

## **webMethods EntireX**

### **Calling Integration Server from COBOL**

Version 10.9

April 2023

This document applies to webMethods EntireX Version 10.9 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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**Document ID: EXX-EEXXSCENARIO-IS2COB-109-20230403**

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## Calling Integration Server from COBOL

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# 1

## About this Documentation

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## Document Conventions

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Convention	Description
<b>Bold</b>	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies:  Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies:  Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the   symbol.
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

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## Data Protection

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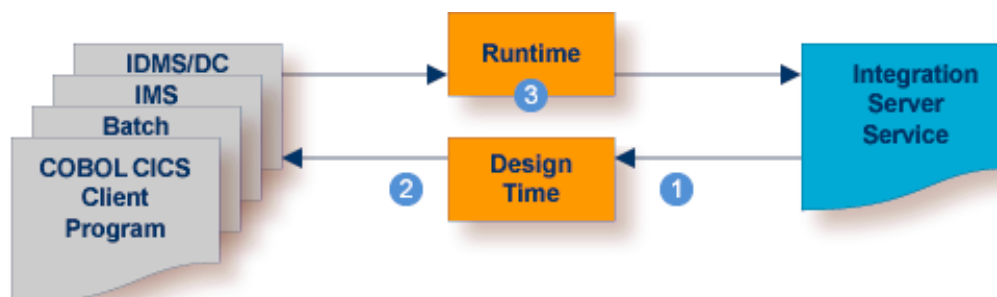
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## 2 Calling Integration Server from COBOL under z/OS

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Under z/OS, the Integration Server can be called from a COBOL client in different environments.



- ❶ Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- ❷ Generate client interface objects and build COBOL client application.
- ❸ Execute the call from the COBOL client to the Integration Server service.

Continue with the appropriate scenario:

- CICS
- Batch
- IMS
- IDMS/DC



# 3

## Calling Integration Server from COBOL under z/OS CICS

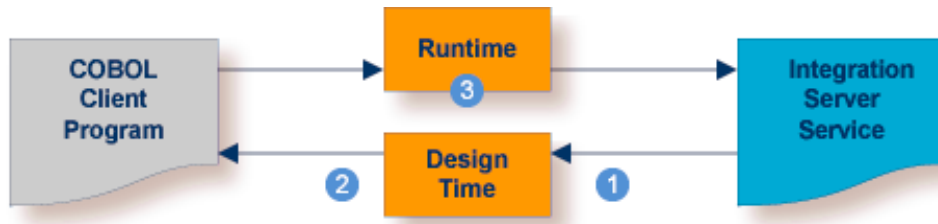
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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction

---



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.



## What do I need to Install for this Scenario?

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- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
  - For z/OS, see *Installing EntireX Broker under z/OS* in the z/OS Installation documentation
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Step 3: Install the Broker Stubs and Bind the Broker Stub Executables* in the z/OS Installation documentation.

## Task 1: Generate Integration Server Connections and Listeners

---

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

## ■ Testing the Extraction Results (Optional)

### Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

### Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
<b>OrderCustomerAddress</b>	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC



The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

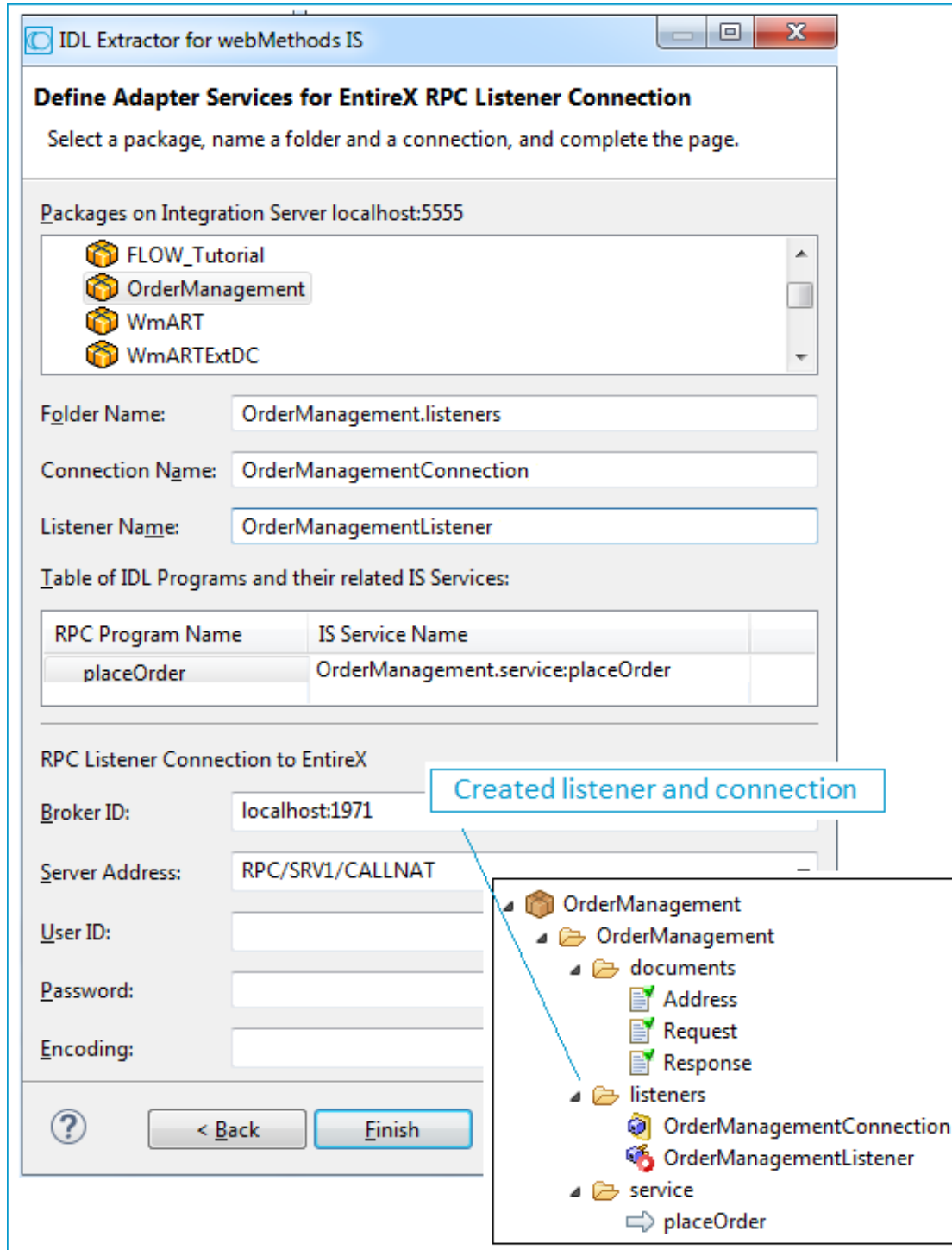
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



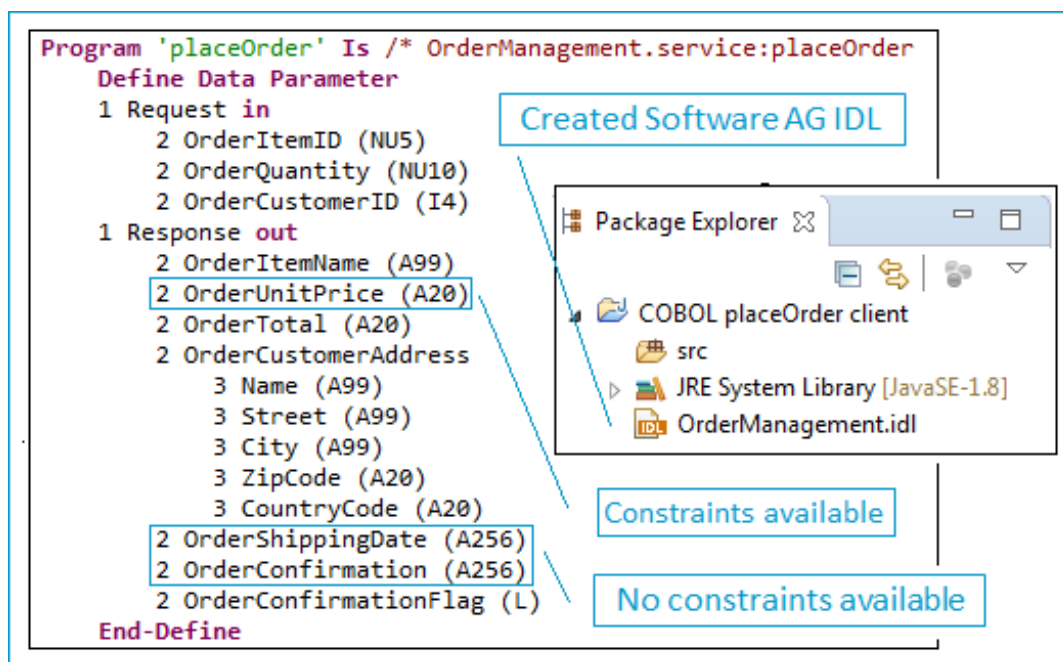
- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

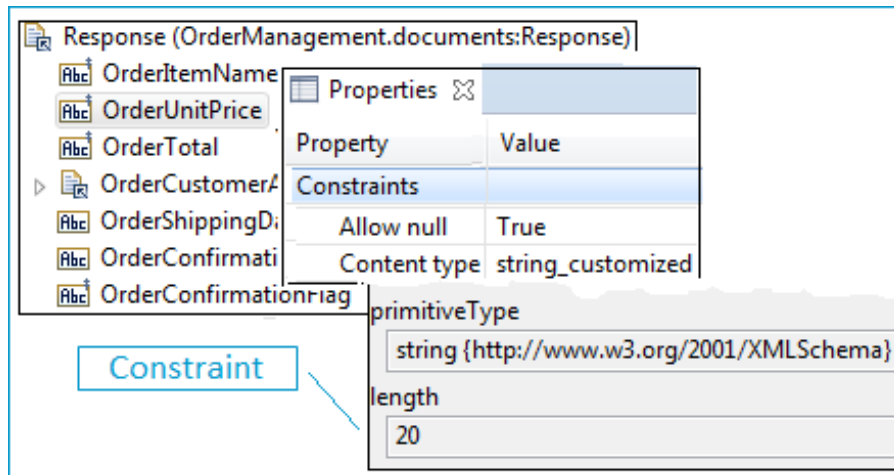
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



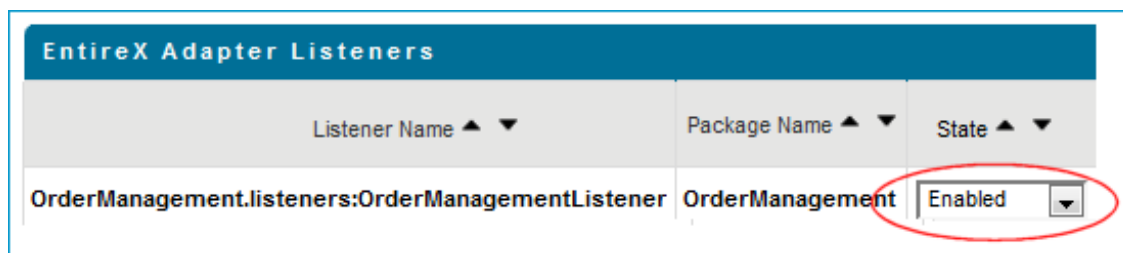
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).

- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a client application window with the following elements:

- Broker:** localhost:1971 (circled in red)
- Server:** RPC/SRV1/CALLNAT (circled in red)
- Buttons:** Call, Ping, Open Conversation, Reset, Exit
- Messages:** A scrollable area for displaying messages.
- Data Table:** A table with two columns: Field Name and Value.
 

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

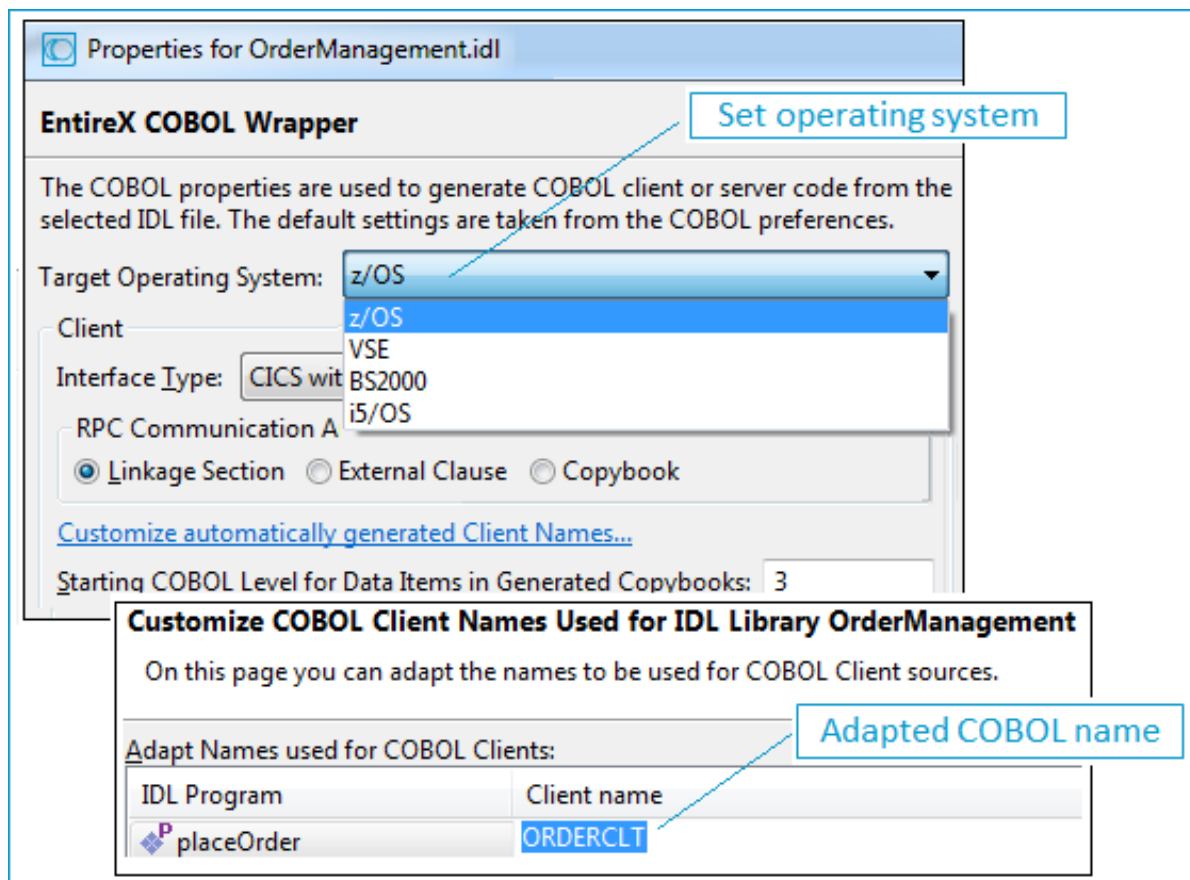
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

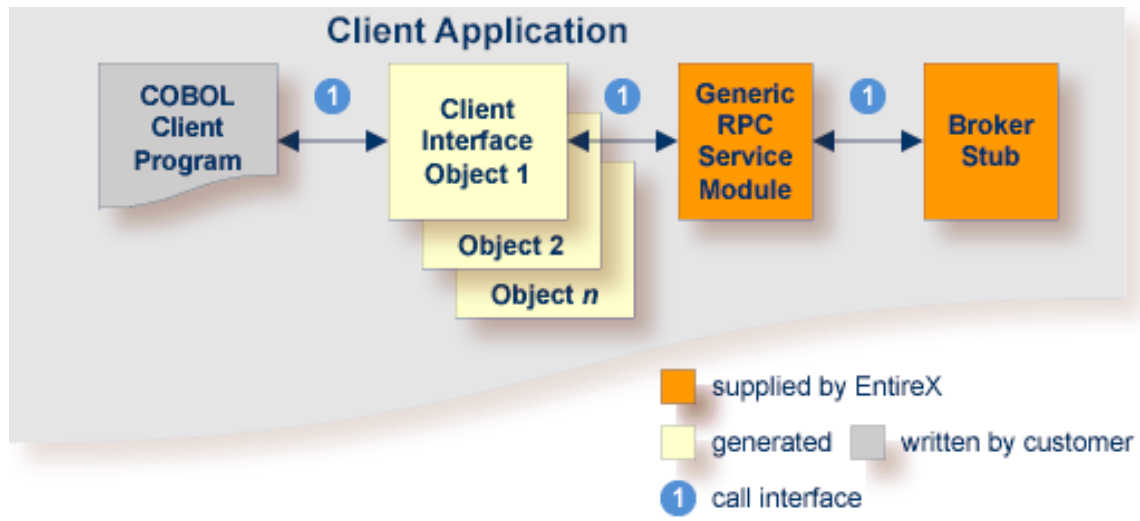
- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.
- 4 Set the appropriate interface type for the generated client interface objects to your application. The options available for CICS are Standard Linkage Calling Convention and DFHCOM-MAREA Calling Convention. These are described below.



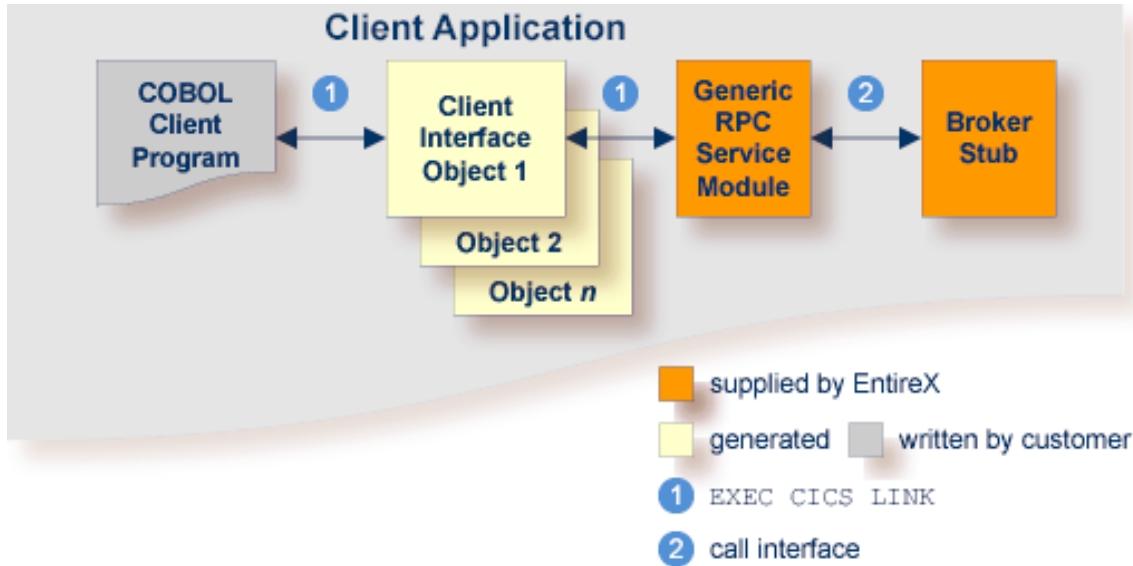
## ■ Standard Linkage Calling Convention



The COBOL Wrapper can be used with a call interface, even in CICS. This means you can build a client application where the COBOL client program, every generated client interface object, the generic RPC services module and the broker stub are linked together, similar to the batch scenario. See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*. Using a call interface within CICS may be useful in the following situations:

- The restriction of the COMMAREA length (about 31 KB) prevents you from using the scenario *Using the COBOL Wrapper for CICS with DFHCOMMAREA Calling Convention (z/OS and z/VSE)* (see above).
- You do *not* require a distributed program link (CICS DPL) to your client interface object(s).
- You prefer a call interface instead of EXEC CICS LINK to your client interface objects.

## ■ DFHCOMMAREA Calling Convention



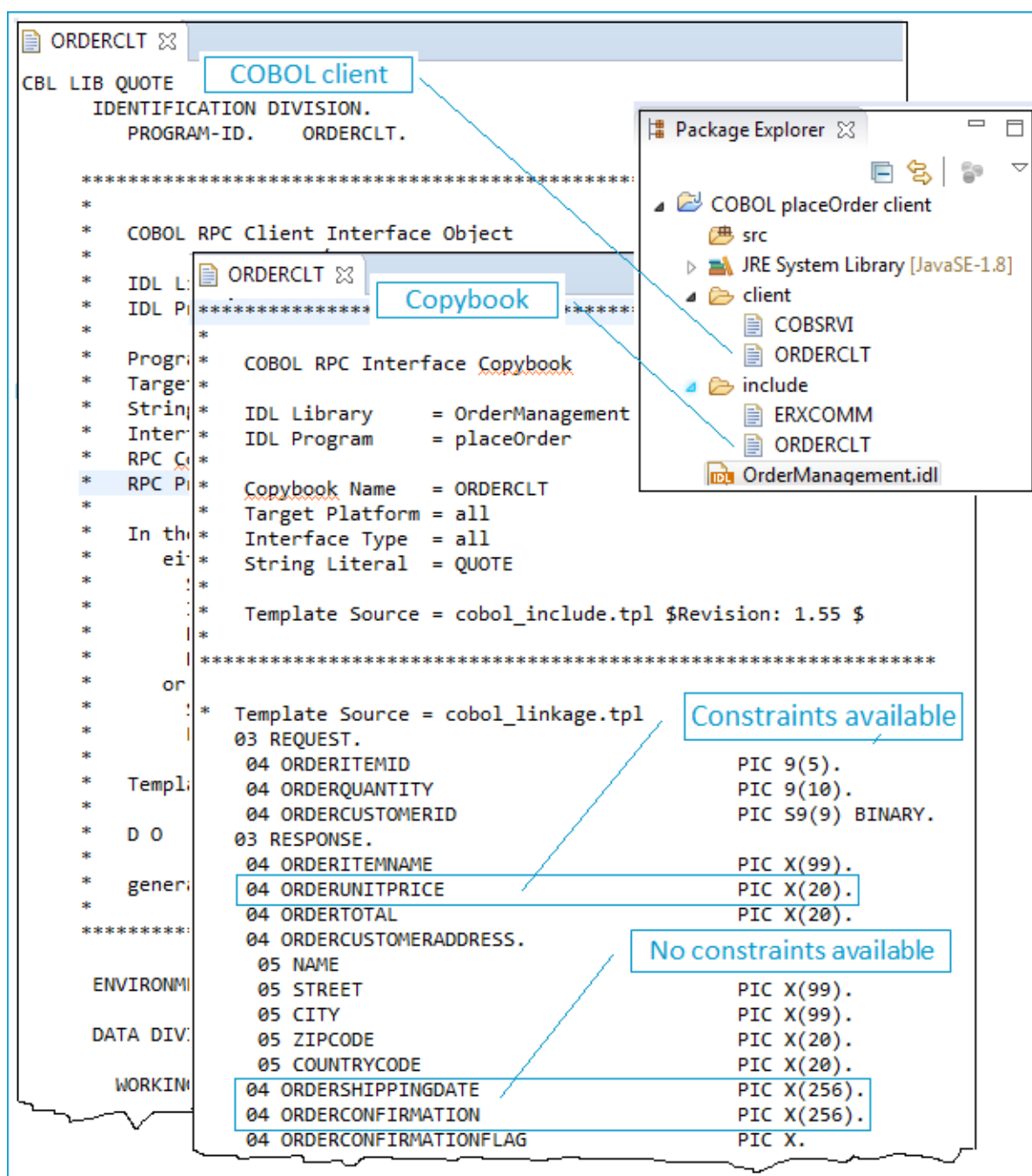
In this scenario, the generic RPC services module and the broker stub are linked together to a CICS program. The COBOL client program, every generated client interface object and the generic RPC services module together with the broker stub are installed each as separate individual CICS programs. Use the COBOL Wrapper with this calling convention in the following situations:

- You want to have an EXEC CICS LINK DFHCOMMAREA interface to your client interface object(s).
- The restriction of the COMMAREA length suits your purposes. Because the RPC communication area is also transferred in the COMMAREA, the effective length that can be used for IDL data is shorter than the CICS COMMAREA length. Nearly 31 KB can be used for IDL data.
- You wish to separate the generic RPC service module and the broker stub from the client interface object(s).
- You require a program link to the client interface object(s).

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:



The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However,

this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application

Depending on the chosen interface type of your client interface objects (CICS with Standard Linkage Calling Convention or CICS with DFHCOMMAREA Calling Convention under *Setting Generation Options (Properties) for the COBOL Wrapper*, refer to

- *Using the COBOL Wrapper for CICS with Call Interfaces (z/OS and z/VSE)*
- *Using the COBOL Wrapper for CICS with DFHCOMMAREA Calling Convention (z/OS and z/VSE)*

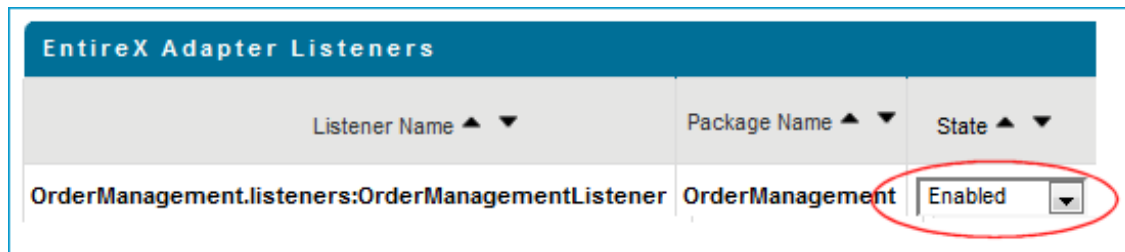
## Task 3: Execute the Call from COBOL to Integration Server

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Use the EntireX IDL Tester to execute the call.

### > To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971 Server: RPC/SRV1/CALLNAT

Call Ping Open Conversation Reset Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW 19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true



# 4

## Calling Integration Server from COBOL under z/OS Batch

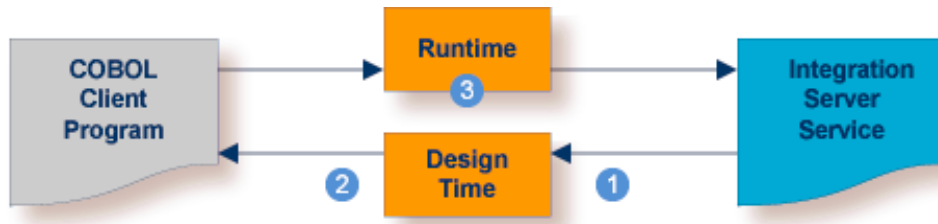
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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction

---



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.





## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
  - For z/OS, see *Installing EntireX Broker under z/OS* in the z/OS Installation documentation
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Step 3: Install the Broker Stubs and Bind the Broker Stub Executables* in the z/OS Installation documentation.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

### ■ Testing the Extraction Results (Optional)

## Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

## Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
OrderCustomerAddress	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

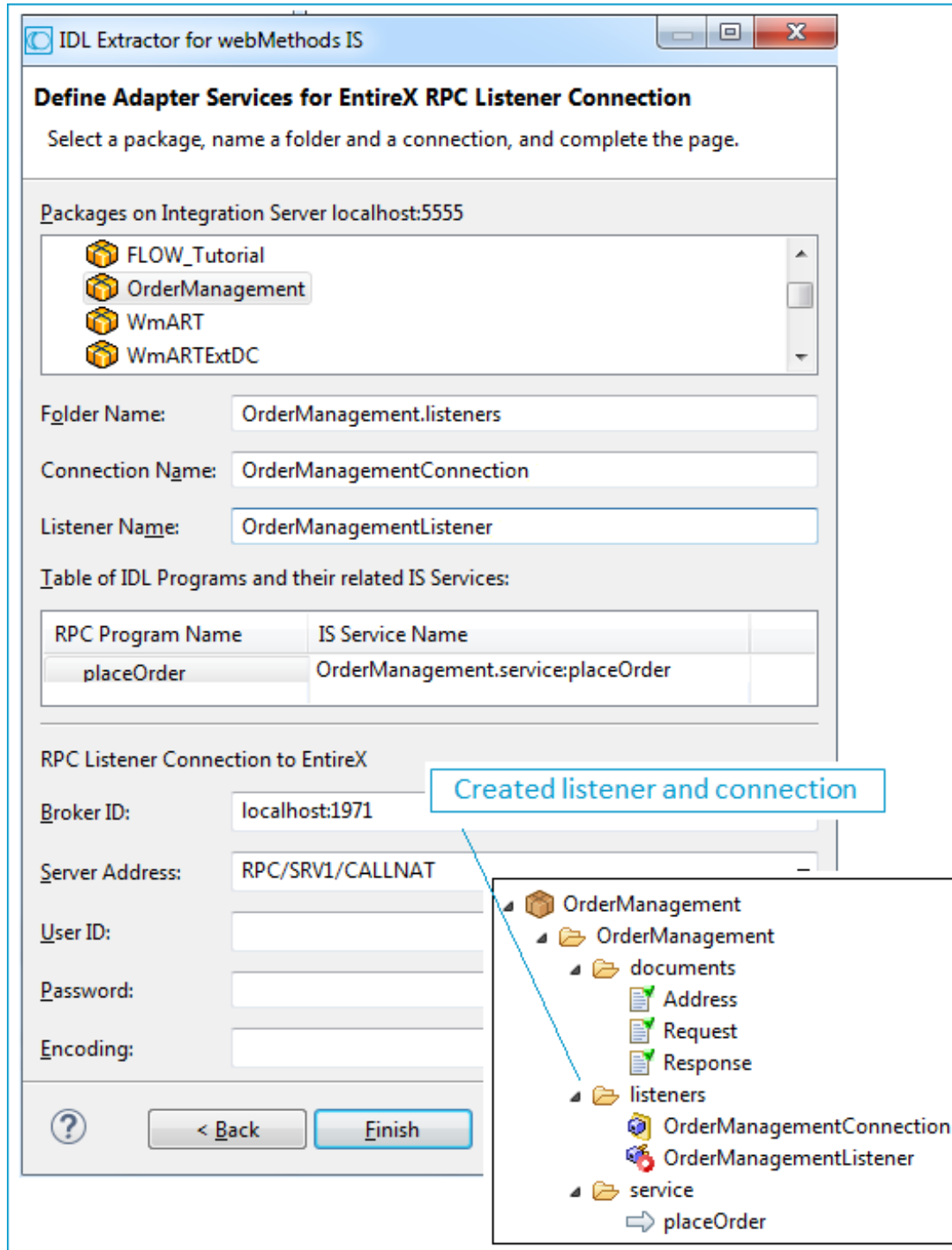
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



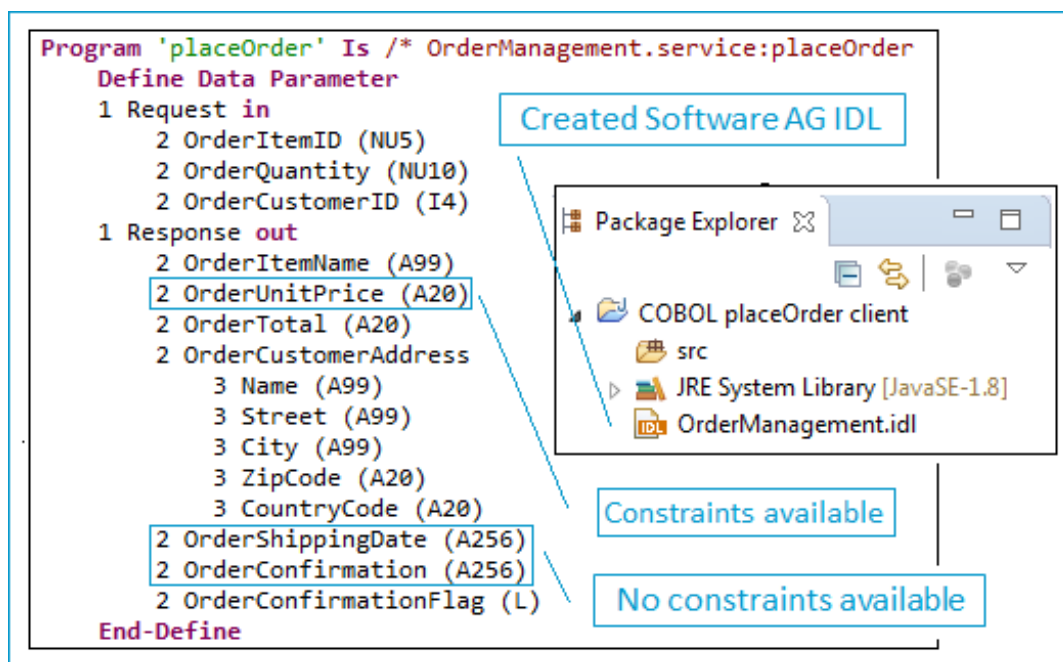
- 2 On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

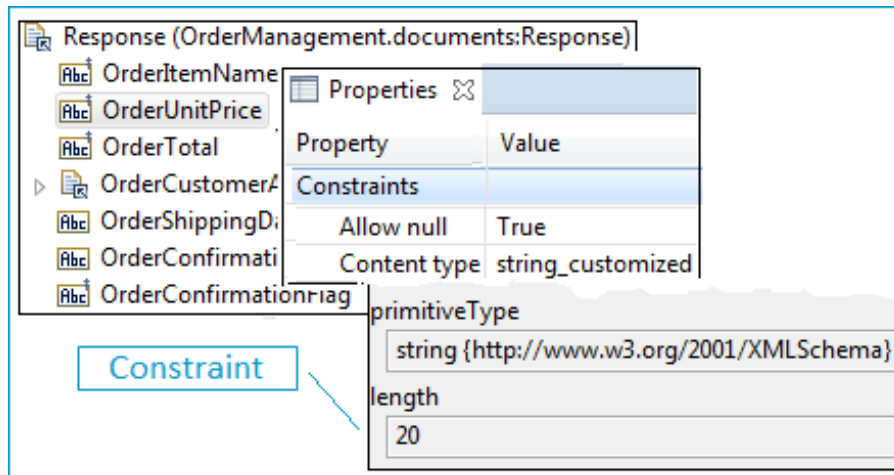
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



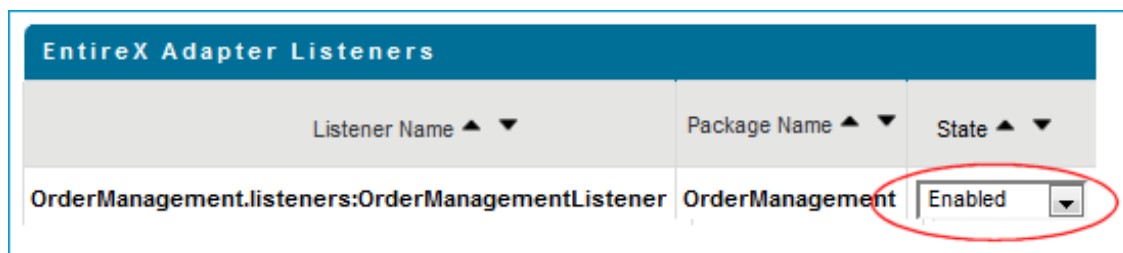
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).



- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a client application window with the following elements:

- Broker:** localhost:1971 (circled in red)
- Server:** RPC/SRV1/CALLNAT (circled in red)
- Buttons:** Call, Ping, Open Conversation, Reset, Exit
- Messages:** A scrollable text area.
- Data Table:**

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

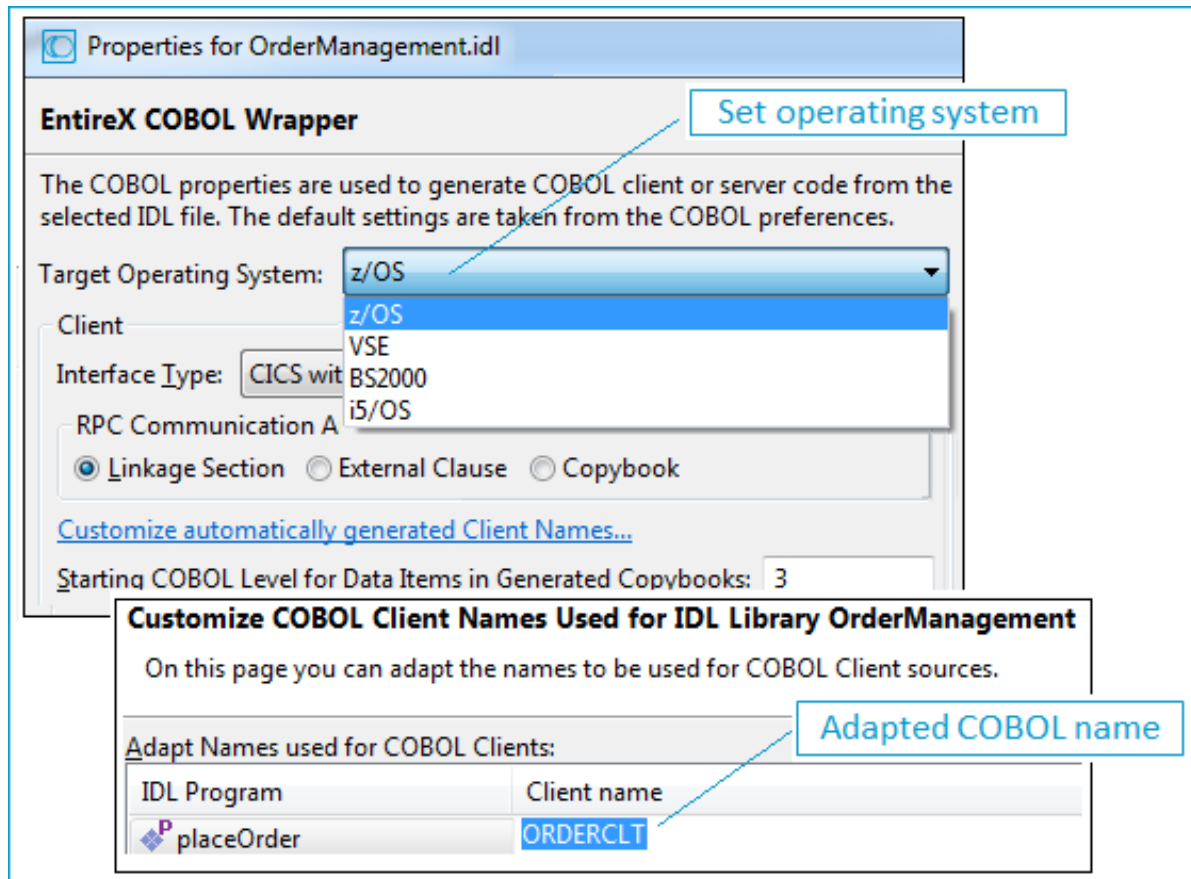
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:

The screenshot shows the Eclipse IDE with the COBOL client generation process. The main editor displays the COBOL code for *ORDERCLT*. The code is structured as follows:

```

CBL LIB QUOTE
IDENTIFICATION DIVISION.
PROGRAM-ID. ORDERCLT.

*****
*
* COBOL RPC Client Interface Object
*
* IDL L: ORDERCLT
* IDL P: *****
*
* Program: COBOL RPC Interface Copybook
* Target:
* String: IDL Library = OrderManagement
* Inter: IDL Program = placeOrder
* RPC C:
* RPC P: Copybook Name = ORDERCLT
*
* In the Target Platform = all
* ei Interface Type = all
* String Literal = QUOTE
*
* Template Source = cobol_include.tpl $Revision: 1.55 $
*
* or
*
* Template Source = cobol_linkage.tpl
* 03 REQUEST.
* 04 ORDERITEMID PIC 9(5).
* 04 ORDERQUANTITY PIC 9(10).
* 04 ORDERCUSTOMERID PIC S9(9) BINARY.
* 03 RESPONSE.
* 04 ORDERITEMNAME PIC X(99).
* 04 ORDERUNITPRICE PIC X(20).
* 04 ORDERTOTAL PIC X(20).
* 04 ORDERCUSTOMERADDRESS.
* 05 NAME PIC X(99).
* 05 STREET PIC X(99).
* 05 CITY PIC X(20).
* 05 ZIPCODE PIC X(20).
* 05 COUNTRYCODE PIC X(20).
* 04 ORDERSHIPPINGDATE PIC X(256).
* 04 ORDERCONFIRMATION PIC X(256).
* 04 ORDERCONFIRMATIONFLAG PIC X.

```

The Package Explorer on the right shows the project structure:

- COBOL placeOrder client
  - src
  - JRE System Library [JavaSE-1.8]
  - client
    - COBSRVI
    - ORDERCLT
  - include
    - ERXCOMM
    - ORDERCLT
  - OrderManagement.idl

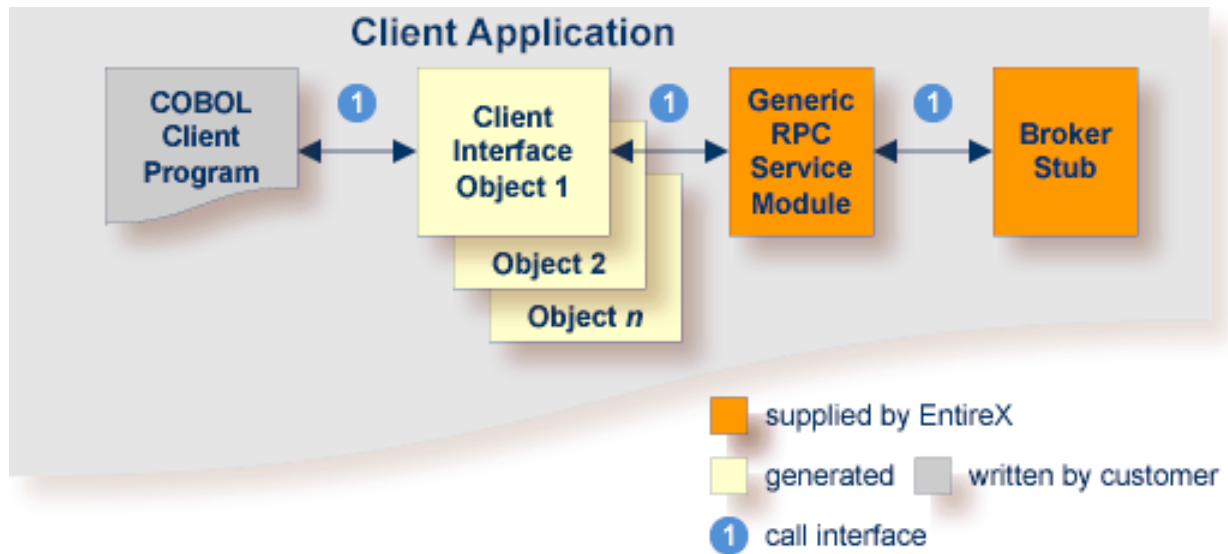
Annotations in the image point to the following sections:

- COBOL client**: Points to the *ORDERCLT* file in the *client* folder.
- Copybook**: Points to the *Copybook Name = ORDERCLT* section in the code.
- Constraints available**: Points to the *04 ORDERUNITPRICE PIC X(20).* line in the code.
- No constraints available**: Points to the *04 ORDERSHIPPINGDATE PIC X(256).* line in the code.

The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

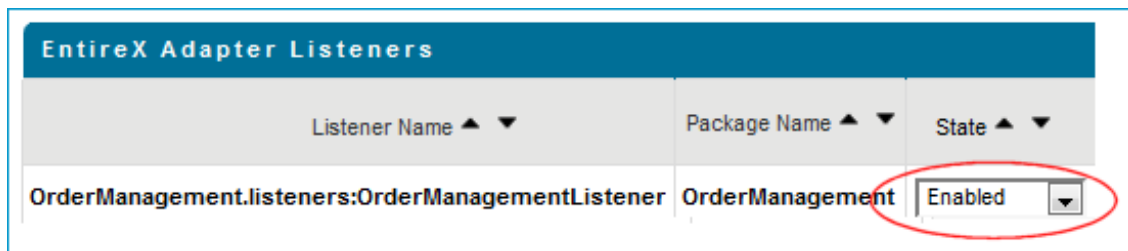
See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a software interface with two input fields at the top: "Broker: localhost:1971" and "Server: RPC/SRV1/CALLNAT". Both fields are circled in red. Below these fields are five buttons: "Call" (highlighted with a dashed border), "Ping", "Open Conversation", "Reset", and "Exit". Below the buttons is a "Messages" section with a scrollable list of data. The data is organized into two columns: a left column with labels and a right column with values.

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

# 5

## Calling Integration Server from COBOL under z/OS IMS

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■ Introduction .....	42
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■ Task 1: Generate Integration Server Connections and Listeners .....	43
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■ Task 3: Execute the Call from COBOL to Integration Server .....	55

This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.





## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
  - For z/OS, see *Installing EntireX Broker under z/OS* in the z/OS Installation documentation
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Step 3: Install the Broker Stubs and Bind the Broker Stub Executables* in the z/OS Installation documentation.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

### ■ Testing the Extraction Results (Optional)

## Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

## Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
OrderCustomerAddress	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

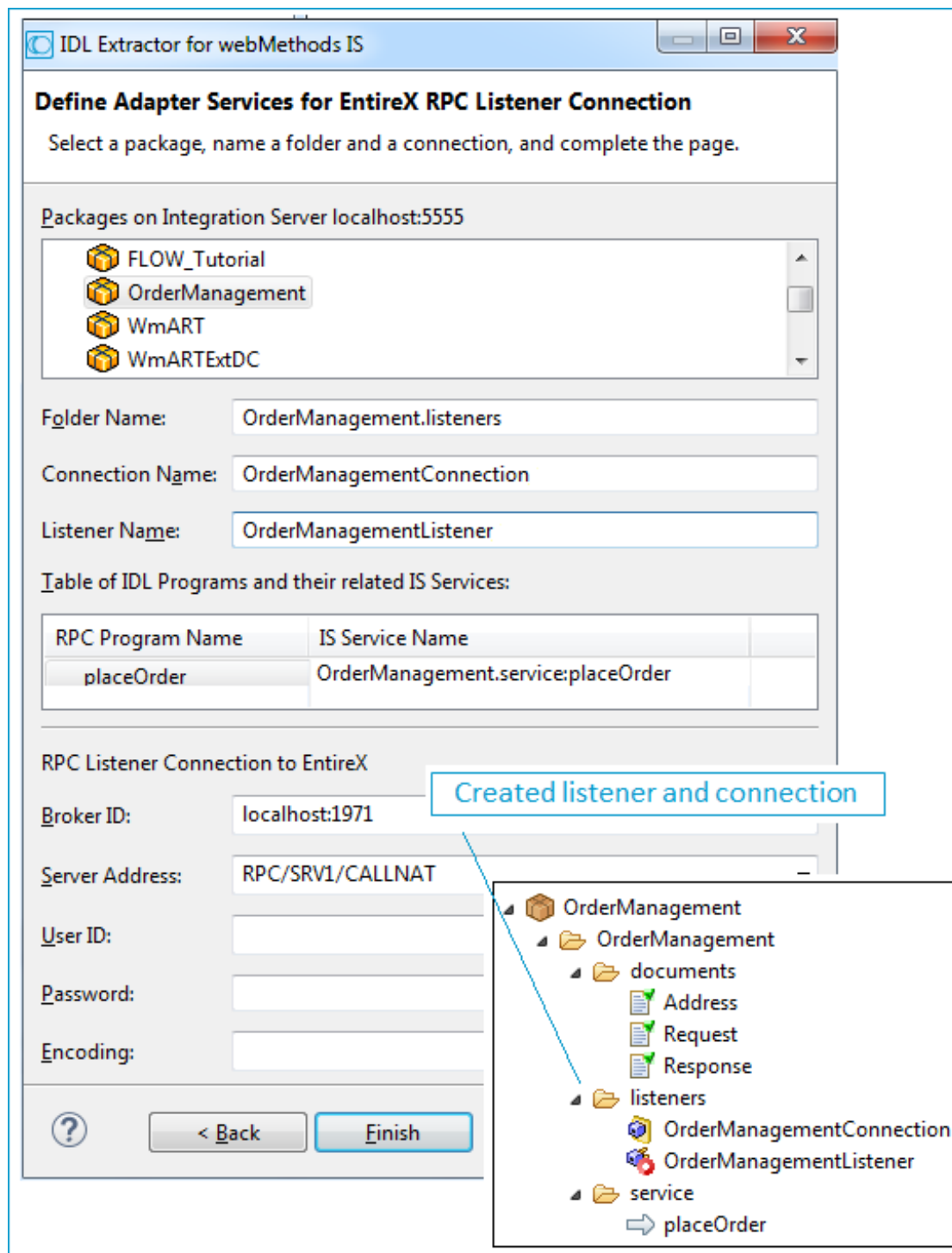
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



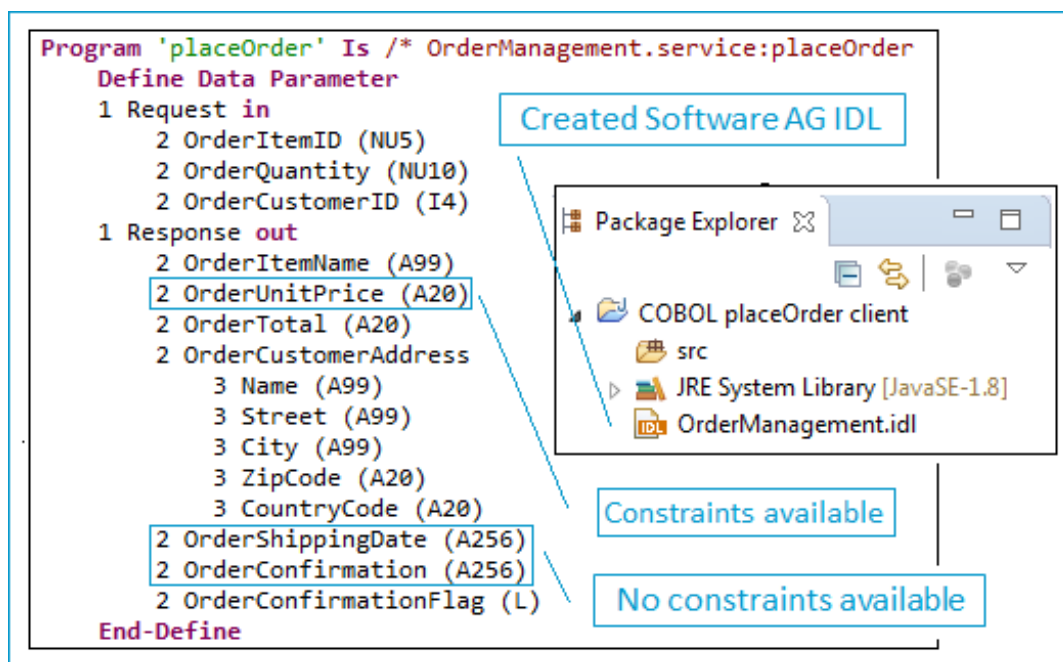
- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

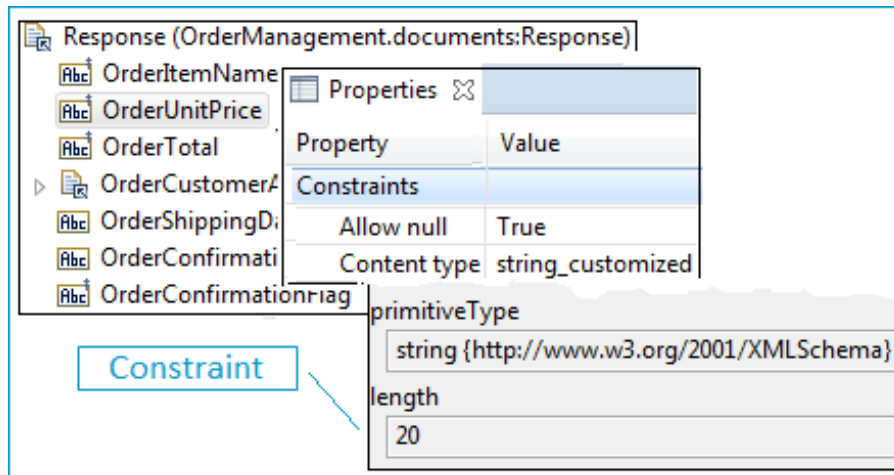
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



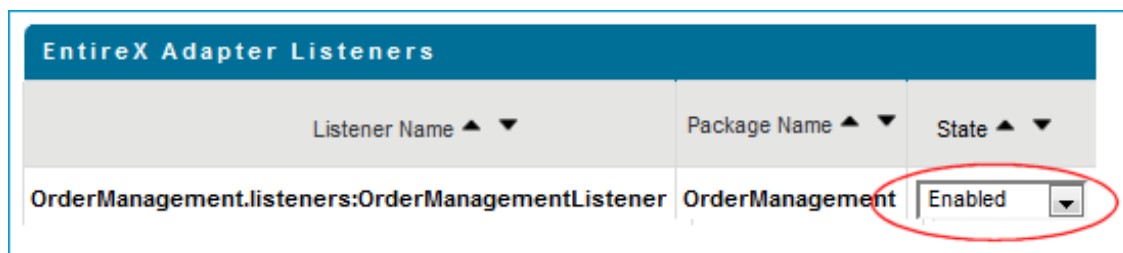
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).



- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a client application window with the following elements:

- Broker:** localhost:1971 (circled in red)
- Server:** RPC/SRV1/CALLNAT (circled in red)
- Buttons:** Call, Ping, Open Conversation, Reset, Exit
- Messages:** A scrollable area for displaying messages.
- Data Table:** A table with two columns: Field Name and Value.
 

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

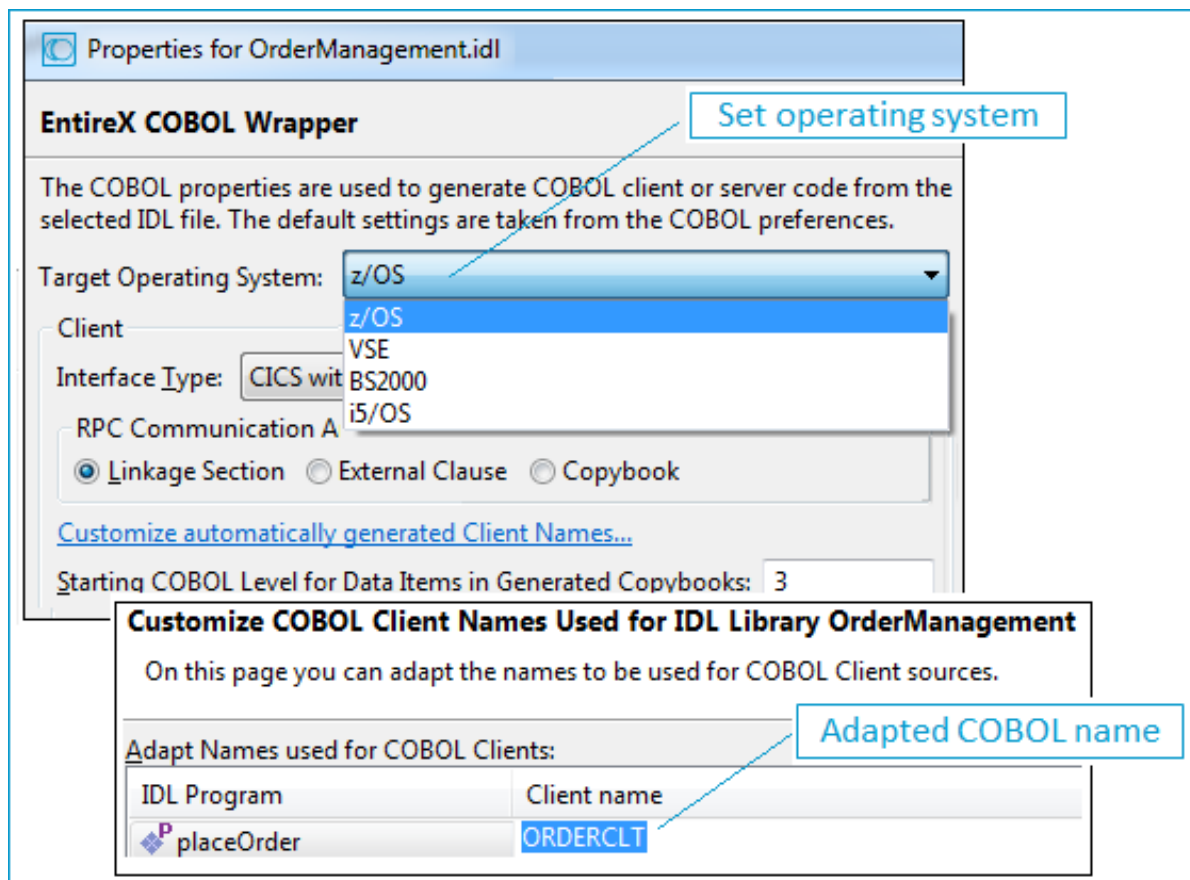
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:

The screenshot shows the Eclipse IDE with the COBOL client *ORDERCLT* generated in the *client* folder and a copybook in the *include* folder. The main editor displays the COBOL code for *ORDERCLT*, which includes a 'COBOL RPC Interface Copybook' section. A 'Package Explorer' on the right shows the project structure with folders 'src', 'client', and 'include'. The 'client' folder contains 'COBSRVI', 'ORDERCLT', and 'include'. The 'include' folder contains 'ERXCOMM' and 'ORDERCLT'. The 'ORDERCLT' file is highlighted in the 'client' folder. The 'include' folder is expanded, showing 'ERXCOMM' and 'ORDERCLT'. The 'ORDERCLT' file is highlighted in the 'include' folder. The 'ORDERCLT' file is highlighted in the 'include' folder. The 'ORDERCLT' file is highlighted in the 'include' folder.

**COBOL client**

```

CBL LIB QUOTE
IDENTIFICATION DIVISION.
PROGRAM-ID. ORDERCLT.

*****
*
* COBOL RPC Client Interface Object
*
* IDL L: ORDERCLT
* IDL P: *****
*
* Program: COBOL RPC Interface Copybook
* Target:
* String: IDL Library = OrderManagement
* Inter: IDL Program = placeOrder
* RPC C:
* RPC P: Copybook Name = ORDERCLT
*
* In the Target Platform = all
* ei Interface Type = all
* String Literal = QUOTE
*
* Template Source = cobol_include.tpl $Revision: 1.55 $
*
*****
*
* or
*
* Template Source = cobol_linkage.tpl
* 03 REQUEST.
* 04 ORDERITEMID PIC 9(5).
* 04 ORDERQUANTITY PIC 9(10).
* 04 ORDERCUSTOMERID PIC S9(9) BINARY.
* 03 RESPONSE.
* 04 ORDERITEMNAME PIC X(99).
* 04 ORDERUNITPRICE PIC X(20).
* 04 ORDERTOTAL PIC X(20).
* 04 ORDERCUSTOMERADDRESS.
* 05 NAME
* 05 STREET PIC X(99).
* 05 CITY PIC X(99).
* 05 ZIPCODE PIC X(20).
* 05 COUNTRYCODE PIC X(20).
* 04 ORDERSHIPPINGDATE PIC X(256).
* 04 ORDERCONFIRMATION PIC X(256).
* 04 ORDERCONFIRMATIONFLAG PIC X.

```

**Copybook**

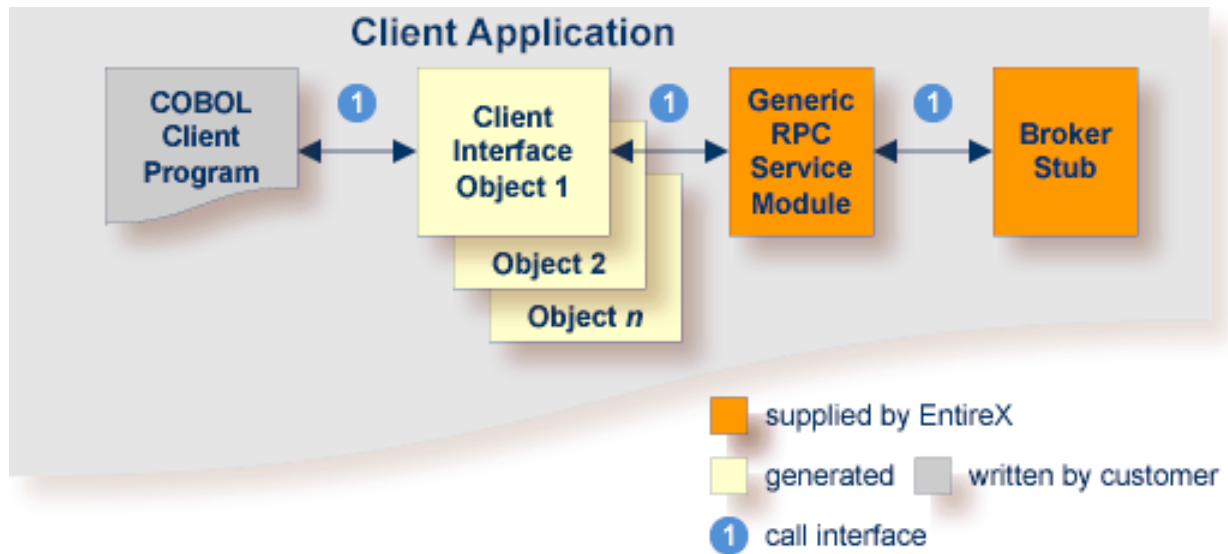
**Constraints available**

**No constraints available**

The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

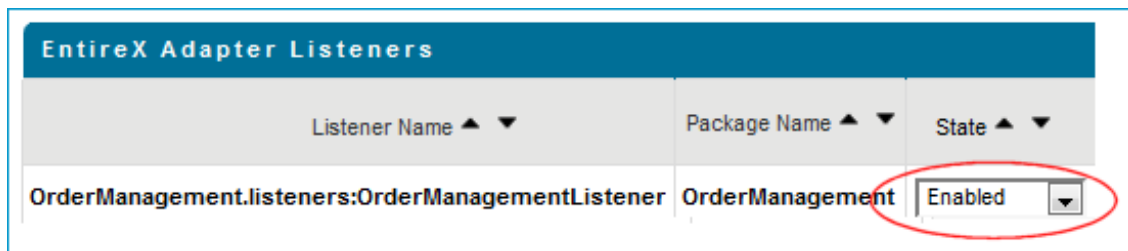
See *Using the COBOL Wrapper for IMS (z/OS)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## 6 Calling Integration Server from COBOL under z/OS IDMS/DC

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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction

---



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.





## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
  - For z/OS, see *Installing EntireX Broker under z/OS* in the z/OS Installation documentation
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Step 3: Install the Broker Stubs and Bind the Broker Stub Executables* in the z/OS Installation documentation.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

### ■ Testing the Extraction Results (Optional)

## Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

## Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

The screenshot displays the IDL Editor interface. The left pane shows the 'Results' tab with the following data:

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
<b>OrderCustomerAddress</b>	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

The right pane shows the 'OrderManagement' package structure. A red box highlights the 'placeOrder' service, with a red arrow pointing to it from the text 'Service to call from COBOL' in the left pane.

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

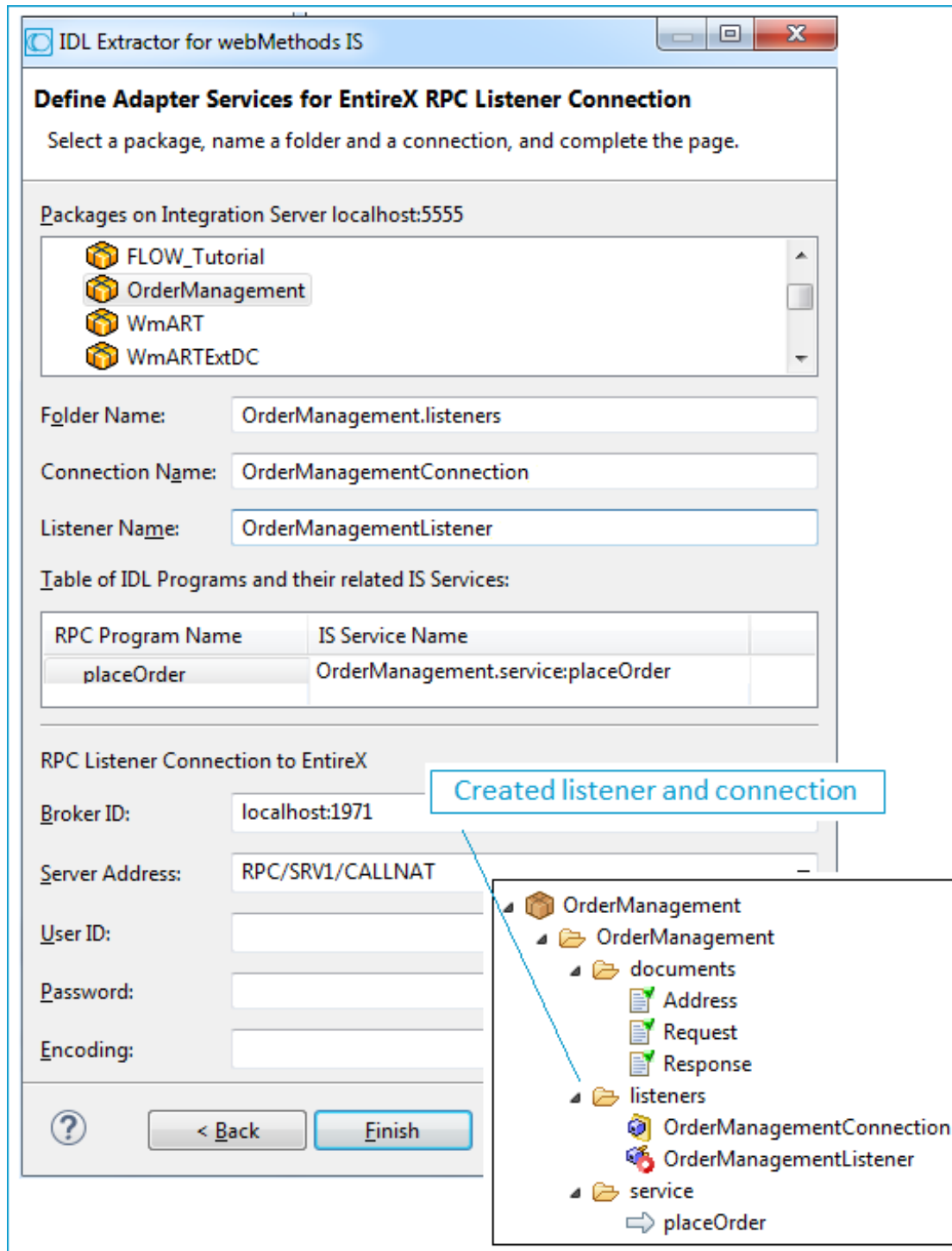
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **> To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



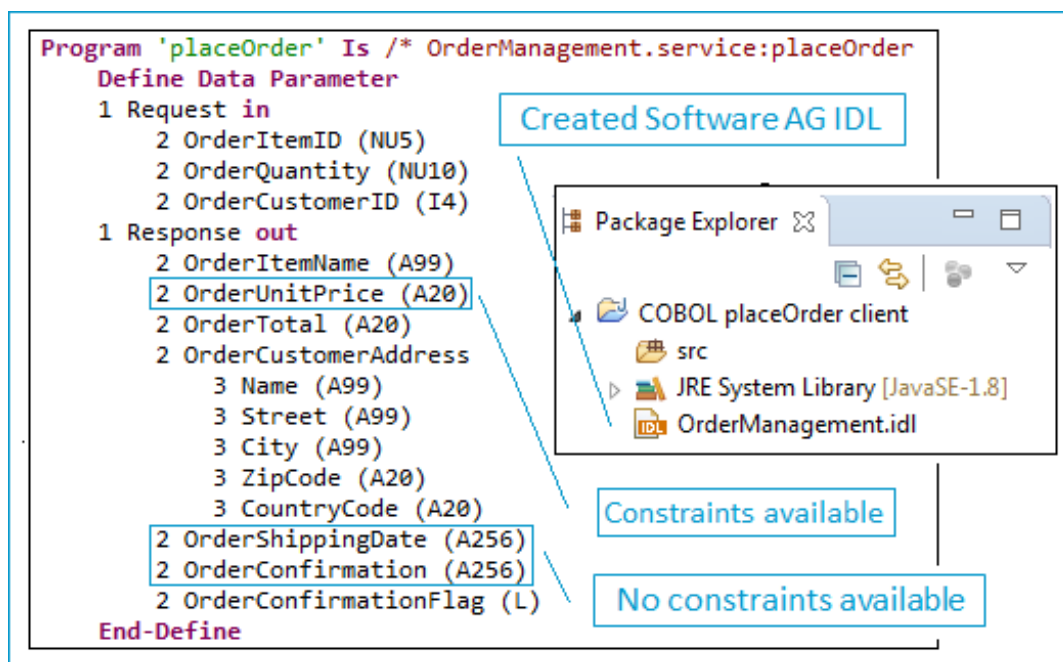
- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

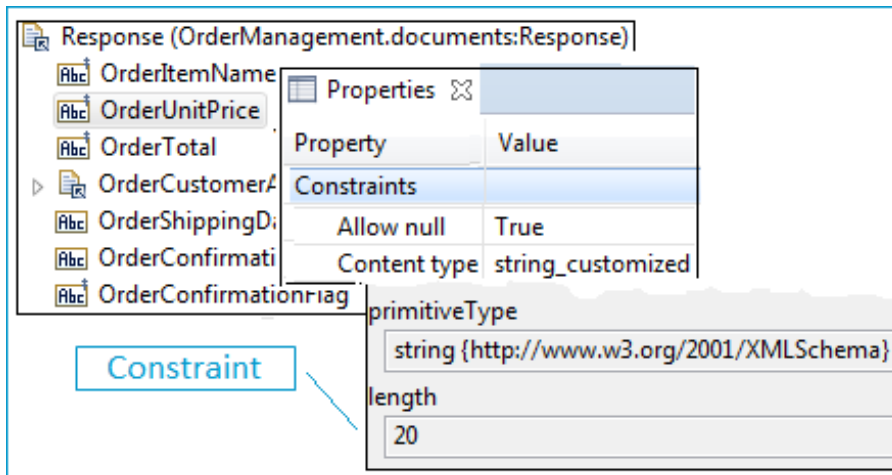
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



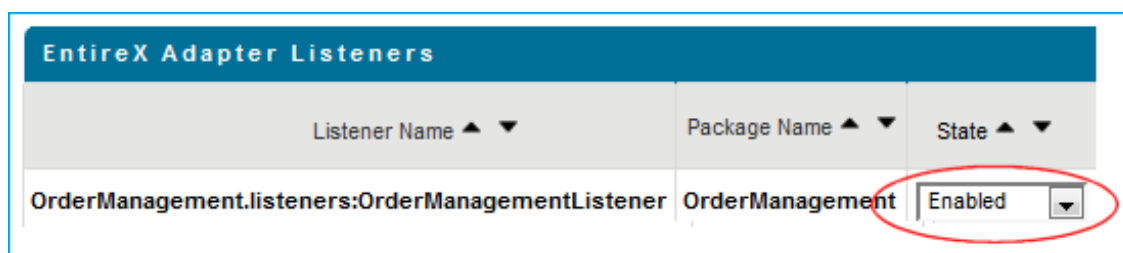
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).



- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

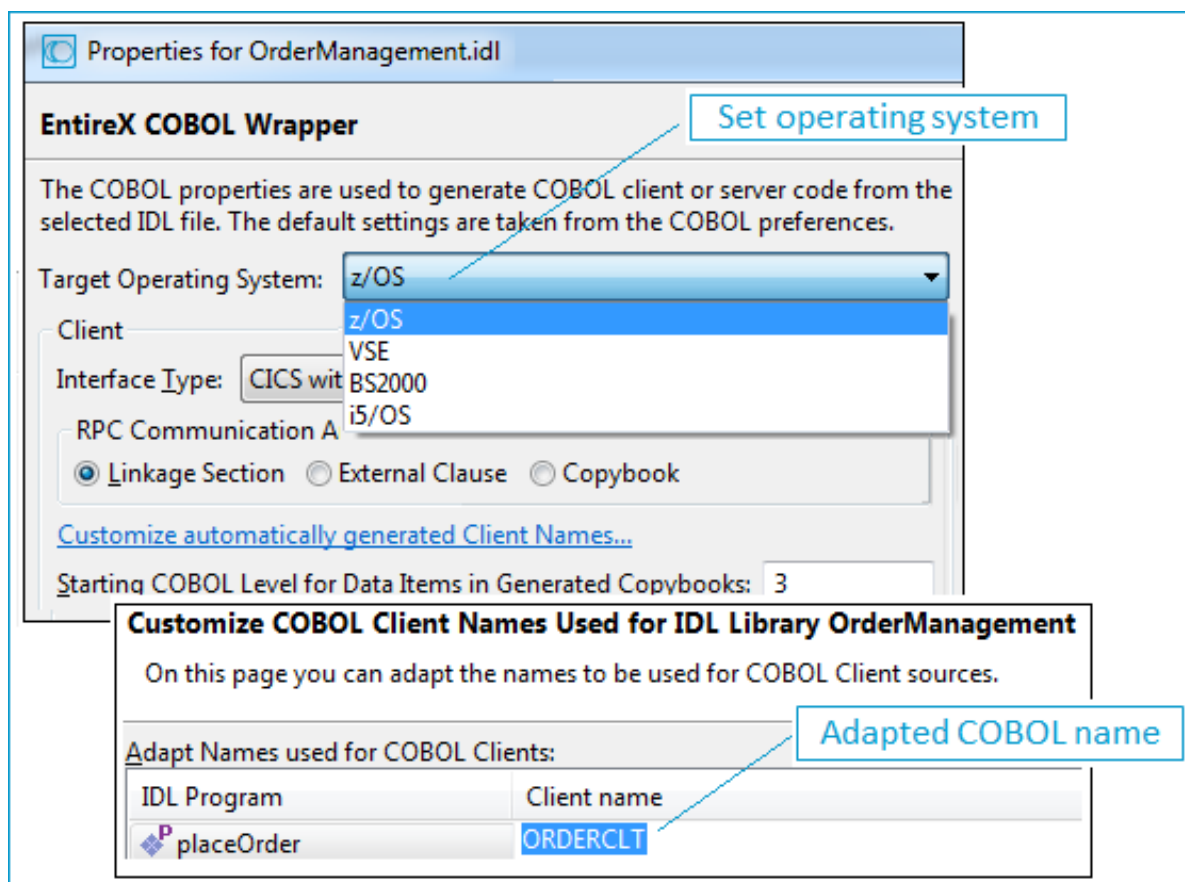
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



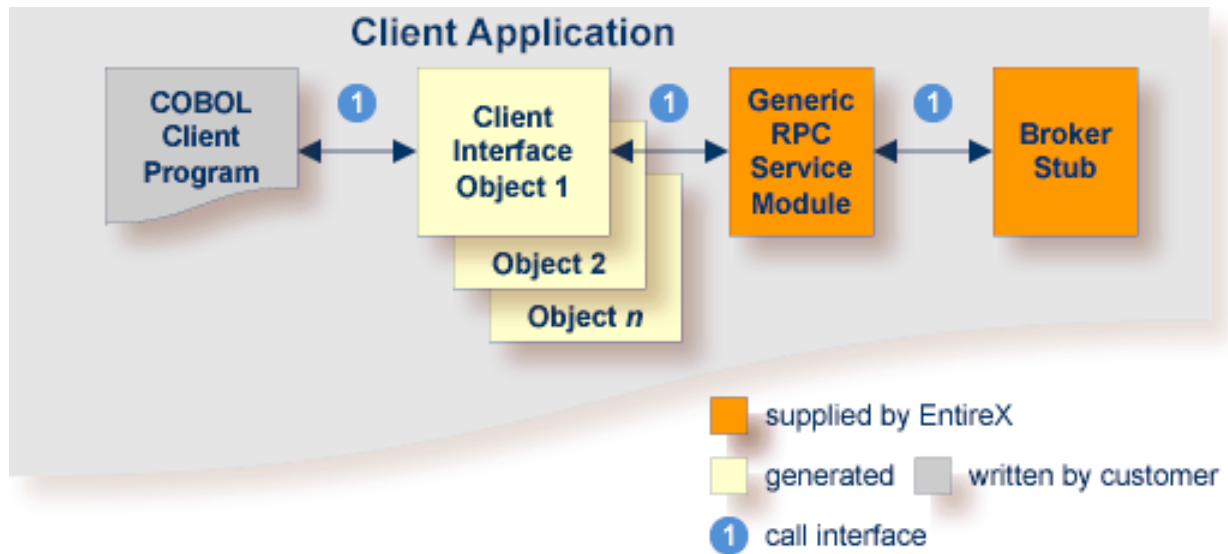
- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.



The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

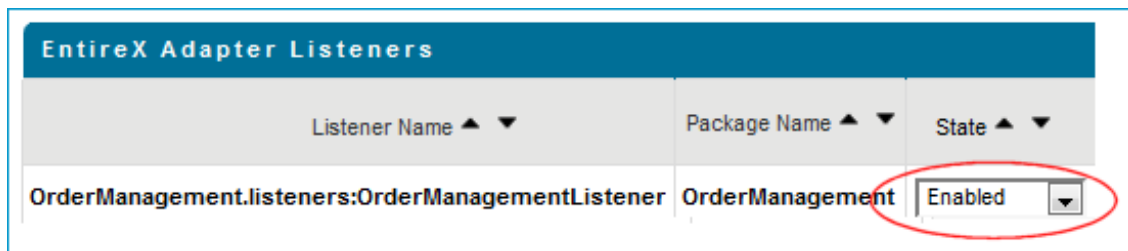
See *Using the COBOL Wrapper for IDMS/DC with Call Interfaces (z/OS)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

# 7

## Calling Integration Server from COBOL under BS2000

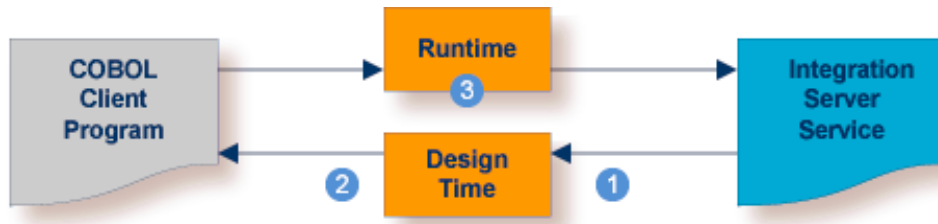
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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction

---



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.





## What do I need to Install for this Scenario?

---

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Administering Broker Stubs* in the BS2000 Administration documentation.

## Task 1: Generate Integration Server Connections and Listeners

---

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

### ■ Testing the Extraction Results (Optional)

## Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

## Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
OrderCustomerAddress	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

- 2 For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

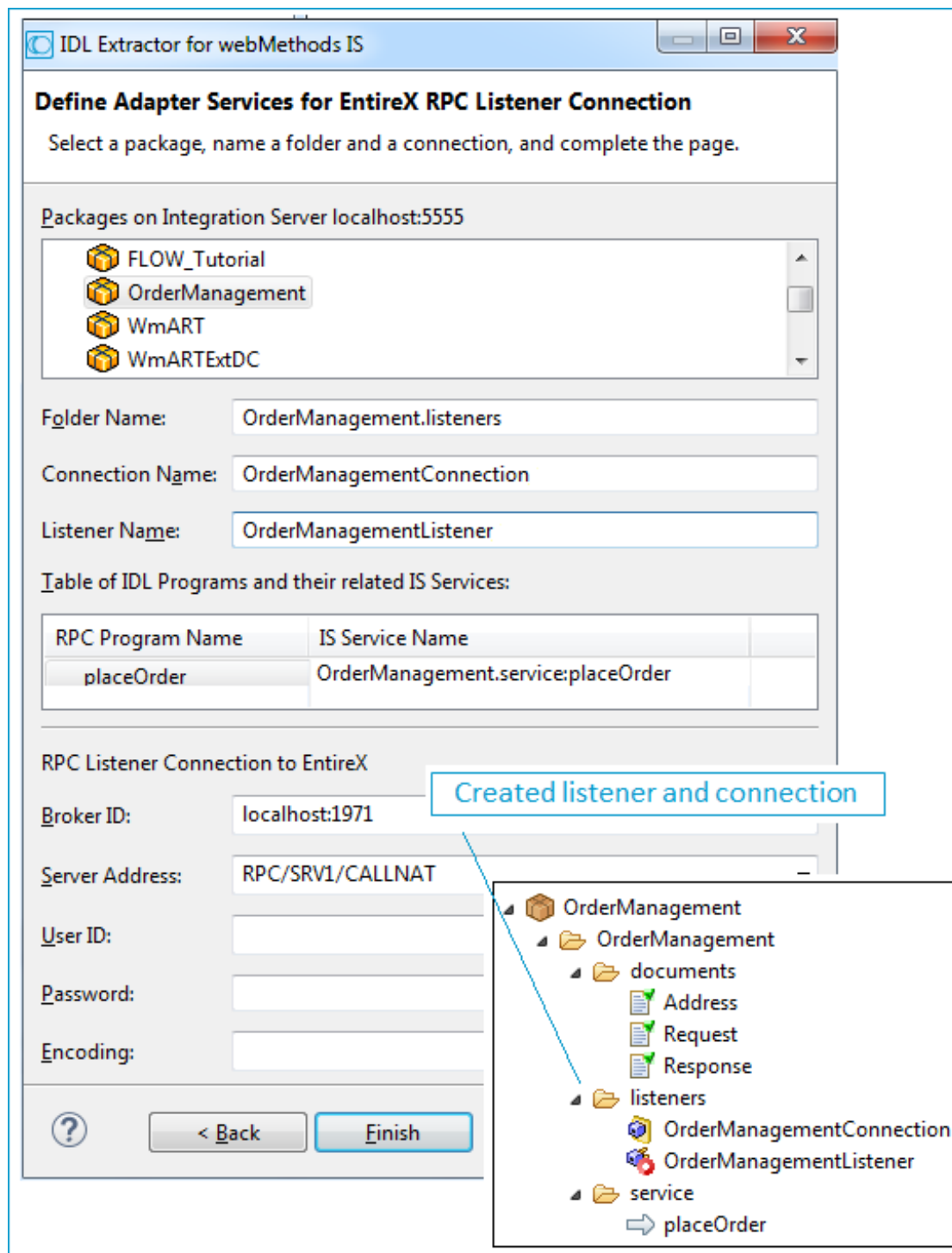
- 3 A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## Creating Listener Objects in Integration Server

### ➤ To create Listener Objects in Integration Server

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



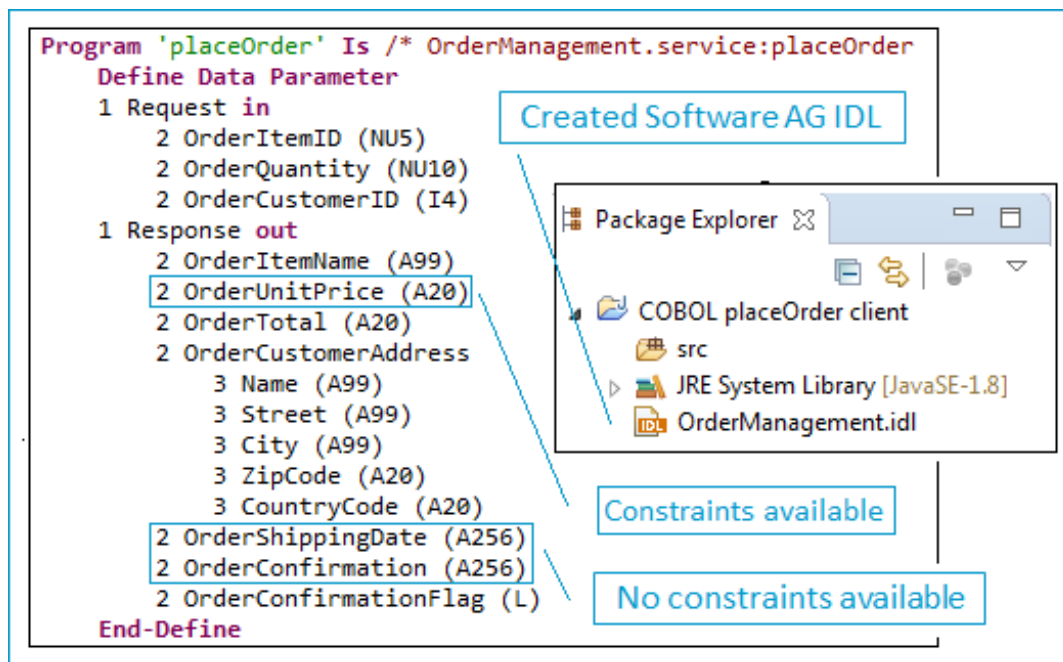
- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

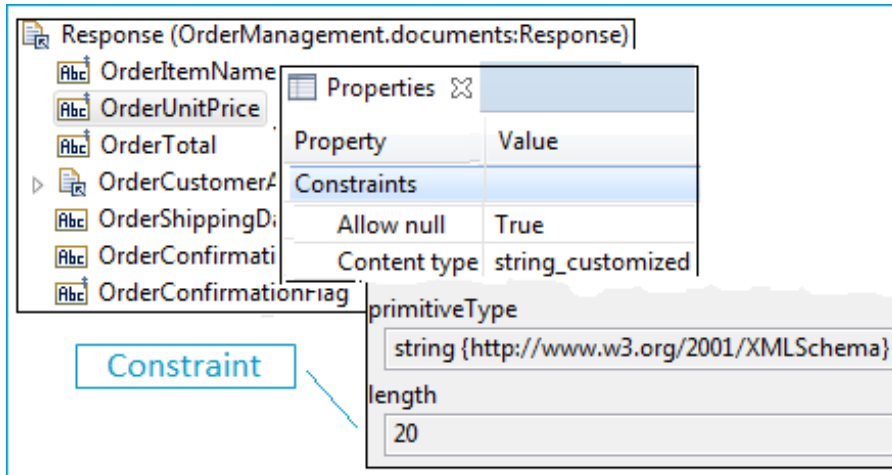
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



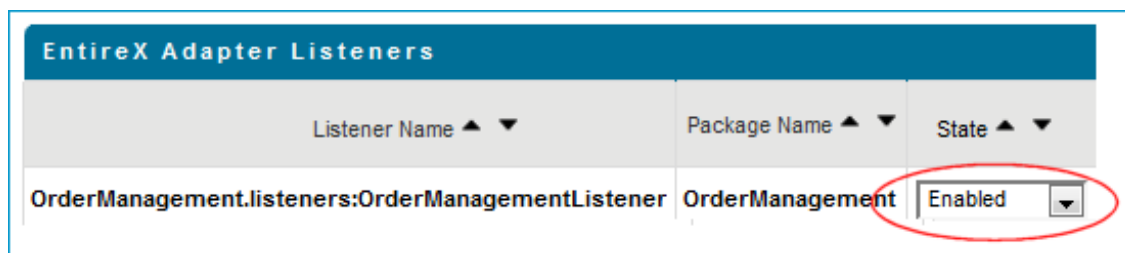
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).



- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a client application window with the following elements:

- Broker:** localhost:1971 (circled in red)
- Server:** RPC/SRV1/CALLNAT (circled in red)
- Buttons:** Call, Ping, Open Conversation, Reset, Exit
- Messages:** A scrollable text area.
- Data Table:**

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

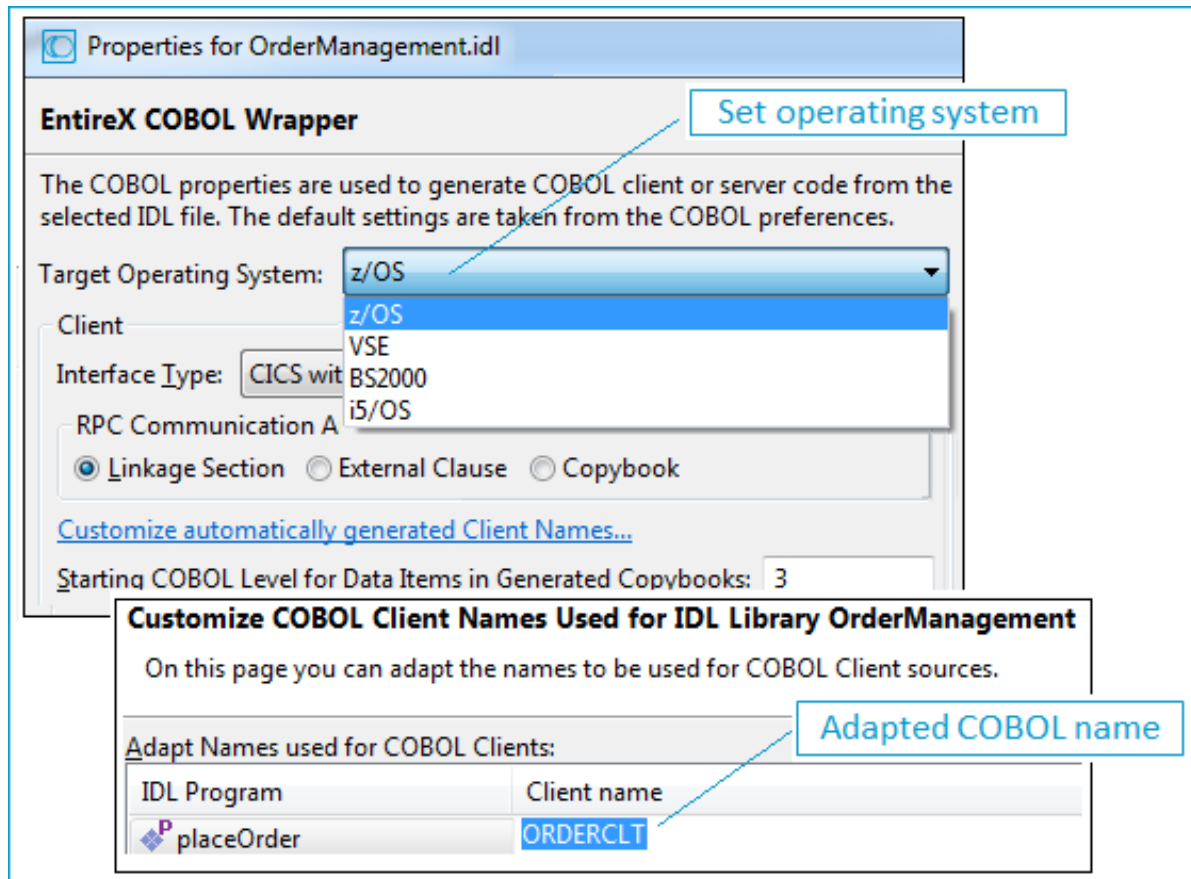
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:

The screenshot shows the Eclipse IDE with the COBOL client generation process. The main editor displays the COBOL code for *ORDERCLT*. The code is structured as follows:

```

CBL LIB QUOTE
IDENTIFICATION DIVISION.
PROGRAM-ID. ORDERCLT.

*****
*
* COBOL RPC Client Interface Object
*
* IDL L: ORDERCLT
* IDL P: *****
*
* Program: COBOL RPC Interface Copybook
* Target:
* String: IDL Library = OrderManagement
* Inter: IDL Program = placeOrder
* RPC C:
* RPC P: Copybook Name = ORDERCLT
*
* In the Target Platform = all
* ei Interface Type = all
* String Literal = QUOTE
*
* Template Source = cobol_include.tpl $Revision: 1.55 $
*
*****
*
* or
*
* Template Source = cobol_linkage.tpl
* 03 REQUEST.
* 04 ORDERITEMID PIC 9(5).
* 04 ORDERQUANTITY PIC 9(10).
* 04 ORDERCUSTOMERID PIC S9(9) BINARY.
* 03 RESPONSE.
* 04 ORDERITEMNAME PIC X(99).
* 04 ORDERUNITPRICE PIC X(20).
* 04 ORDERTOTAL PIC X(20).
* 04 ORDERCUSTOMERADDRESS.
* 05 NAME
* 05 STREET PIC X(99).
* 05 CITY PIC X(99).
* 05 ZIPCODE PIC X(20).
* 05 COUNTRYCODE PIC X(20).
* 04 ORDERSHIPPINGDATE PIC X(256).
* 04 ORDERCONFIRMATION PIC X(256).
* 04 ORDERCONFIRMATIONFLAG PIC X.

```

The Package Explorer on the right shows the project structure:

- COBOL placeOrder client
  - src
  - JRE System Library [JavaSE-1.8]
  - client
    - COBSRVI
    - ORDERCLT
  - include
    - ERXCOMM
    - ORDERCLT
  - OrderManagement.idl

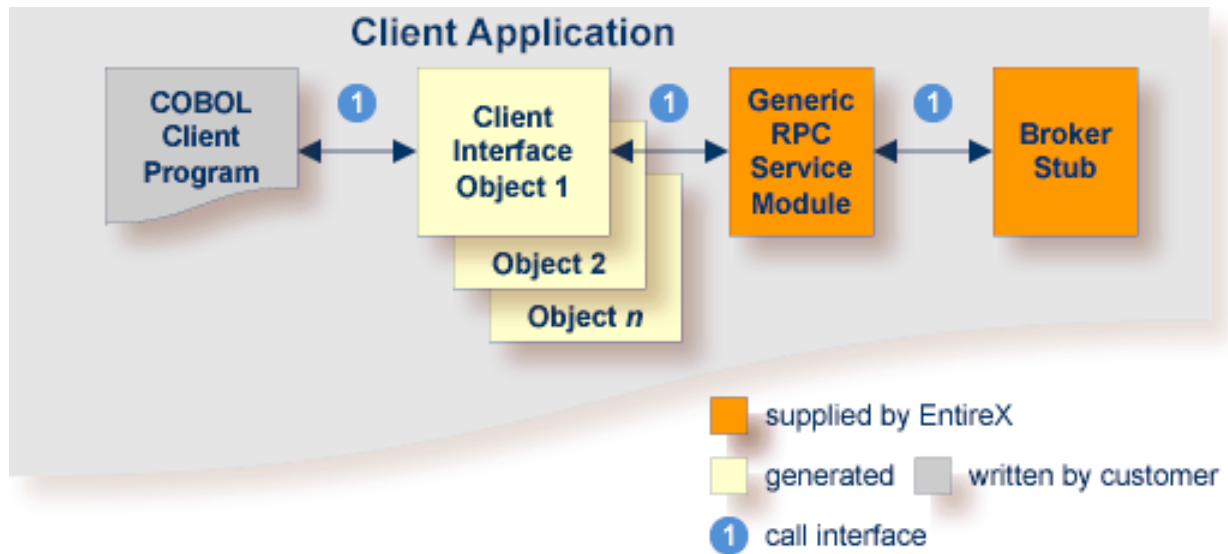
Annotations in the image point to the following elements:

- COBOL client**: Points to the *client* folder in the Package Explorer.
- Copybook**: Points to the *Copybook Name = ORDERCLT* line in the COBOL code.
- Constraints available**: Points to the table of data types and their constraints.
- No constraints available**: Points to the *ORDERSHIPPINGDATE* and *ORDERCONFIRMATION* fields, which are marked as having no constraints.

The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

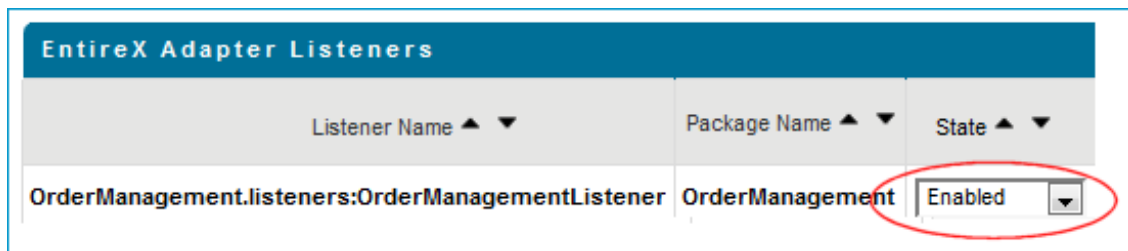
See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## 8      **Calling Integration Server from COBOL under z/VSE CICS**

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■ Task 1: Generate Integration Server Connections and Listeners .....	91
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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.





## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Administering Broker Stubs under z/VSE* in the z/VSE Administration documentation.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

## ■ Testing the Extraction Results (Optional)

### Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

### Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
<b>OrderCustomerAddress</b>	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

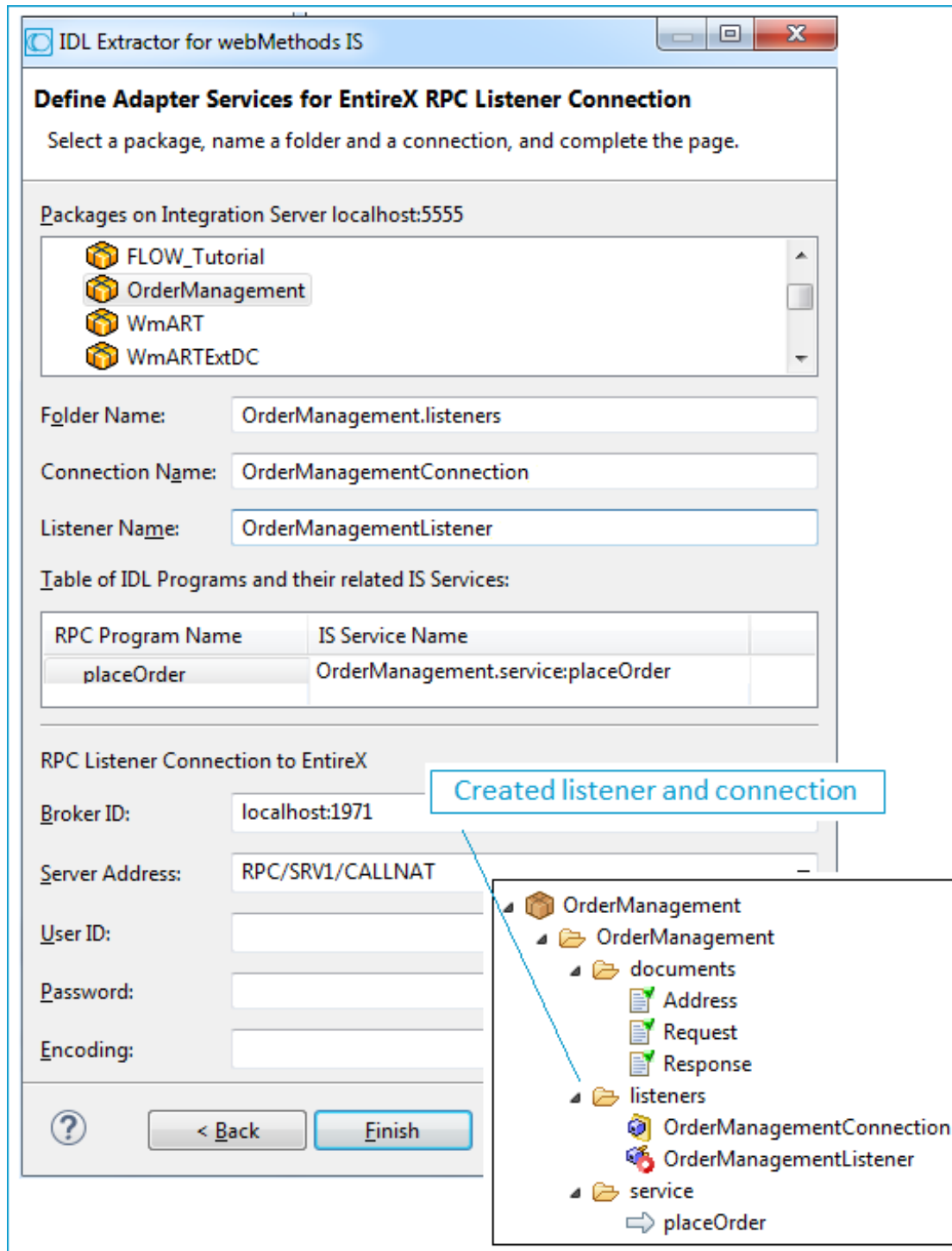
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



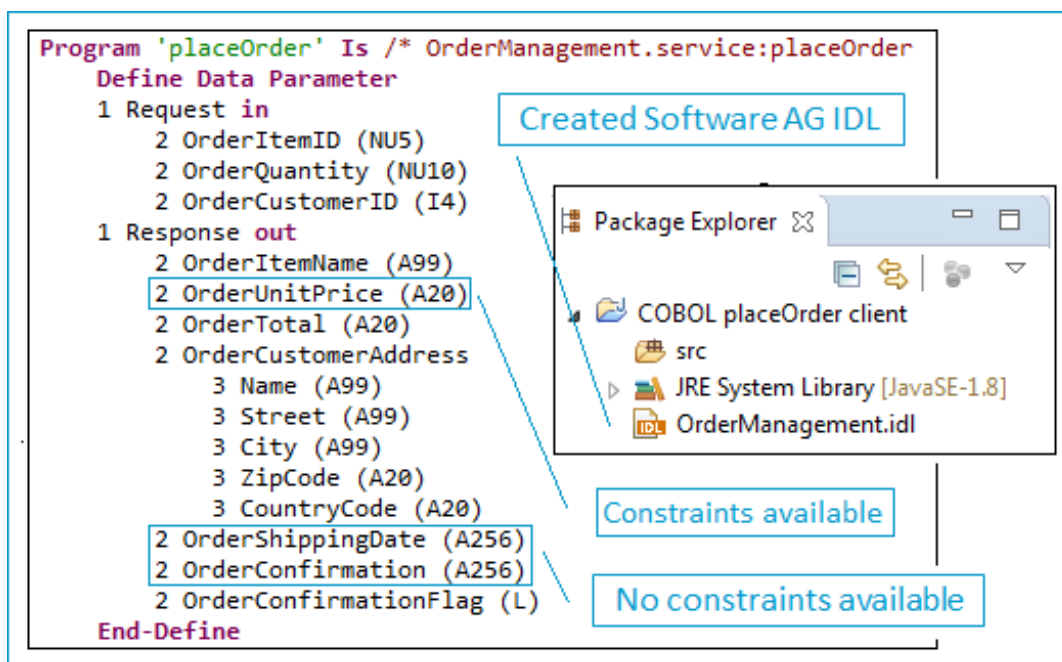
- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

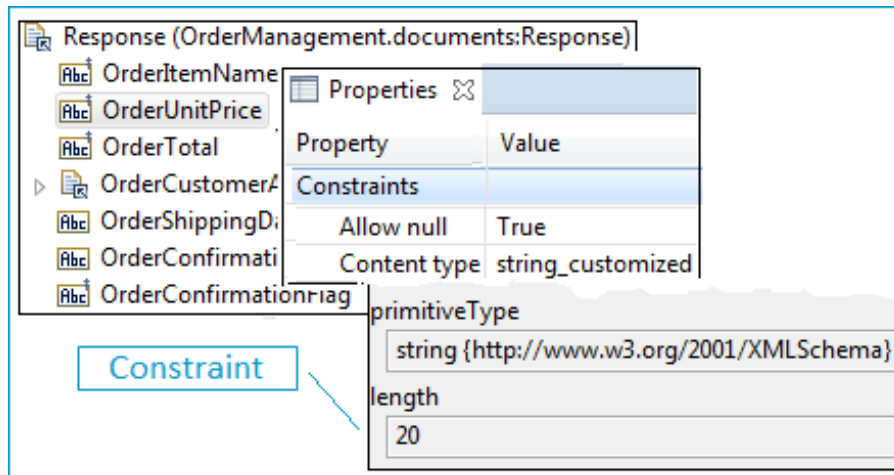
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



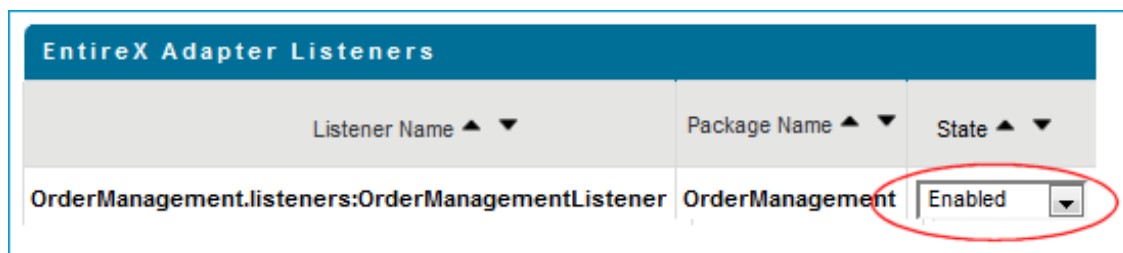
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).



- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

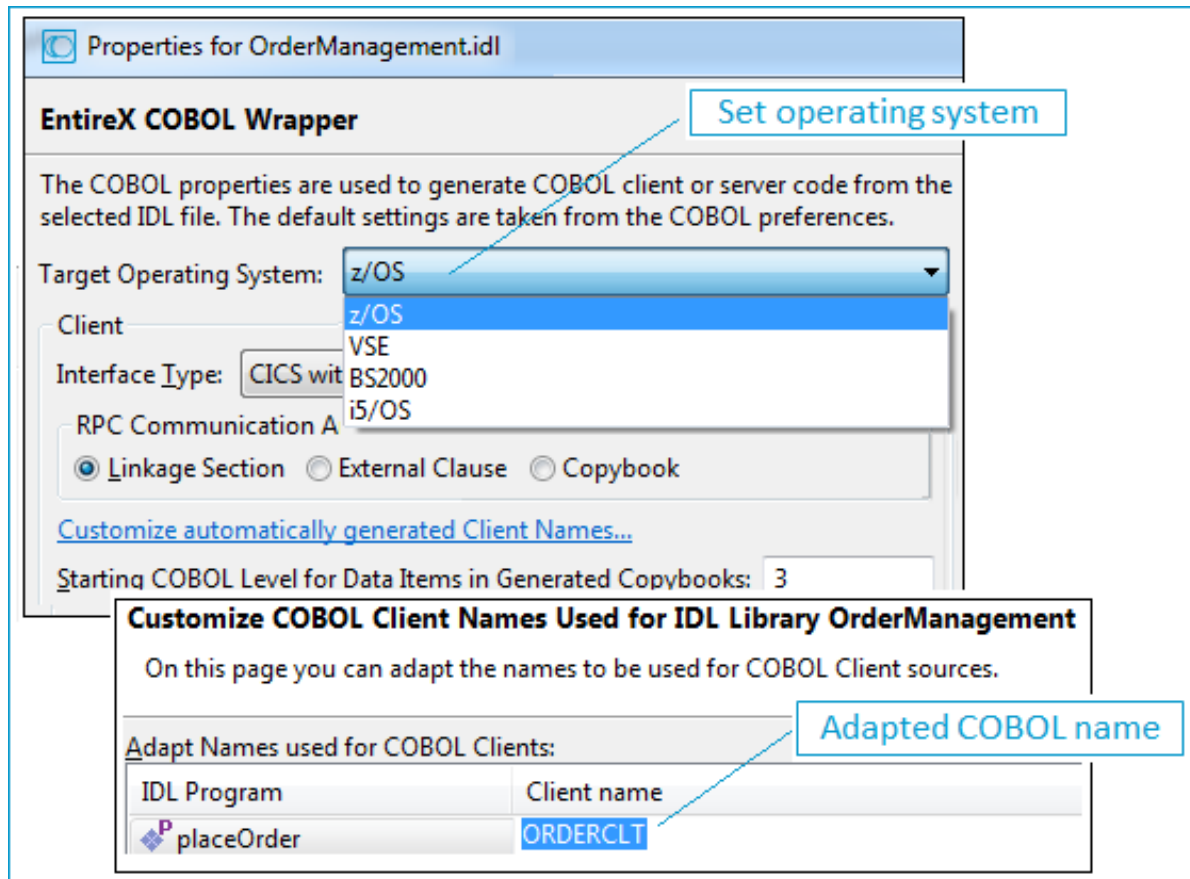
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

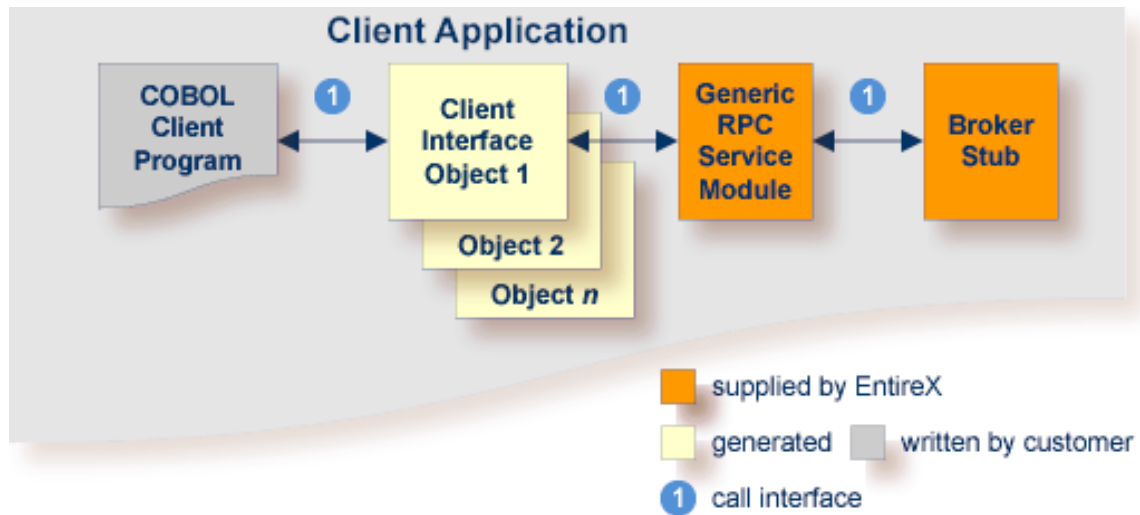
### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



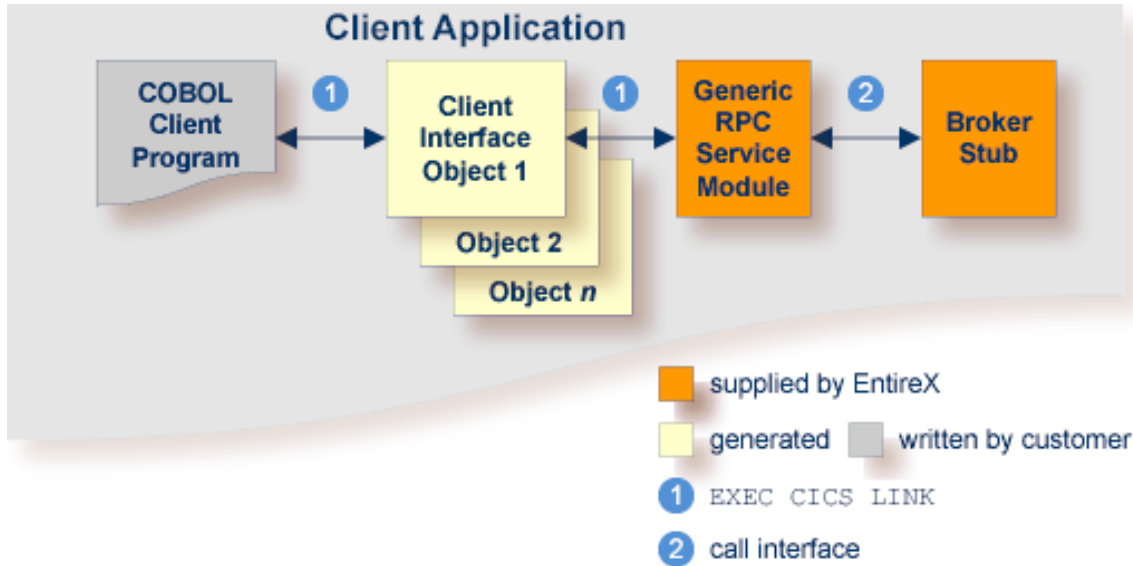
- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.
- 4 Set the appropriate interface type for the generated client interface objects to your application. The options available for CICS are Standard Linkage Calling Convention and DFHCOM-MAREA Calling Convention. These are described below.

## ■ Standard Linkage Calling Convention



The COBOL Wrapper can be used with a call interface, even in CICS. This means you can build a client application where the COBOL client program, every generated client interface object, the generic RPC services module and the broker stub are linked together, similar to the batch scenario. See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*. Using a call interface within CICS may be useful in the following situations:

- The restriction of the COMMAREA length (about 31 KB) prevents you from using the scenario *Using the COBOL Wrapper for CICS with DFHCOMMAREA Calling Convention (z/OS and z/VSE)* (see above).
  - You do *not* require a distributed program link (CICS DPL) to your client interface object(s).
  - You prefer a call interface instead of EXEC CICS LINK to your client interface objects.
- ## ■ DFHCOMMAREA Calling Convention



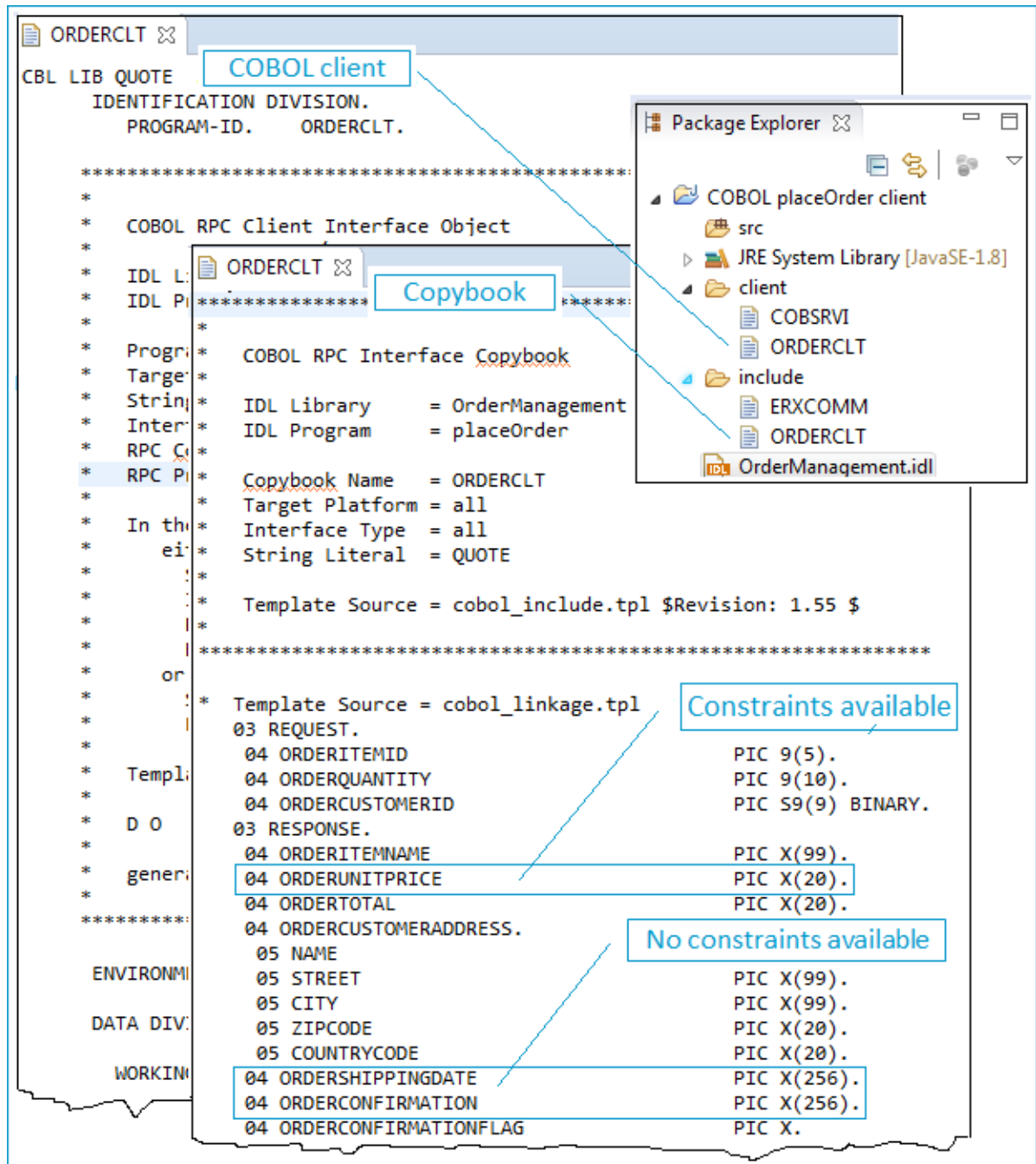
In this scenario, the generic RPC services module and the broker stub are linked together to a CICS program. The COBOL client program, every generated client interface object and the generic RPC services module together with the broker stub are installed each as separate individual CICS programs. Use the COBOL Wrapper with this calling convention in the following situations:

- You want to have an EXEC CICS LINK DFHCOMMAREA interface to your client interface object(s).
- The restriction of the COMMAREA length suits your purposes. Because the RPC communication area is also transferred in the COMMAREA, the effective length that can be used for IDL data is shorter than the CICS COMMAREA length. Nearly 31 KB can be used for IDL data.
- You wish to separate the generic RPC service module and the broker stub from the client interface object(s).
- You require a program link to the client interface object(s).

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:



The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However,

this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application

Depending on the chosen interface type of your client interface objects (CICS with Standard Linkage Calling Convention or CICS with DFHCOMMAREA Calling Convention under *Setting Generation Options (Properties) for the COBOL Wrapper*, refer to

- *Using the COBOL Wrapper for CICS with Call Interfaces (z/OS and z/VSE)*
- *Using the COBOL Wrapper for CICS with DFHCOMMAREA Calling Convention (z/OS and z/VSE)*

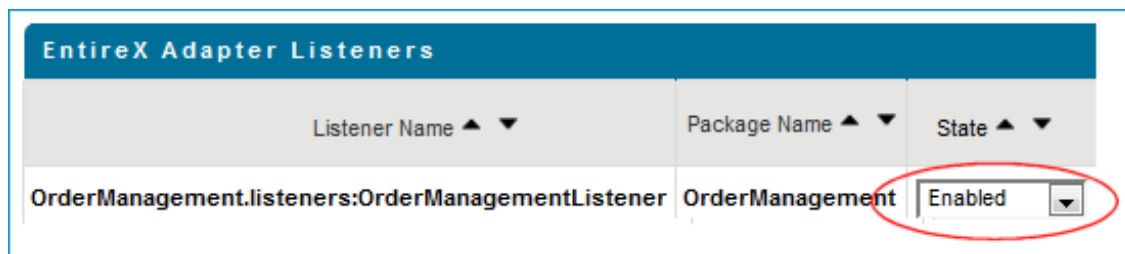
## Task 3: Execute the Call from COBOL to Integration Server

---

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971 Server: RPC/SRV1/CALLNAT

Call Ping Open Conversation Reset Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW 19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true





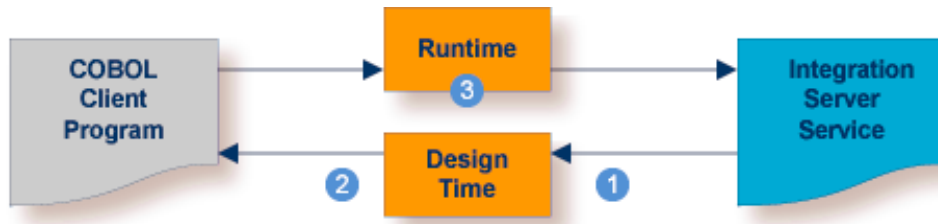
## 9      **Calling Integration Server from COBOL under z/VSE Batch**

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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.



## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Administering Broker Stubs under z/VSE* in the z/VSE Administration documentation.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

## ■ Testing the Extraction Results (Optional)

### Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

### Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

The screenshot displays the IDL Editor interface. The left pane shows the 'Results' tab with the following data:

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
<b>OrderCustomerAddress</b>	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

The right pane shows the 'OrderManagement' package structure. A red box highlights the 'placeOrder' service, with a red arrow pointing to it from the text 'Service to call from COBOL' in the left pane.

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

**Extract IDL from the selected package**

Select the package (source), specify the container and file name (target) and choose the mapping.

**Source (Integration Server)**  
 Packages on Integration Server localhost:5555

- OrderManagement
- WmEntireX
- WmFlatFile
- WmIExtDC

**Target (Eclipse Workspace)**  
 Container: COBOL placeOrder client Browse...  
 IDL File Name: OrderManagement

Optimize extracted IDL for usage with: COBOL

Map Integration Server data type to IDL

- ☐ alphanumeric with variable length
- ☒ alphanumeric with fixed length of 256

Used if no constraints available

☒ Create Listener Objects in Integration Server

? < Back Next > Finish Cancel

- For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

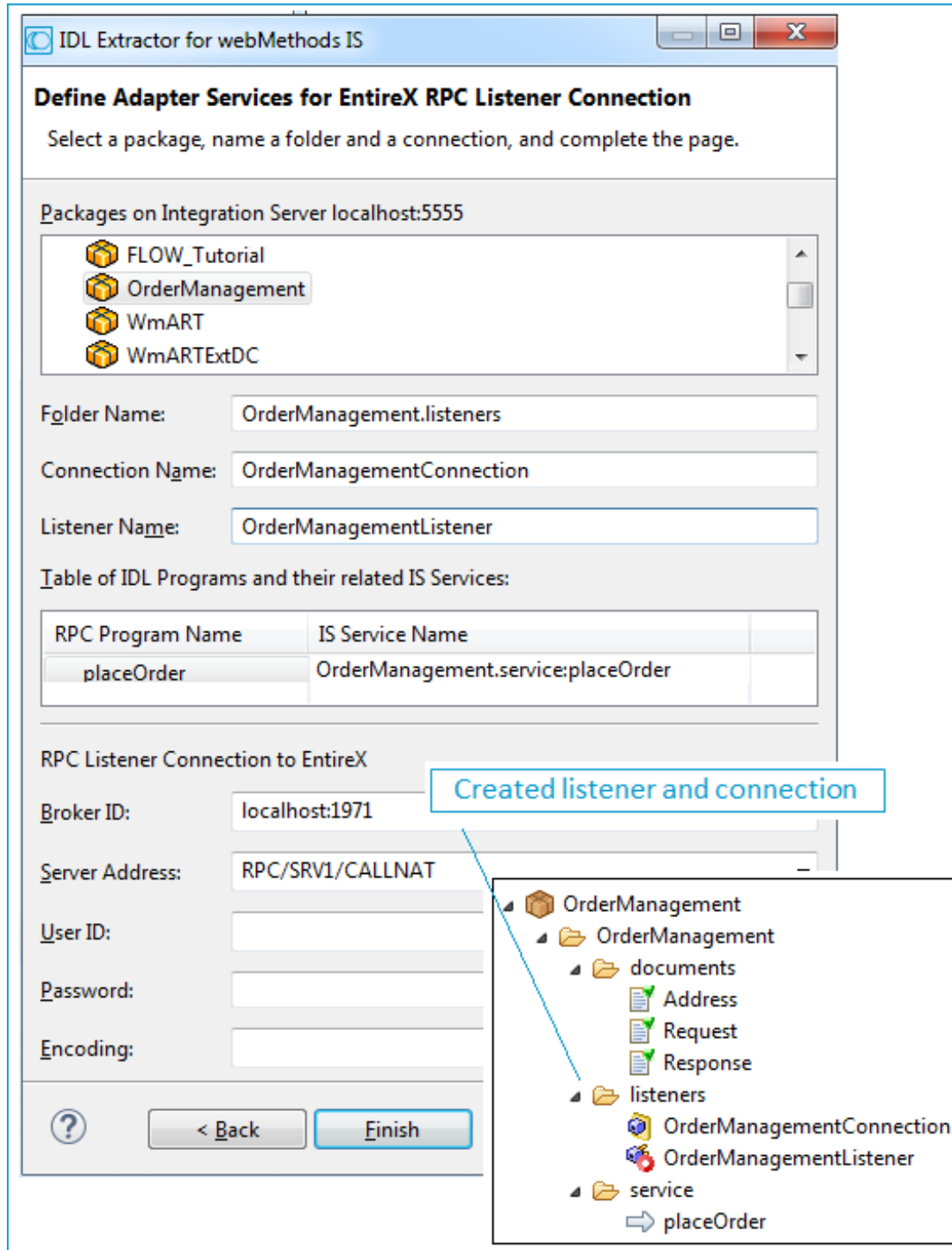
- A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

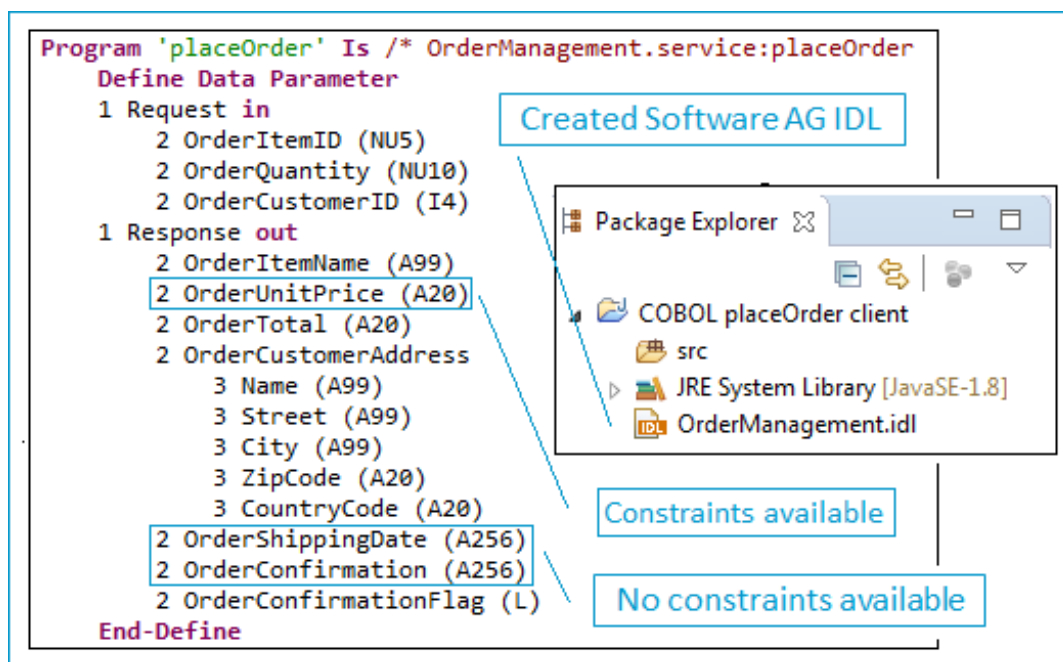


- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

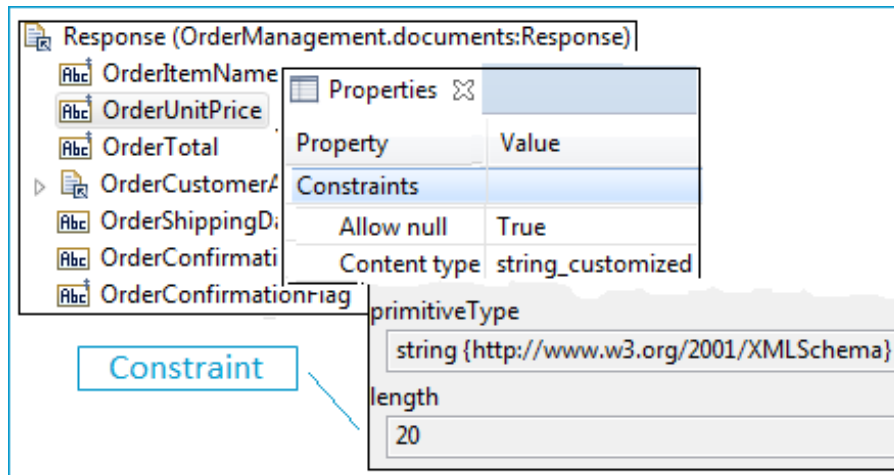
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



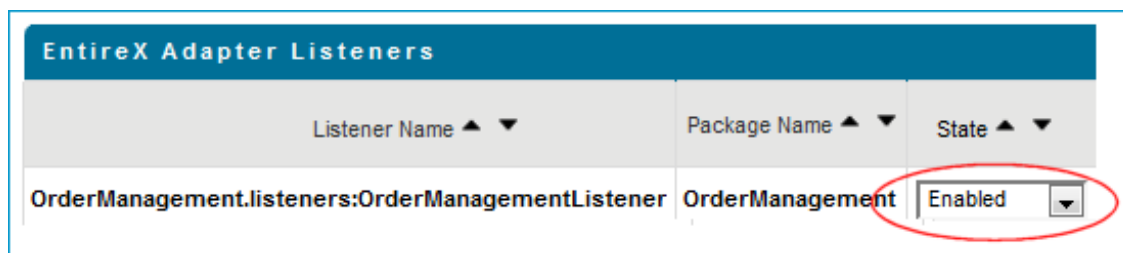
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).

- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

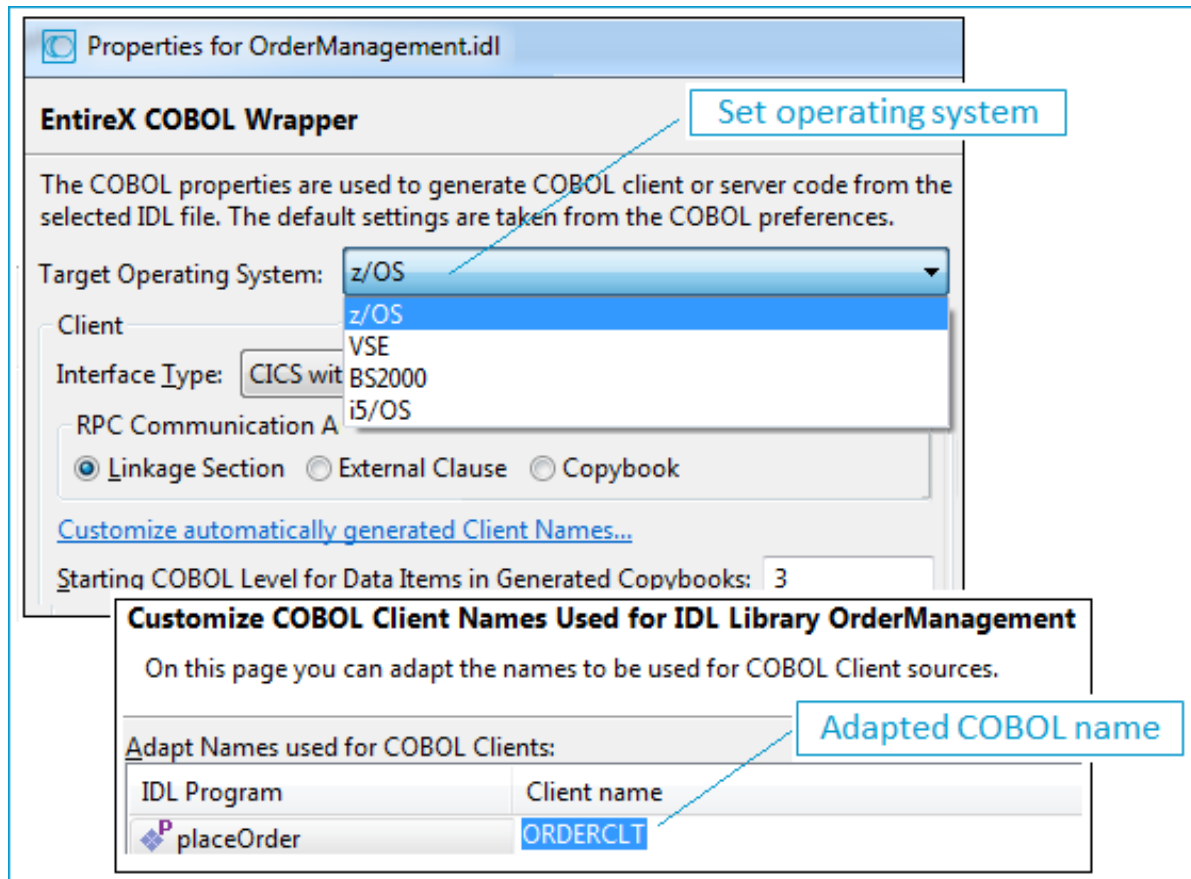
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.

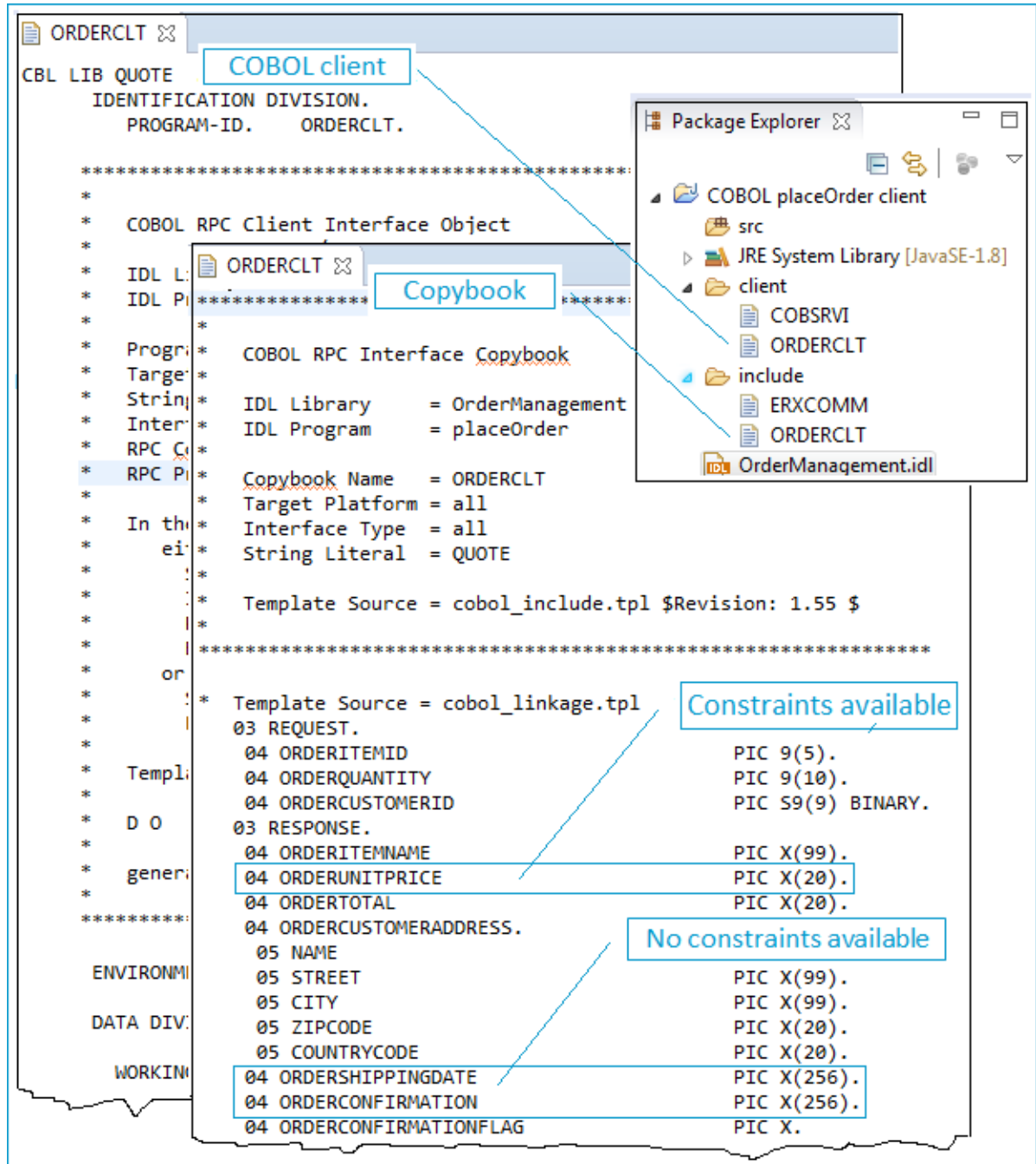


- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.

## Generating COBOL Code

➤ To generate COBOL code

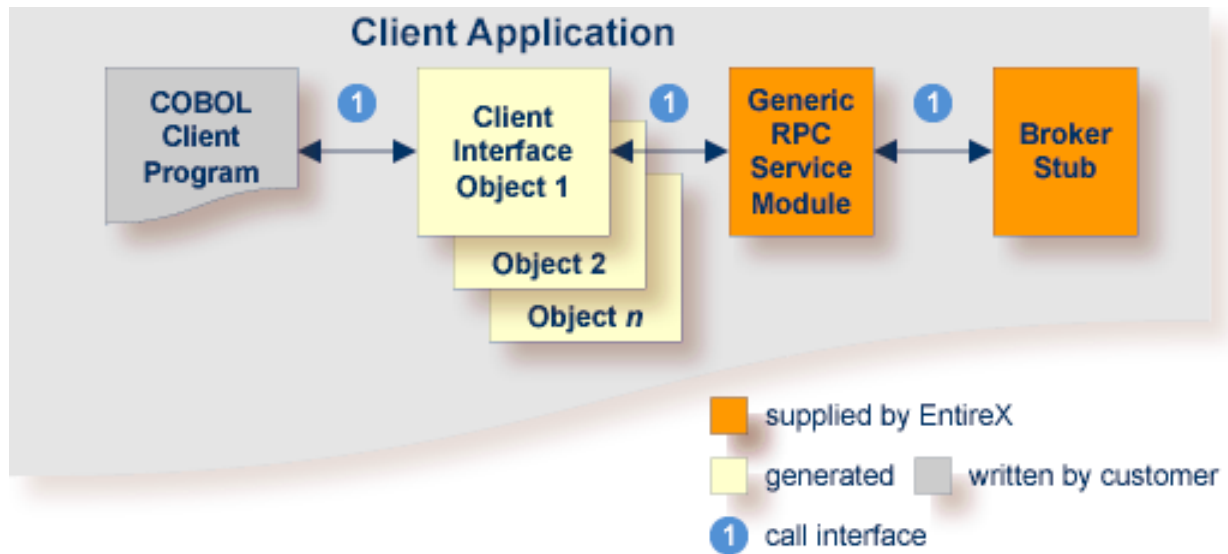
- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:



The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

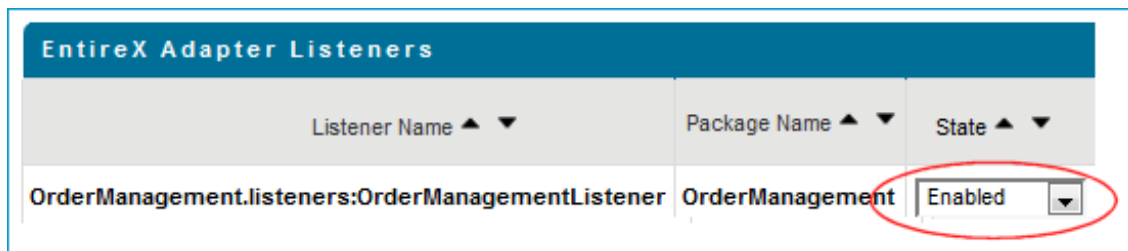
See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

Broker: localhost:1971      Server: RPC/SRV1/CALLNAT

Call   Ping   Open Conversation   Reset   Exit

Messages

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true



# 10

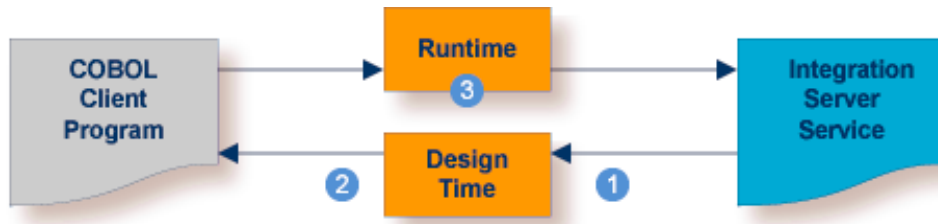
## Calling Integration Server from COBOL under IBM i

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This scenario uses the tools IDL Extractor for Integration Server and COBOL Wrapper of the Designer.

## Introduction



- 1 Use IDL Extractor for Integration Server to generate Integration Server connections and listeners from the Integration Server service to be called.
- 2 Generate client interface objects and build COBOL client application.
- 3 Execute the call from the COBOL client to the Integration Server service.

This scenario makes the following important assumptions:

For Task 1:

- You have a working Integration Server Service that you want to call from COBOL.

For Task 3:

- You can call the Integration Server service at runtime using different methods:
  - For the EntireX RPC connection method you need EntireX Broker on one of the supported platforms: z/OS | Linux | Windows | BS2000.



- For the EntireX Direct RPC connection method there are no additional prerequisites.



## What do I need to Install for this Scenario?

- You have Software AG Designer installed with EntireX plugins and Service Development plugins.
  - For EntireX plugins, see *Designer > EntireX Designer* under *EntireX Installation Packages* in the General Installation documentation.
  - For Service Development plugins, refer to the Integration Server documentation.
- You have an Integration Server with EntireX Adapter installed. See *Adapters > EntireX Adapter* under *EntireX Installation Packages* in the General Installation documentation.
- Optionally, for RPC Connection method (Task 3), you have an EntireX Broker installed.
  - For Linux and Windows, see *EntireX Broker* under *EntireX Installation Packages* in the General Installation documentation.
- On the machine where the COBOL client program is executed, you have the Broker stubs installed. See *Installing EntireX under IBM i*.

## Task 1: Generate Integration Server Connections and Listeners

This section covers the following topics:

- [Introduction](#)
- [Sample webMethods IS Service](#)
- [Extracting the Interface of the webMethods IS Service](#)
- [Creating Listener Objects in Integration Server](#)
- [Viewing the Extracted IDL](#)

### ■ Testing the Extraction Results (Optional)

## Introduction

Follow the instructions for extracting a webMethods Integration Server (IS) service under *Using the IDL Extractor for Integration Server*.

This process creates the following EntireX metafiles:

- an IDL file, containing definitions of the interface between client and server; see *Software AG IDL File* in the IDL Editor documentation in the IDL Editor documentation
- a webMethods IS Connection
- a webMethods IS Listener, depending on connection type. See *Listeners* in the EntireX Adapter documentation.

Connection types are described under *Creating Listener Objects in Integration Server*.

## Sample webMethods IS Service

Imagine that a new order management system is being developed with webMethods Integration Server in your organization. A package *OrderManagement* with flow service is provided. From your existing COBOL application you would like to call the flow service *placeOrder* on the IS.

Results [localhost:5555] OrderManagement.service:placeOrder

Name	Value
<b>Request</b>	
OrderItemID	45
OrderQuantity	18
OrderCustomerID	234
<b>Response</b>	
OrderItemName	tennis racquet
OrderUnitPrice	79.89 GBP
OrderTotal	1438.02 GBP
OrderCustomerAddress	
Name	The All England Lawn Tennis Club (Championships) Limited
Street	Church Road
City	Wimbledon London
ZipCode	SW19 5AE
CountryCode	UK
OrderShippingDate	Your order will be shipped on Mo, Jul 4, 2016.
OrderConfirmation	Your order is confirmed.

Service to call from COBOL

OrderManagement

- OrderManagement
  - documents
    - Address
    - Request
    - Response
  - service
    - placeOrder
- WmEntireX
- WmFlatFile
- WmISExtDC

The following input is required:

- ID of the item to be ordered (*OrderItemID*)
- a quantity (*OrderQuantity*)
- customer ID *OrderCustomerID*)

The following output is returned:

- item name (*OrderItemName*)
- unit and total price (*OrderUnitPrice* and *OrderTotal*)
- etc.

### Extracting the Interface of the webMethods IS Service

First create a project in Designer. This project is the container into which all extracted and generated EntireX artifacts are placed. Name this project *COBOL placeOrder client*.

#### ➤ To start the IDL Extractor for Integration Server

- 1 Switch to the EntireX perspective.
- 2 Invoke the IDL Extractor for webMethods IS, which is a New Wizard in Eclipse. From the **File** menu, choose **New**. Select IDL Extractor for webMethods IS in the following page.

Or:

Choose **New** from the toolbar or context menu of a view showing resources.

Or:

Press **Ctrl-N** to start the selection of the New Wizards.

- 3 If you are using the wizard for the first time without any predefined Integration Server connections, enter the TCP/IP address of the webMethods IS to extract from. Otherwise select the connection to the Integration Server.
- 4 Press **Next**.

#### ➤ To extract the IDL from the selected package

- 1 Under **Source (Integration Server)**, select the package you want to extract from.

- 2 For **Target (Eclipse Workspace)**, specify project *COBOL placeOrder client*. Extraction results will be placed in this container. You can keep the **IDL File Name** as it has been derived from the package name by default. Since COBOL is your desired endpoint, select **Optimize extracted IDL for usage with: COBOL**.



**Note:** COBOL only supports fixed-length data items, whereas webMethods IS has variable length types, often without any length restrictions (constraints). Parameters with no specified constraints will take the default fixed length. You can specify this default in field alphanumeric with fixed length. Use 256 for this example. You can see the effect of this default under [Viewing the Extracted IDL](#).

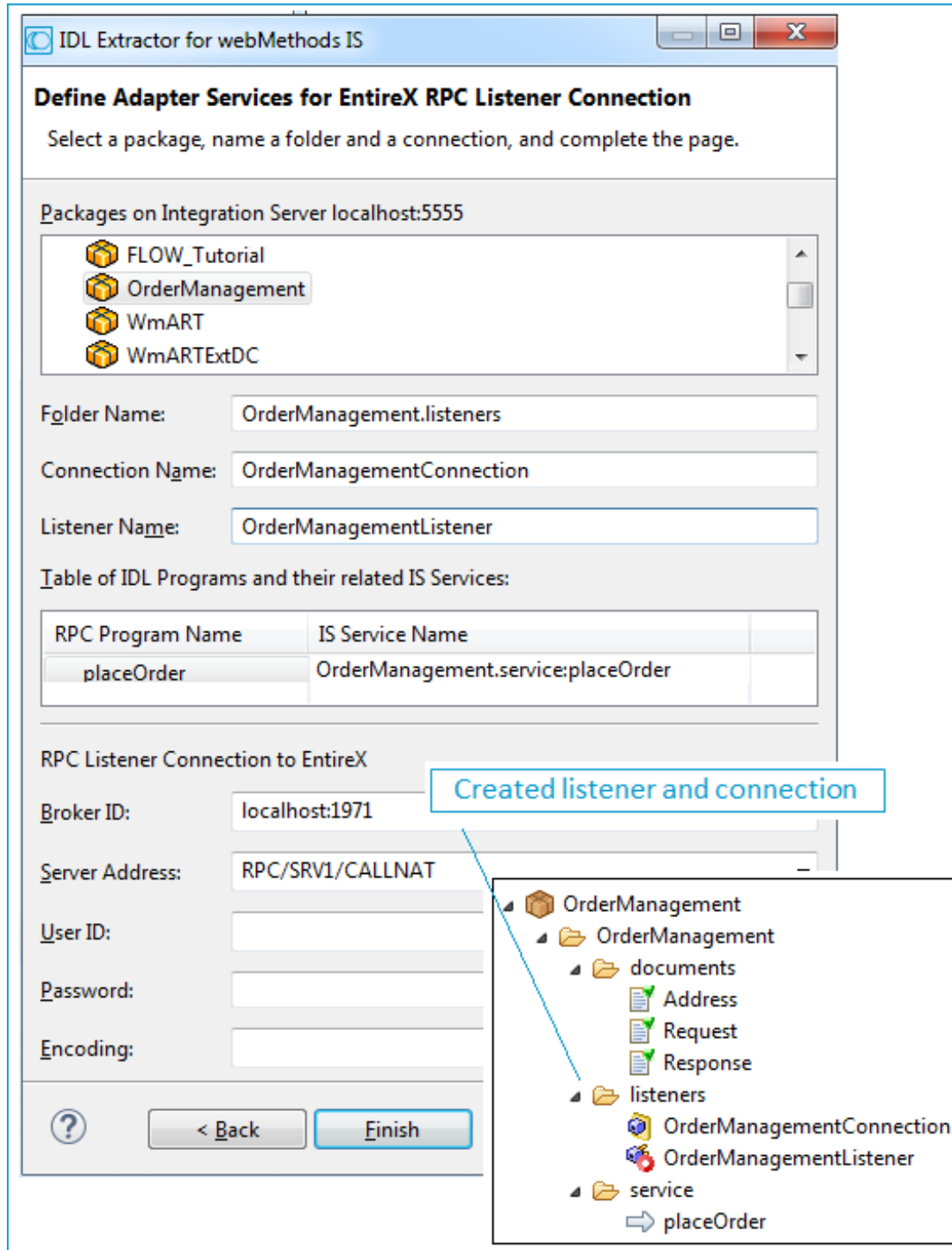
- 3 A listener is required for calling webMethods IS from an RPC client, so check **Create Listener Objects in Integration Server**.

4 Press **Next**.

## **Creating Listener Objects in Integration Server**

### **➤ To create Listener Objects in Integration Server**

- 1 Select a Listener connection type used for inbound connection to the Integration Server.
  - An EntireX RPC Listener connection is the standard way and is always available.
  - If your interface contains only In parameters, an EntireX Reliable RPC Listener connection is available.
  - If it is enabled by the license for the webMethods Integration Server:
    - an EntireX Direct RPC Listener connection is available
    - if your interfaces contain only In parameters, an EntireX Direct Reliable RPC Listener connection is available



- On this page, you set the properties for the listener objects to create; these objects will wait for the incoming COBOL requests. Select the package and specify the folder name into which the listener is generated. If the folder does not exist, it will be created automatically.

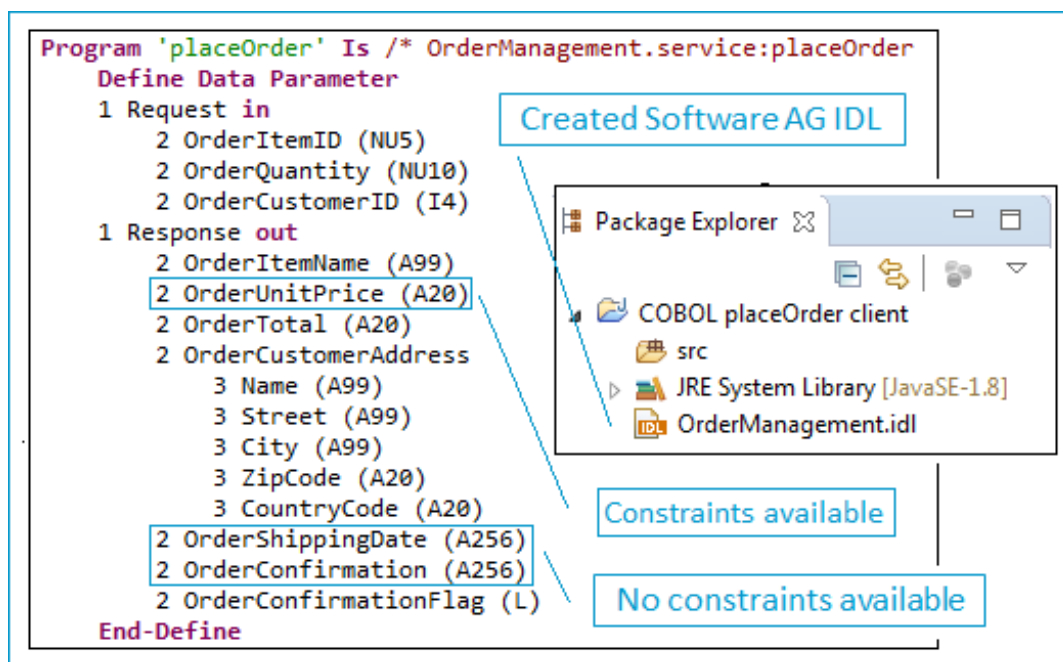


- 3 Keep the defaults given for **RPC Listener Connection to EntireX**. The **Broker ID** is a TCP/IP or SSL/TLS address and **Server Address** is an EntireX-specific namespace to locate a target server (here: *OrderManagementListener*).
- 4 When creating a connection, a package dependency is added such that the selected package depends on webMethods EntireX (the package WmEntireX) with the version currently used.
- 5 Press **Finish**. The listener and the connection appear in the package navigator. For the package navigator, switch to the service development perspective by choosing **Window > Perspective > Open Perspective > Service Development**.

## Viewing the Extracted IDL

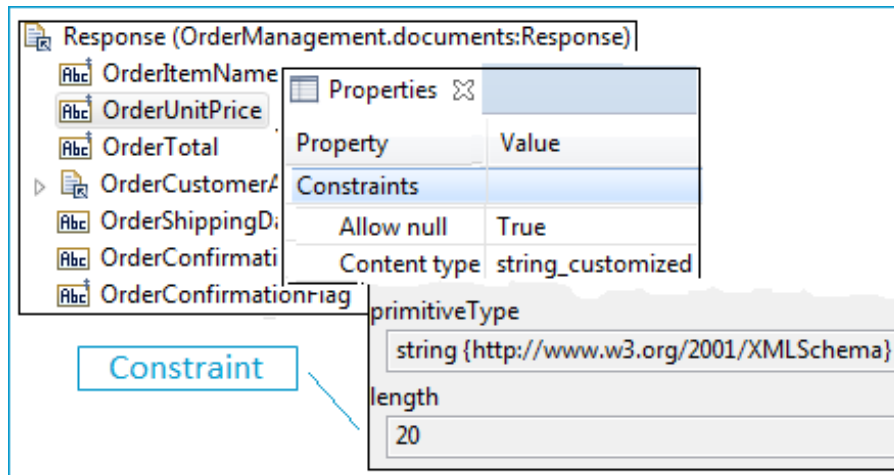
### ➤ To view the extracted the IDL

- The Software AG IDL is saved in the target Eclipse workspace as selected: container *COBOL placeOrder client* and IDL file *OrderManagement.idl*:



The IDL *placeOrder* is a description of the interface of the flow service *placeOrder*. See [Sample webMethods IS Service](#) above.

Parameters with no constraints specified are given the specified default length of 256. At runtime, if concrete business data fits into the length given (either by constraint or by default), then you are on the safe side. However, if the runtime data length exceeds the data field length, then you will not be able to transport the full data length. Therefore you have to choose both the data length constraints and the default carefully. See also note under [To extract the IDL from the selected package](#) above.



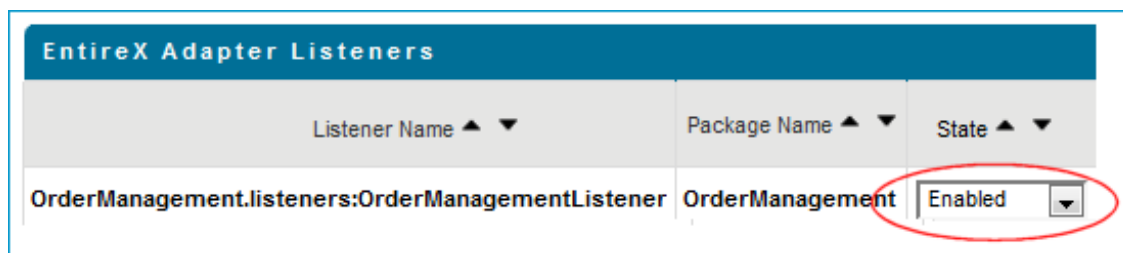
For more information on data type mapping, see *Mapping Integration Server Data Types to IDL* in the IDL Extractor for Integration Server documentation.

### Testing the Extraction Results (Optional)

You can test the results of the extraction and the server back end, using the EntireX IDL Tester.

#### > To test the extraction results

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.
- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).

- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a client application window. At the top, there are two text input fields: "Broker:" with the value "localhost:1971" and "Server:" with the value "RPC/SRV1/CALLNAT". Both fields are circled in red. Below these fields are five buttons: "Call" (highlighted with a dashed border), "Ping", "Open Conversation", "Reset", and "Exit". Below the buttons is a "Messages" section with a scrollable list box. Below the list box is a table with two columns. The table contains the following data:

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true

## Task 2: Generate Client Interface Objects and Build Client Application

This section covers the following topics:

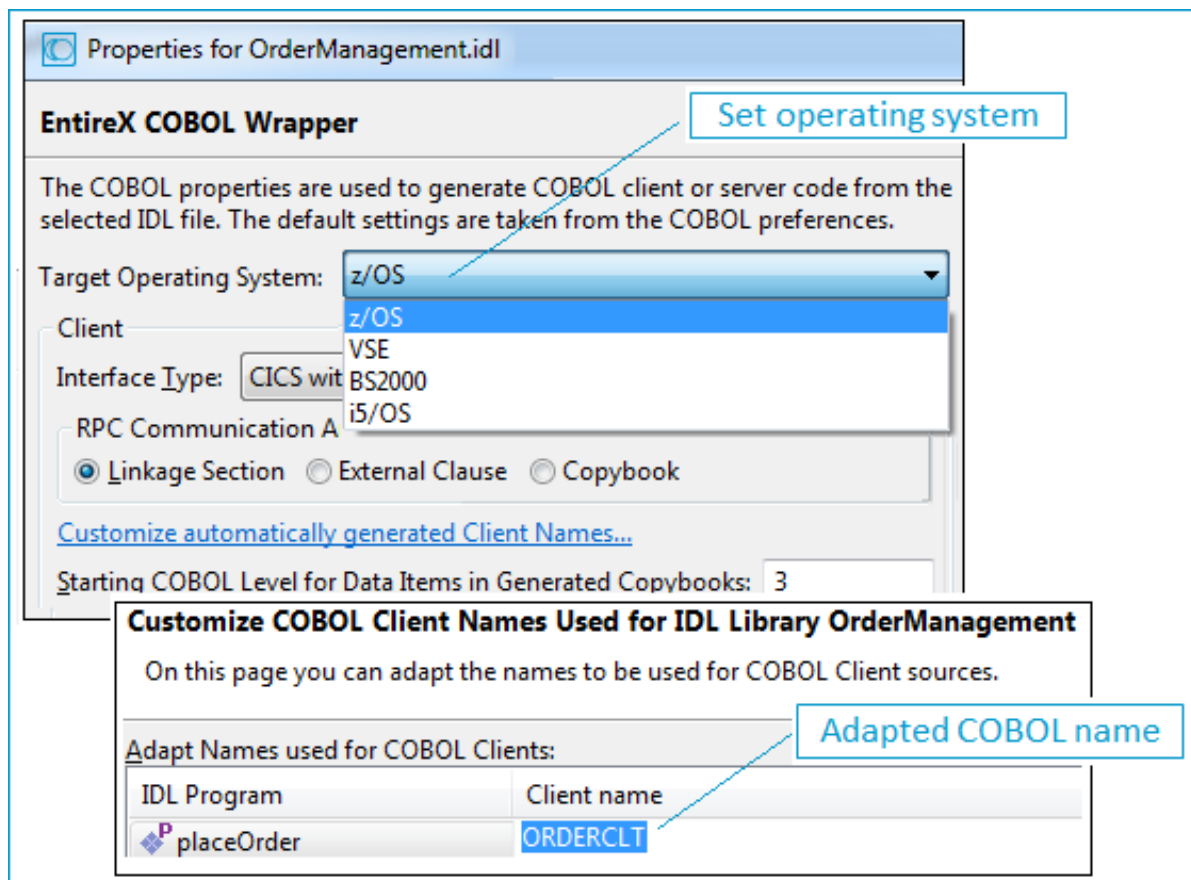
- [Setting Generation Options \(Properties\) for the COBOL Wrapper](#)
- [Generating COBOL Code](#)

■ Building the Client Application

## Setting Generation Options (Properties) for the COBOL Wrapper

### ➤ To set generation options (properties) for the COBOL Wrapper

- 1 To generate suitable COBOL code for your environment, first set the correct target operating system. Make sure the EntireX perspective is active (**Window > Perspective > Open Perspective > EntireX**) and call the properties of the COBOL Wrapper.



- 2 From the context menu of the IDL file, choose **Properties > EntireX COBOL Wrapper**. On the COBOL Wrapper **Properties** page, set the **Target Operating System**
- 3 Adapt the name of the generated COBOL program: Choose **Customize automatically generated Client Names**. Take ORDERCLT as the COBOL program's name.

## Generating COBOL Code

### ➤ To generate COBOL code

- For COBOL code generation, make sure the EntireX Perspective is active: Choose **Window > Perspective > Open Perspective > EntireX**. From context menu of the IDL file, choose **COBOL > Generate RPC Client**. This generates the COBOL client *ORDERCLT* in folder *client* and a copybook in folder *include*:

The screenshot shows the Eclipse IDE with the COBOL client *ORDERCLT* generated in the *client* folder and a copybook in the *include* folder. The main editor displays the COBOL code for *ORDERCLT*, which includes a 'COBOL RPC Interface Copybook' section. A 'Package Explorer' on the right shows the project structure with folders 'src', 'client', and 'include'. The 'client' folder contains 'COBSRVI', 'ORDERCLT', and 'include'. The 'include' folder contains 'ERXCOMM' and 'ORDERCLT'. The 'src' folder contains 'OrderManagement.idl'. The 'copybook' section of the COBOL code lists various data items and their constraints, such as '03 REQUEST', '04 ORDERITEMID', '04 ORDERQUANTITY', '04 ORDERCUSTOMERID', '03 RESPONSE', '04 ORDERITEMNAME', '04 ORDERUNITPRICE', '04 ORDERTOTAL', '04 ORDERCUSTOMERADDRESS', '05 NAME', '05 STREET', '05 CITY', '05 ZIPCODE', '05 COUNTRYCODE', '04 ORDERSHIPPINGDATE', '04 ORDERCONFIRMATION', and '04 ORDERCONFIRMATIONFLAG'. Annotations highlight the 'COBOL client' folder, the 'Copybook' section, and the 'Constraints available' and 'No constraints available' sections.

```

CBL LIB QUOTE
IDENTIFICATION DIVISION.
PROGRAM-ID. ORDERCLT.

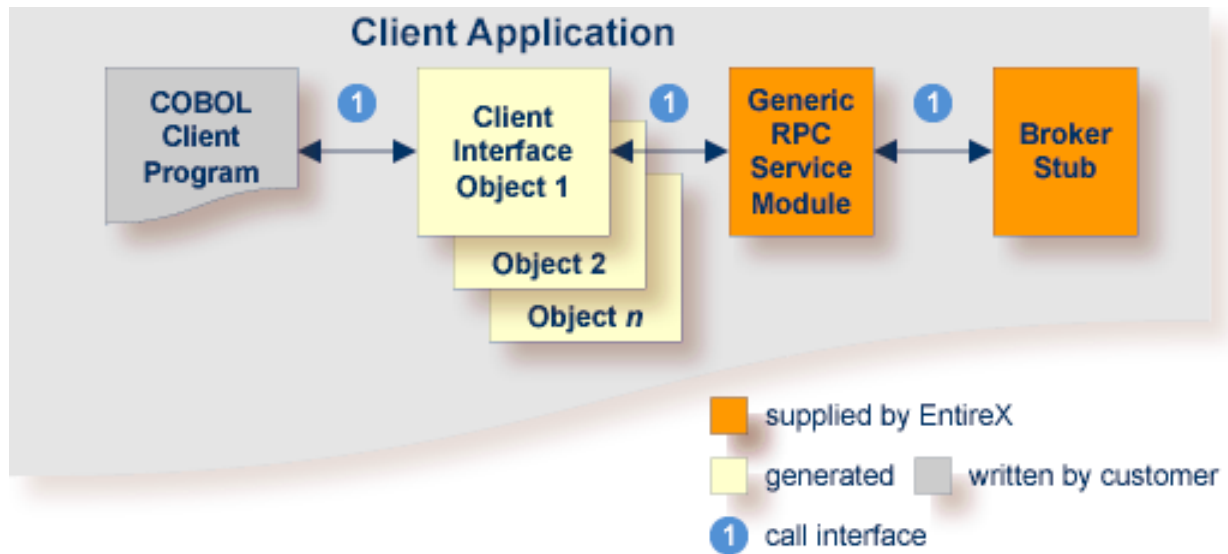
*****
*
* COBOL RPC Client Interface Object
*
* IDL L: ORDERCLT
* IDL P: *****
*
* Program: COBOL RPC Interface Copybook
* Target:
* String: IDL Library = OrderManagement
* Inter: IDL Program = placeOrder
* RPC C:
* RPC P:
* Copybook Name = ORDERCLT
* Target Platform = all
* Interface Type = all
* String Literal = QUOTE
*
* In the
* ei
*
* Template Source = cobol_include.tpl $Revision: 1.55 $
*
* or
*
* Template Source = cobol_linkage.tpl
* 03 REQUEST.
* 04 ORDERITEMID PIC 9(5).
* 04 ORDERQUANTITY PIC 9(10).
* 04 ORDERCUSTOMERID PIC S9(9) BINARY.
* 03 RESPONSE.
* 04 ORDERITEMNAME PIC X(99).
* 04 ORDERUNITPRICE PIC X(20).
* 04 ORDERTOTAL PIC X(20).
* 04 ORDERCUSTOMERADDRESS.
* 05 NAME PIC X(99).
* 05 STREET PIC X(99).
* 05 CITY PIC X(20).
* 05 ZIPCODE PIC X(20).
* 05 COUNTRYCODE PIC X(20).
* 04 ORDERSHIPPINGDATE PIC X(256).
* 04 ORDERCONFIRMATION PIC X(256).
* 04 ORDERCONFIRMATIONFLAG PIC X.

```

The copybook is the COBOL programmer's API. It is for use in the COBOL application.

As you would expect, the length of generated COBOL parameters exactly matches the lengths extracted. COBOL parameters always have a fixed length defined at compile time. They are not altered at runtime to reflect actual string length as in modern programming languages. This means that if you choose your default length (see [Extracting the Interface of the webMethods IS Service](#)) you have to choose the maximum possible data size to ensure all data can be transmitted. However, this may needlessly increase the message size if no constraints are set for fields of shorter data length. Choose your defaults and constraints carefully.

## Building the Client Application



In this scenario, the COBOL client program, every generated client interface object, generic RPC services module and the broker stub are linked together to the client application.

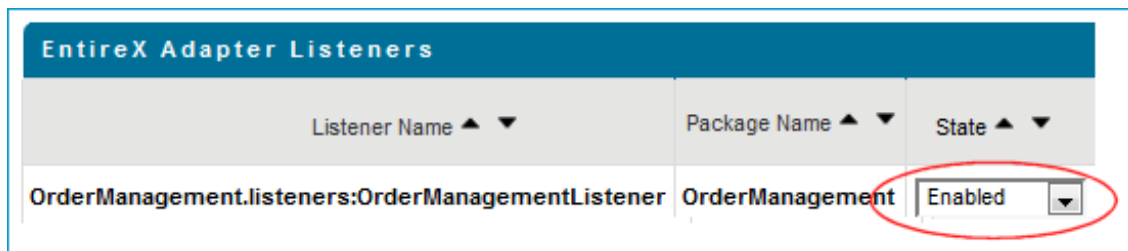
See *Using the COBOL Wrapper for Batch (z/OS, BS2000, z/VSE and IBM i)*.

## Task 3: Execute the Call from COBOL to Integration Server

Use the EntireX IDL Tester to execute the call.

### ➤ To execute the call

- 1 For EntireX RPC (see [Task 3](#) in the [Introduction](#)) and an RPC Listener Connection, make sure EntireX Broker is running.
- 2 Enable the EntireX Adapter Listener.



- 3 Activate the EntireX perspective by choosing **Window > Perspective > Open Perspective > EntireX**, and from the context menu of the IDL file, choose **IDL Tester**.

- 4 This step depends on the method used to call the server (see [Task 3](#) in the [Introduction](#)).
  - For *EntireX RPC*, enter the same TCP/IP address for **Broker** that you supplied when you created the RPC Listener Connection to EntireX (localhost:1971).
  - For *Direct RPC*, that is, you generated a Direct RPC Listener Connection, enter the TCP/IP address from the Integration Server (localhost:1971).
- 5 For **Server**, enter the values you specified for the server address (RPC/SRV1/CALLNAT).

The screenshot shows a software interface with two input fields at the top: "Broker: localhost:1971" and "Server: RPC/SRV1/CALLNAT". Both fields are circled in red. Below these fields are five buttons: "Call" (highlighted with a dashed border), "Ping", "Open Conversation", "Reset", and "Exit". Below the buttons is a "Messages" section with a scrollable list of data. The data is organized into two columns: a left column with labels and a right column with values.

2 OrderItemID (N5)	45
2 OrderQuantity (N10)	18
2 OrderCustomerID (I4)	234
2 OrderItemName (A99)	tennis racquet
2 OrderUnitPrice (A20)	79.89 GBP
2 OrderTotal (A20)	1438.02 GBP
3 Name (A99)	The All England Lawn Tennis Club (Championships) Limited
3 Street (A99)	Church Road
3 City (A99)	Wimbledon London
3 ZipCode (A20)	SW19 5AE
3 CountryCode (A20)	UK
2 OrderShippingDate (A256)	Your order will be shipped on Wed, Jul 27, 2016.
2 OrderConfirmation (A256)	Your order is confirmed.
2 OrderConfirmationFlag (L)	true