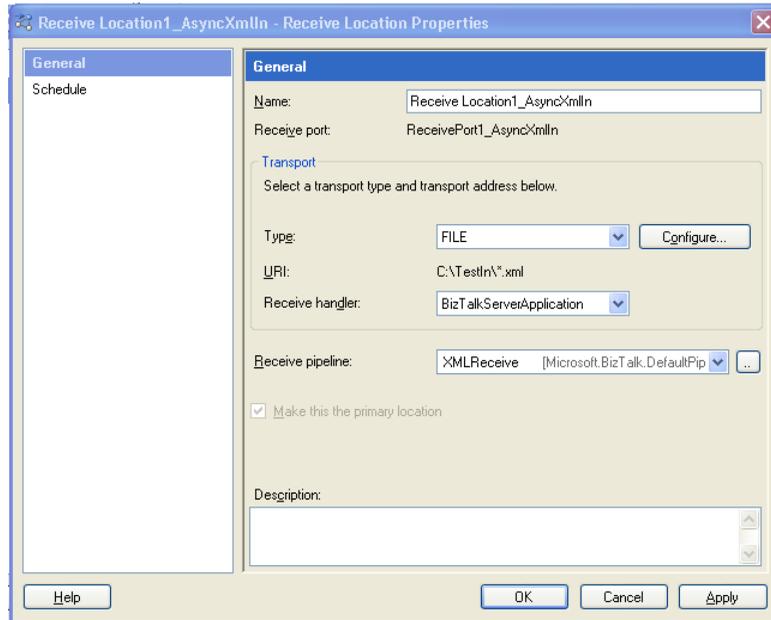
4. Create a new folder that will be used as the receive folder. Name the folder **TestIn**. Select **TestIn** and click **OK**.



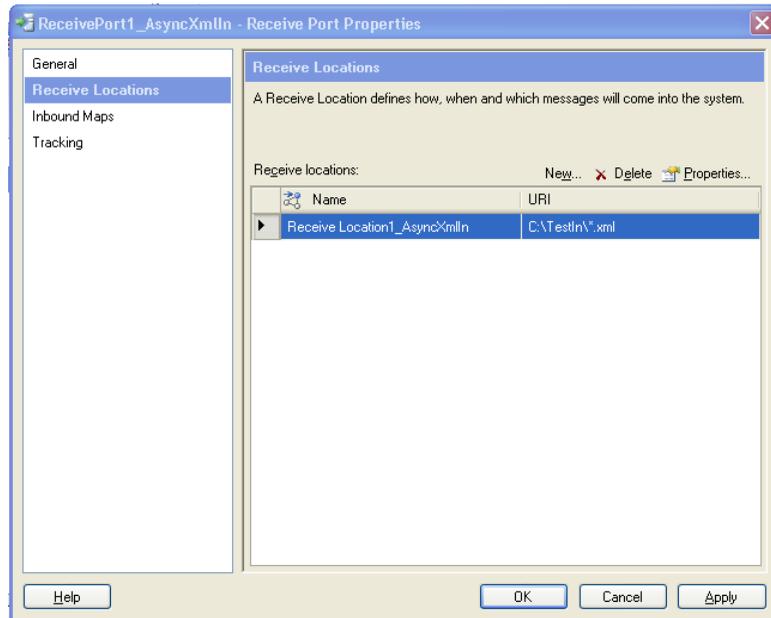
5. Click **OK** to continue.



5. Set **Receive pipeline** to **XMLReceive**, click **Apply** and then click **OK**.

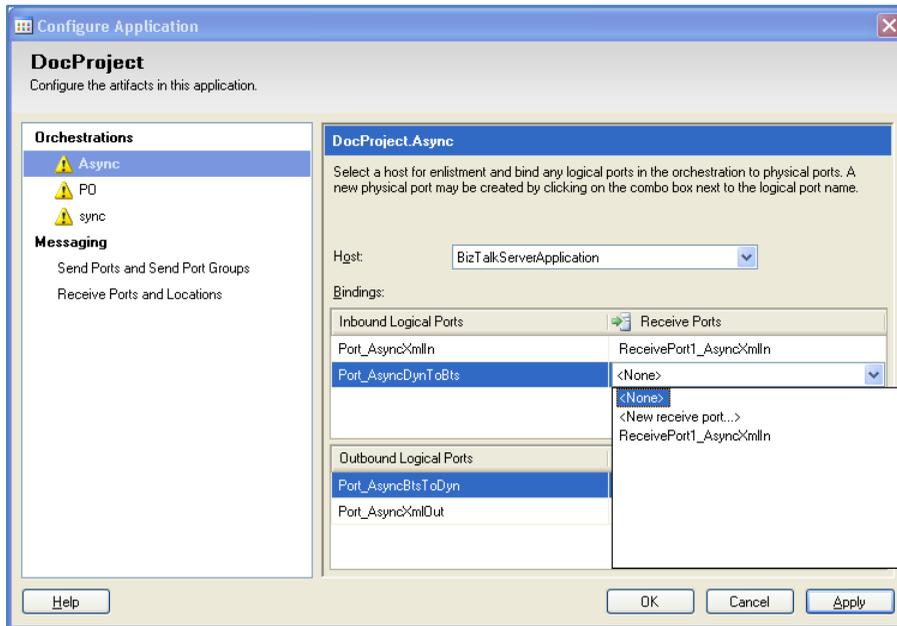


6. Click **OK**.

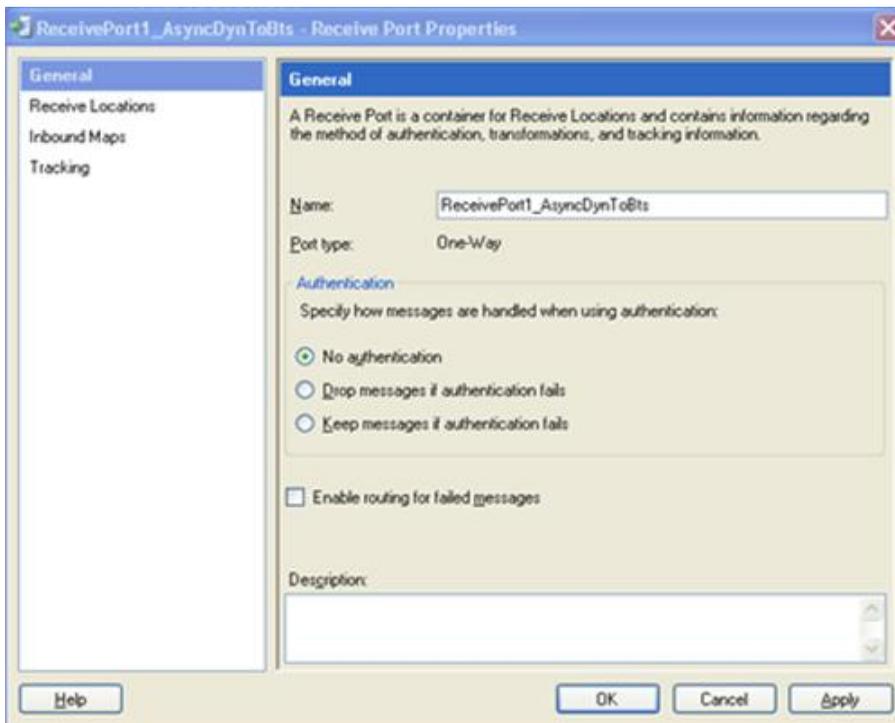


## Configure receive port Port\_AsyncDynToBts

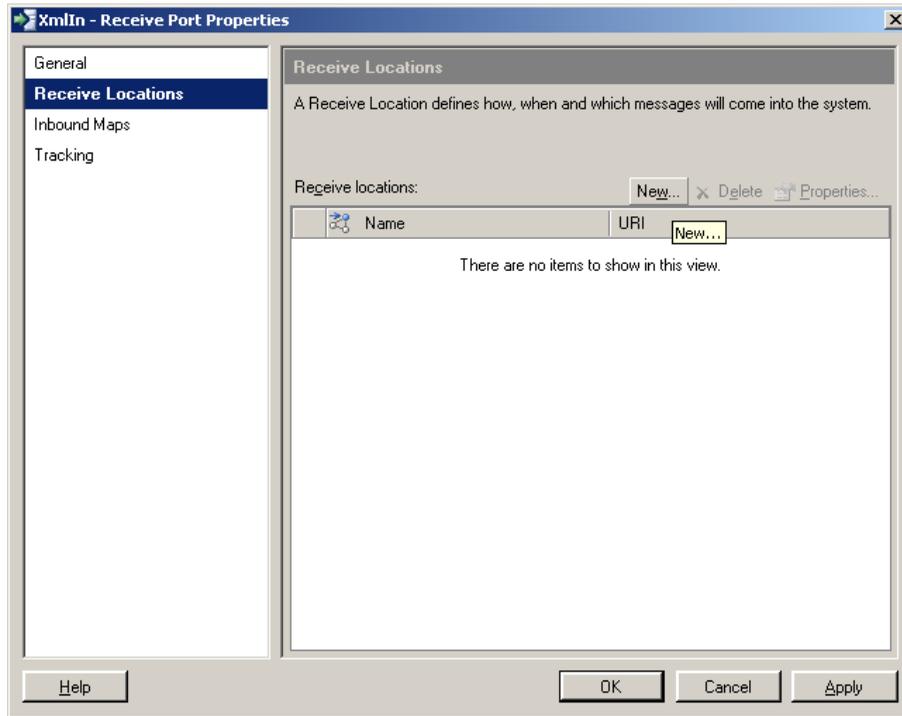
1. In the **Configure Application** window, click **<None>** in the receive ports field for **Port\_AsyncDynToBts** and select **New Receive Port**.



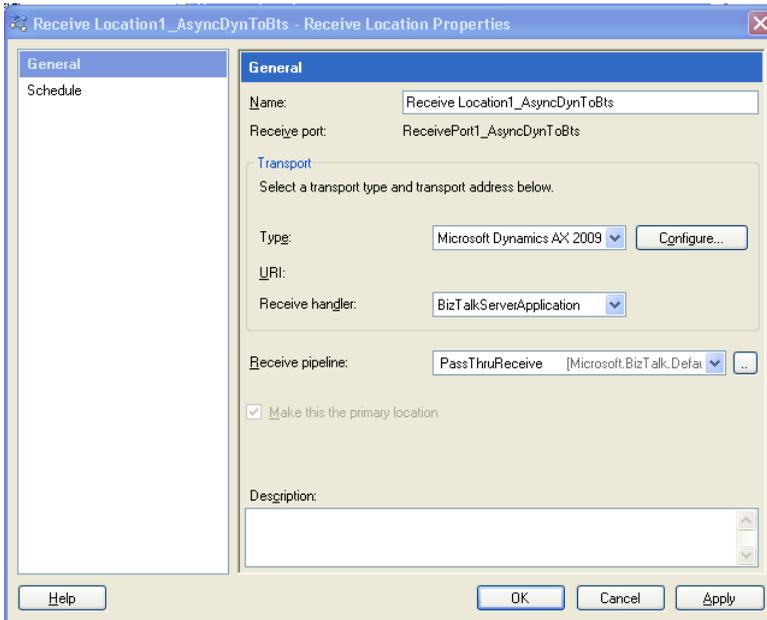
2. In the **Receive Port Properties** window, set **Name** to ReceivePort1\_AsyncDyntoBts. Click **Receive Locations**.



3. In the **Receive Locations** window, click **New**.

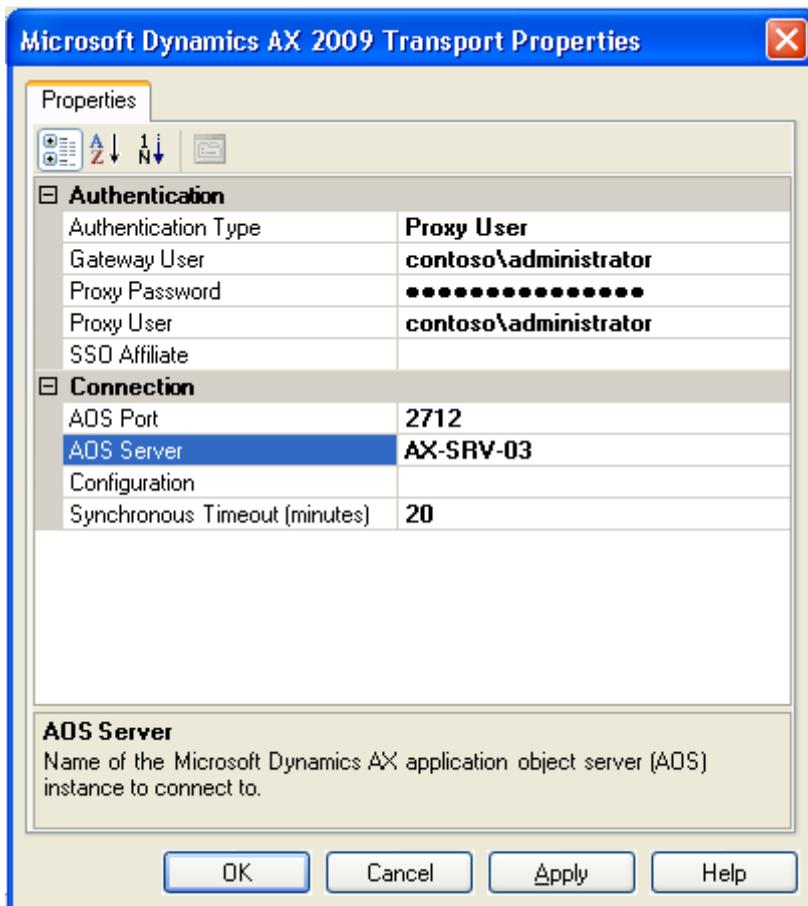


4. In the **Receive Location Properties** window, set the properties as follows.
  - Set **Name** = ReceiveLocation1\_AsyncDynToBts.
  - Set **Type** = Microsoft Dynamics AX 2009 (from the list) and then click **Configure**.

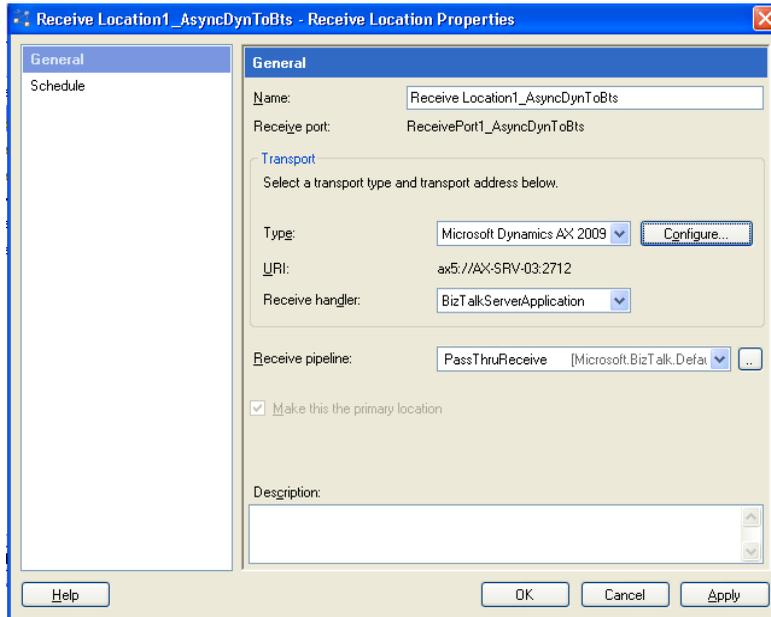


5. In the **Microsoft Dynamics AX 2009 Transport Properties** window, set the property values as follows:

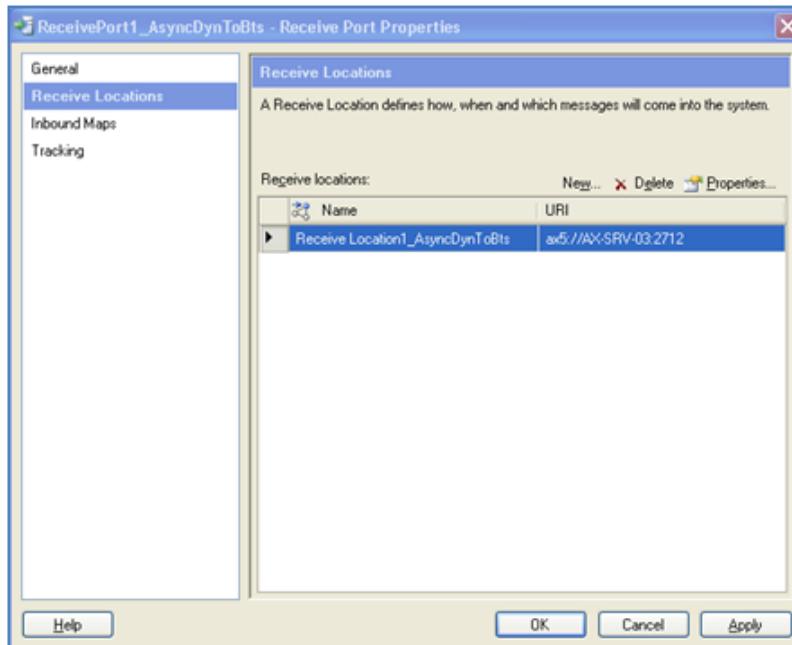
- Set **Authentication Type** = Select Proxy User from the list.
- Set **Gateway User** = contoso\administrator.
- Set **Proxy User** = contoso\administrator.
- Set **Proxy User Password** = Password of the proxy user (pass@word1).
- Set **AOS Port** = 2712.
- Set **AOS Server** = AX-SRV-03.
- Click **Apply** and then click **OK**.



6. In the **Receive Location Properties** window, click **Apply** and then click **OK**.

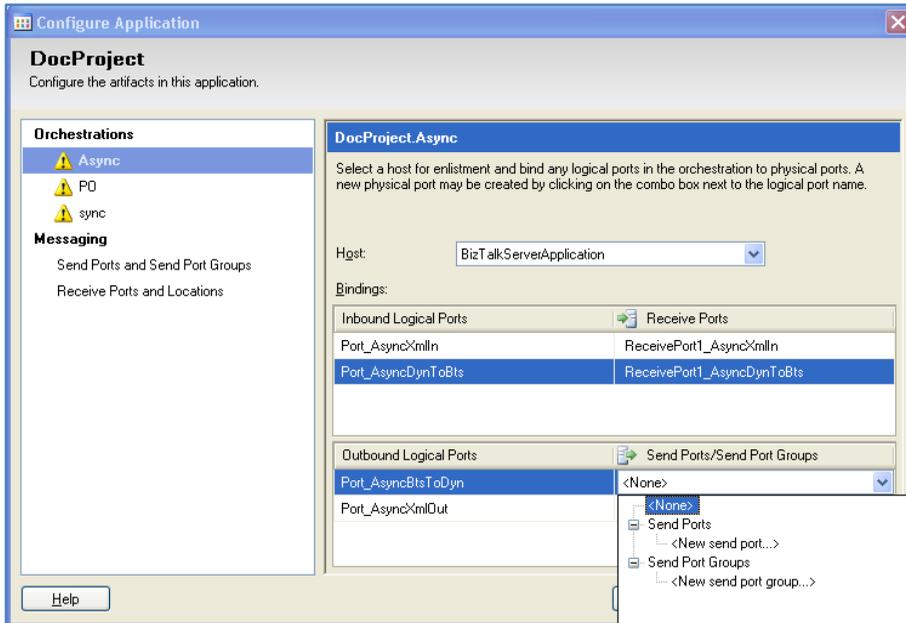


7. Click **OK**.

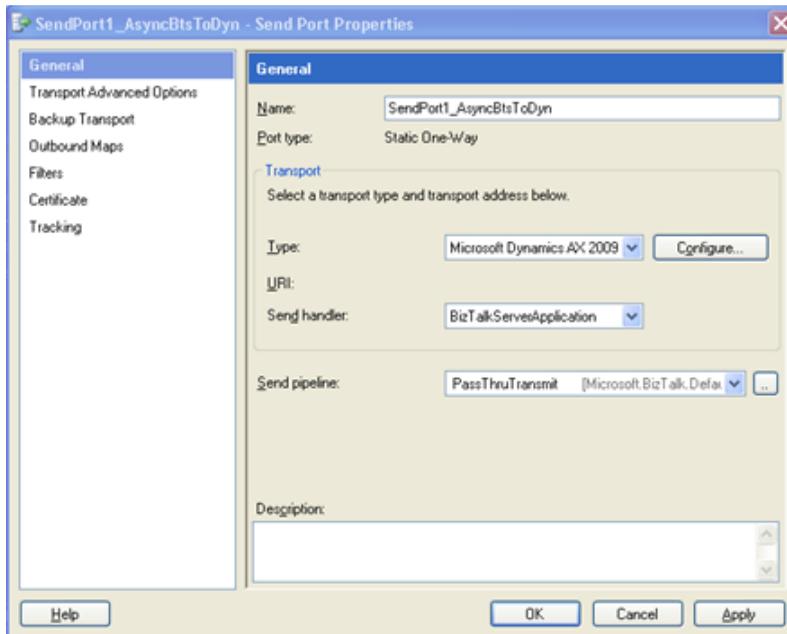


## Configure send port Port\_AsyncBtsToDyn

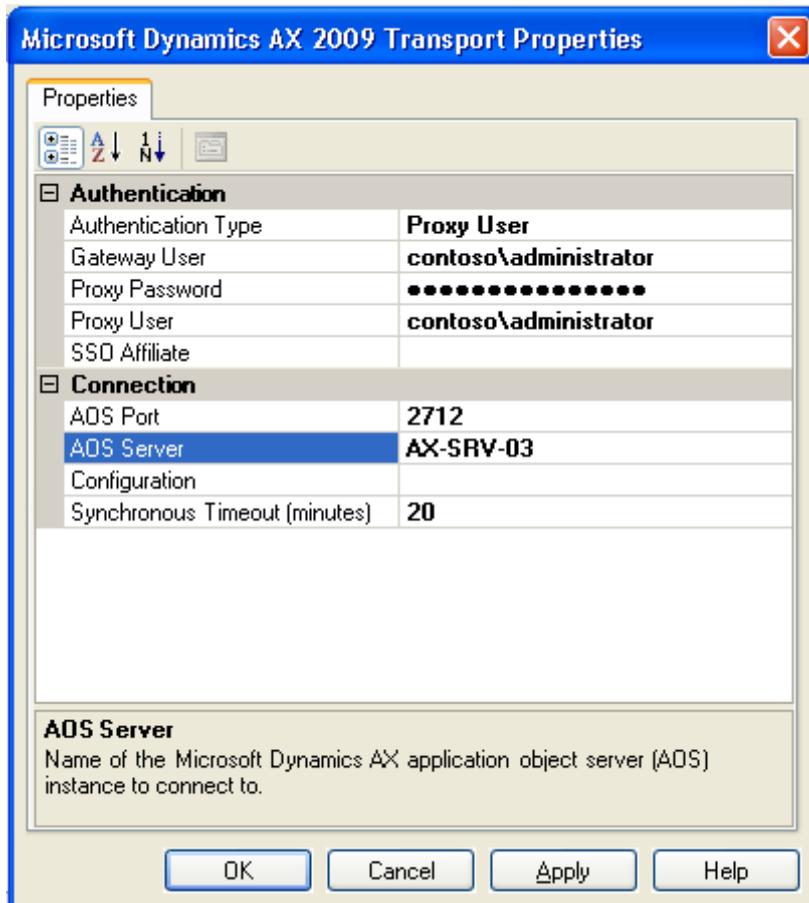
1. In the **Configure Application** window, click **<None>** in **Port\_AsyncBtsToDyn** field as shown in the following screen shot. Then select **< New Send Port...>** from the list.



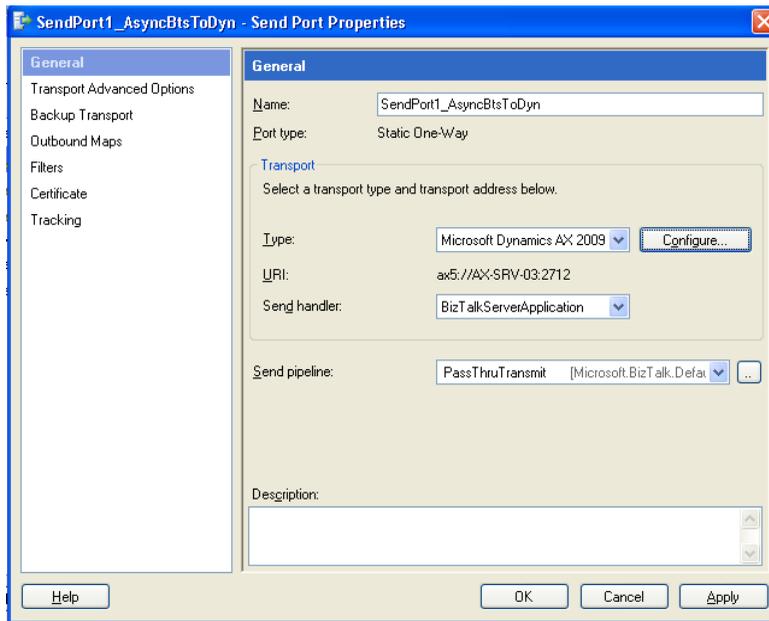
2. In the **Send Port Properties** window, set property values as follows:
  - Set **Name** = SendPort1\_AsyncBtsToDyn.
  - Set **Type** = Microsoft Dynamics AX 2009 (from the list).
  - Click **Configure**.



3. In the **Microsoft Dynamics AX 2009 Transport Properties** window, set the following property values:
  - Set **Authentication Type** = Select **Proxy User** from the list.
  - Set **Gateway User** = contoso\administrator.
  - Set **Proxy User** = contoso\administrator.
  - Set **Proxy User Password** = Password of the proxy user (pass@word1).
  - Set **AOS Port** = 2712.
  - Set **AOS Server** = AX-SRV-03.
  - Click **Apply** and then click **OK**.

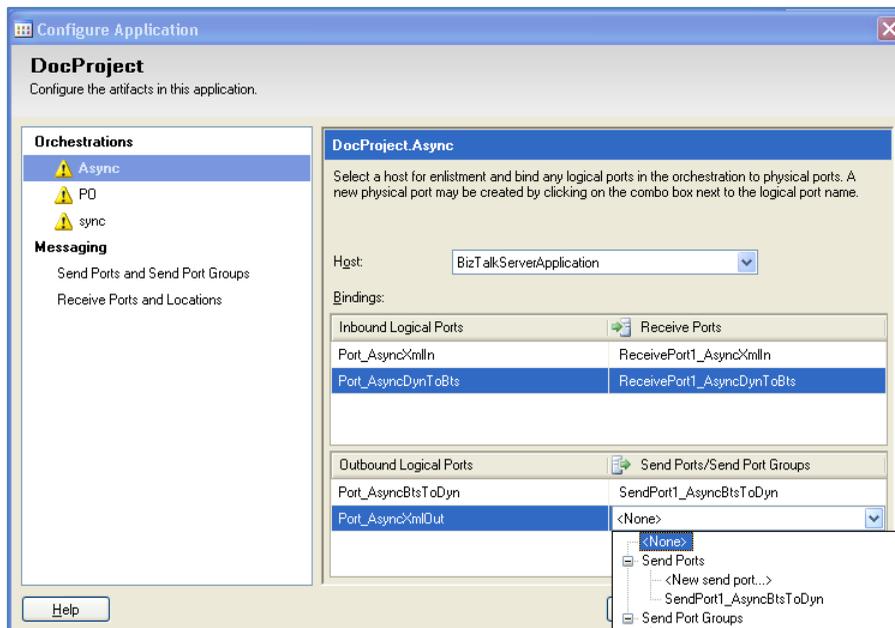


4. In the **Send Port Properties** window, click **Apply** and then click **OK**.

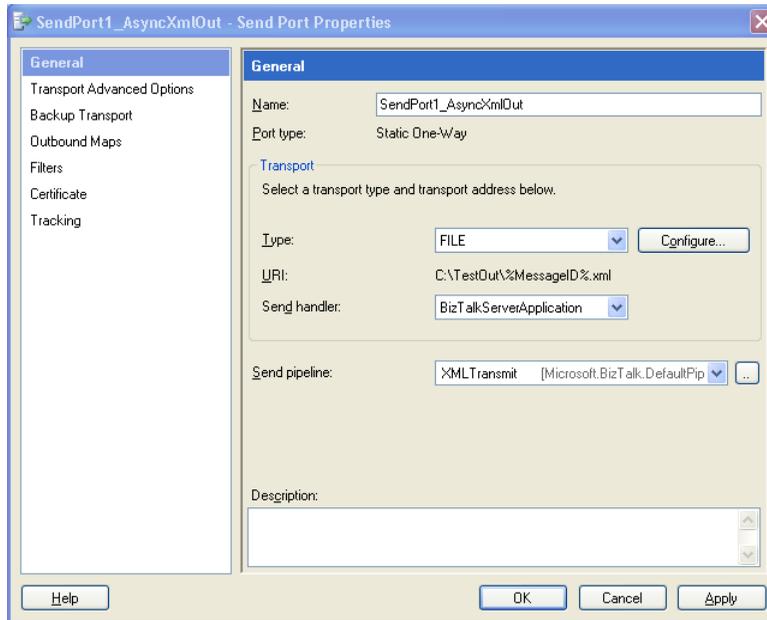


### Configure send port Port\_AsyncXmlOut.

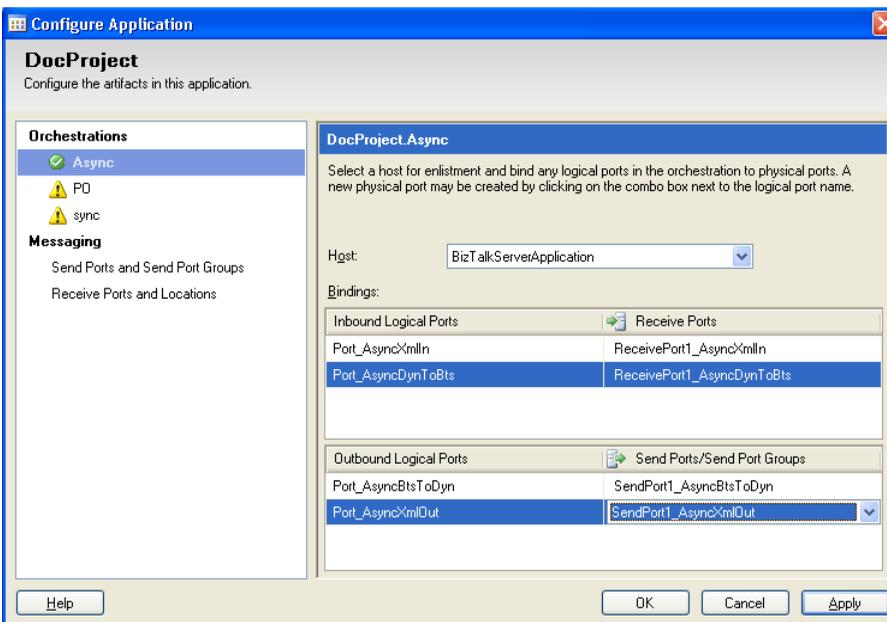
1. In the **Configure Application** window, click **<None>** in the **Port\_AsyncXmlOut** field as shown in the following screen shot. Select **<New Send Port... >** from the list.



2. In the **Send Port Properties** window, set property values as follows:
  - Set **Name** = SendPort1\_AsyncXmlOut.
  - To set **Type**, select **File** from the list and then click **Configure**. Create and select a folder called C:\TestOut.
  - To set **Send Pipeline**, select XMLTransmit (from the list).
3. Click **Apply** and then click **OK**.

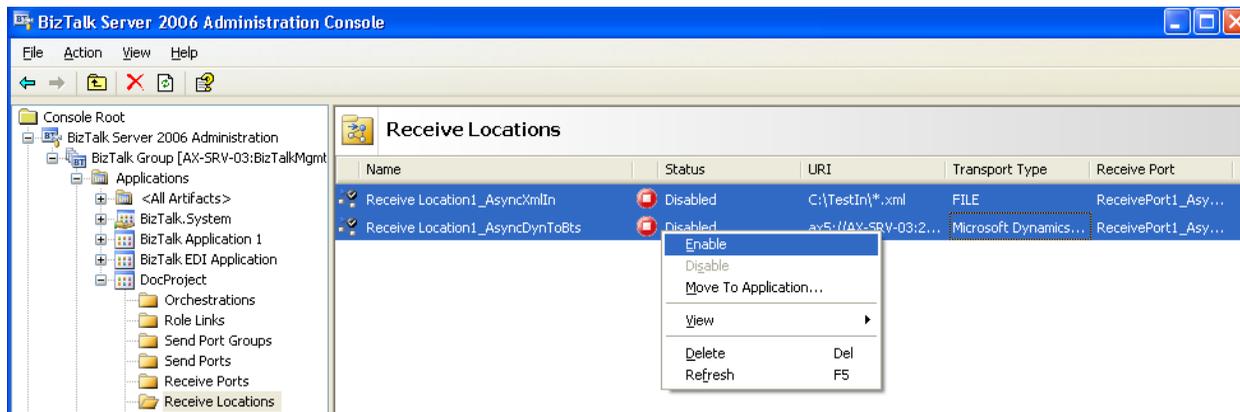


4. Make sure your screen looks like the following screen shot. Click **Apply**, then click **OK**.



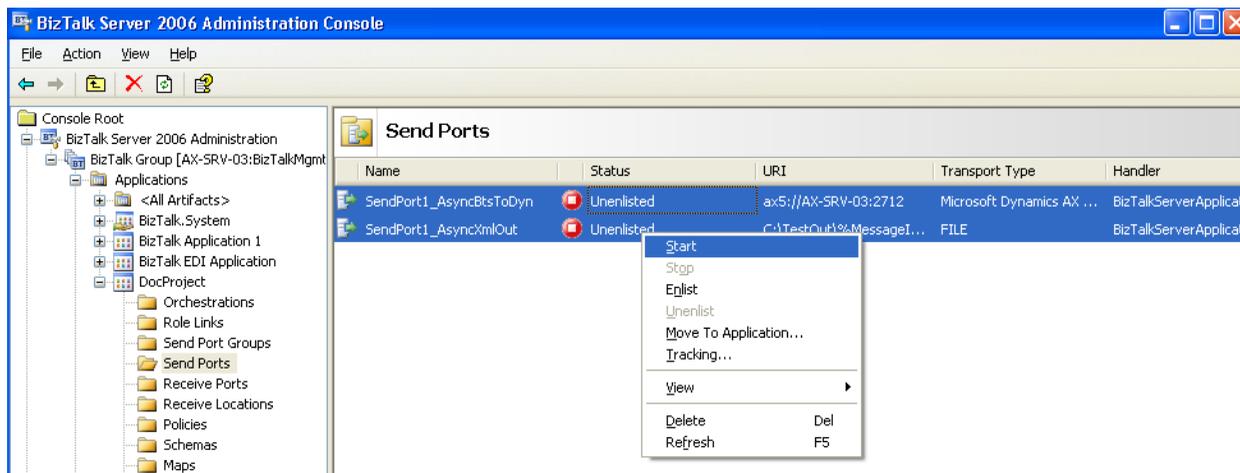
### Enable the receive locations for asynchronous orchestration.

Click the **Receive Locations** node in the **BizTalk Server 2006 Administration Console**. Select both the locations, right-click and select **Enable**.



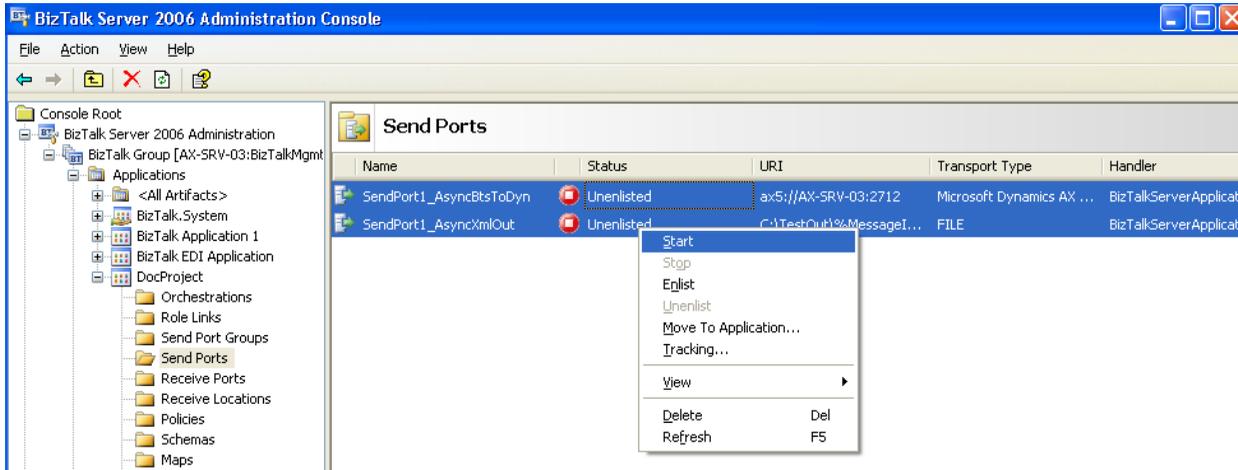
### Start the send ports for asynchronous orchestration.

Click the **Send Ports** node. Select both the send Ports. Right-click. Select **Start**.



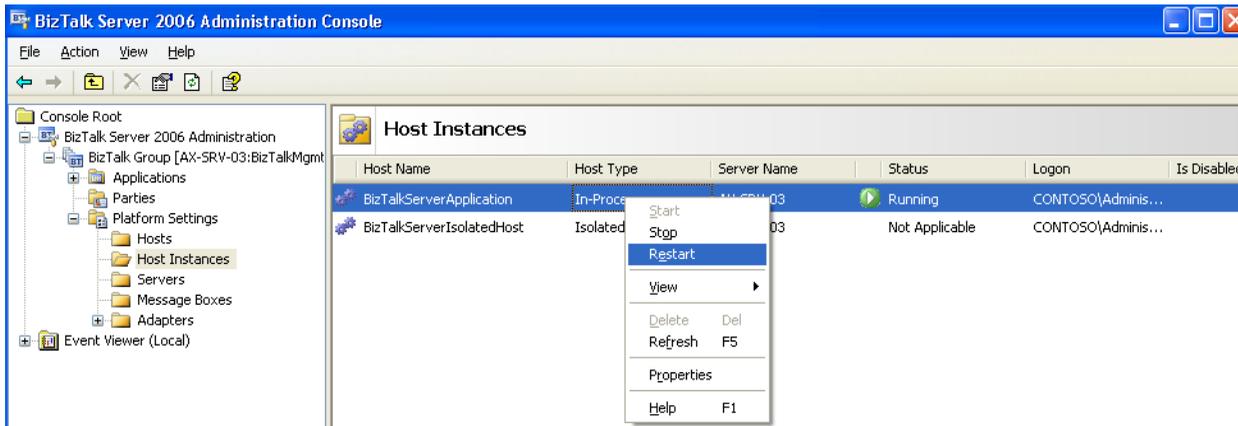
## Start the asynchronous orchestration.

Select the **Orchestrations** node. Right-click **DocProject.Async** and then select **Start**.



## Restart the host instances.

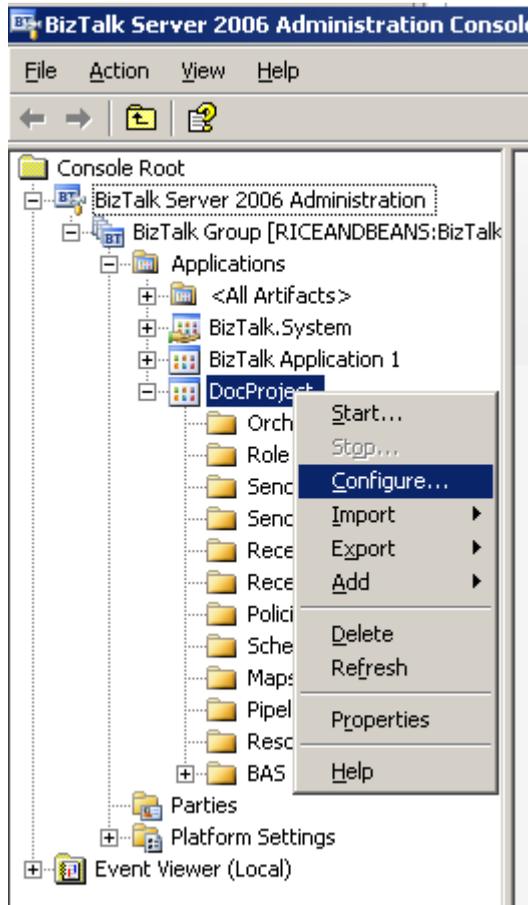
Select **Platform Settings > Host Instances**. Right-click **BiztalkServerApplication** and select **Restart**.



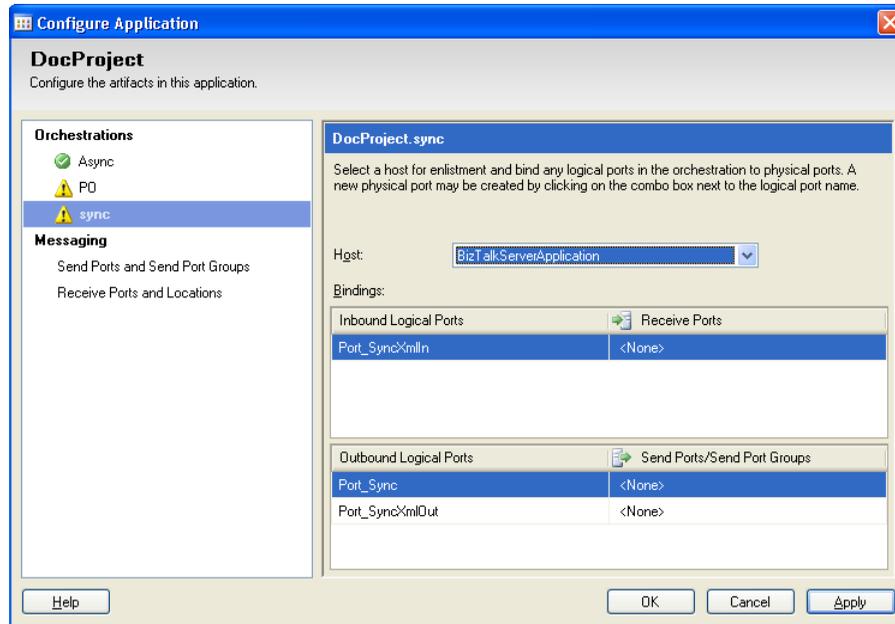
## Configure synchronous orchestration (Sync.odx)

This section provides step-by-step instructions to configure the orchestration that creates a sales order in the synchronous mode. You can configure all your orchestrations together instead of configuring one orchestration at a time. However, this document configures each orchestration separately for ease of learning. To begin:

1. Launch the **BizTalk Server 2006 Administration Console**. If the administrative console is already launched, you need to right-click the BizTalk group and click **Refresh**.
2. Navigate to **DocProject** by expanding parent nodes as shown in the following screen shot. Right-click **DocProject** and select **Configure**.

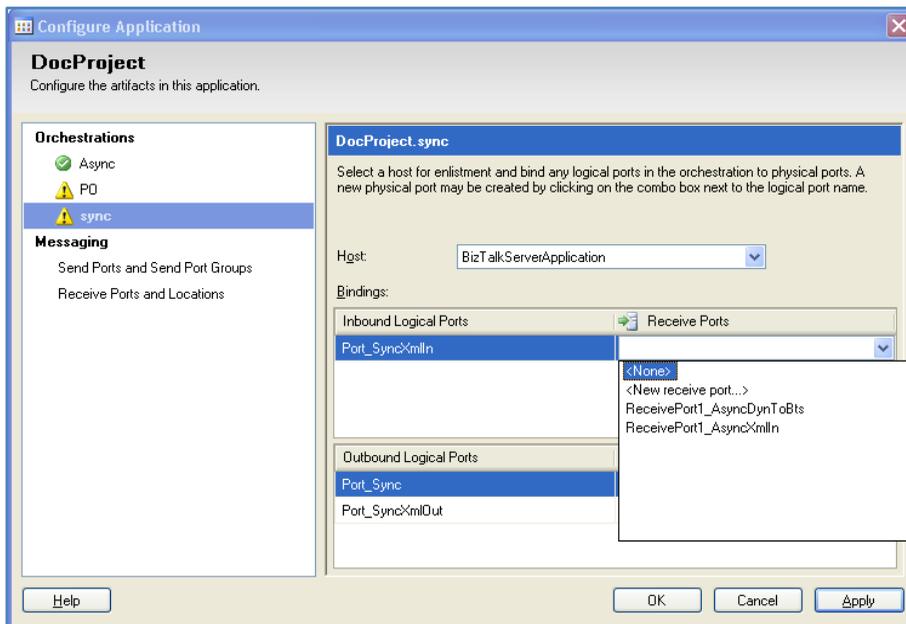


3. Set property values as follows:
  - Select **Sync** from orchestrations list.
  - Set **Host** to **BizTalk Server Application**.

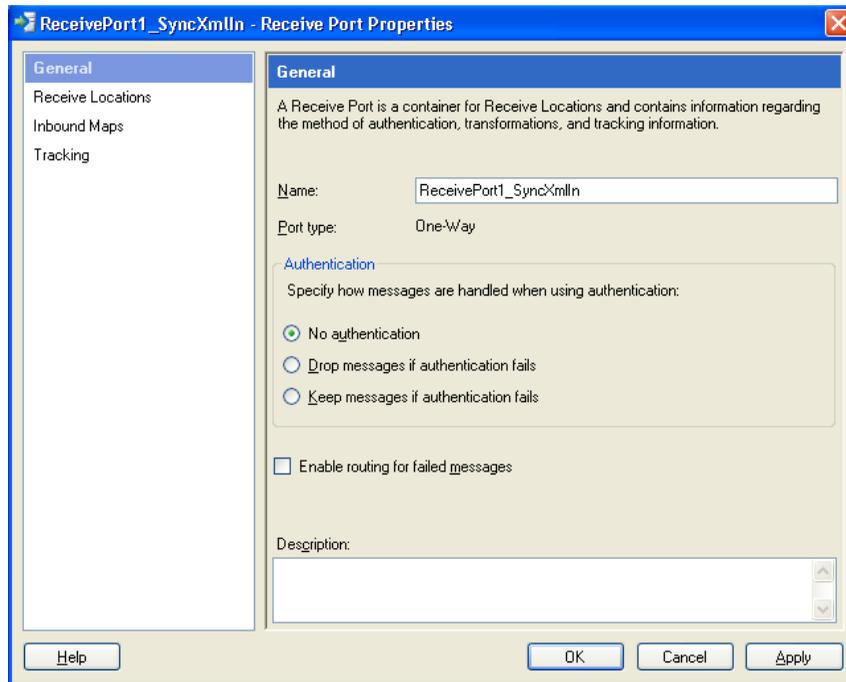


### Configure receive port Port\_SyncXmlIn.

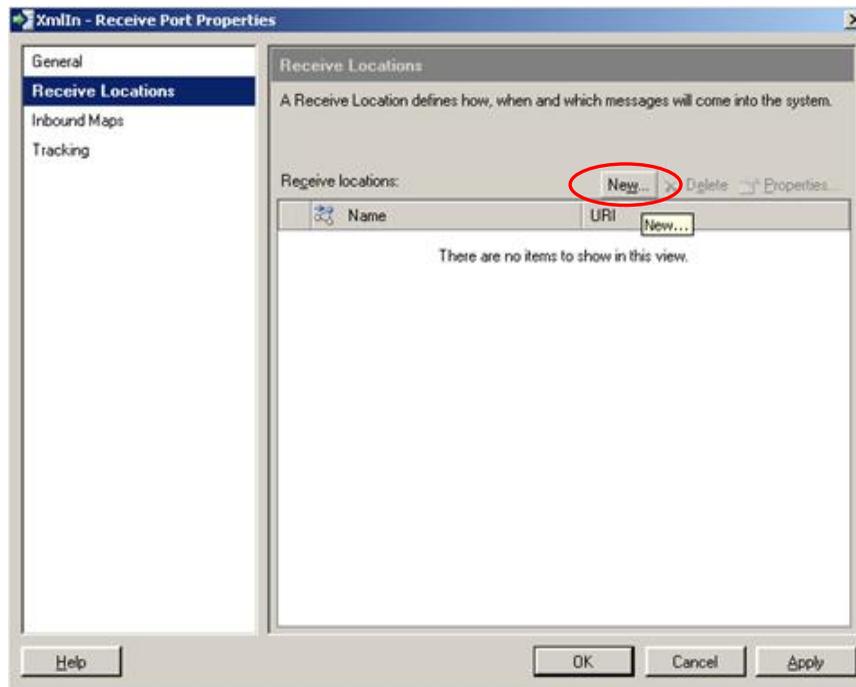
1. Click **<None>** in the **Port\_SyncXmlIn** field as shown in the following screen shot. Select **<New Receive Port...>** from the list.



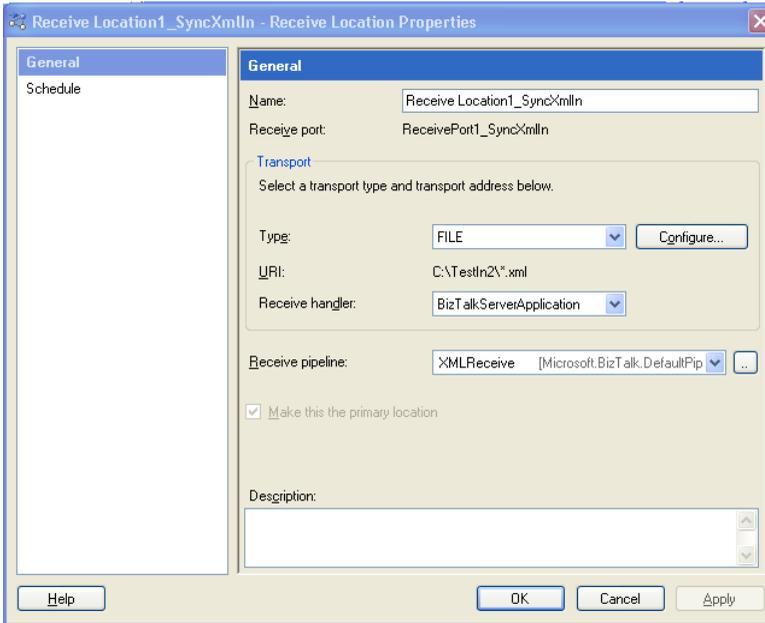
2. In the **Receive Port Properties** window, set the **Name** field to ReceivePort1\_SyncXmlIn and then click **Receive Locations**.



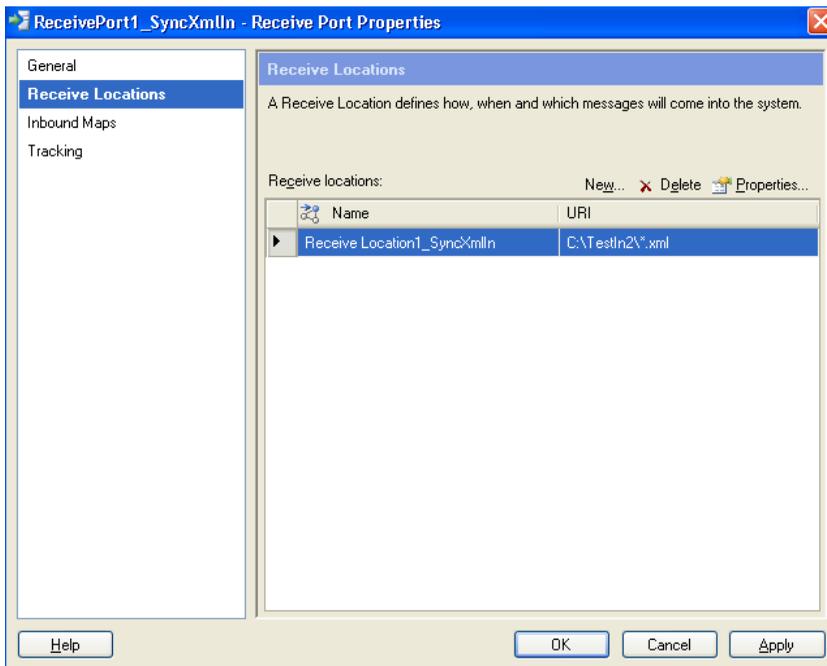
3. In the **Receive Locations** window, click **New**.



- In the **Receive Location Properties** window, set property values as follows:
  - Set **Name** = ReceiveLocation1\_SyncXmlIn.
  - Set **Type** = File. Click **Configure**. Create and select a new folder called C:\TestIn2.
  - Set **Receive Pipeline** = XMLReceive (from the list).
- Click **Apply** and then click **OK**.

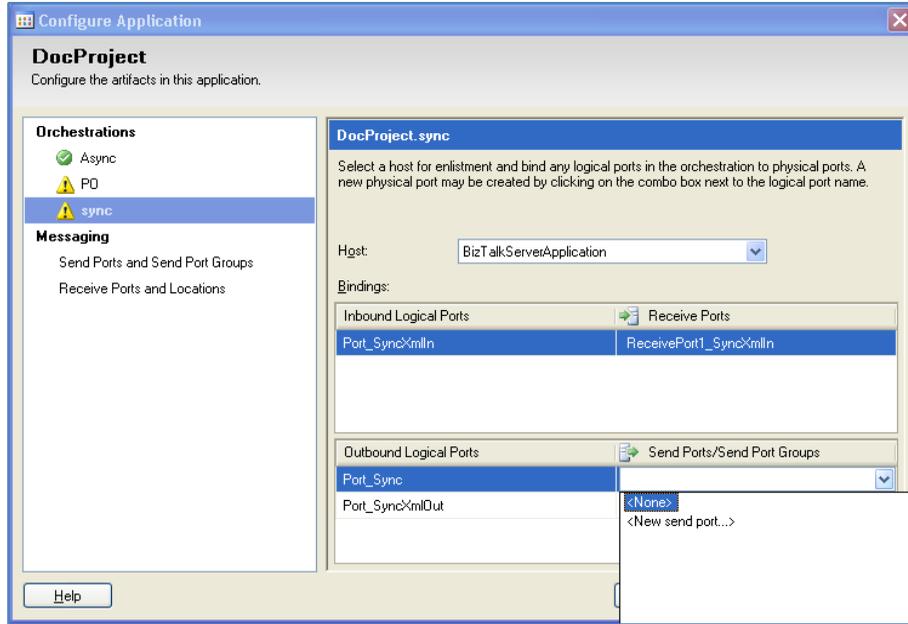


- Click **OK** to return to **Configure Application** window.

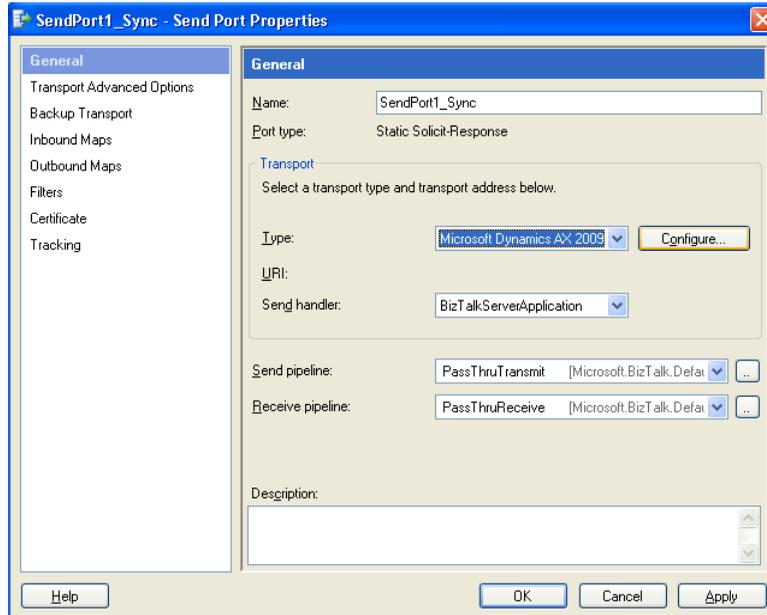


## Configure send port Port\_Sync

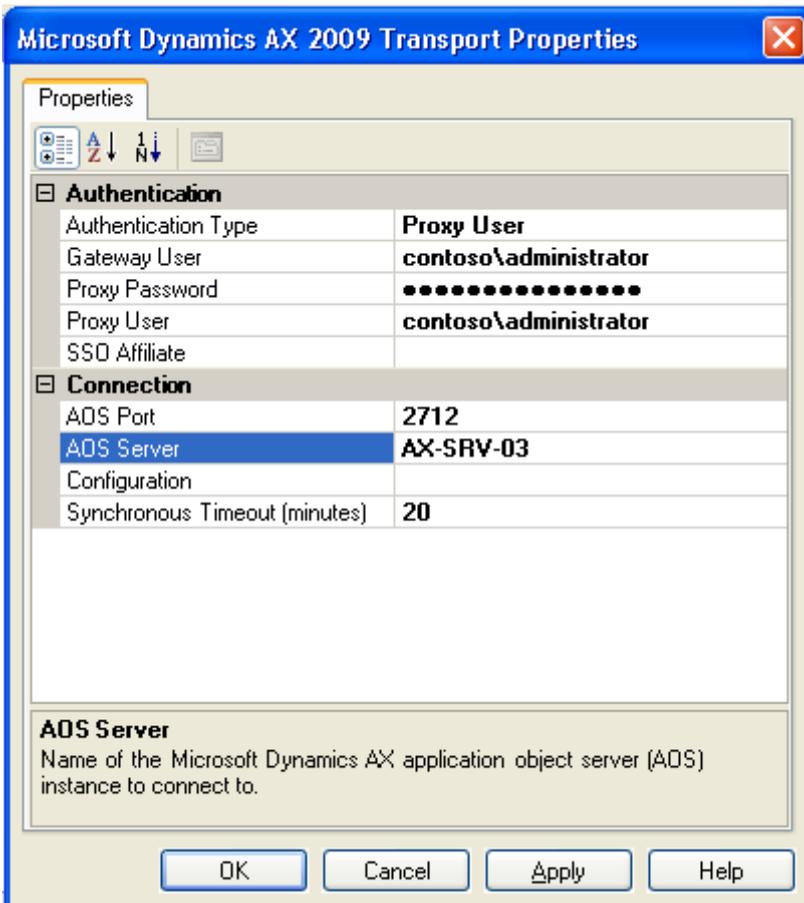
1. Click **<None>** in the **Port\_Sync** field as shown in the following screen shot. Select **<New Send Port...>** from the list.



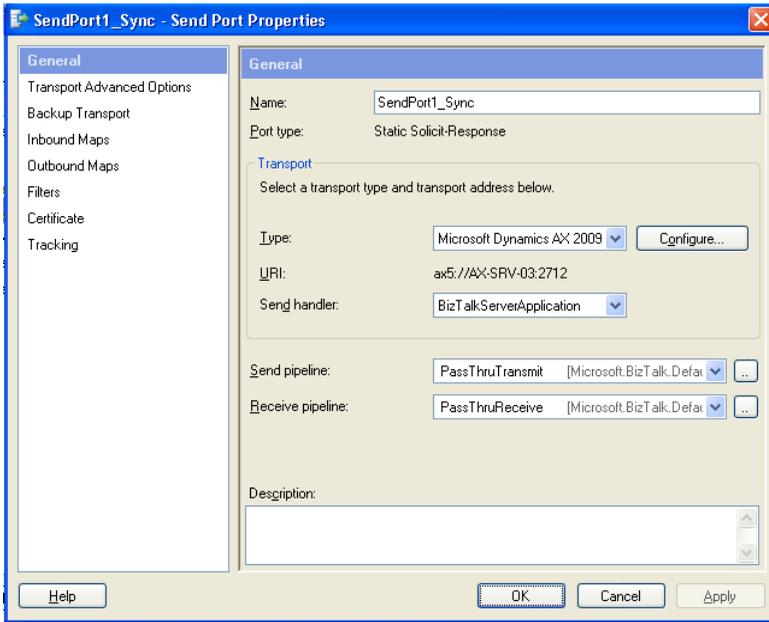
2. In the Send **Port Properties** window, set the property values as follows:
  - Set **Name** = SendPort1\_Sync
  - Set **Type** = Microsoft Dynamics 2009. Click **Configure**.



3. In the **Microsoft Dynamics AX 2009 Transport Properties** window, set the following property values:
  - Set **Authentication Type** = Select **Proxy User** from the list.
  - Set **Gateway User** = contoso\administrator.
  - Set **Proxy User** = contoso\administrator.
  - Set **Proxy User Password** = Password of the proxy user (pass@word1).
  - Set **AOS Port** = 2712.
  - Set **AOS Server** = AX-SRV-03.
4. Click **Apply** and then click **OK**.

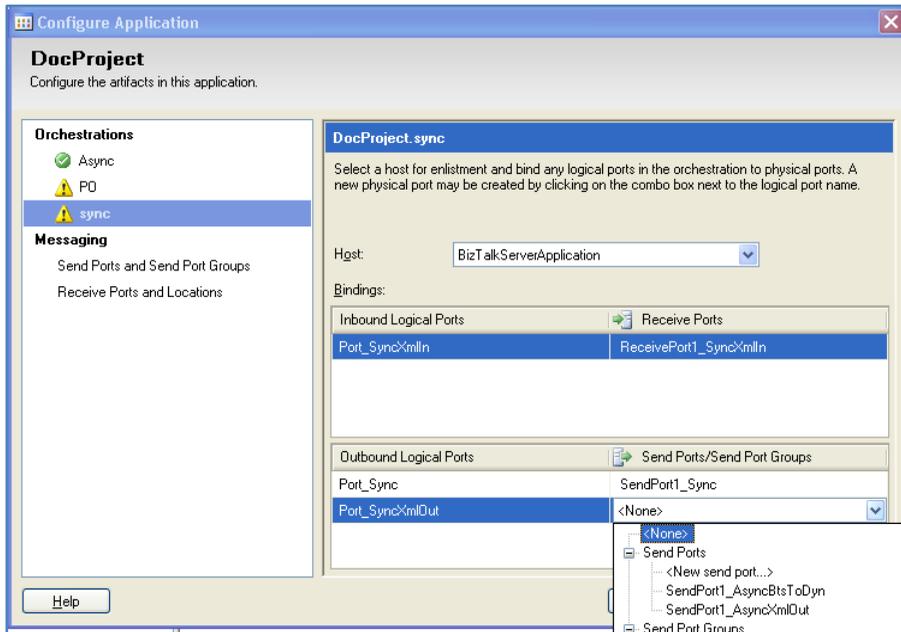


5. In the **Send Port Properties** window, click **Apply** and then click **OK**.



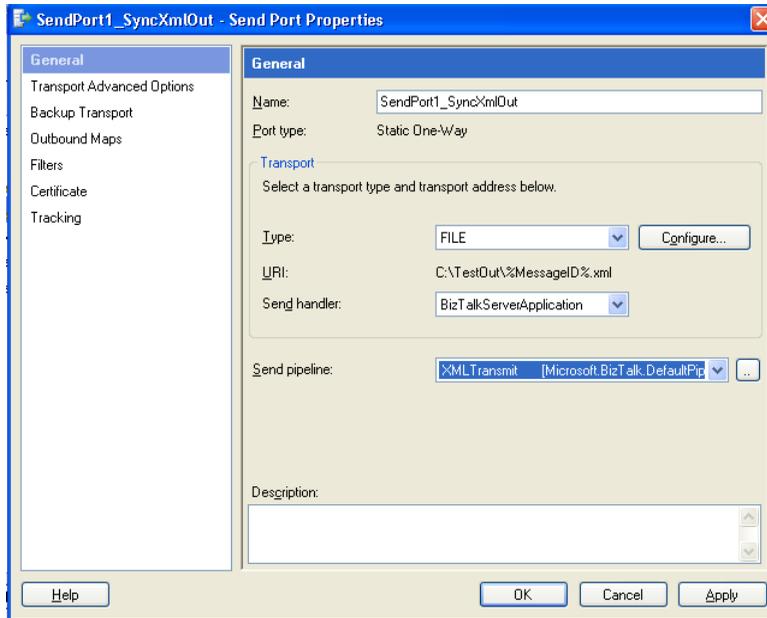
### Configure send port Port\_SyncXmlOut

1. Click **<None>** in the **Port\_SyncXmlOut** field as shown in the following screen shot. Select **<New Send Port...>** from the list.

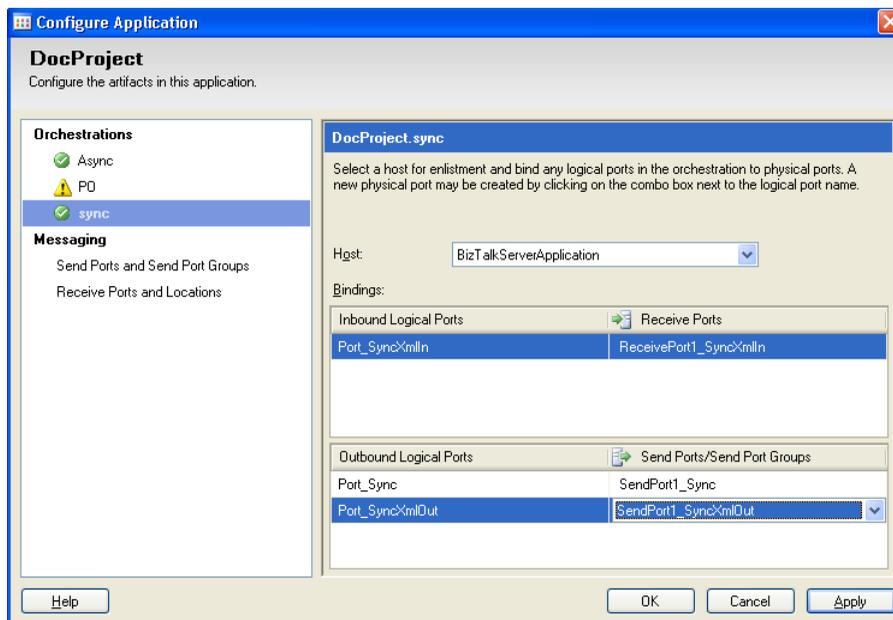


2. In the **Send Port Properties** window, set property values as follows:

- Set **Name** = SendPort1\_SyncXmlOut.
- To set **Type**, select File from the list. Click **Configure** to select folder C:\TestOut. This folder was created during the configuration of the asynchronous orchestration. You will not need to create the folder.
- Set **Send Pipeline** = XMLTransmit (from the list).
- Click **Apply** and then click **OK**.

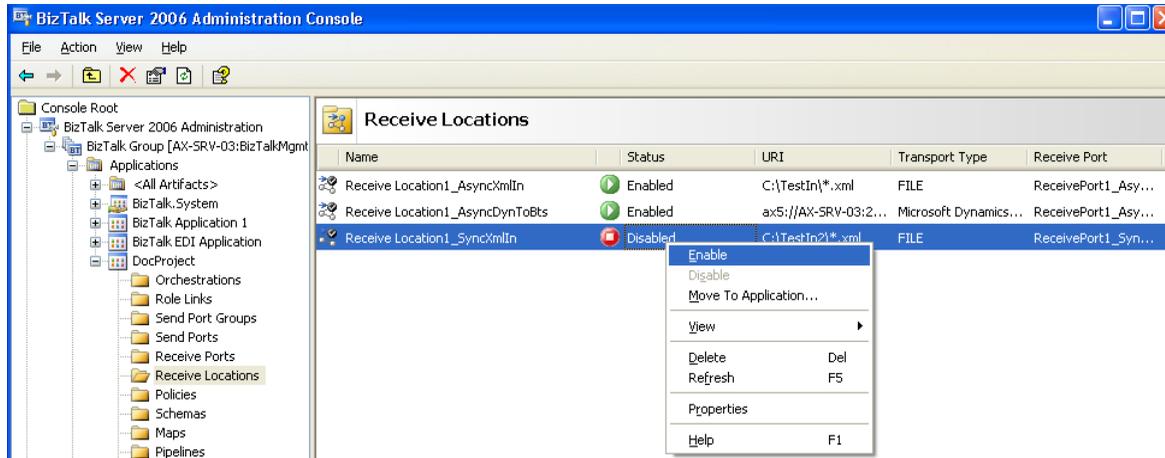


3. Make sure the **Configure Application** window looks like the following screen shot. Click **Apply** and then click **OK**.



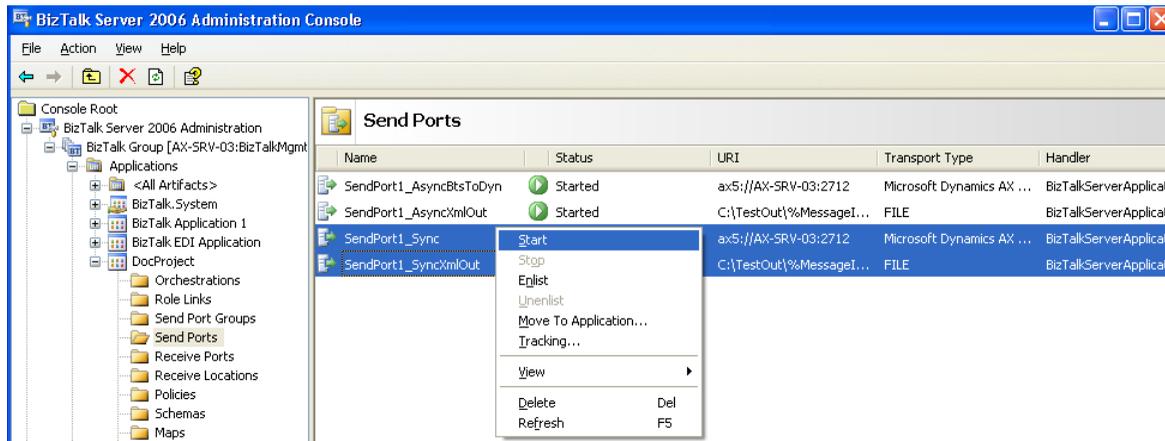
## Enable receive locations for synchronous orchestration.

Click the **Receive Locations** node in the **BizTalk Server 2006 Administration Console**. Right-click **Receive Location1\_SyncXmlIn** and then select **Enable**.



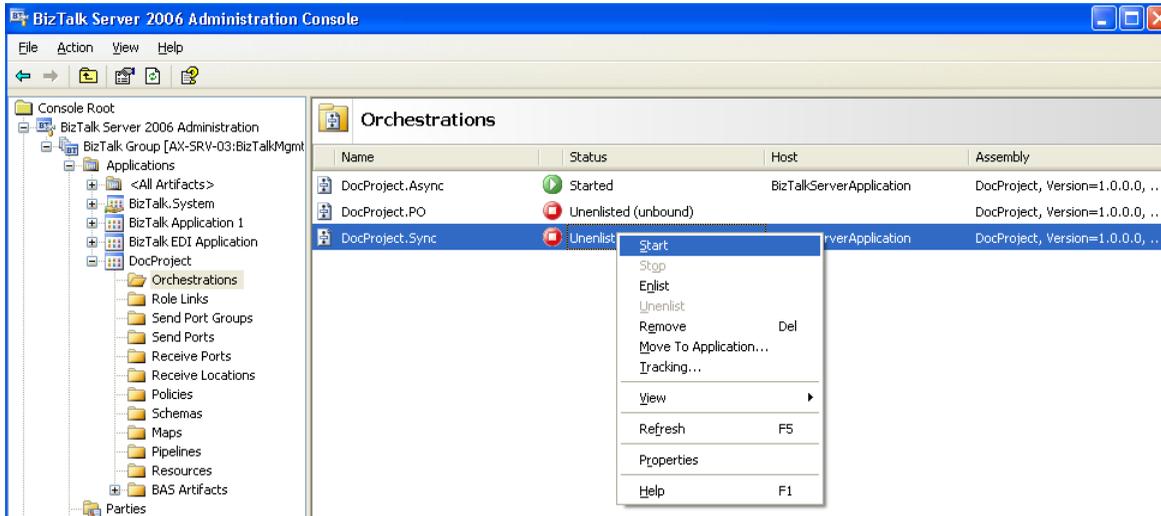
## Start send ports for synchronous orchestration.

Click the **Send Ports** node. Select **SendPort1\_sync** and **SendPort1\_SyncXmlOut**. Right-click and select **Start**.



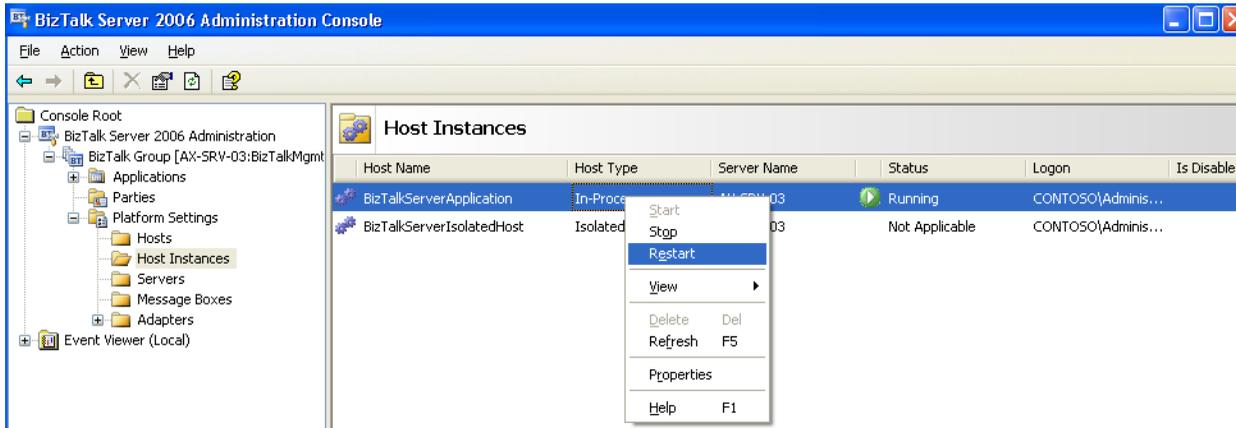
## Start the synchronous orchestration.

Click the **Orchestrations** node. Select **DocProject.Sync**. Right-click and select **Start**.



## Restart the host instances.

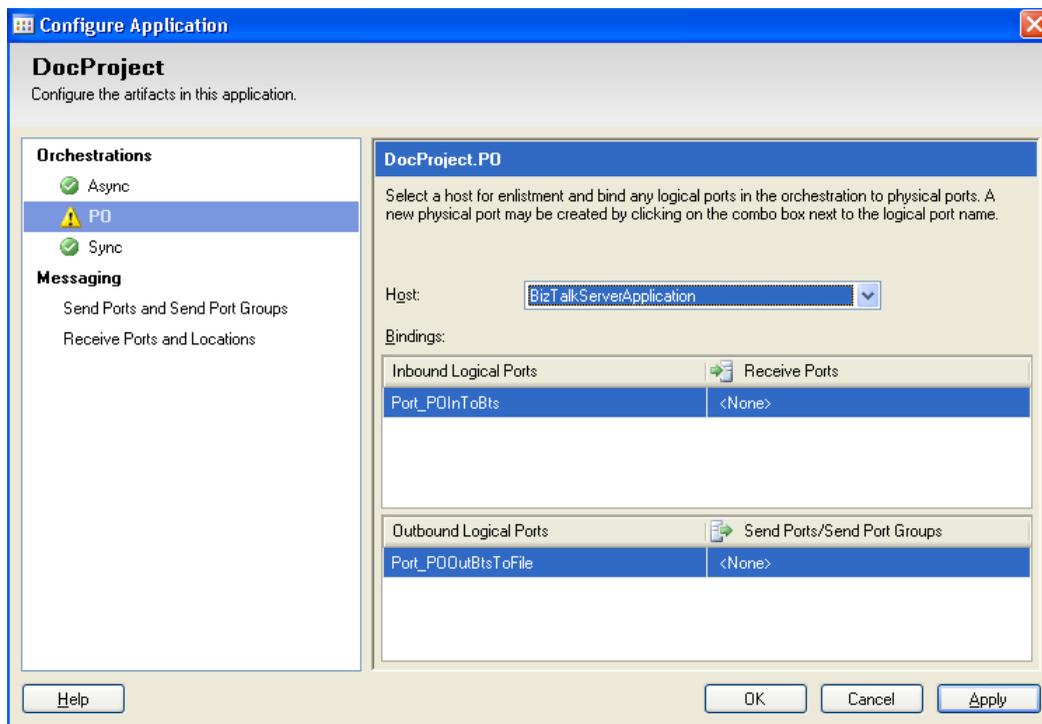
Select **Platform Settings > Host Instances**. Right-click **BiztalkServerApplication** and select **Restart**.



## Configure asynchronous orchestration for purchase order (PO.odx)

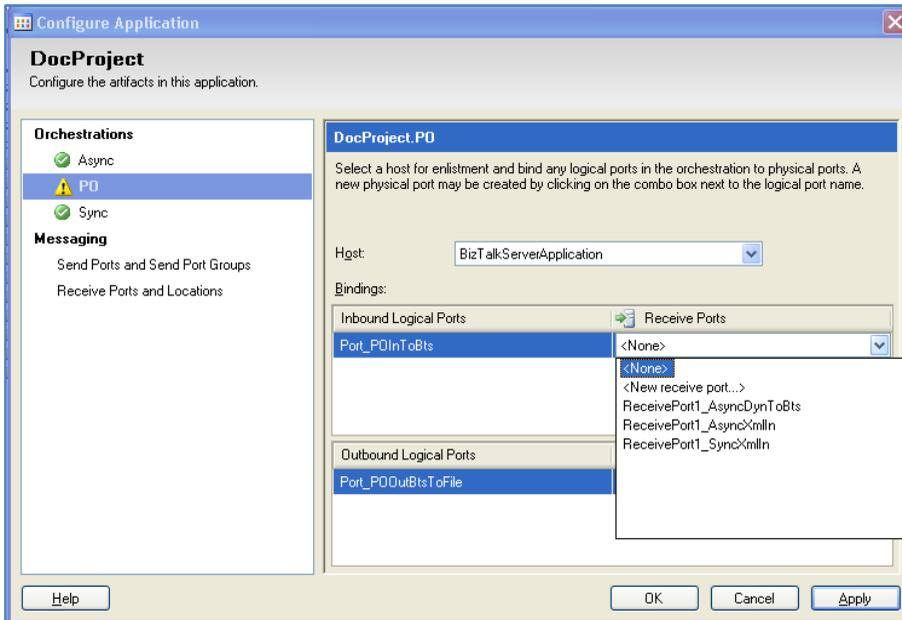
This section provides step-by-step instructions to configure the orchestration that sends the purchase order from AIF to BizTalk Server in asynchronous mode. Note that it is technically possible for you to configure all your orchestration at the same time. This document provides steps to configure each orchestration separately for ease of use and learning. To begin:

1. Launch BizTalk Server 2006 Administration Console.
2. Navigate to Console Root > BizTalk Server 2006 Administration > BizTalk Group > Applications > DocProject. Right-click DocProject and select Configure.
3. Set property values as follows:
  - Select **PO** from orchestrations list.
  - Set **Host** to **BizTalk Server Application**.



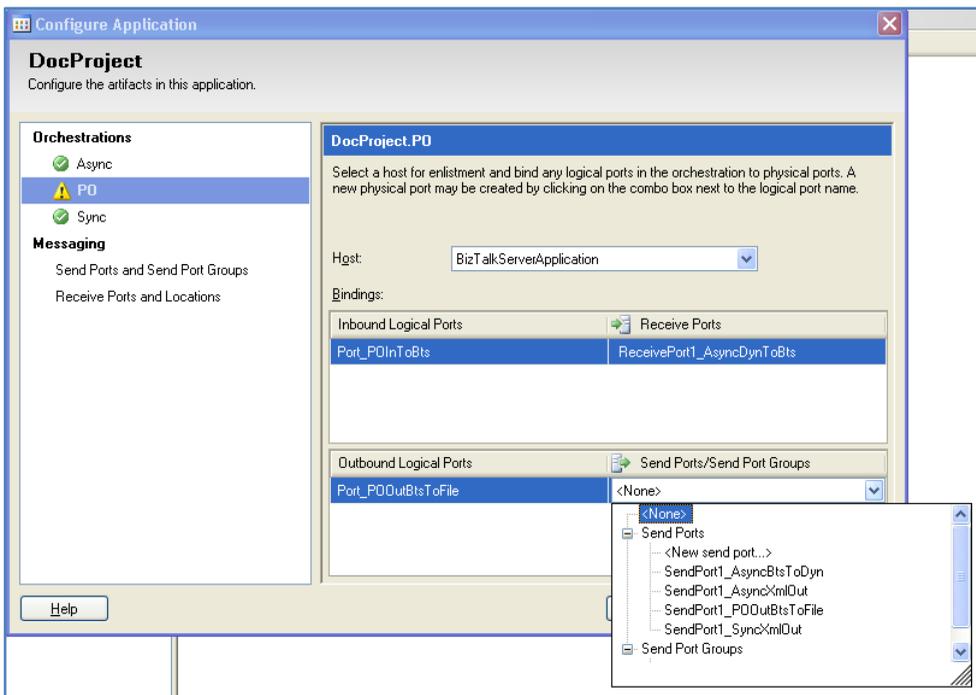
### Configure receive port Port\_POInToBts.

Click **<None>** in the **Port\_POInToBts** field as shown in the following screen shot. Select **ReceivePort1\_AsyncDynToBts** from the list.



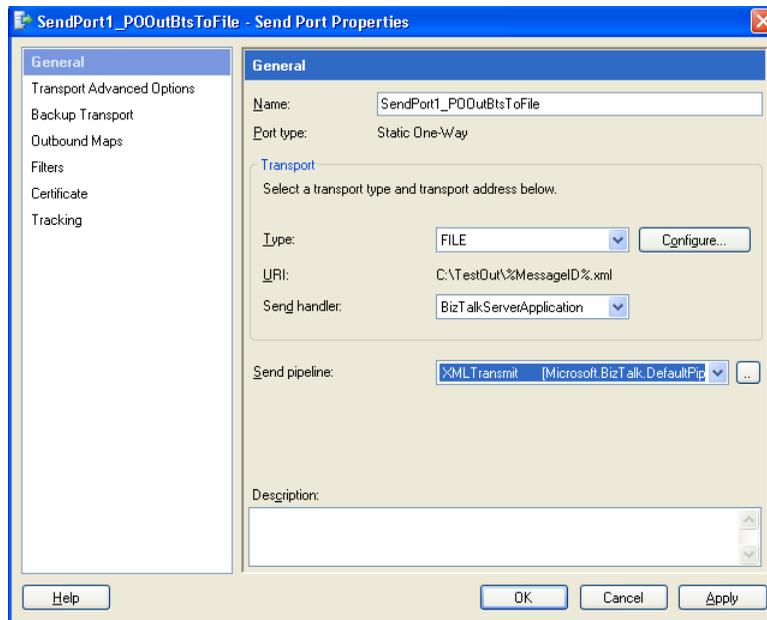
### Configure send port Port\_POOutBtsToFile.

1. Click **<None>** in the **Port\_POOutBtsToFile** field as shown in the following screen shot.. Select **<New Send Port...>** from the list.

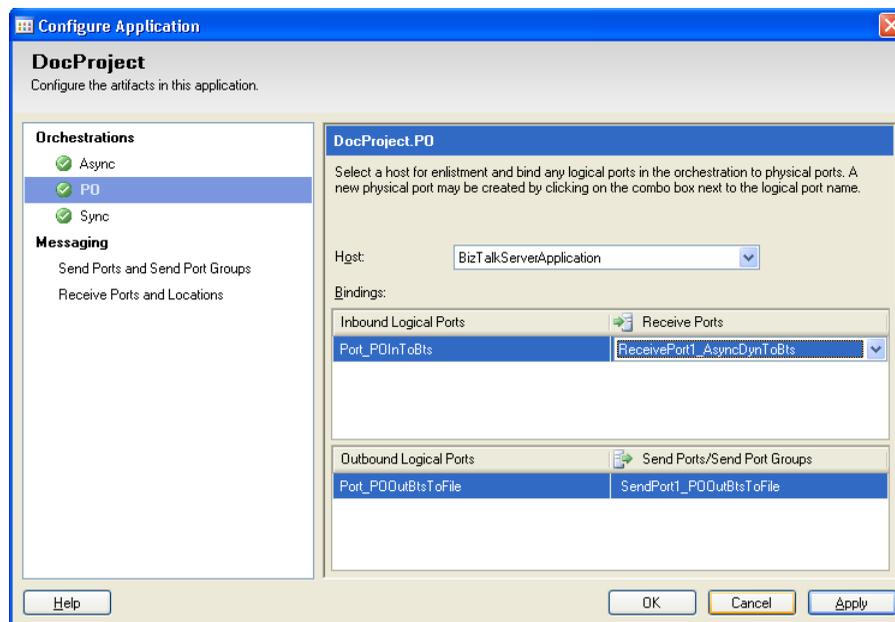


2. In the **Send Port Properties** window, set property values as follows:

- Set **Name** = SendPort1\_POOutBtsToFile.
- To set **Type**, select File from the list. Click **Configure** to select folder C:\TestOut. We created this folder when we set up the asynchronous configuration. You will not need to create the folder.
- Set **Send Pipeline** = XMLTransmit (from the list).
- Click **Apply** and then click **OK**.

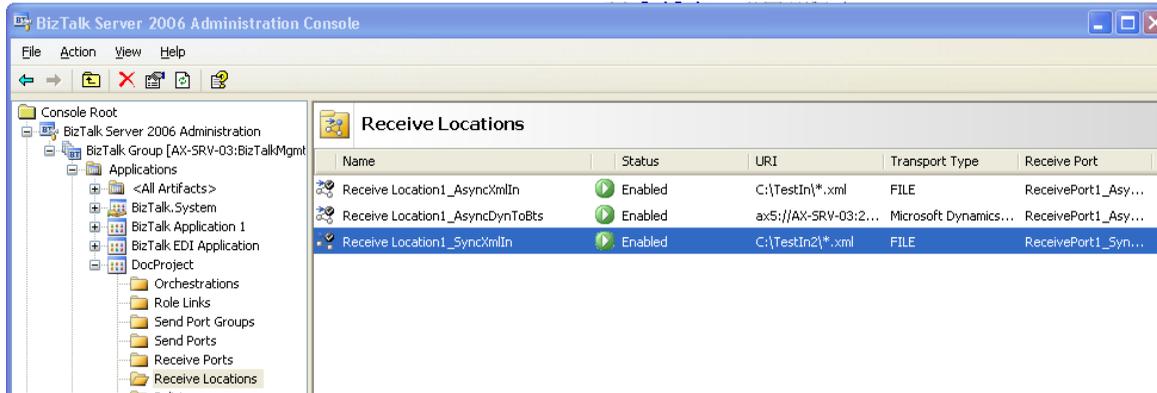


3. Make sure the **Configure Application** window looks like the following diagram. Click **Apply** and then click **OK**.



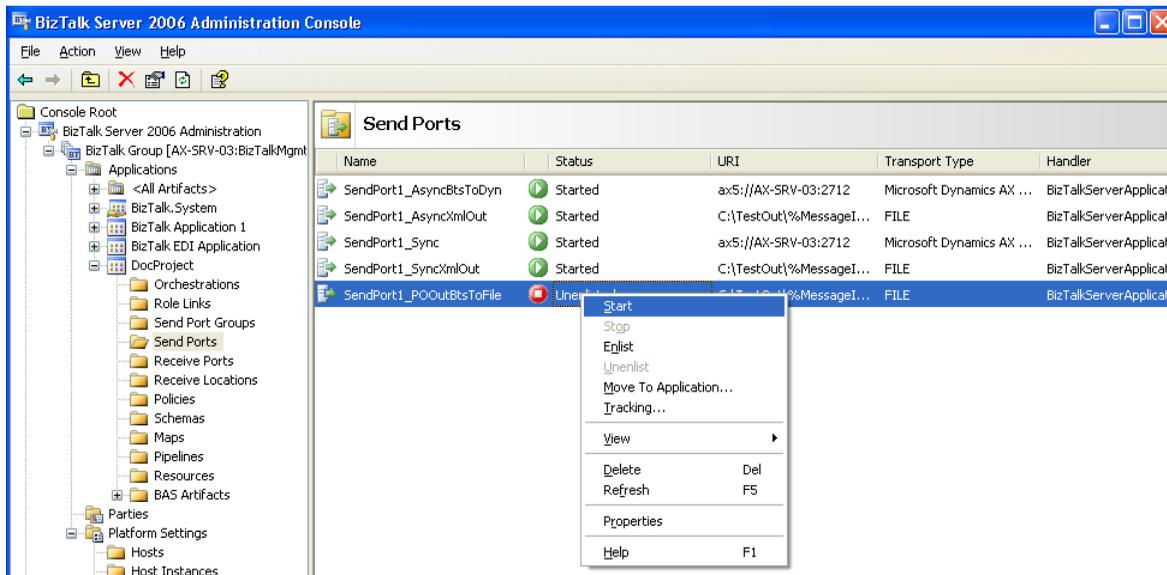
### Enable receive locations for asynchronous orchestration.

Click the **Receive Locations** node in the **BizTalk Server 2006 Administration Console**. Confirm that all the receive locations are enabled as shown in the following screen shot. We are re-using **ReceiveLocation1\_AsyncDynToBts** for this orchestration. Therefore, there is no change in the receive location.



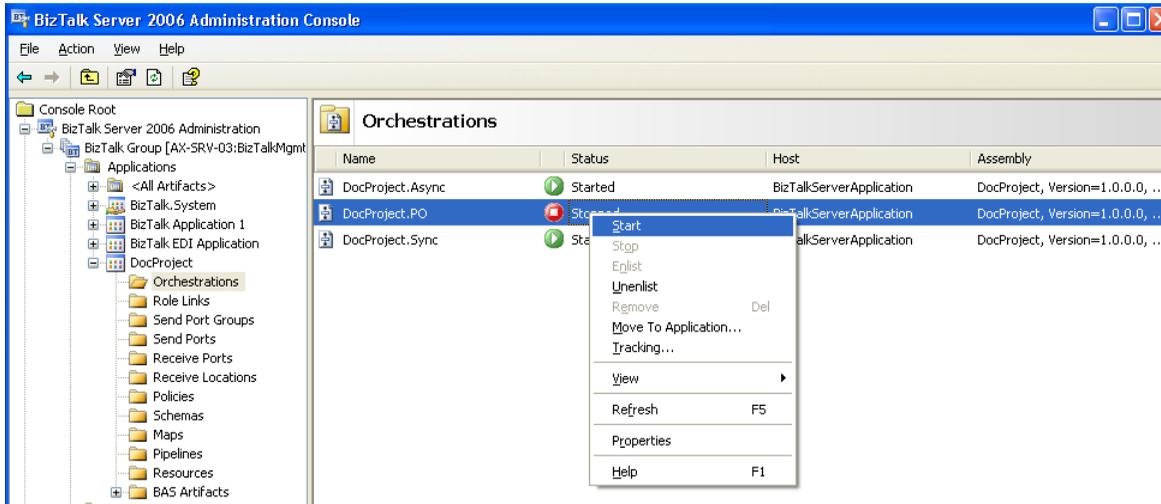
### Start send ports for synchronous orchestration.

Click the **Send Ports** node. Right-click **SendPort1\_POOutBtsToFile** and select **Start**.

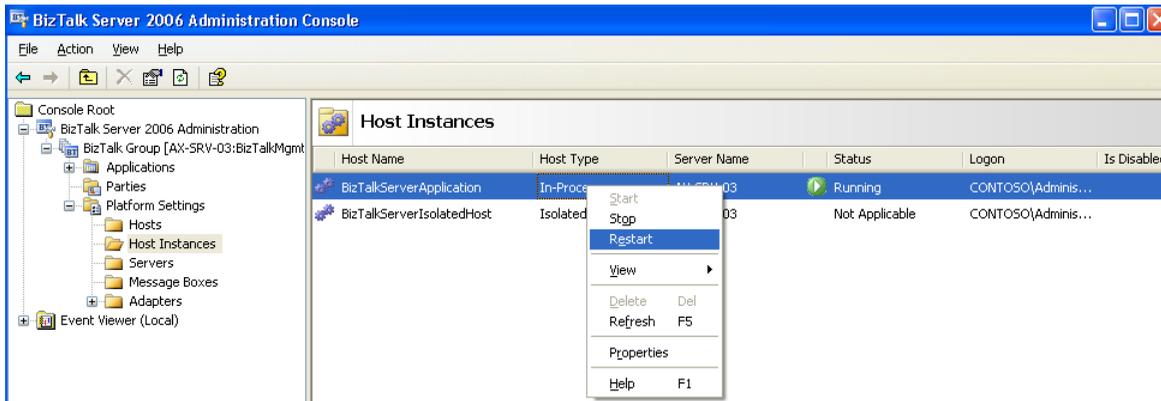


## Start the synchronous orchestration.

Click the **Orchestrations** node. Right-click **DocProject.PO** and select **Start**.



Restart the host instances. Select **Platform Settings > Host Instances**. Right-click **BiztalkServerApplication** and select **Restart**.





- Set Task Description = out 1.
  - Set **Company accounts** = CEU (from the list).
  - Set **Class Name** = AifOutboundProcessingService (from the list).
6. Save the form.
  7. Insert a new record and set values for the following fields.
    - Set Task Description = out 2.
    - Set **Company accounts** = CEU (from the list).
    - Set **Class Name** = AifGatewaySendService (from the list).
  8. Save and close the form, which should resemble the following screen shot.

Batch tasks (1) - Task description: Out 2, Withhold, Batch Job Id: 5637145826

Status	Task description	Company accounts	Class name	Class description	Has conditions	Run location	Batch group	Progress	Start date/time	End date/time
Withhold	Out 2	CEU	AifGatewaySendService	AIF Gateway S...	No	Server		0.00	12:00:00 am	
Withhold	Out 1	CEU	AifOutboundProcessingService	AIF Outbound ...	No	Server		0.00	12:00:00 am	
Withhold	In 2	CEU	AifInboundProcessingService	AIF Inbound Pr ...	No	Server		0.00	12:00:00 am	
Withhold	In 1	CEU	AifGatewayReceiveService	AIF Gateway R...	No	Server		0.00	12:00:00 am	

9. Close the **Batch tasks** Form.

## Configure the recurrence schedule

On the **Batch job** form, click the **Recurrence** button. Set **Count** to one (1) minute to process the jobs faster. You need to be careful in setting the recurrence count in a production environment. Depending on the number of the messages processed, size of the messages, and frequency of recurrence, batch jobs may impact the overall performance of your production environment. Click **OK**.

**Recurrence (1)**

TimezoneInformation  
 TimezoneId: (GMT-08:00) Pacific Time (US & Canada)

Range of recurrence  
 Starting time: 10:54:47 am Starting date: 5/14/2008  
 No end date  
 End after:  
 Count: 1  
 End by:  
 End date: 5/14/2008

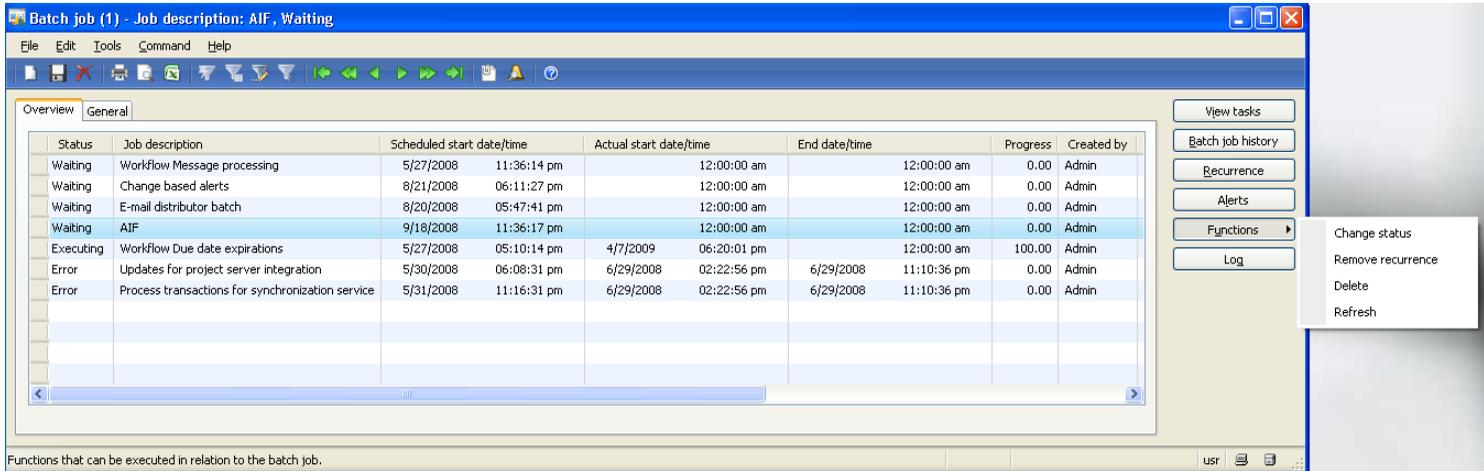
Recurring pattern  
 Minutes Repeat after specified number of minutes  
 Count: 1  
 Hours  
 Days  
 Weeks  
 Months  
 Years

OK Cancel

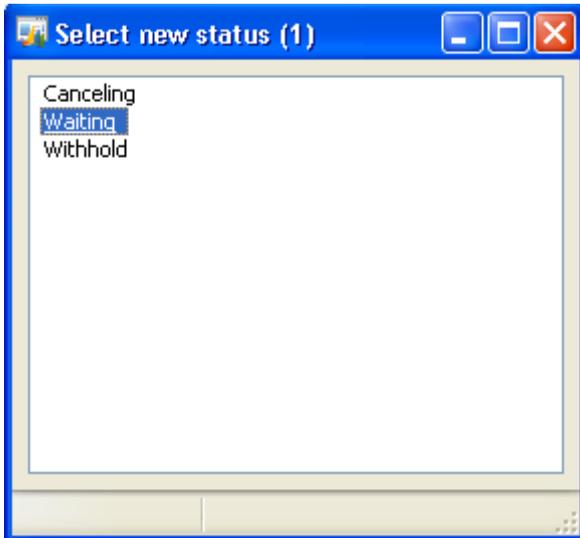
Interval between two occurrences.

## Configure the job status

1. On the **Batch jobs** form, click the record containing the AIF job. Click the **Functions** button and then select **Change status**.



2. In the **Select New Status** window, click **Waiting**.



The batch tasks will run every minute.

## Test the asynchronous orchestration

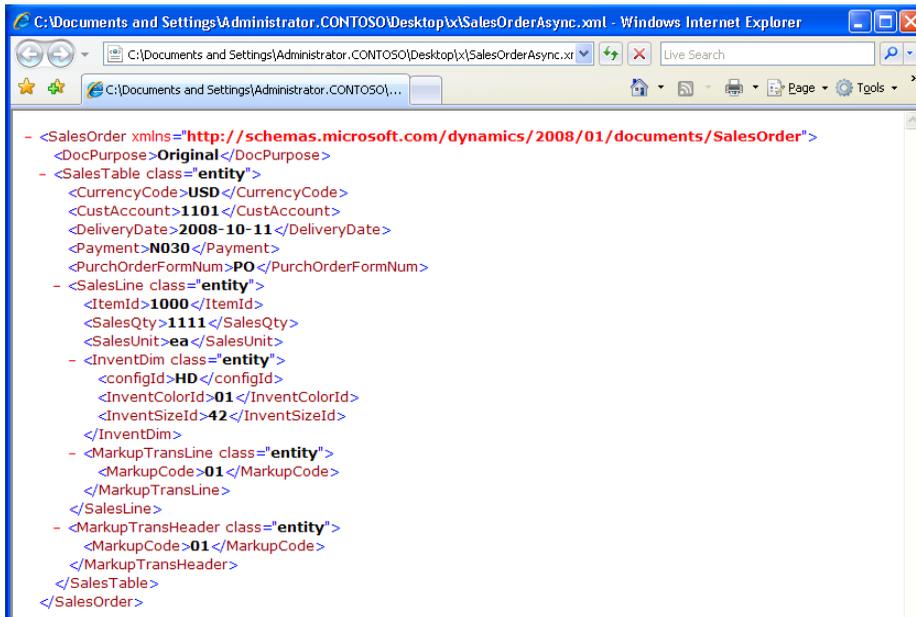
This section provides instruction to create a process and test the sales order using the asynchronous orchestration.

### Create an XML document for the asynchronous test

The following sample XML file contains the data of the sales order to be created in Microsoft Dynamics AX. There is no endpoint or action information in this XML file—that information is added to the message in the BizTalk orchestration. The test data used for synchronous and asynchronous tests is identical except for the quantity. The XML document for the asynchronous test has a quantity value of 1111.

```
<SalesOrder xmlns="http://schemas.microsoft.com/dynamics/2008/01/documents/SalesOrder">
  <DocPurpose>Original</DocPurpose>
  <SalesTable class="entity">
    <CurrencyCode>USD</CurrencyCode>
    <CustAccount>1101</CustAccount>
    <DeliveryDate>2008-10-11</DeliveryDate>
    <Payment>N030</Payment>
    <PurchOrderFormNum>PO</PurchOrderFormNum>
    <SalesLine class="entity">
      <ItemId>1000</ItemId>
      <SalesQty>1111</SalesQty>
      <SalesUnit>ea</SalesUnit>
      <InventDim class="entity">
        <configId>HD</configId>
        <InventColorId>01</InventColorId>
        <InventSizeId>42</InventSizeId>
      </InventDim>
      <MarkupTransLine class="entity">
        <MarkupCode>01</MarkupCode>
      </MarkupTransLine>
    </SalesLine>
    <MarkupTransHeader class='entity'>
      <MarkupCode>01</MarkupCode>
    </MarkupTransHeader>
  </SalesTable>
</SalesOrder>
```

The following screen shot shows a preview of the sample XML file in Internet Explorer.



```
<SalesOrder xmlns="http://schemas.microsoft.com/dynamics/2008/01/documents/SalesOrder">
  <DocPurpose>Original</DocPurpose>
  <SalesTable class="entity">
    <CurrencyCode>USD</CurrencyCode>
    <CustAccount>1101</CustAccount>
    <DeliveryDate>2008-10-11</DeliveryDate>
    <Payment>N030</Payment>
    <PurchOrderFormNum>PO</PurchOrderFormNum>
  </SalesTable>
  <SalesLine class="entity">
    <ItemId>1000</ItemId>
    <SalesQty>1111</SalesQty>
    <SalesUnit>ea</SalesUnit>
    <InventDim class="entity">
      <configId>HD</configId>
      <InventColorId>01</InventColorId>
      <InventSizeId>42</InventSizeId>
    </InventDim>
    <MarkupTransLine class="entity">
      <MarkupCode>01</MarkupCode>
    </MarkupTransLine>
  </SalesLine>
  <MarkupTransHeader class="entity">
    <MarkupCode>01</MarkupCode>
  </MarkupTransHeader>
</SalesTable>
</SalesOrder>
```

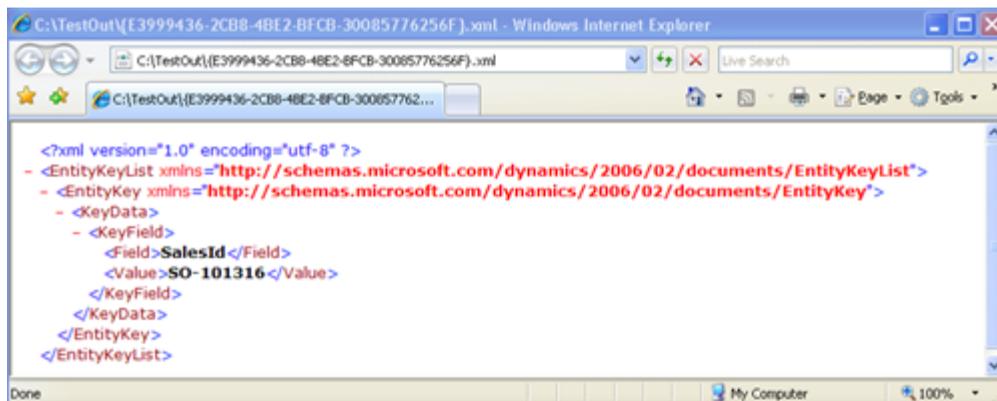
## Process the sales order in asynchronous mode

Copy the XML file to folder C:\TestIn. This is the folder that we have configured for the asynchronous orchestration. BizTalk Server will monitor the folder and will pick up the file. When you refresh the folder C:\TestIn, you should see nothing in it.

## Test the creation of a sales order and the return value

AIF processes the incoming XML from BizTalk Server and creates a sales order based on information received. AIF then returns an entity key (sales order number) to BizTalk Server in an XML document. BizTalk Server places the XML document in the outbound folder C:\TestOut. You can use the XML file in the outbound folder and the Microsoft Dynamics AX application to validate the test results as follows:

1. Verify that BizTalk has sent the request and received the sales order number by checking C:\TestOut folder. We have configured C:\TestOut as the outbound folder for both the synchronous and the asynchronous orchestrations. You should see an XML document with a name such as {E3999436-2CB8-4BE2-BFCB-30085776256F}.xml. This XML document provides the sales order ID of the new sales order as shown in the following screen shot.



```
<?xml version="1.0" encoding="utf-8" ?>
<EntityKeyList xmlns="http://schemas.microsoft.com/dynamics/2006/02/documents/EntityKeyList">
  <EntityKey xmlns="http://schemas.microsoft.com/dynamics/2006/02/documents/EntityKey">
    <KeyData>
      <KeyField>
        <Field>SalesId</Field>
        <Value>SO-101316</Value>
      </KeyField>
    </KeyData>
  </EntityKey>
</EntityKeyList>
```

- In the Microsoft Dynamics AX application, navigate to **Accounts receivable > Common Forms > Sales Order Details**. Confirm that the sales order is processed in the Microsoft Dynamics AX application as shown in the following screen shot. Note that customer, item, and quantity details match the XML file that we sent via BizTalk.

The screenshot displays the Microsoft Dynamics AX interface for a sales order. The title bar indicates the sales order is SO-101316, with customer Name Forest Wholesales and item name LCD Television HD Black 42 inches (1 - ceu).

The main window is divided into two sections: Overview and Lines.

**Overview Section:** This section contains a table listing multiple sales orders. The selected row is SO-101316.

Sales order	Customer account	Invoice account	Order type	Status	Currency	Project	Blanket order	Customer requisition	Quality order status
SO-101293	1304	1304	Sales order	Open order	USD				
SO-101301	1101	1101	Sales order	Open order	USD				
SO-101306	1101	1101	Sales order	Open order	EUR			PO	
SO-101308	1101	1101	Journal	Open order	USD			PO	
SO-101309	1101	1101	Journal	Open order	USD			PO	
SO-101310	1101	1101	Journal	Open order	USD			PO	
SO-101311	1101	1101	Journal	Open order	USD			PO	
SO-101312	1101	1101	Journal	Open order	USD			PO	
SO-101313	1101	1101	Journal	Open order	USD			PO	
SO-101314	1101	1101	Journal	Open order	USD			PO	
SO-101315	1101	1101	Journal	Open order	USD			PO	
SO-101316	1101	1101	Journal	Open order	USD			PO	

**Lines Section:** This section provides a detailed view of the selected sales order line (Item number 1000).

Item number	Configuration	Size	Color	Site	Warehouse	Batch number	Serial number	Quantity	Unit	Unit price	Discount	Disc. pct.	Net amount	Item name
1000				2	21			1,111.00	ea	2,000.00			2,222,000.00	LCD Television HD Black

Below the table, there are fields for dates and delivery options:

- Requested receipt date: 9/29/2008
- Confirmed receipt date: 9/26/2008
- Delivery date control: Sales lead time
- Requested ship date: 9/29/2008
- Confirmed ship date: 9/26/2008
- Mode of delivery: 10
- Shipping location time zone: (GMT-06:00) Central Time (US & Canada)

The status bar at the bottom indicates the order is identified and the currency is USD.

- If the sales order is not created, check your configuration settings and the troubleshooting section in this document.

## Test the synchronous orchestration

This section provides instruction to create a process and test the sales order using the asynchronous orchestration.

### Create an XML document for the synchronous test

The following sample XML file contains the data of the sales order to be created in Microsoft Dynamics AX. There is no endpoint or action information in this XML file—that information is added to the message in the BizTalk orchestration. The test data used for synchronous and asynchronous tests is identical except for the quantity. The XML document for the synchronous test has a quantity value of 2222

```
<SalesOrder xmlns="http://schemas.microsoft.com/dynamics/2008/01/documents/SalesOrder">
  <DocPurpose>Original</DocPurpose>
  <SalesTable class="entity">
    <CurrencyCode>USD</CurrencyCode>
    <CustAccount>1101</CustAccount>
    <DeliveryDate>2008-10-11</DeliveryDate>
    <Payment>N030</Payment>
    <PurchOrderFormNum>PO</PurchOrderFormNum>
    <SalesLine class="entity">
      <ItemId>1000</ItemId>
      <SalesQty>2222</SalesQty>
      <SalesUnit>ea</SalesUnit>
      <InventDim class="entity">
        <configId>HD</configId>
        <InventColorId>01</InventColorId>
        <InventSizeId>42</InventSizeId>
      </InventDim>
      <MarkupTransLine class="entity">
        <MarkupCode>01</MarkupCode>
      </MarkupTransLine>
    </SalesLine>
    <MarkupTransHeader class='entity'>
      <MarkupCode>01</MarkupCode>
    </MarkupTransHeader>
  </SalesTable>
</SalesOrder>
```

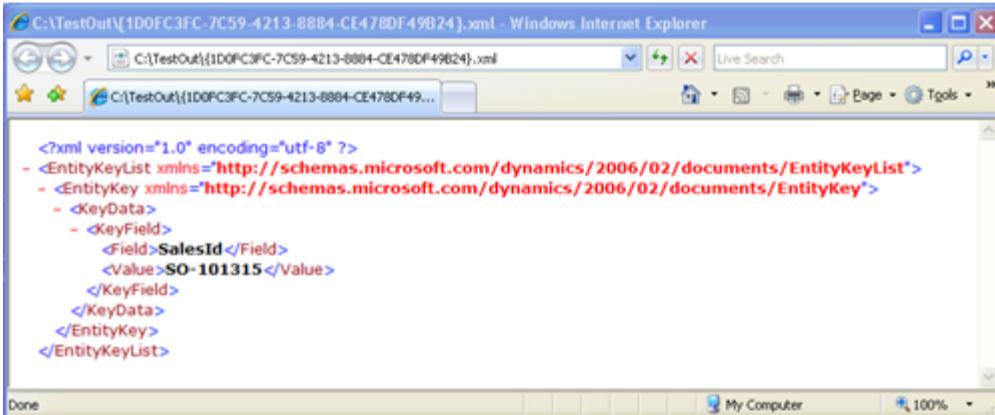
### Process the sales order in the synchronous mode

Copy the XML file to folder C:\TestIn2. This is the folder that we have configured for the synchronous orchestration. BizTalk Server will monitor the folder and will pick up the file. When you refresh the folder, you should see nothing in it.

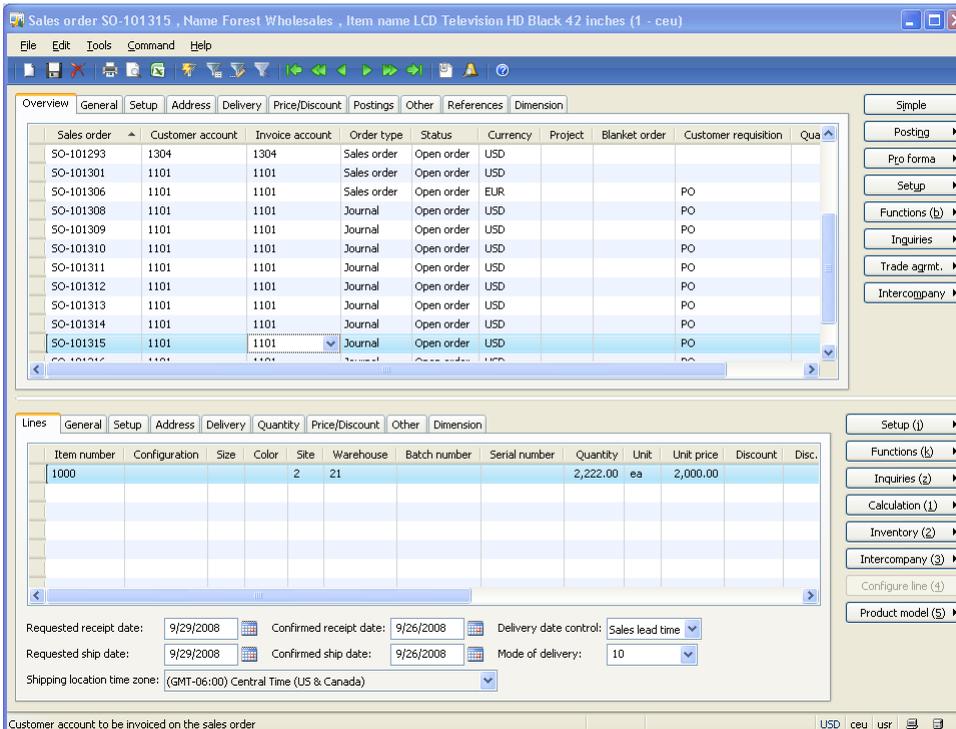
### Test the creation of the sales order and the return value

AIF processes the incoming XML from BizTalk Server, creates a sales order, and provides a response synchronously. In the response document, AIF returns an entity key (sales order number) to BizTalk Server. BizTalk Server places the XML document in the outbound folder C:\TestOut. You can use the XML file in the outbound folder and Microsoft Dynamics AX application to validate the test results as follows:

1. Verify that BizTalk has sent the request and received the sales order number by checking "C:\TestOut" folder. We have configured "C:\TestOut" as the outbound folder for both the synchronous and the asynchronous orchestrations. You should see an XML document with a name such as {E3999436-2CB8-4BE2-BFCB-30085776256F}.xml. This XML document provides the sales order ID of the new sales order as shown in the following screen shot.



2. In the Microsoft Dynamics AX application, navigate to **Accounts receivable > Common Forms > Sales Order Details**. Confirm that the sales order is processed in the Microsoft Dynamics AX application as shown in the following screen shot. Note that customer, item, and quantity details match the XML file that we sent via BizTalk.



3. If the sales order is not created, check your configuration settings and check the troubleshooting section in this document.

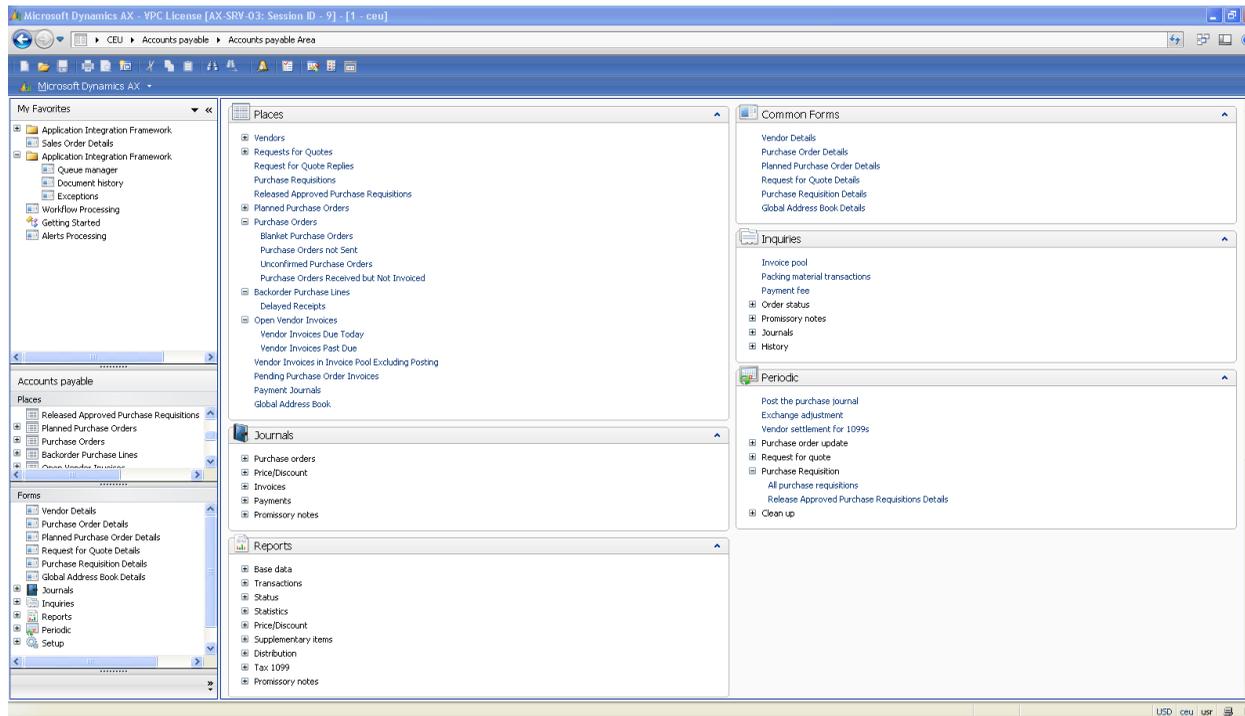
## Test the orchestration to send purchase orders

This section provides instruction to test the electronic transmission of the purchase order from AIF to BizTalk Server.

### Post an open purchase order

This section provides instructions for posting an open purchase order and then sending the purchase order electronically via AIF.

1. Launch the Microsoft Dynamics AX Windows client. Click **Accounts payable > Places > Purchase Orders** to launch the purchase order list page.



2. In the purchase order list page, select any purchase order with a status of **Open order**. In this case, we will use purchase order 000403. Double-click on purchase order 000403 to open the **Purchase order form**.

The screenshot shows the "Purchase Orders" list page in Microsoft Dynamics AX. The page has a ribbon with tabs for "Purchase", "Receive", "Invoice", "Intercompany", and "General". Below the ribbon is a table of purchase orders. The table has columns for "Purchase order", "Vendor account", "Vendor Name", "Invoice account", "Purchase type", "Status", "Blanket order", and "Quality order status".

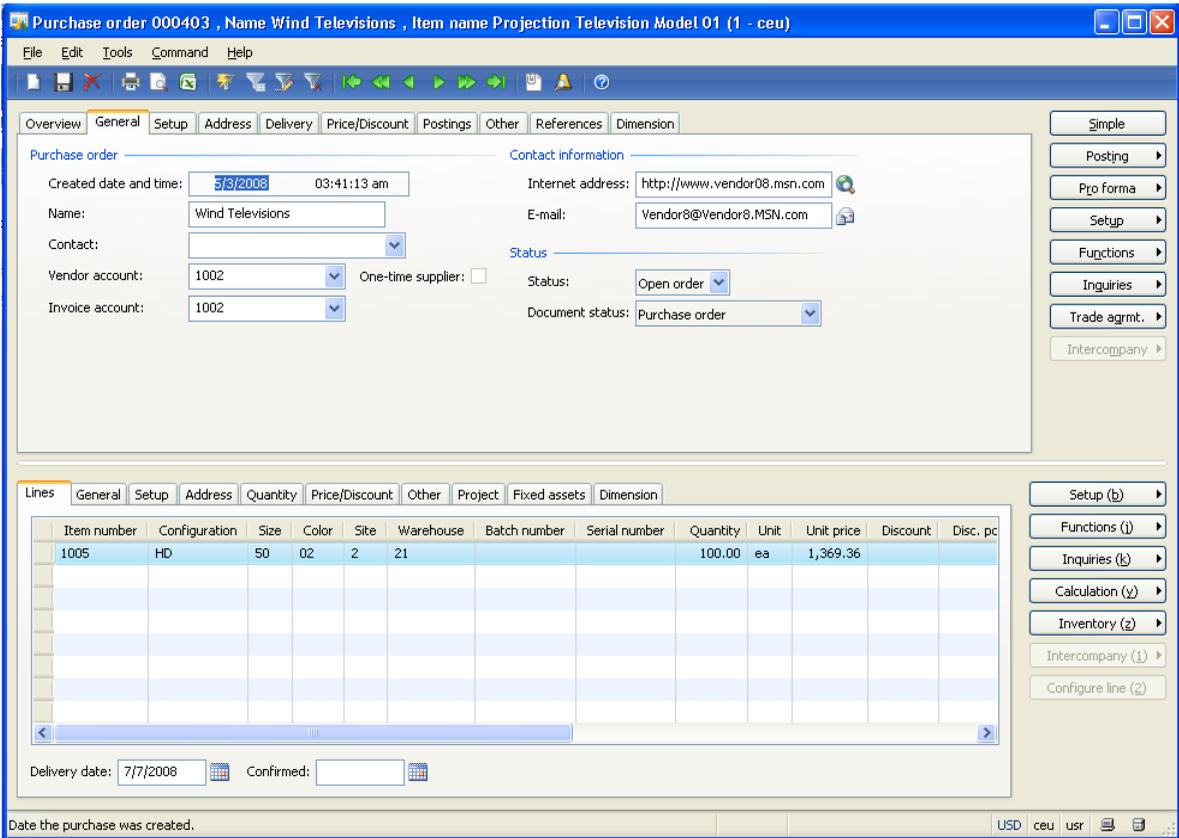
Purchase order	Vendor account	Vendor Name	Invoice account	Purchase type	Status	Blanket order	Quality order status
000403	1002	Wind Televisions	1002	Purchase order	Open order		
000404	9200	Contoso Asia	9200	Purchase order	Open order		
000405	2001	Datum Receivers	2001	Purchase order	Open order		

- Click the **Posting button** and then click **Purchase order**. This will launch the **Posting purchase order** form as shown in the next step.

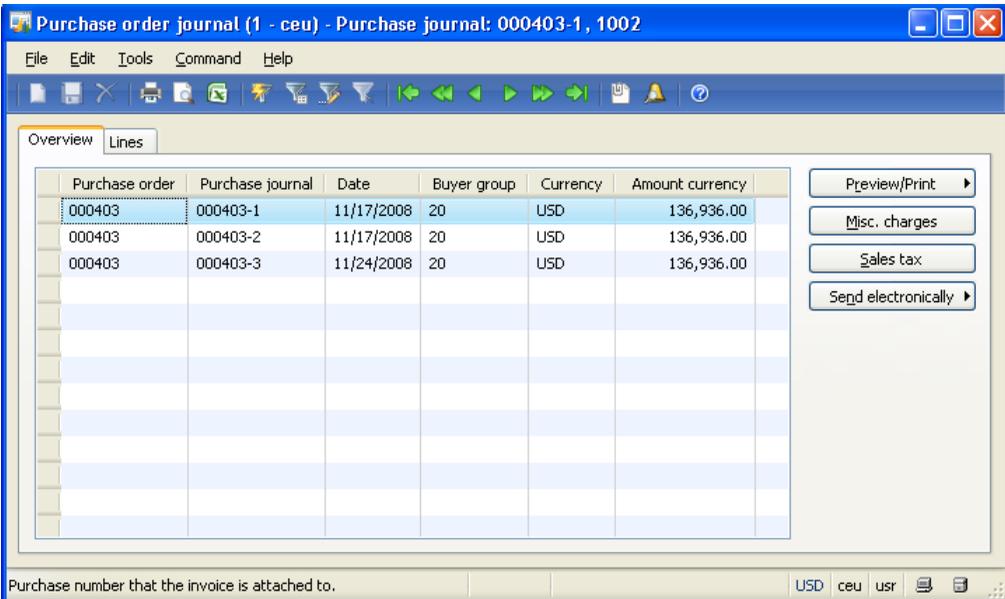
- In the **Quantity** field, select **All** from the list. Click **OK**. This will launch the **Purchase order** form with purchase order 000403 as shown in the next step.

Update	Purchase order	Name
[checked]	Purchase order 000403	Wind Televisions

- Click **Inquiries** and then **Purchase order**.



- Click **Send electronically** and then select **Original**. You can either select **Original** or **Copy** from the popup menu to send either the original or copy of the purchase order as an XML document.





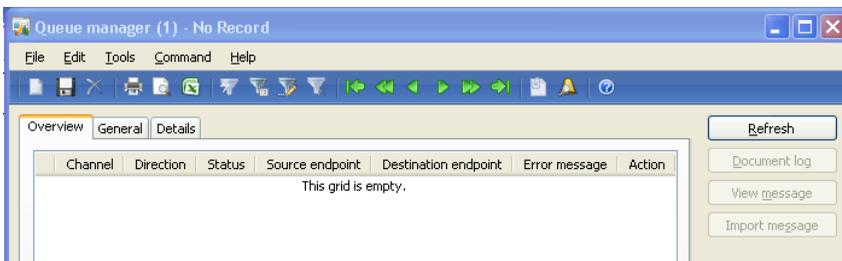
## Troubleshooting

If you get an error message, check your configuration settings in Microsoft Dynamics AX, BizTalk Server, and the Visual Studio project. Also check the XML schema of your document and make sure all the required fields are included. This section provides information on additional tools that you can use to troubleshoot error messages.

### Microsoft Dynamics AX application

Errors might typically result from an invalid XML schema or improper settings of the AIF configuration. You can use the following tools to determine the source of the error.

1. Check the AIF **Queue manager** form. To launch the form select **Basic > Periodic > Application Integration Framework > Queue manager**. Use this form to view messages (both inbound and outbound) in the Microsoft Dynamics AX queues for asynchronous document exchanges that use adapters.



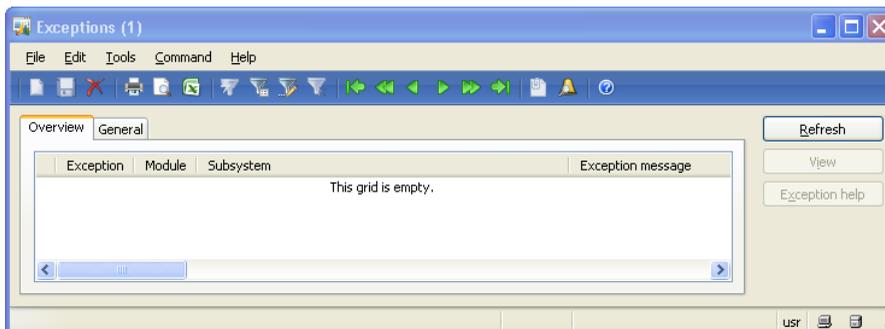
2. You can use the **View Document Log** form to export a message that has an error, edit the document to fix the error, and then click **Import message** on the **Queue manager** form to resubmit the updated document to the queue for processing.

For more information, see the following topics in the [Server and Database Administration Help](#):

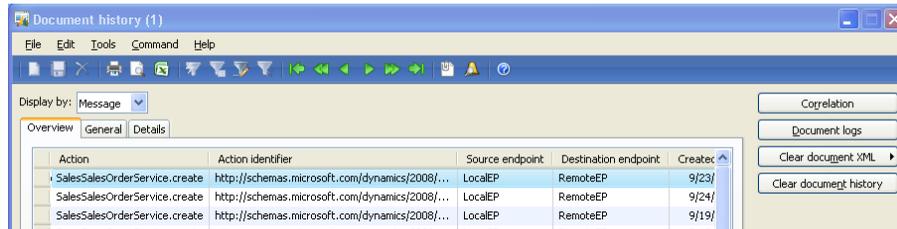
- Configure endpoint action policies
- Configure a channel
- Configure an endpoint manager form

3. Check the AIF **Exceptions** form. To launch the form, select **Basic > Periodic > Application Integration Framework > Exceptions**. Use this form to view exceptions including processing errors, warnings, and informational messages that are related to document exchanges and other AIF events..

For more information, see "The error log and queue management" in the [Server and Database Administration Guide](#).



4. Check the AIF **Document history** form. To launch the form, select **Basic > Periodic > Application Integration Framework > Document history**. Use this form to track the history of documents that are transferred. To save copies of the XML code for these documents, click **Document logs**. For more information, see the topic "Viewing the document log" in the [Server and Database Administration Guide](#).



## BizTalk Server and Visual Studio

Launch the Windows **Event Viewer** and check the **Application** and **System** logs to view error messages from BizTalk Server. Check the configuration settings in the Visual Studio application and BizTalk Server Administration Console. For more information on specific error messages, refer to the system documentation for these products.

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