IBM WebSphere Adapter for SAP Software 7.0.0.0
Quick Start Scenarios

October 1, 2009

This edition applies to version 7 of IBM WebSphere Adapter for SAP Software and to all subsequent releases and modifications unless otherwise indicated in new editions.

Table of contents

Chapter 1. Introduction

This document demonstrates how you can use the WebSphere Adapter for SAP Software could be used to provide business integration connectivity to SAP systems.

The BAPI outbound sample demonstrates how the WebSphere Adapter for SAP Software can be used to discover BAPI objects from SAP systems and create Business Objects corresponding to them. The sample shows how to generate a SCA component and, once deployed, how to invoke it to create a Customer object in SAP by invoking the BAPI.

The ALE Inbound sample demonstrates how the WebSphere Adapter for SAP Software can be used to receive events from the SAP EIS by taking a sample IDoc in to consideration. The sample scenario shows how to configure the adapter as an SCA component and, once deployed, how to configure an endpoint to receive a SAP invoked IDoc asynchronous event.

The Structured Query sample scenario demonstrates a query object being created and query data is sent to SAP (Outbound process) and receive a response as a result set based on the query.

Additional scenarios such as BAPI Work Unit, ALE Outbound and ALE inbound for a non-split IDoc are provided explaining about a few scenarios related to ALE and BAPI interfaces.

Chapter 2. Hardware and software prerequisites

Please refer to the following link for a listing of hardware and software requirements to run the WebSphere Adapter for SAP Software

IBM WebSphere Adapter for SAP Software HW/SW requirements

Chapter 3. Installing the adapter

WebSphere Adapters are packaged along with products like WebSphere Integration Developer and Rational Application Developer. When used with WebSphere Integration Developer, the adapter Resource Archives(RAR) can be located at

<WID_installation>/ResourceAdapters/SAP_7.0.0.0 directory.

Note:

The Resource Archive file (RAR) file has support for running the New External Service wizard as well as to process requests coming into the SCA module.

Use the **CWYAP_SAPAdapter.rar** file if you want to perform ALE, BAPI, SQI & AEP processing without Local Transaction support. When using the RAR without Local Transaction support, the adapter is in an auto-commit configuration.

Use the **CWYAP_SAPAdapter_Tx.rar** file if you want the container (WebSphere Process Server) to appropriately invoke the commit and rollback methods implemented for the Local Transaction support in the adapter. This is applicable for BAPI transaction and ALE outbound transaction processing scenarios. When using this RAR, the adapter is capable of participating in Local Transactions managed by the container.

The **CWYAP_SAPAdapterExt.jar** file available at *<WID_installation>/ResourceAdapters/SAP_7.0.0.0/ext* contains the JCo 3 provider implementation for use by the adapter

UNIX® and Windows platforms share the same installed directory and file structure, with the only difference being the directory path designation (forward slash '/' for UNIX, backslash '\' for Windows).

Deployment prerequisites

You must install these products before you can deploy the adapter:

WebSphere Integration Developer7.0 (WID)

WebSphere Process Server 7.0 administrative console

For WebSphere Process Server installation instructions, see the WebSphere Process Server documentation.

After you complete these steps, make sure you have the following information with you to access the SAP application:

SAP User Name

SAP Password

SAP Host name (or IP address)

SAP System number (usually 00)

SAP Client number (usually 100)

Obtain the SAP JCo3 from SAP Marketplace at https://websmp101.sap-ag.de/ . Please obtain the userID/Password for this URL from your BASIS respectively.

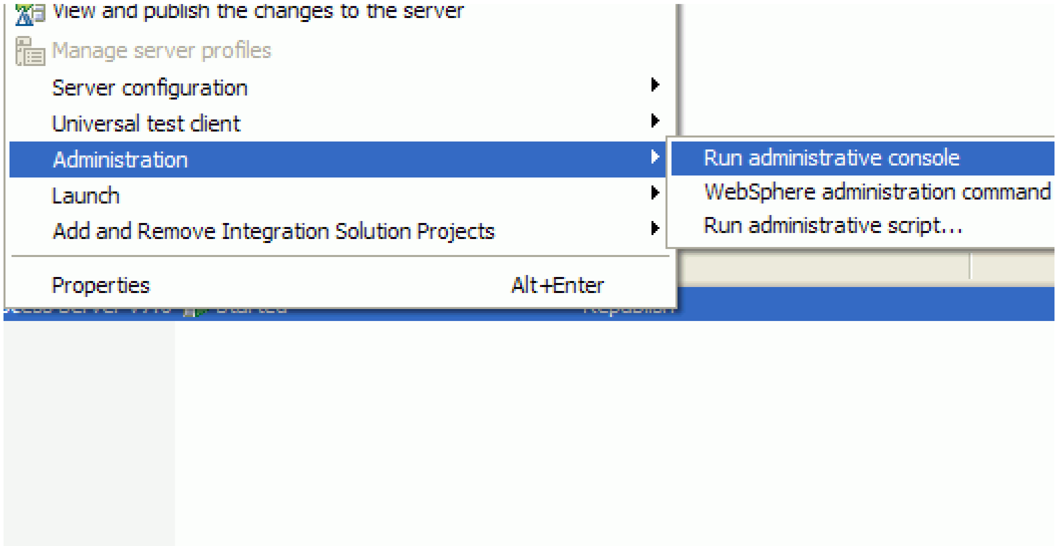
Configuring the Authentication Alias on the process server

Before you install an application onto WebSphere Process Server, you must create an Authentication Alias for use with your SAP instance. Once an Authentication Alias has been created, other SAP application project modules can use it as well.

Starting the WebSphere Process Server Administrative console:

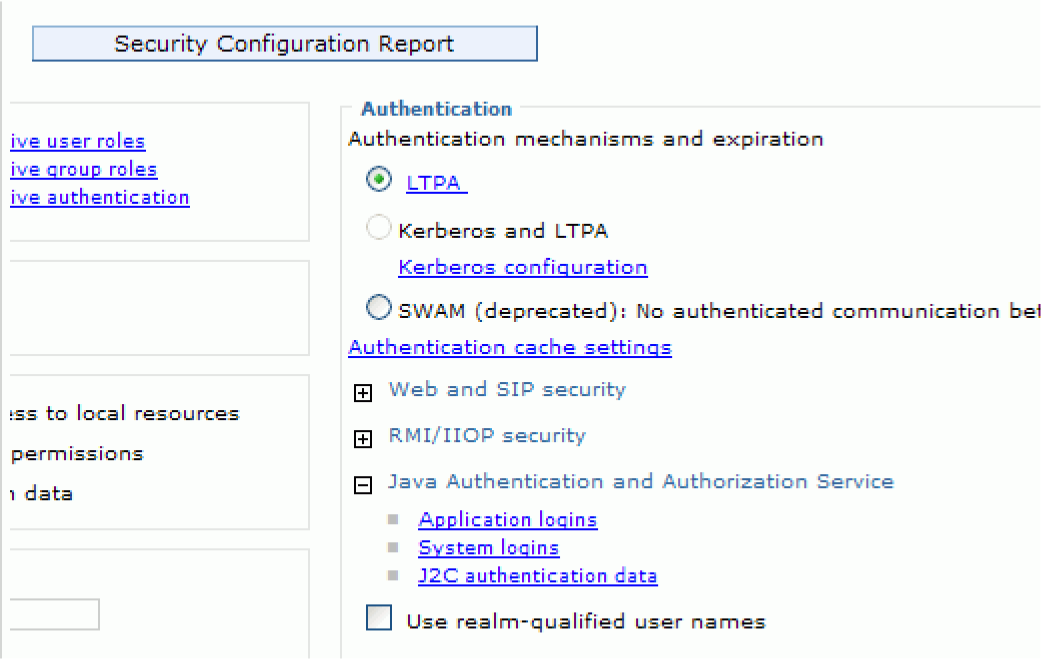
Open the Business Integration perspective in WebSphere Integration Developer.

Under the Server tab right click on your server instance, for example, **WebSphere Process Server v7.0**>**Administration** and select **Run administrative console**.


View and publish the changes to the server
Manage server profiles
Server configuration
Universal test client
Administration
Launch
Add and Remove Integration Solution Projects
Properties
Alt+Enter
Run administrative console
WebSphere administration command
Run administrative script...

In the administration console of WebSphere Process Server, click **Security** > **Global Security.**

Select Java Authentication and Authorization Service > J2C authentication data.



ive user roles
ive group roles
ive authentication

ıss to local resources
permissions
ı data

Authentication

Authentication mechanisms and expiration

● LTPA

○ Kerberos and LTPA

Kerberos configuration

○ SWAM (deprecated): No authenticated communication bet

Authentication cache settings

⊞ Web and SIP security

⊞ RMI/IIOP security

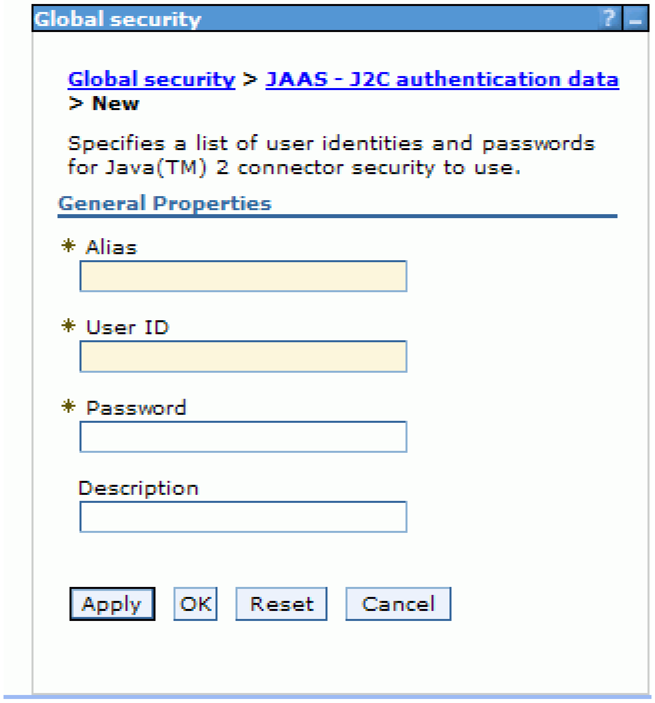
⊟ Java Authentication and Authorization Service

- Application logins
- System logins
- J2C authentication data

□ Use realm-qualified user names

In the **Authentication** column, if an alias named **SAP_Auth_Alias** does not already exist, create it now.

Click **New**. The **General properties** screen appears.



Global security

Global security > JAAS - J2C authentication data > New

Specifies a list of user identities and passwords for Java(TM) 2 connector security to use.

General Properties

* Alias

* User ID

* Password

Description

In the **Alias** field, specify **SAP_Auth_Alias** (Remember this authentication alias can be used while generating inbound\outbound services using the adapter).

Specify the User ID and password that are required to connect to the SAP system.

Click **OK.**

Click **Save**.

Chapter 4. Tutorial 1: Retrieving data from SAP (outbound processing) using the simple BAPI Interface

Business Case

A Customer Relationship Officer needs to retrieve a customer's information from the SAP server after being notified of a customer complaint raised on the Customer Services Portal.

Scenario

The following scenario illustrates a simple BAPI outbound processing using Synchronous RFC calls.

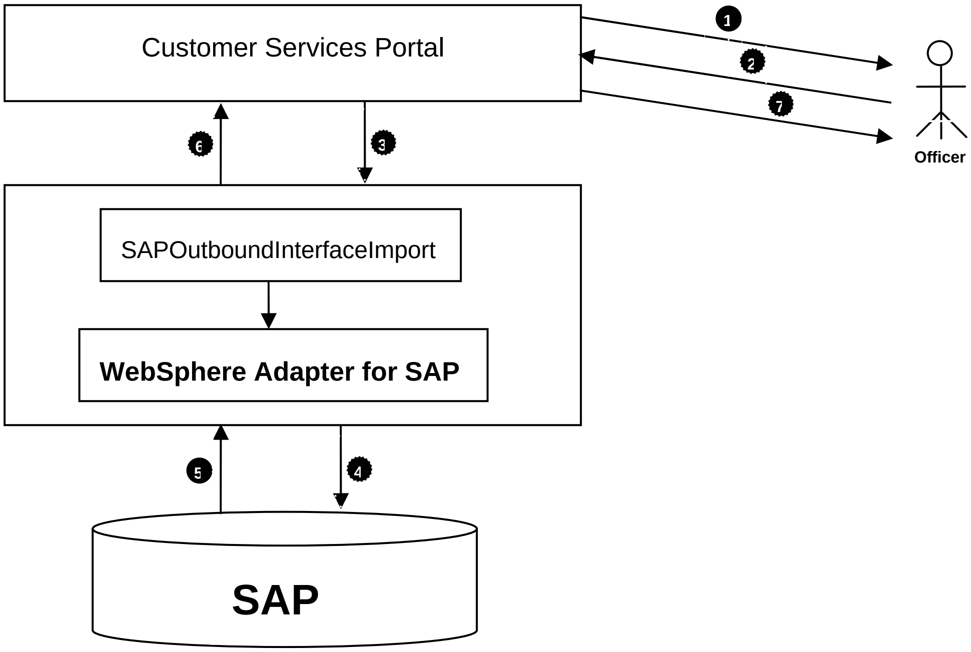


Figure: Scenario illustrating simple BAPI outbound processing

1. The Customer Services portal notifies the Officer of a new complaint.
2. The Officer logs into the Customer Services portal and requests details of the customer.
3. The Customer Services portal will in turn invokes an SCA module using the WebSphere Adapter for SAP Software to execute the BAPI_CUSTOMER_GETDETAIL BAPI.
   - i. The adapter module receives a request from the client application in the form of a BAPI_CUSTOMER_GETDETAIL Business Object. The adapter sends this data to SAP server.
   - ii. The adapter then converts the data in the Business Object into a native BAPI object and sends it to the SAP server.
4. The SAP server responds with the details of the customer in native object format.
5. The adapter handles the response from SAP, converts it into a Business Object format as required by the client application and is returns the response.
6. The Customer Services portal returns the response to the officer.

Configuration prerequisites

You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector interface is an external dependency that the adapter requires in order to connect to the SAP systems. The adapter uses SAP JCo to call to the SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library interface to the imported project. You must copy all external libraries and JAR files must first be copied to the appropriate locations on WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to
WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Application Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to
WAS_SERVER_ONLY_server_region_classpath

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

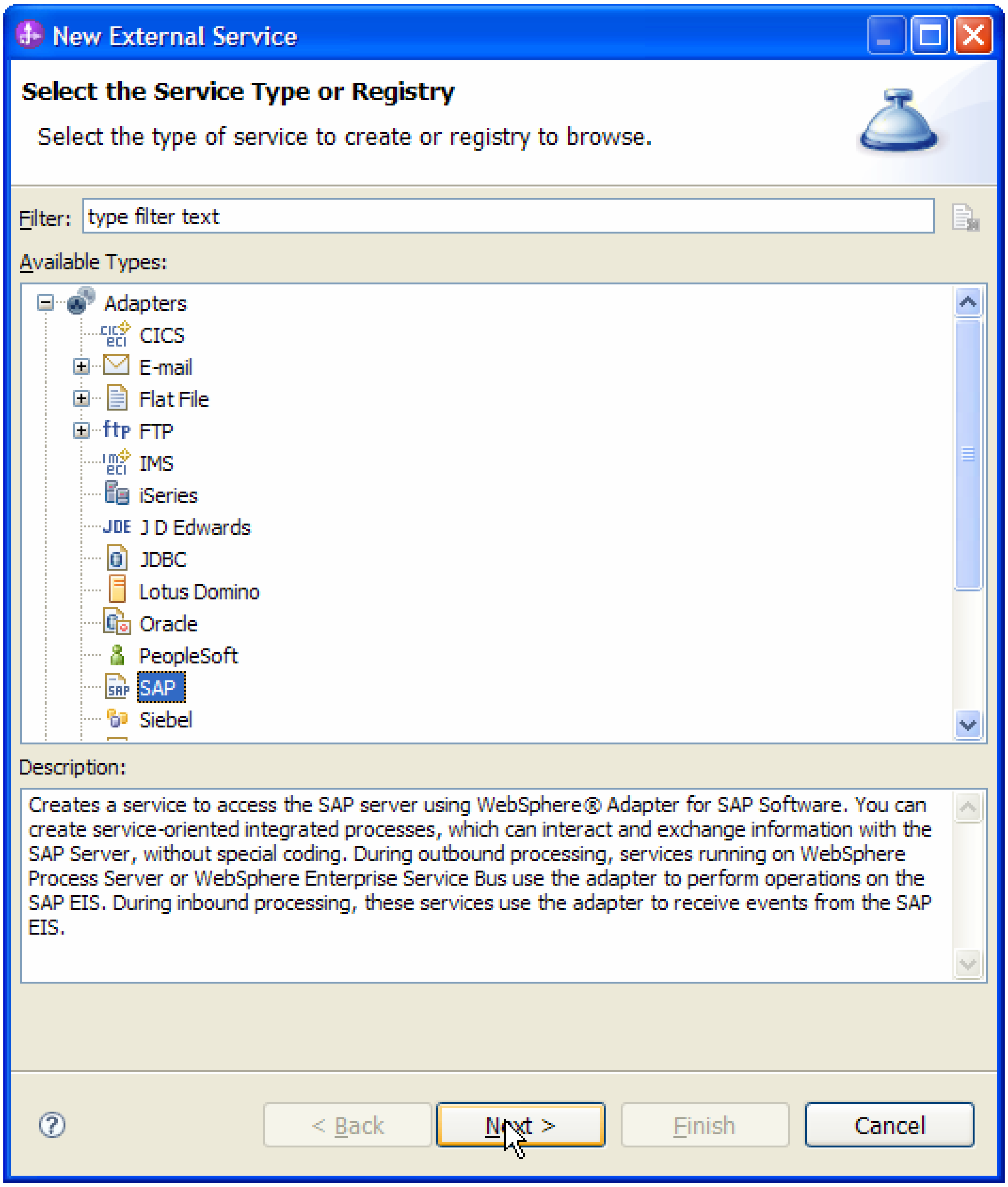
Configuring the adapter for outbound processing

Run the New External Service wizard to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**.

Start the New External Service wizard by choosing: **File**-> **New** -> **External**

1. Select **Adapters** > **SAP** in the **Select the Service Type of Registry** screen and click **Next.**



Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

Available Types:

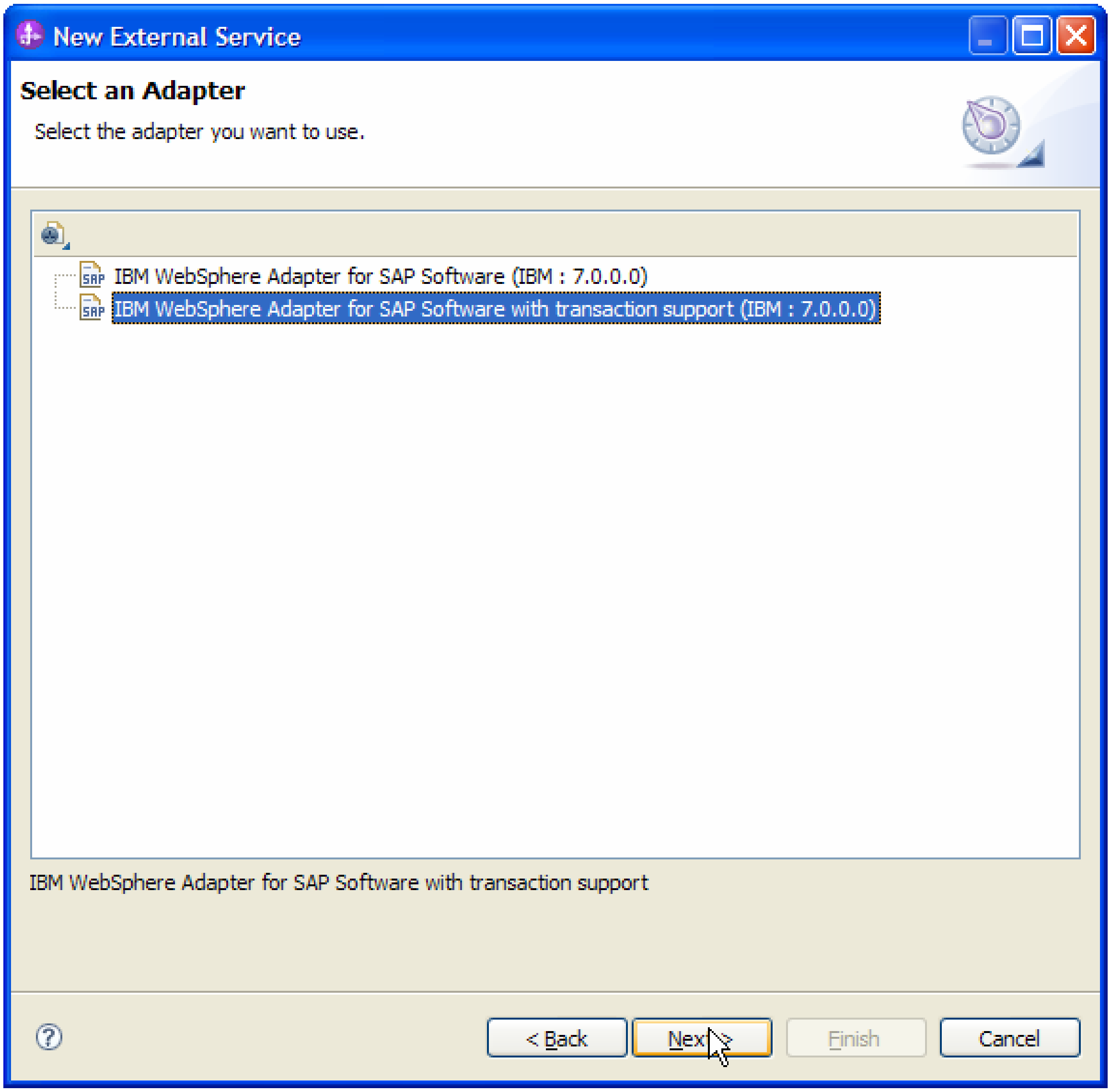
- Adapters
  - CICS
  - E-mail
  - Flat File
  - FTP
  - IMS
  - iSeries
  - J D Edwards
  - JDBC
  - Lotus Domino
  - Oracle
  - PeopleSoft
  - SAP
  - Siebel

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** in the **Select an Adapter** screen and click **Next**.



Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

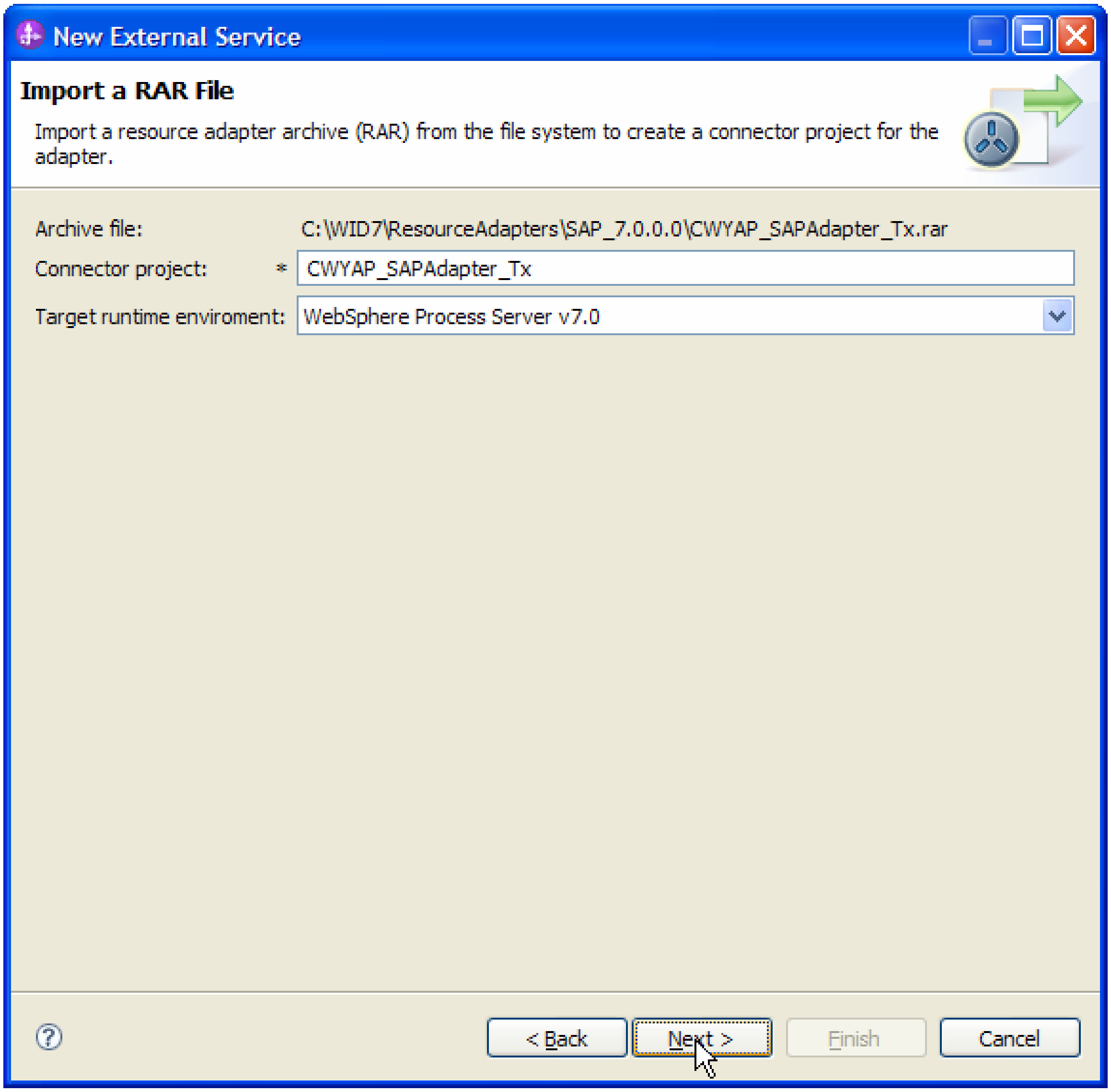
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR** File screen and click **Next**.



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

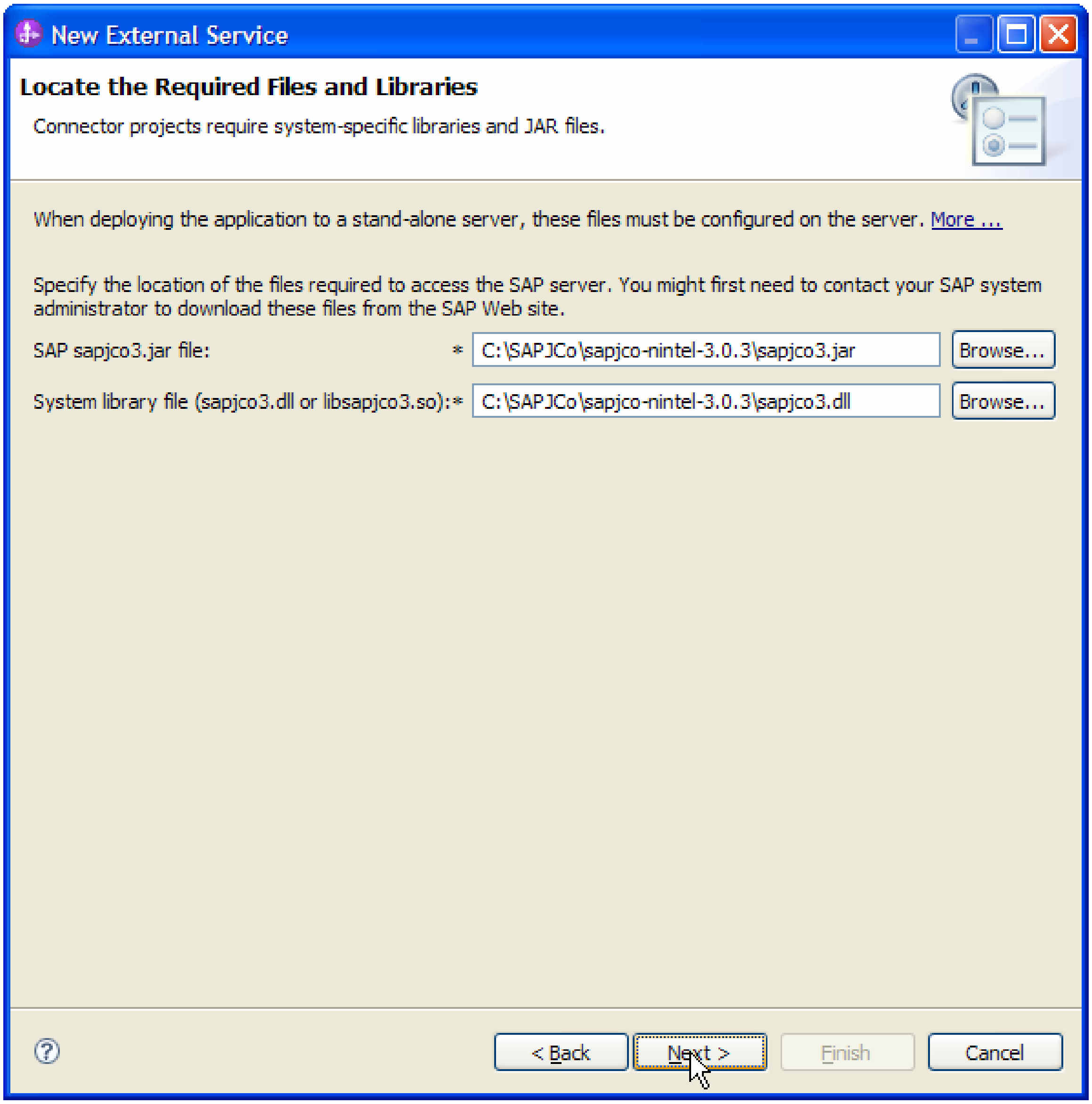
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

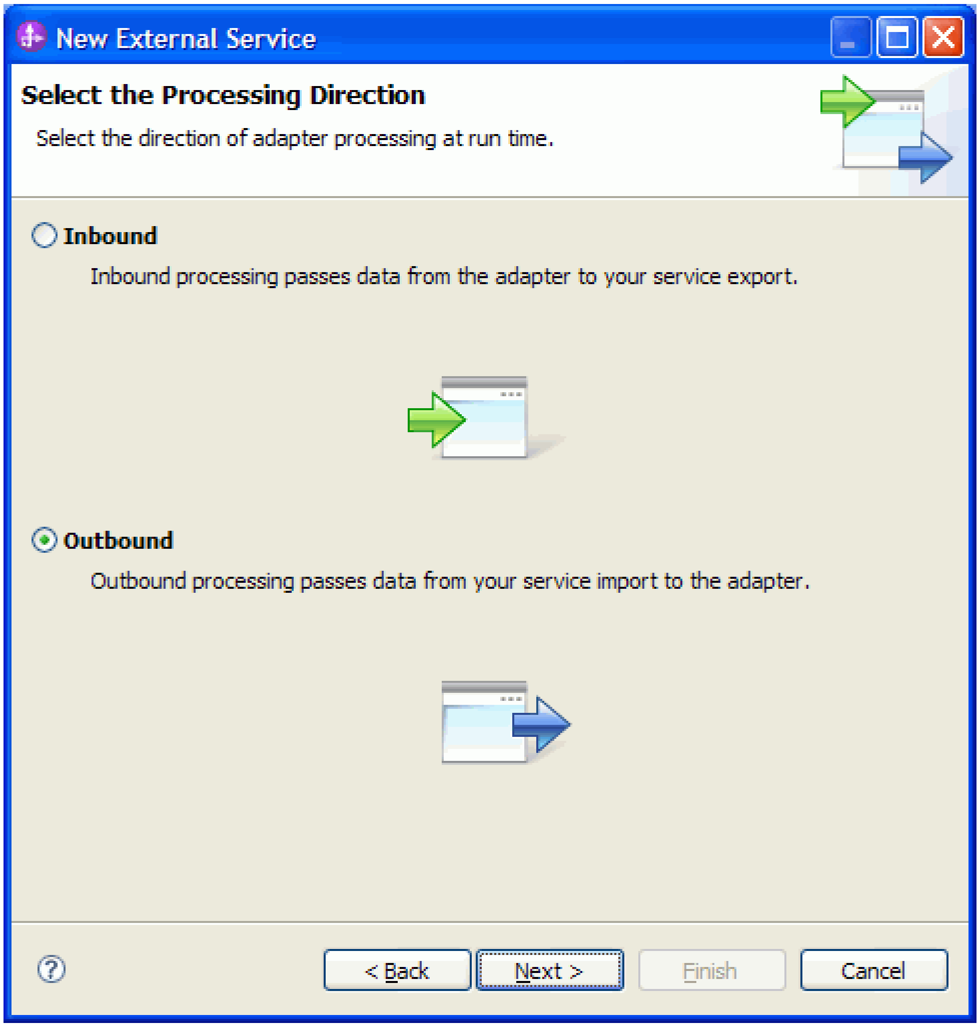
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

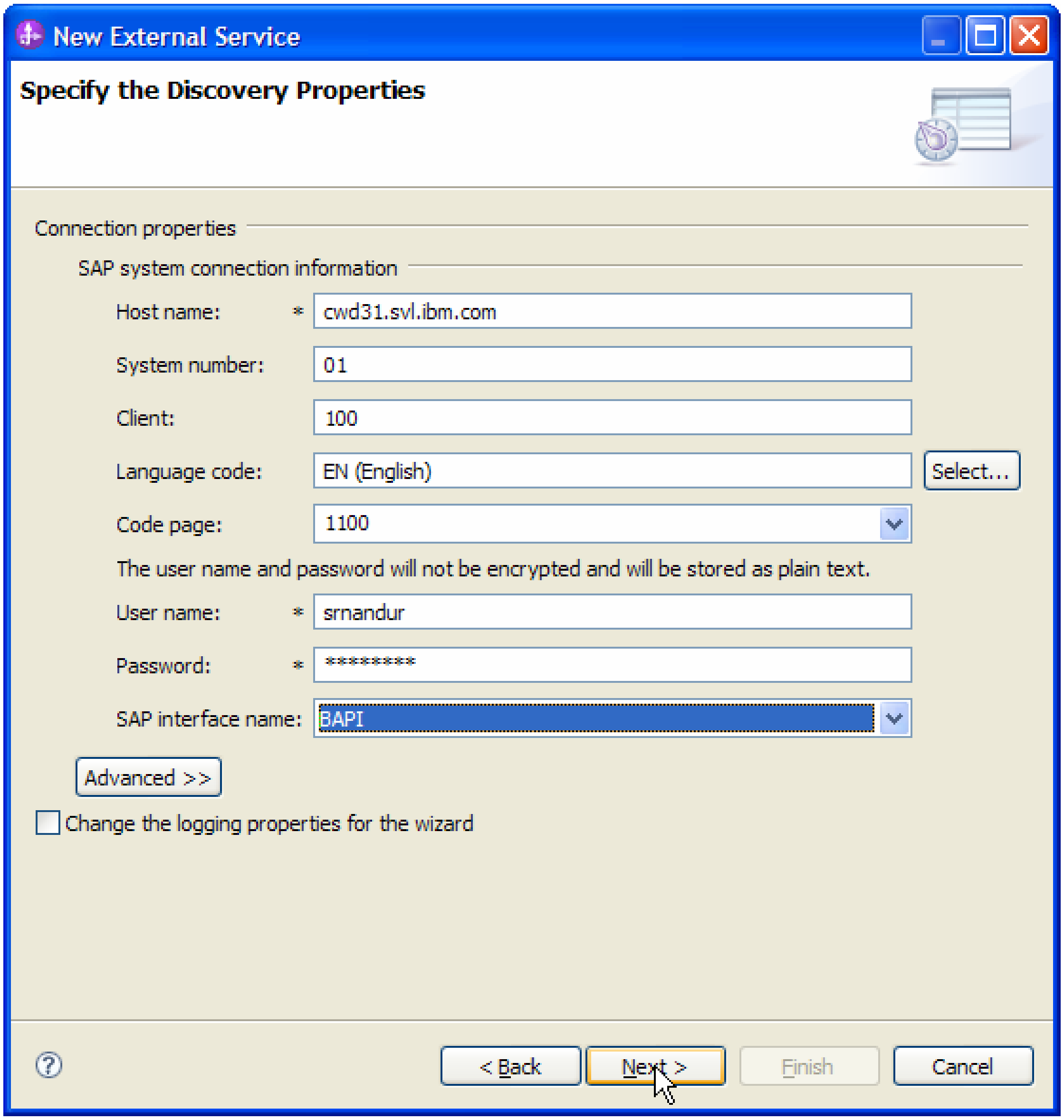
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

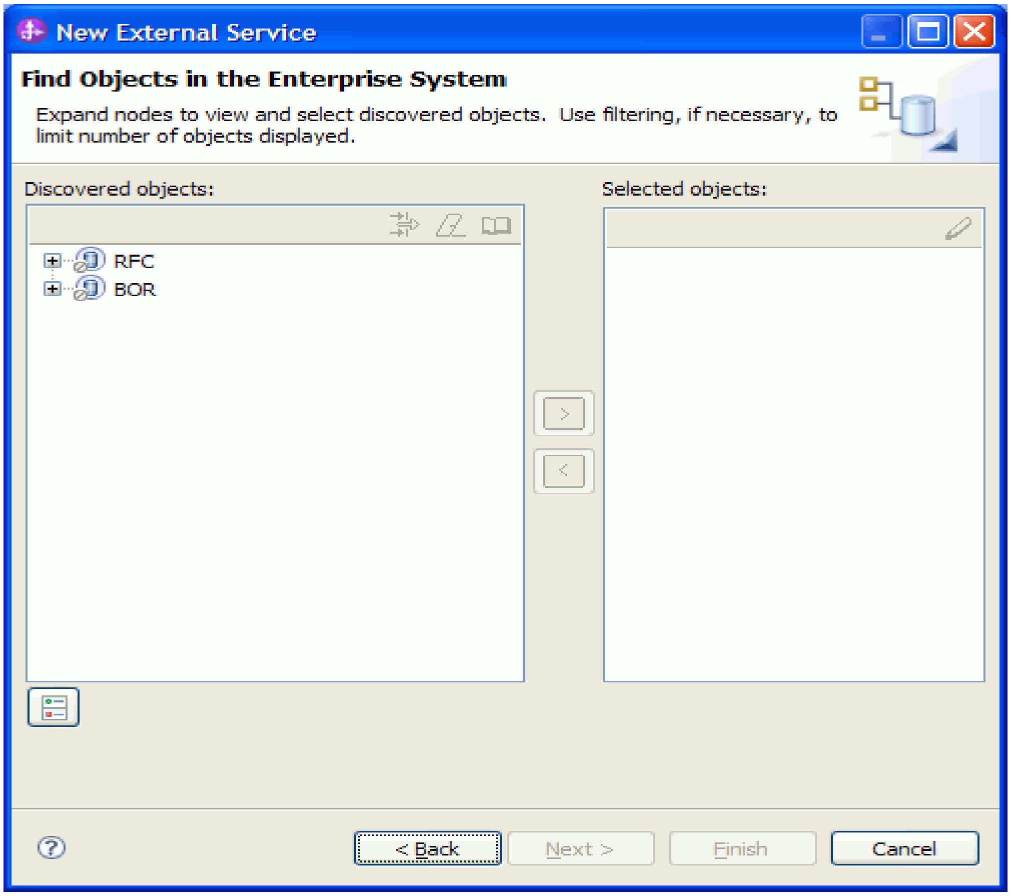
SAP interface name: BAPI

□ Change the logging properties for the wizard

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

1. In the **Find objects in the Enterprise System** screen, click on RFC node. Then click the ⇥ button to enter a filter.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

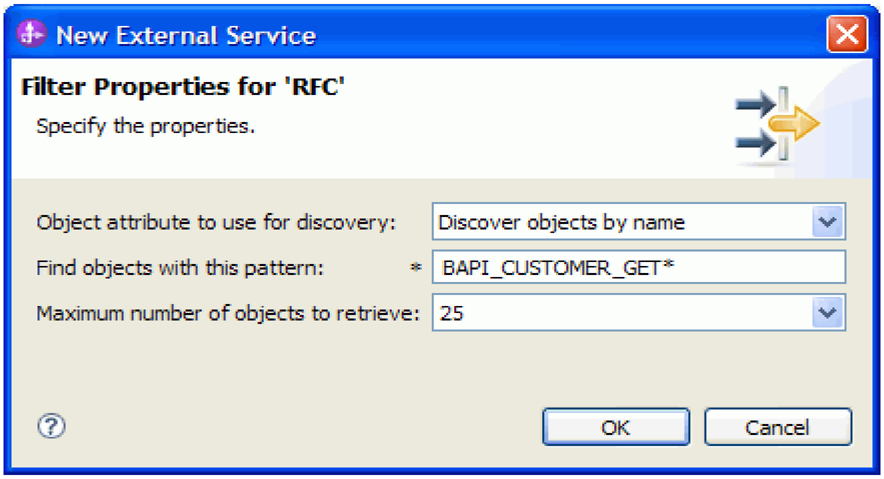
Discovered objects:

- RFC
- BOR

Selected objects:

Figure: Object Discovery and Selection

2. Enter BAPI_CUSTOMER_GET* (the name of the BAPI in SAP plus an asterisk as a wild card character) in the **Filter Properties for 'RFC'** screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

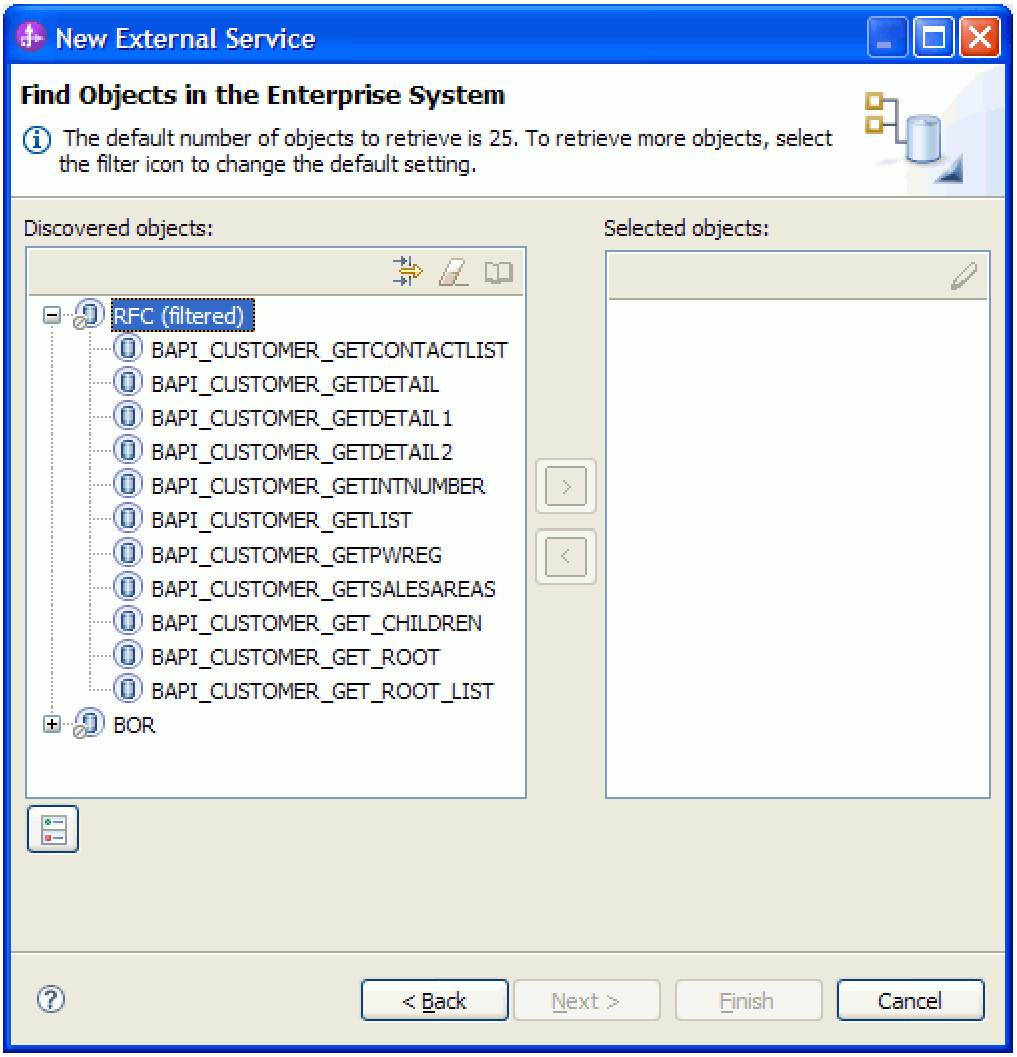
Find objects with this pattern: * BAPI_CUSTOMER_GET*

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

3. Click **OK**.

4. Expand the **RFC** node.



Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- RFC (filtered)
  - BAPI_CUSTOMER_GETCONTACTLIST
  - BAPI_CUSTOMER_GETDETAIL
  - BAPI_CUSTOMER_GETDETAIL1
  - BAPI_CUSTOMER_GETDETAIL2
  - BAPI_CUSTOMER_GETINTNUMBER
  - BAPI_CUSTOMER_GETLIST
  - BAPI_CUSTOMER_GETPWREG
  - BAPI_CUSTOMER_GETSALESAREAS
  - BAPI_CUSTOMER_GET_CHILDREN
  - BAPI_CUSTOMER_GET_ROOT
  - BAPI_CUSTOMER_GET_ROOT_LIST
- BOR

Selected objects:

Figure: Retrieved BAPIs based on search criteria

5. Select the **BAPI_CUSTOMER_GETDETAIL** from the metadata tree.

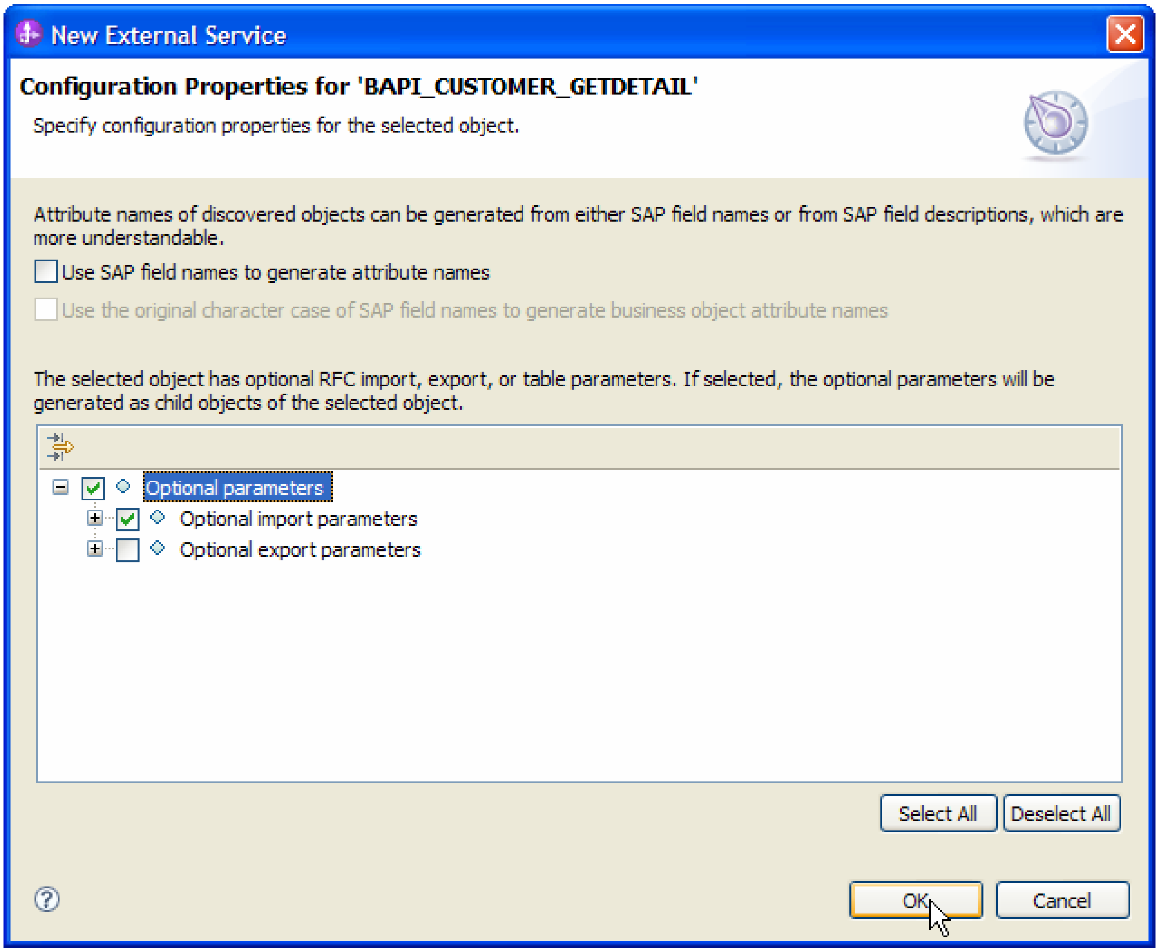
6. Click the > button.

7. A popup will appear containing the Configuration properties for the BAPI_CUSTOMER_GETDETAIL object.

8. Check the **Use SAP filed names to generate attributes names** checkbox if you want the Business Object attribute names to be generated using SAP field Names.

9. You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click **OK**.



New External Service

Configuration Properties for 'BAPI_CUSTOMER_GETDETAIL'

Specify configuration properties for the selected object.

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

- ☑ Optional parameters
  - ☑ Optional import parameters
  - □ Optional export parameters

Figure: Setting configuration parameters for the BAPI selected

10. Click **Next**.

Generating Business Object definitions and related artifacts

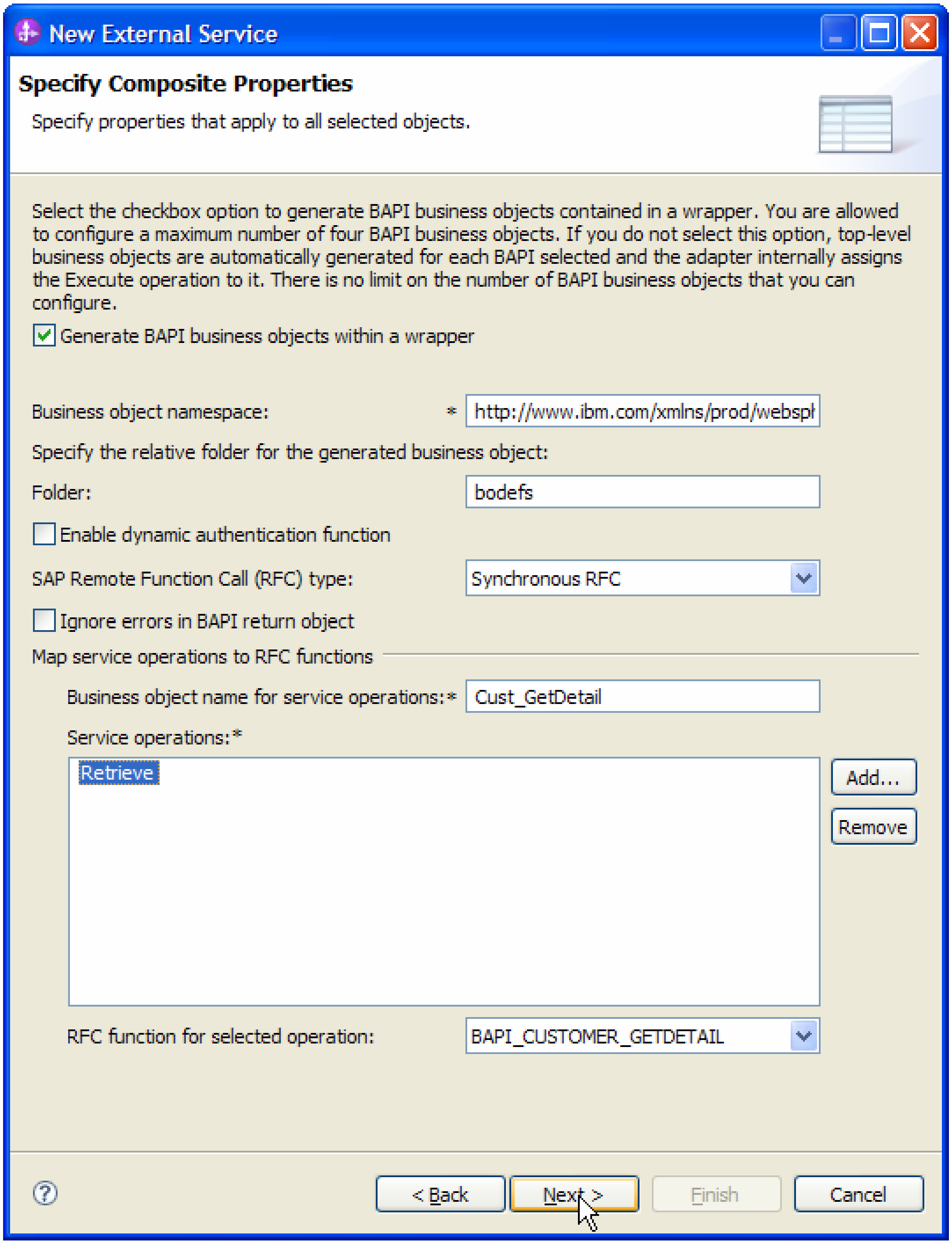
In the Specify Composite Properties screen, you can enter a business object folder name where the Business Objects should be created instead of the default location.

Enter **bodefs** as the folder name.

Check the Generate BAPI Business Objects within a wrapper.

Enter Cust_GetDetail in the Business object for service operations field.

Under **Service Operations**, click **Add** and add the **Retrieve** operation.



Specify Composite Properties

Specify properties that apply to all selected objects.

Select the checkbox option to generate BAPI business objects contained in a wrapper. You are allowed to configure a maximum number of four BAPI business objects. If you do not select this option, top-level business objects are automatically generated for each BAPI selected and the adapter internally assigns the Execute operation to it. There is no limit on the number of BAPI business objects that you can configure.

☑ Generate BAPI business objects within a wrapper

Business object namespace: * http://www.ibm.com/xmlns/prod/websph

Specify the relative folder for the generated business object:

Folder: bodefs

□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Synchronous RFC

□ Ignore errors in BAPI return object

Map service operations to RFC functions

Business object name for service operations:* Cust_GetDetail

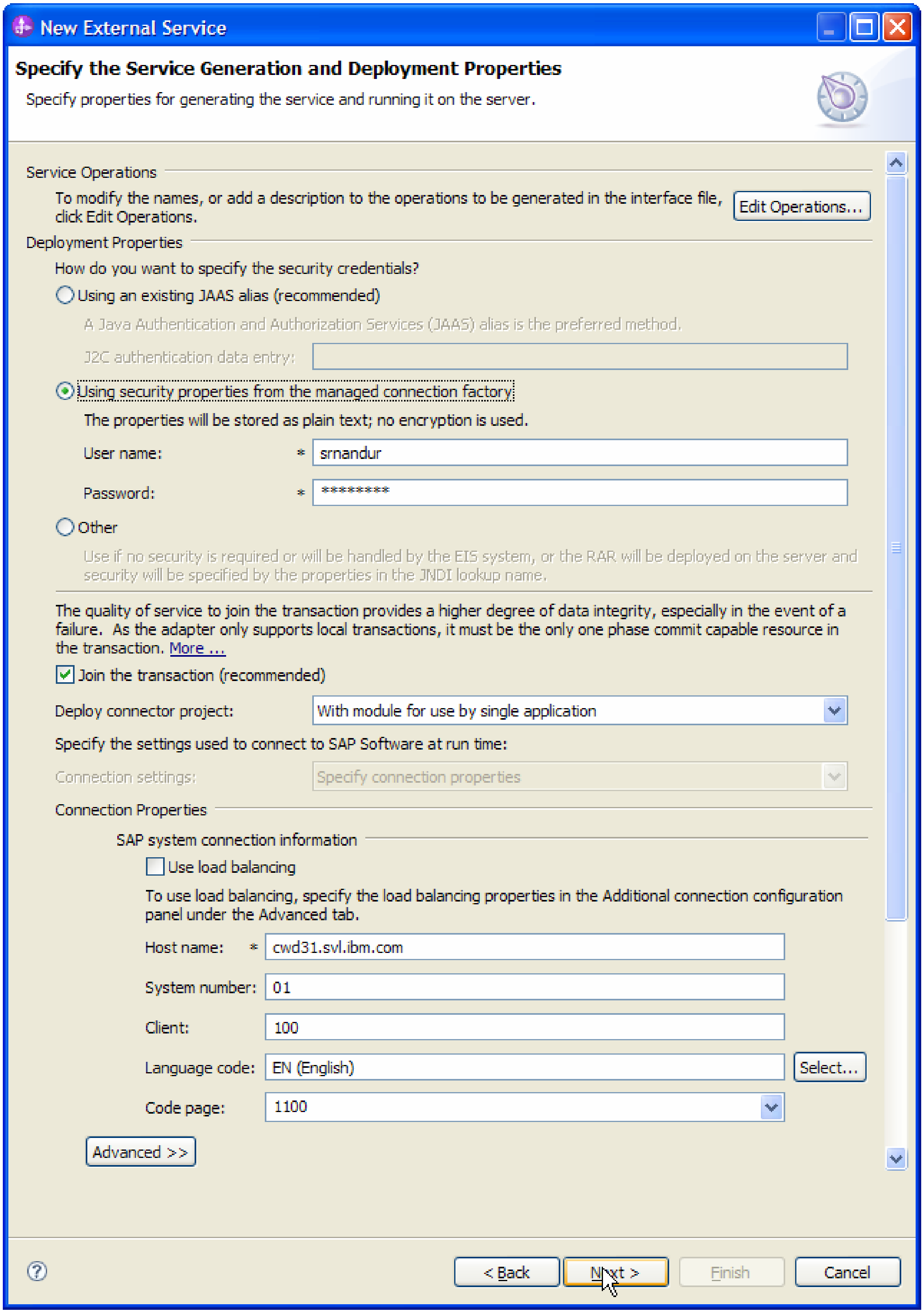
Service operations:* Retrieve

RFC function for selected operation: BAPI_CUSTOMER_GETDETAIL

Figure: Specify Composite Properties

Click **Next**.

In the **Service Generation and Deployment Properties** screen, enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

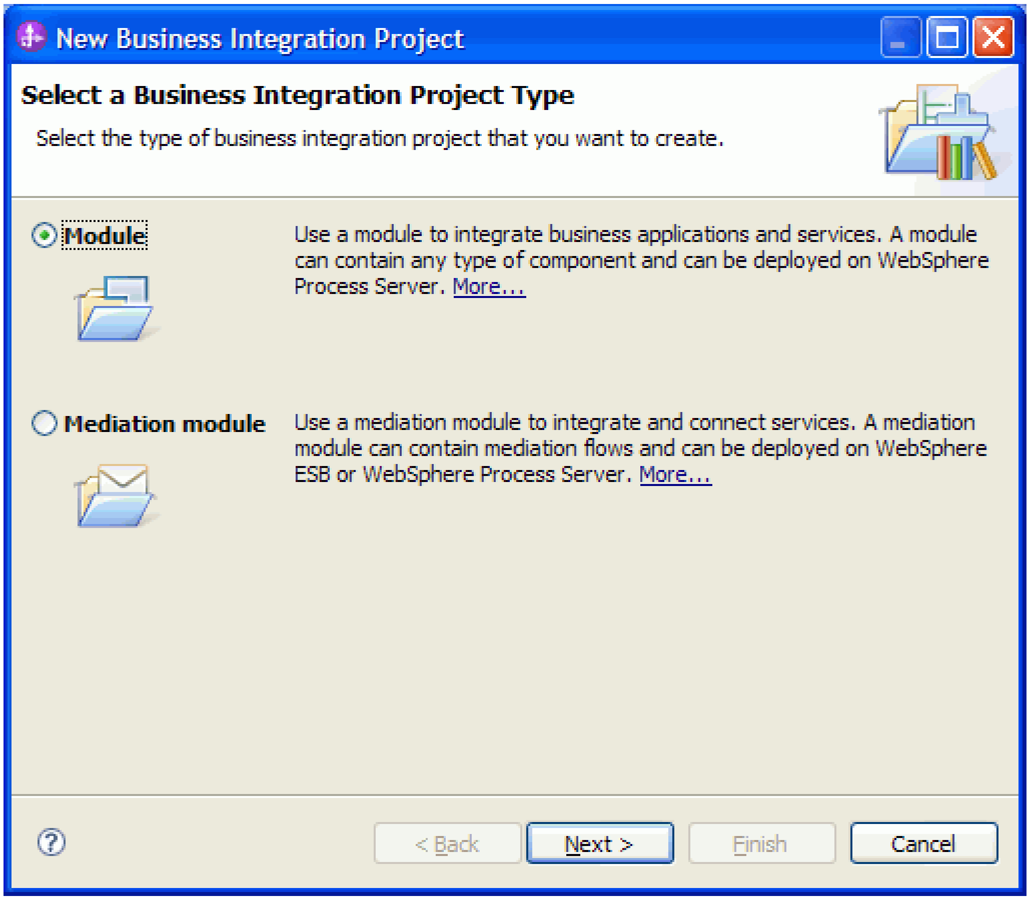
Figure: Service Generation and Deployment Configuration

Note: You can either the user can enter an **Authentication Alias** previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

Click **Next**.

In the **Specify the Location Properties** screen, click the **New** button next to the **Module** field to create a new module.

When the **New Business Integration Project** screen appears, select the **Module** radio button and click **Next.**



New Business Integration Project

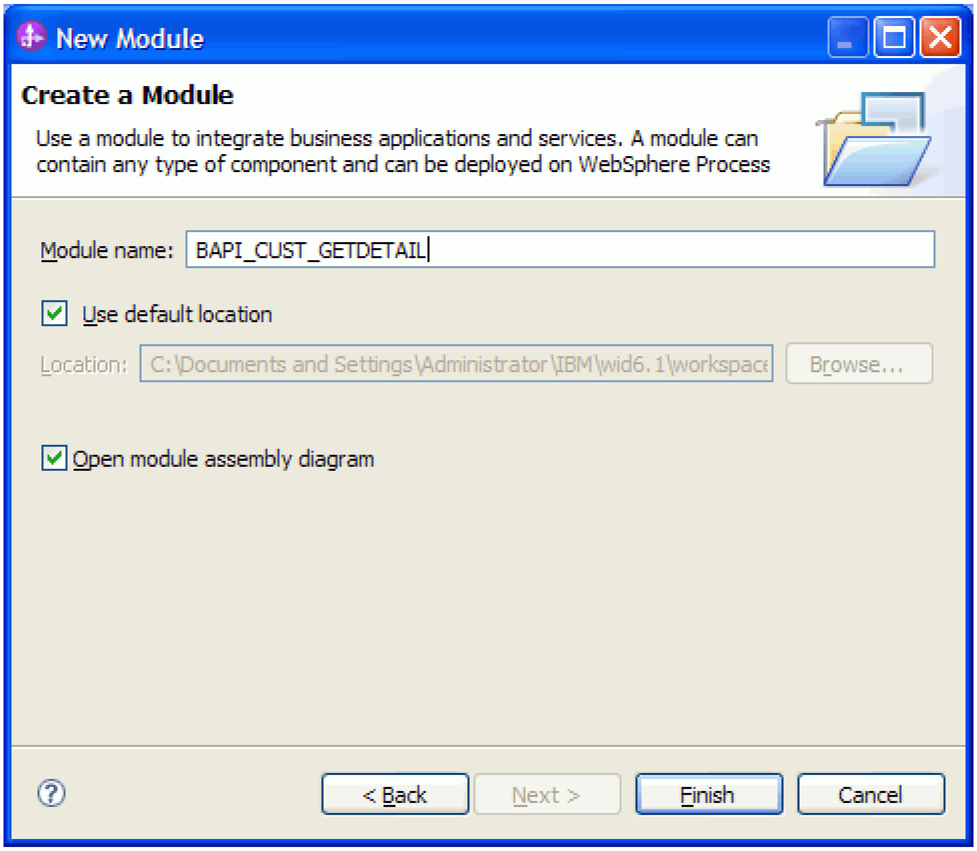
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_CUST_GETDETAIL** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process

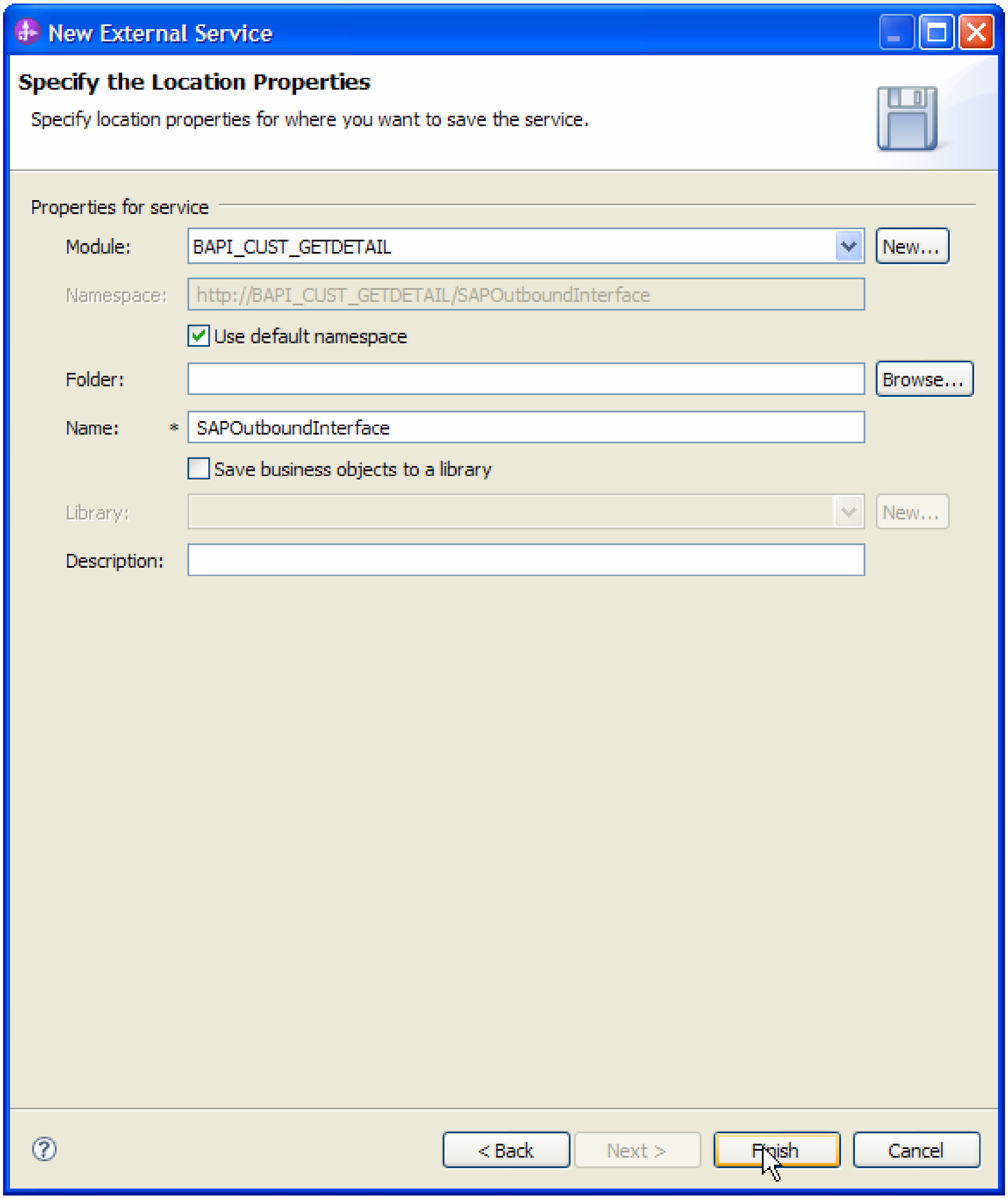
Module name: BAPI_CUST_GETDETAIL

☑ Use default location

Location: C:\Documents and Settings\Administrator\IBM\wid6.1\workspace

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: BAPI_CUST_GETDETAIL

Namespace: http://BAPI_CUST_GETDETAIL/SAPOutboundInterface

☑ Use default namespace

Folder:

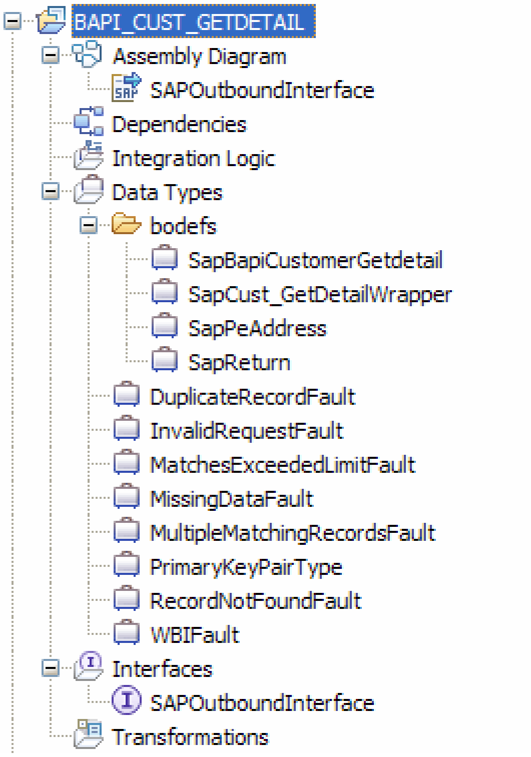
Name: * SAPOutboundInterface

☐ Save business objects to a library

Library:

Description:

Verify the results.



- BAPI_CUST_GETDETAIL
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapBapiCustomerGetdetail
      - SapCust_GetDetailWrapper
      - SapPeAddress
      - SapReturn
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

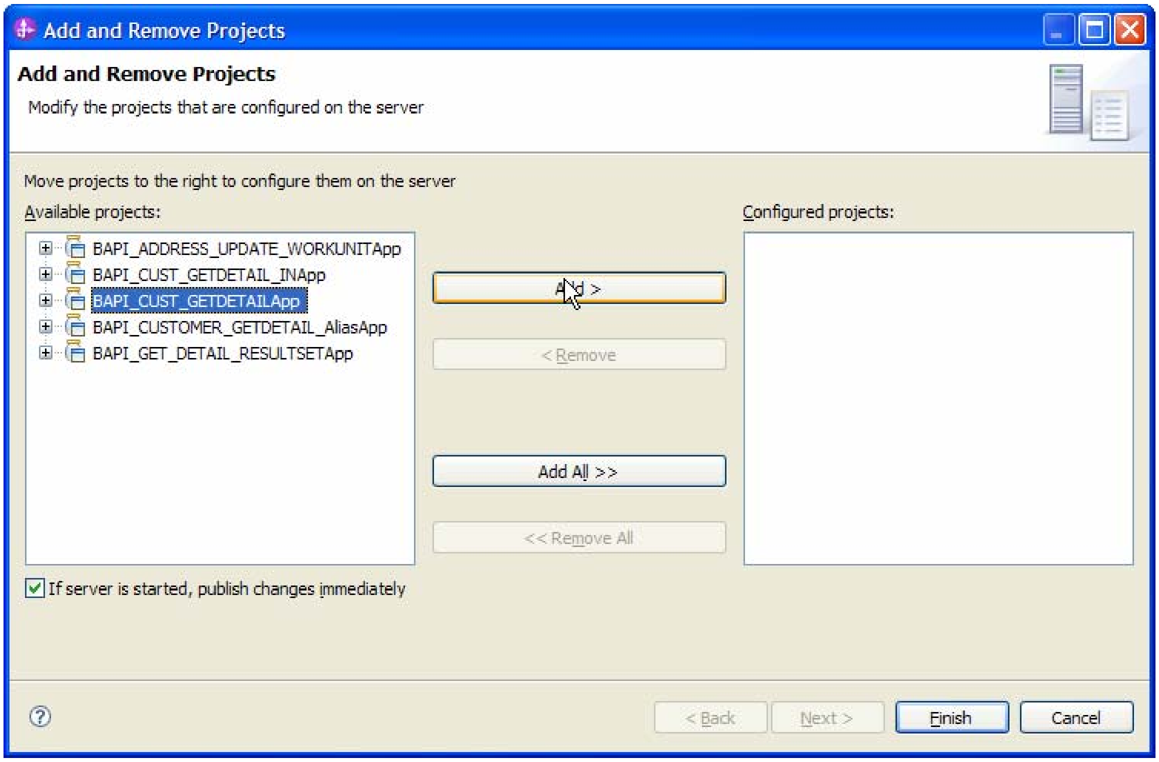
Figure: Artifacts created after the EMD run for the Simple BAPI Module

Deploying the module in the test environment

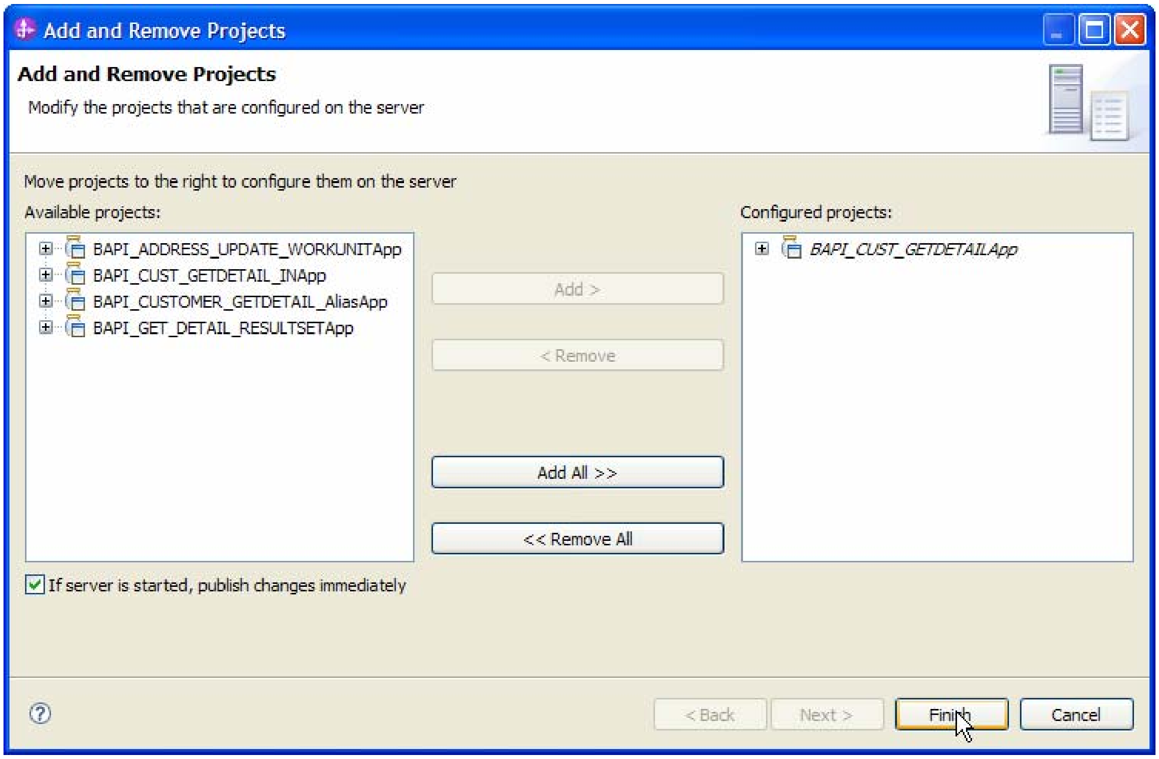
After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_CUST_GETDETAIL by selecting **Add and Remove Projects**.

The project BAPI_CUST_GETDETAILApp will be listed under **Available projects**.


Add and Remove Projects
Add and Remove Projects
Modify the projects that are configured on the server
Move projects to the right to configure them on the server
Available projects:
BAPI_ADDRESS_UPDATE_WORKUNITApp
BAPI_CUST_GETDETAIL_INApp
BAPI_CUST_GETDETAILApp
BAPI_CUSTOMER_GETDETAIL_AliasApp
BAPI_GET_DETAIL_RESULTSETApp
Add >
< Remove
Add All >>
<< Remove All
Configured projects:
☑ If server is started, publish changes immediately
< Back
Next >
Finish
Cancel

Click on the project name and Add it to the list of **Configured Projects**. Click **Finish** to deploy the SCA module.

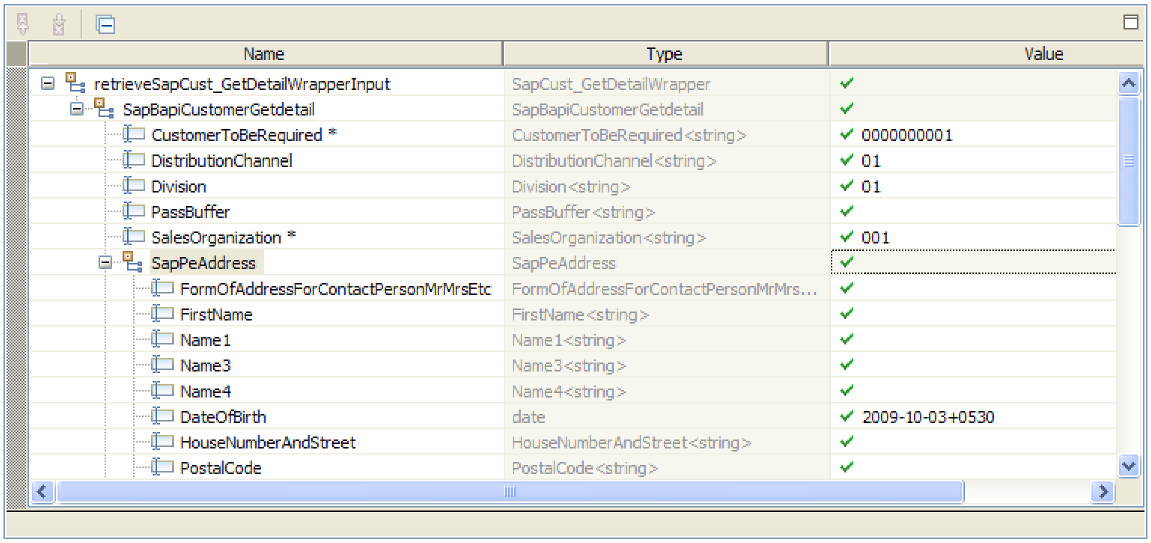

Add and Remove Projects
Add and Remove Projects
Modify the projects that are configured on the server
Move projects to the right to configure them on the server
Available projects:
BAPI_ADDRESS_UPDATE_WORKUNITApp
BAPI_CUST_GETDETAIL_INApp
BAPI_CUSTOMER_GETDETAIL_AliasApp
BAPI_GET_DETAIL_RESULTSETApp
Add >
< Remove
Add All >>
<< Remove All
Configured projects:
BAPI_CUST_GETDETAILApp
☑ If server is started, publish changes immediately
< Back
Next >
Finish
Cancel

Testing the assembled adapter application

Test the assembled adapter application using the WebSphere Integration Developer integration test client.

1. After you have deployed the module to the server, right click the module BAPI_CUST_GETDETAIL in the Projects view and select **Test > Test Module** from the pop-up menu.

2. Enter values in the **Test Client** as shown in the following figure.



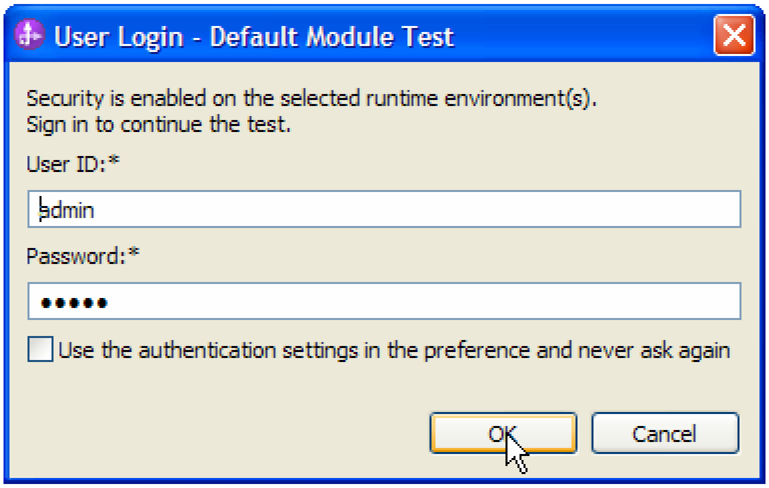
Name	Type	Value
retrieveSapCust_GetDetailWrapperInput	SapCust_GetDetailWrapper	✓
SapBapiCustomerGetdetail	SapBapiCustomerGetdetail	✓
CustomerToBeRequired *	CustomerToBeRequired<string>	✓ 0000000001
DistributionChannel	DistributionChannel<string>	✓ 01
Division	Division<string>	✓ 01
PassBuffer	PassBuffer<string>	✓
SalesOrganization *	SalesOrganization<string>	✓ 001
SapPeAddress	SapPeAddress	✓
FormOfAddressForContactPersonMrMrsEtc	FormOfAddressForContactPersonMrMrs...	✓
FirstName	FirstName<string>	✓
Name1	Name1<string>	✓
Name3	Name3<string>	✓
Name4	Name4<string>	✓
DateOfBirth	date	✓ 2009-10-03+0530
HouseNumberAndStreet	HouseNumberAndStreet<string>	✓
PostalCode	PostalCode<string>	✓

Figure: Entering the Input values

3. Click the Continue button ▶.

When the Select Deployment screen appears, select the WebSphere Process Server to which you added the project and click the Finish button.

4. If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK**.



User Login - Default Module Test

Security is enabled on the selected runtime environment(s).
Sign in to continue the test.

User ID:*

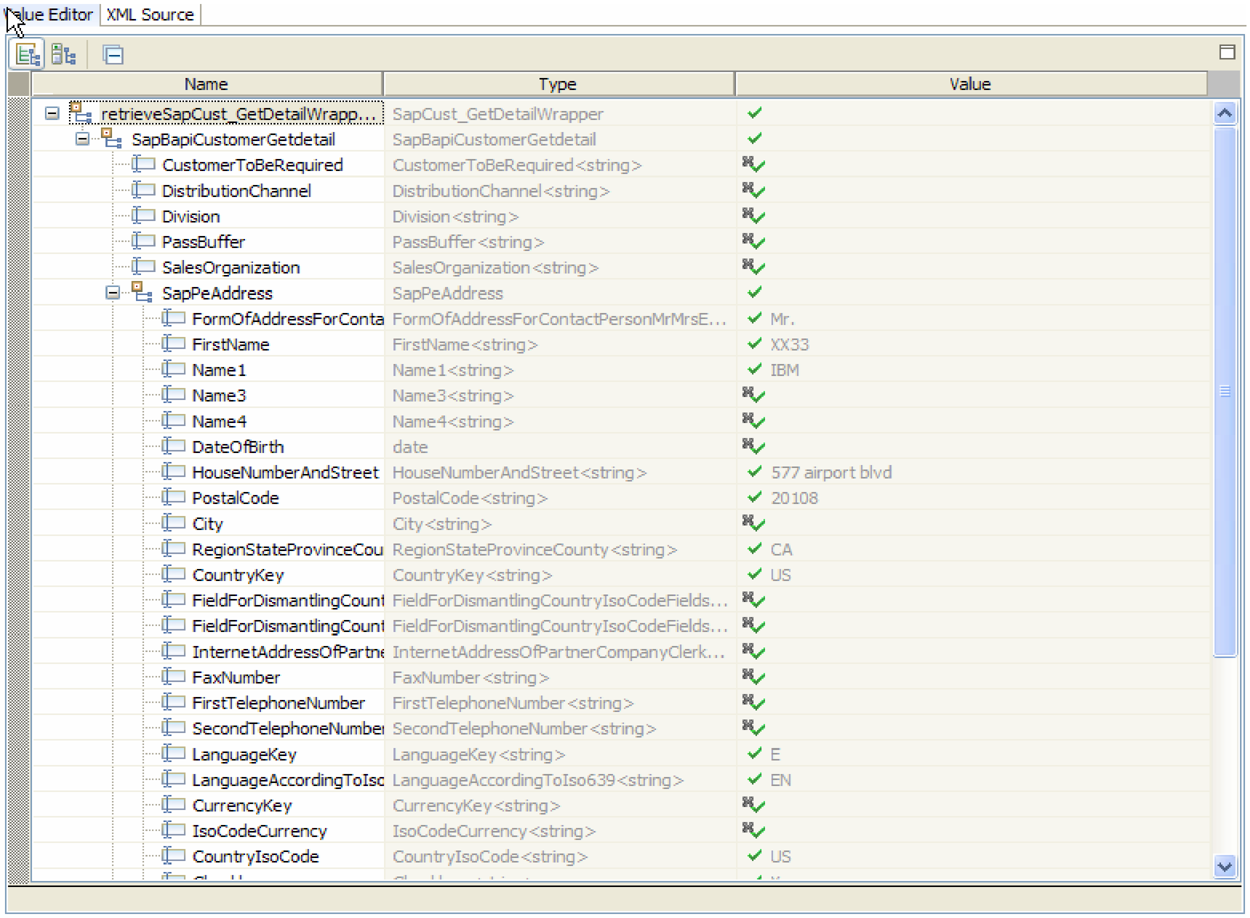
admin

Password:*

•••••

□ Use the authentication settings in the preference and never ask again

5. Check the output of the service in the test client.



Name	Type	Value
retrieveSapCust_GetDetailWrapp...	SapCust_GetDetailWrapper	✓
SapBapiCustomerGetdetail	SapBapiCustomerGetdetail	✓
CustomerToBeRequired	CustomerToBeRequired<string>	✗✓
DistributionChannel	DistributionChannel<string>	✗✓
Division	Division<string>	✗✓
PassBuffer	PassBuffer<string>	✗✓
SalesOrganization	SalesOrganization<string>	✗✓
SapPeAddress	SapPeAddress	✓
FormOfAddressForConta	FormOfAddressForContactPersonMrMrsE...	✓ Mr.
FirstName	FirstName<string>	✓ XX33
Name1	Name1<string>	✓ IBM
Name3	Name3<string>	✗✓
Name4	Name4<string>	✗✓
DateOfBirth	date	✗✓
HouseNumberAndStreet	HouseNumberAndStreet<string>	✓ 577 airport blvd
PostalCode	PostalCode<string>	✓ 20108
City	City<string>	✗✓
RegionStateProvinceCou	RegionStateProvinceCounty<string>	✓ CA
CountryKey	CountryKey<string>	✓ US
FieldForDismantlingCount	FieldForDismantlingCountryIsoCodeFields...	✗✓
FieldForDismantlingCount	FieldForDismantlingCountryIsoCodeFields...	✗✓
InternetAddressOfPartne	InternetAddressOfPartnerCompanyClerk...	✗✓
FaxNumber	FaxNumber<string>	✗✓
FirstTelephoneNumber	FirstTelephoneNumber<string>	✗✓
SecondTelephoneNumbe	SecondTelephoneNumber<string>	✗✓
LanguageKey	LanguageKey<string>	✓ E
LanguageAccordingToIsc	LanguageAccordingToIso639<string>	✓ EN
CurrencyKey	CurrencyKey<string>	✗✓
IsoCodeCurrency	IsoCodeCurrency<string>	✗✓
CountryIsoCode	CountryIsoCode<string>	✓ US

6. Check that the data retrieved in the Test Client matches your EIS data.

7. Login to the SAP GUI using the credentials for the given SAP server

8. Open the BAPI Explorer (tcode – se37)

9. Enter the BAPI name BAPI_CUSTOMER_GETDETAIL in the **Function Module** field,

10. Press F8 to execute the BAPI.

11. Enter the values provided in step (2) above for **Test Function Module: Initial screen**, under **Import parameters**

12. Press F8 to Execute the BAPI using the values that are entered.

13. Check that the values in **Export Parameters** in the **Test Function Module: Result screen** and match the values returned in step (5) above

To read the documentation pertaining to any BAPI.

1. Open the BAPI Explorer using tcode – se37.

2. Enter the name of the BAPI in the **Function Builder: Initial Screen**.

3. Click **Display**.

4. Click Function Module Documentation or press Ctrl + F4

Clearing the sample content

No clean up is required after this tutorial.

Chapter 5. Tutorial 2: Updating data in SAP (outbound processing) using the BAPI Work Unit Interface

Business Case

A Manager has to update an employee's address in an SAP system when informed of a change.

Scenario

The following scenario illustrates outbound processing of BAPI units of work. A BAPI work unit consists of a set of BAPIs that are processed in sequence to complete a task.

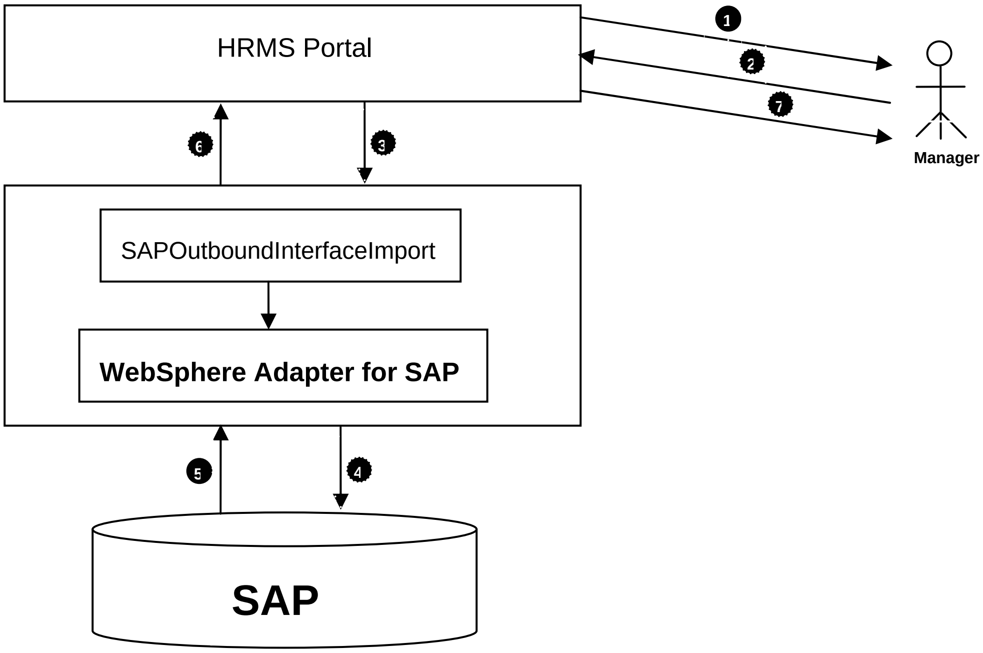


Figure: Scenario illustrating BAPI Work Unit outbound processing

1. The HRMS portal notifies the Manager with the details of the address change of an employee

2. The Officer logs in to the administrative console of the HRMS Portal and submits the address change request for the employee.

3. The HRMS portal will invoke the SCA Import configured to update an employee record using the WebSphere Adapter for SAP Software . This is accomplished by calling the three BAPIs, in the same work unit sequentially:

BAPI_EMPLOYEE_ENQUEUE

BAPI_EMPLOYEE_DEQUEUE

BAPI_EMPLOYEE_CHANGE

4. The first BAPI locks the employee record. The second updates the record, and the third approves the update.

Note: The advantage of using the BAPI Work Unit interface is that the client application can request the employee record change with a single call, though the work unit consists of three separate functions. Also, the BAPI Work Unit interface can be used if your SAP system requires that certain BAPIs are to be processed in a specific sequence for a business flow to complete correctly.

5. The adapter receives a request from the client application as a wrapper Business Object that contains these three child BAPI objects.

BAPI_ADDRESSEMP_ENQUEUE

BAPI_ADDRESSEMP_DEQUEUE

BAPI_ADDRESSEMP_CHANGE

6. The adapter sends this data to the SAP system which responds with the details of the three BAPIs.

7. The adapter handles the SAP response, converts it into a Business Object format as required by the client application and returns it.

8. The HRMS portal returns the appropriate response to the Manager.

Configuration prerequisites

You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to
WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Application Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to
WAS_SERVER_ONLY_server_region_classpath

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

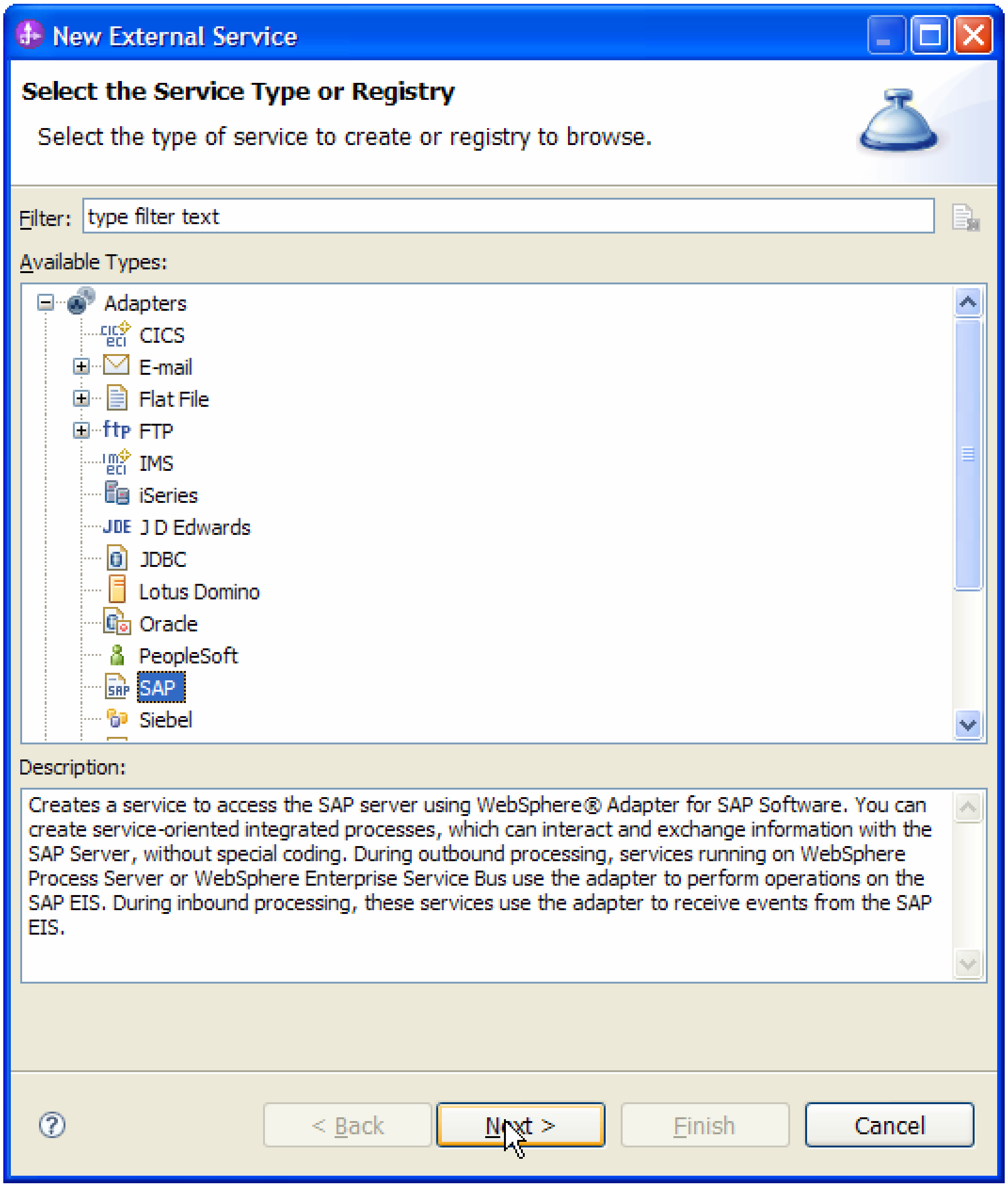
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

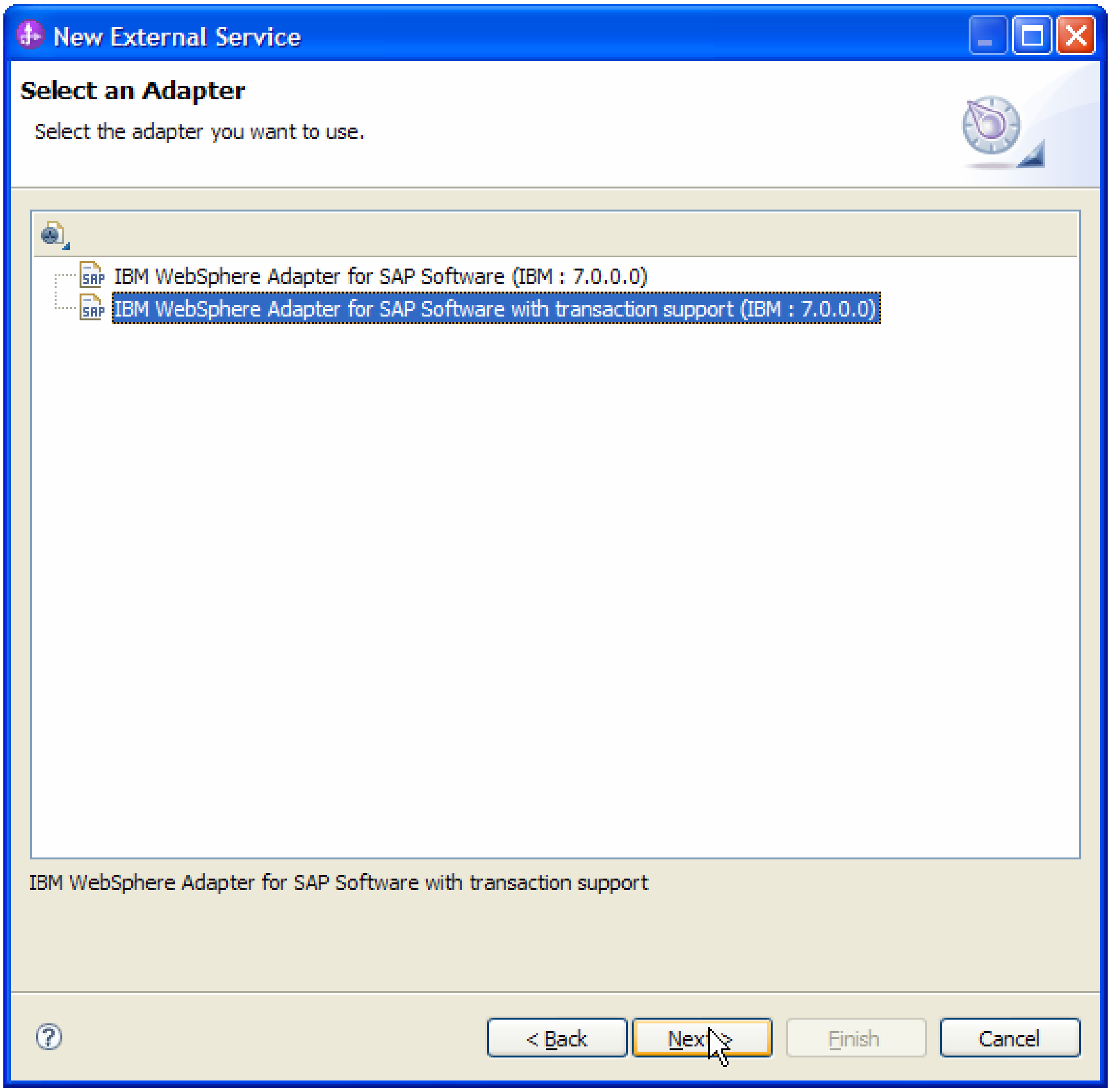
1. Select **Adapters** > **SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



Select an Adapter

Select the adapter you want to use.

- IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
- IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

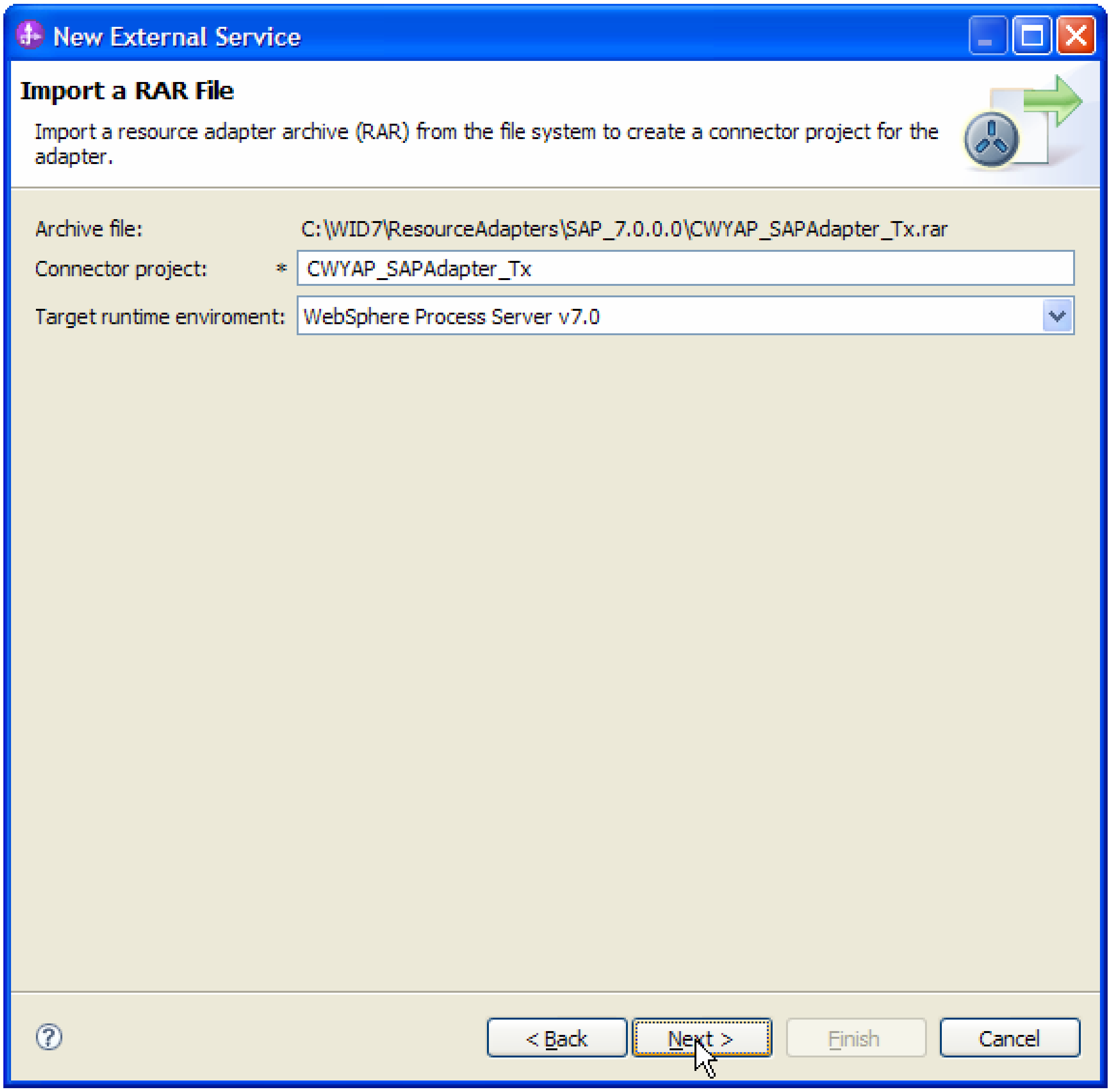
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the Import a RAR File screen and proceed by clicking on **Next.**



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

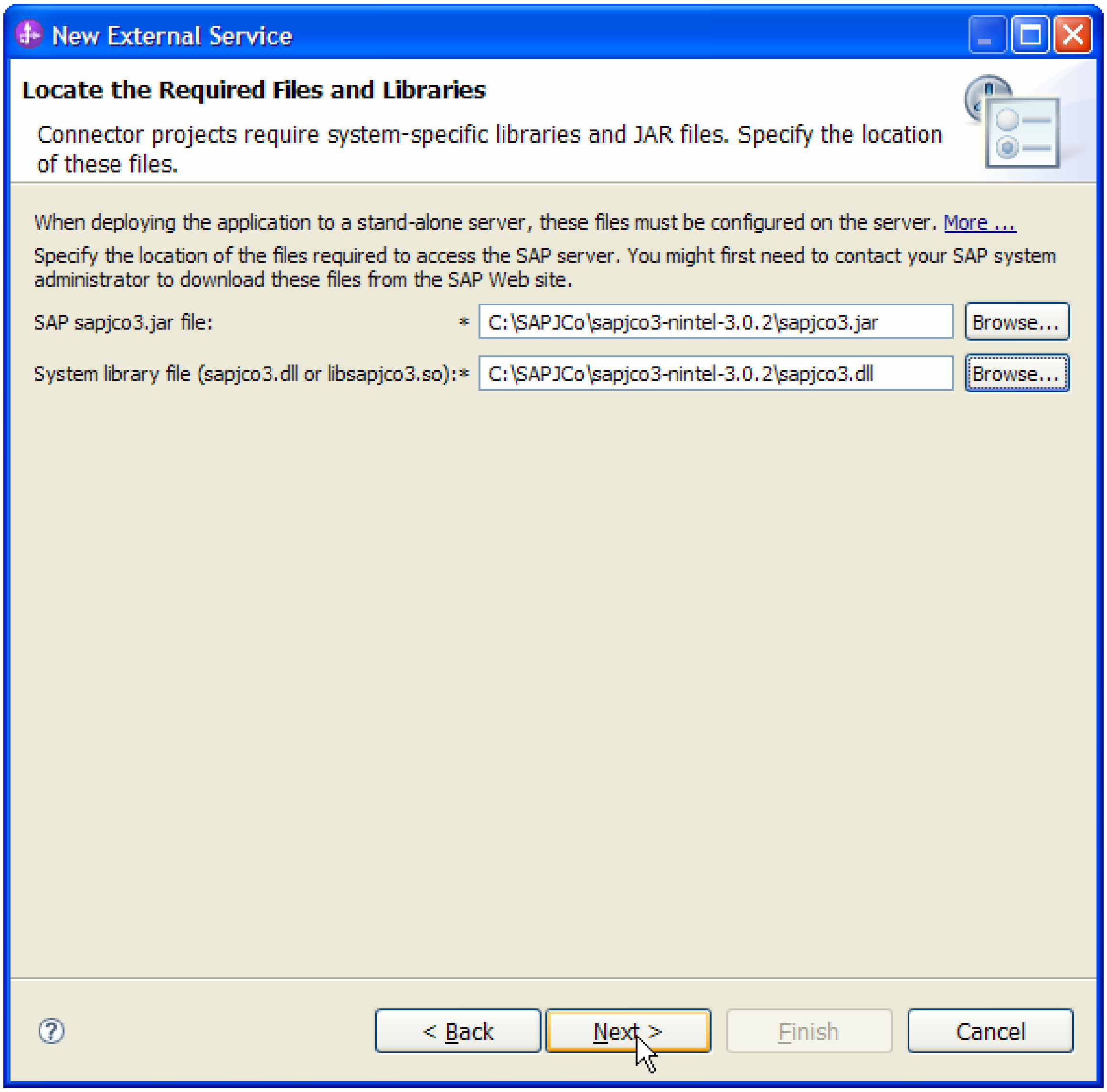
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** Screen, provide the location of **sapjco3.jar** and **sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

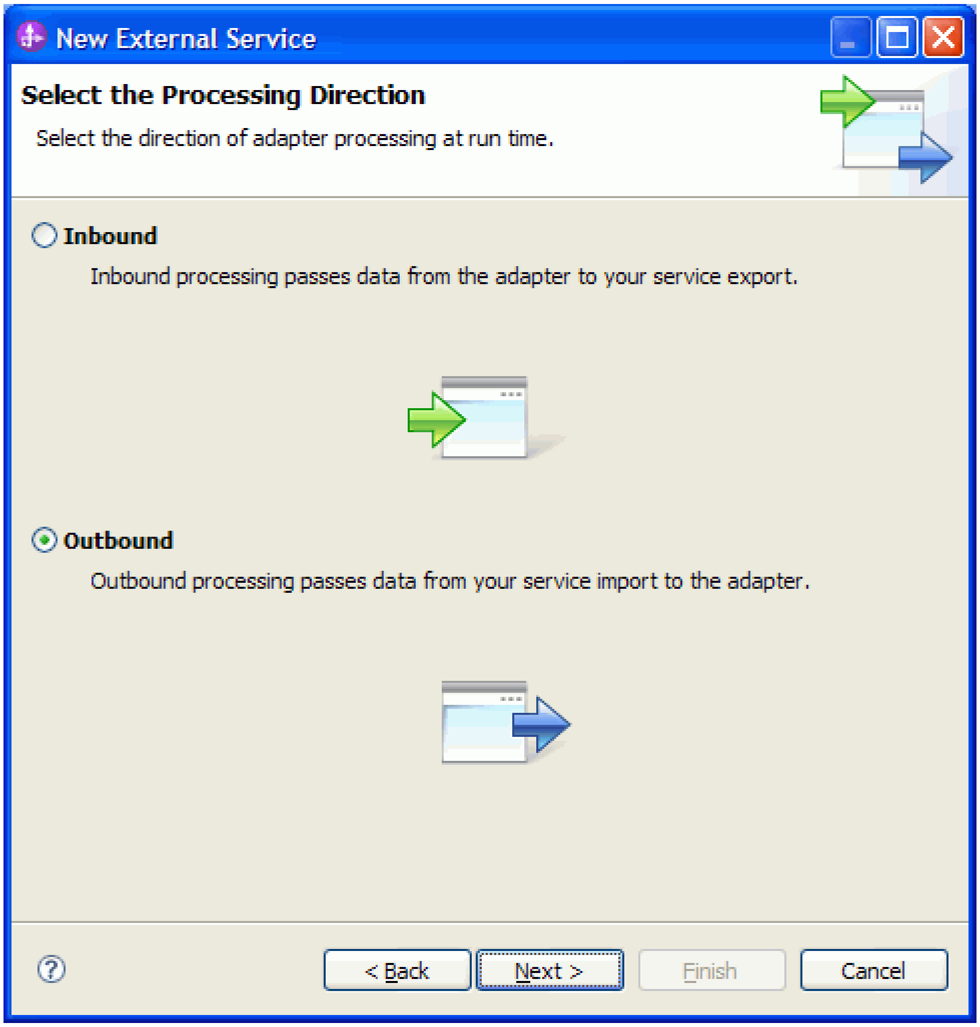
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

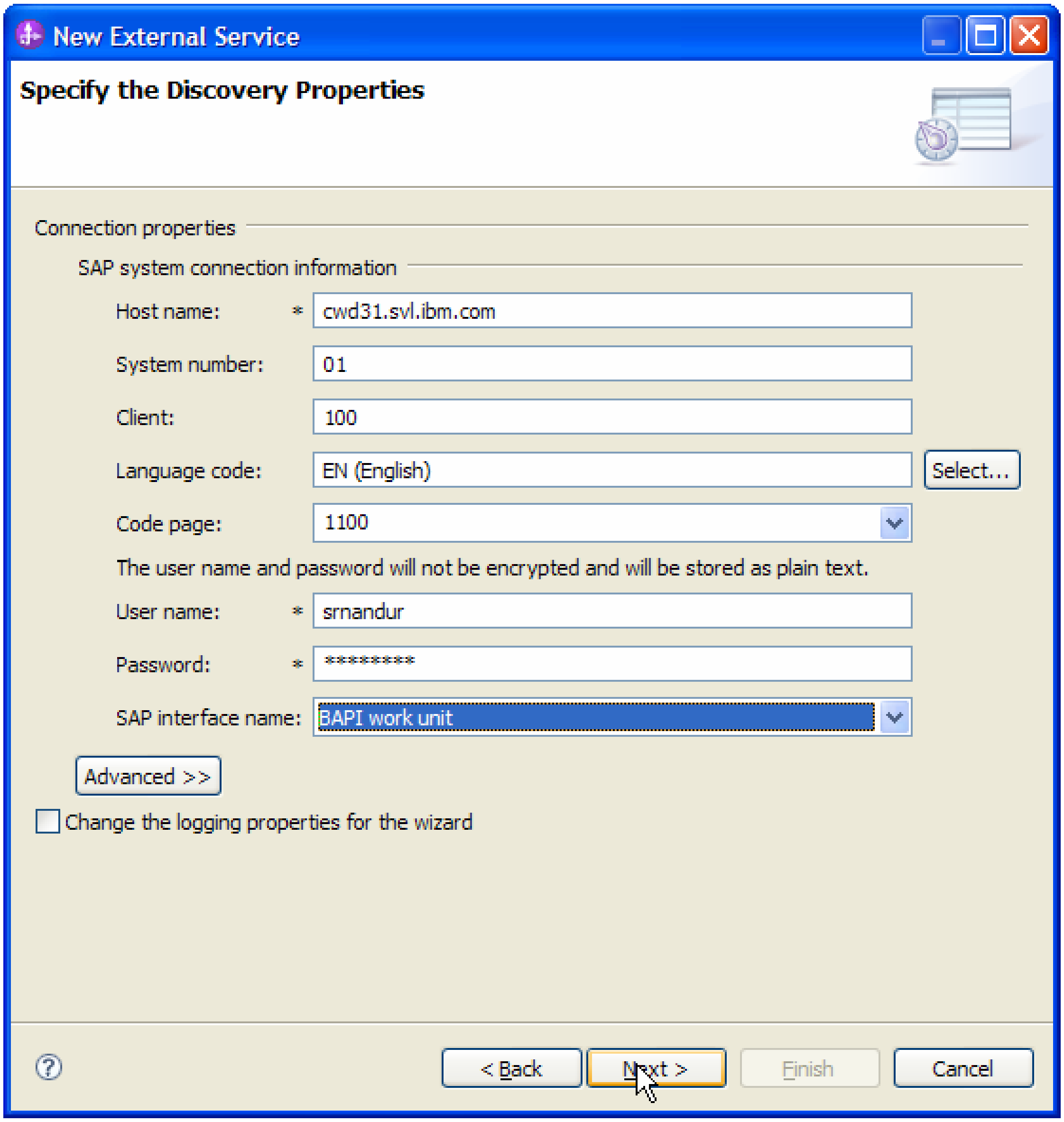
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select **BAPI Work Unit** as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

SAP interface name: BAPI work unit

□ Change the logging properties for the wizard

Figure: Select BAPI Work Unit as the interface

Selecting the Business Objects and services to be used with the adapter

1. In the **Find objects in the Enterprise System** screen, click expand RFC node. Then click on the button.

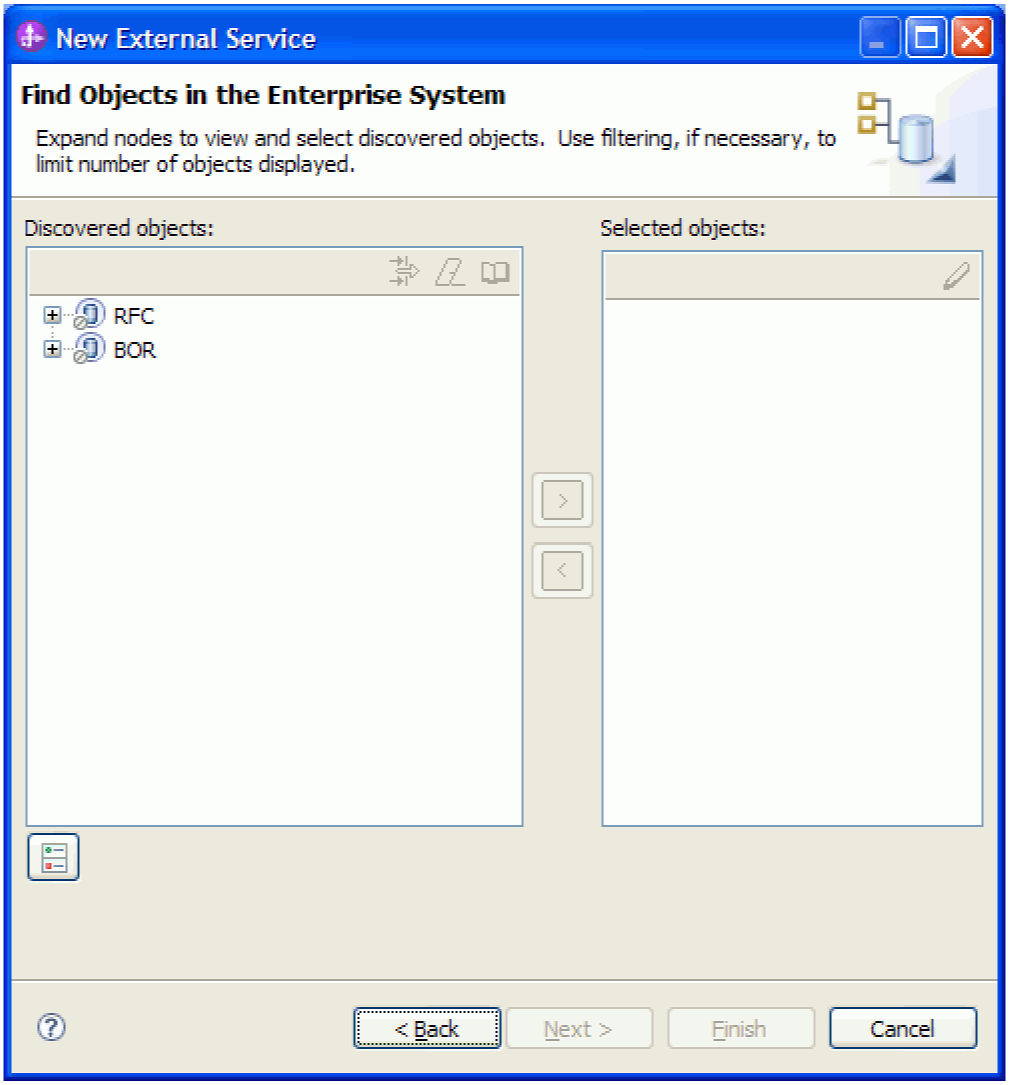
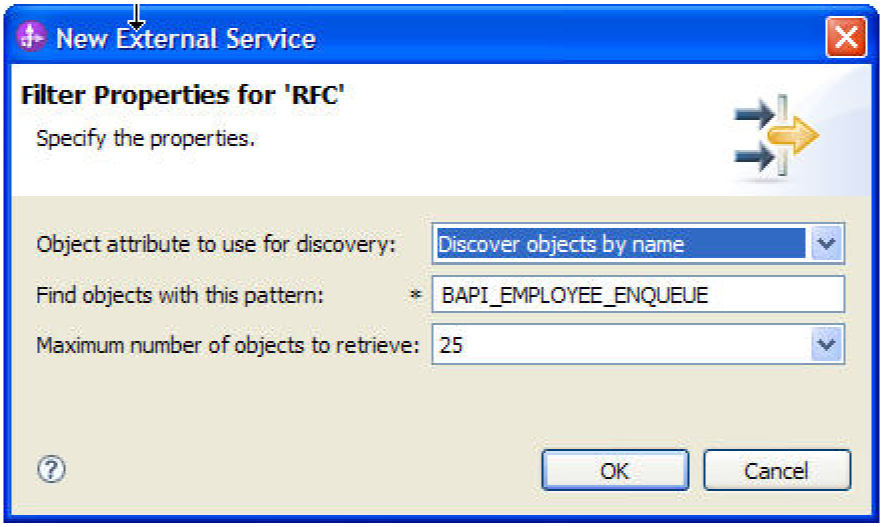

New External Service
Find Objects in the Enterprise System
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.
Discovered objects:
Selected objects:
RFC
BOR
< Back
Next >
Finish
Cancel

Figure: Object Discovery and Selection

2. Enter BAPI_EMPLOYEE_ENQUEUE (the name of the BAPI in SAP plus an asterisk as a wild card character) in the Filter Properties for Discover by Name screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

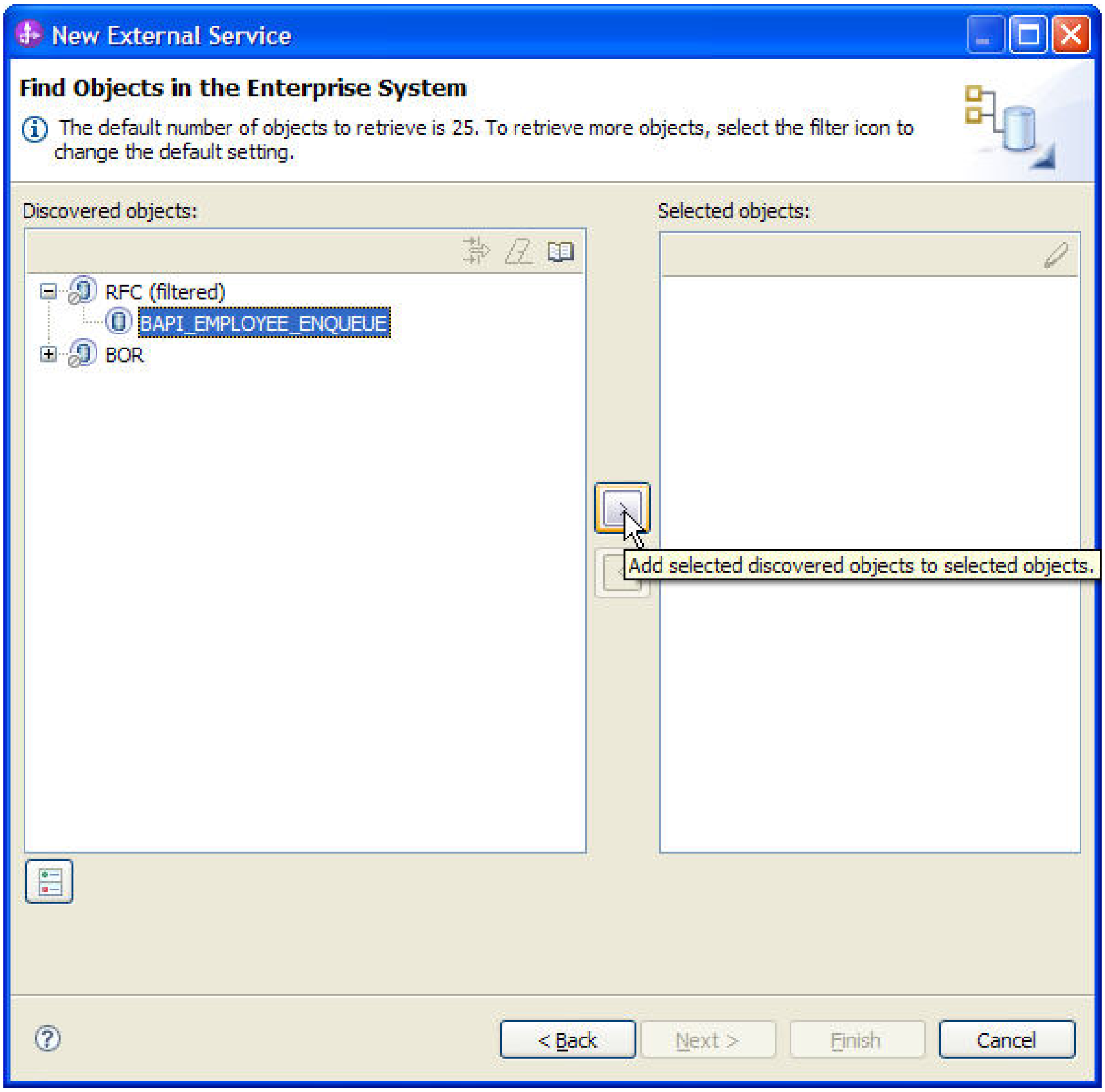
Find objects with this pattern: * BAPI_EMPLOYEE_ENQUEUE

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

3. Click **OK**.

4. Expand the **RFC** node.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- RFC (filtered)
  - BAPI_EMPLOYEE_ENQUEUE
- BOR

Selected objects:

Add selected discovered objects to selected objects.

< Back | Next > | Finish | Cancel

Figure: Retrieved BAPI based on search criteria

5. Select the BAPI_EMPLOYEE_ENQUEUE.

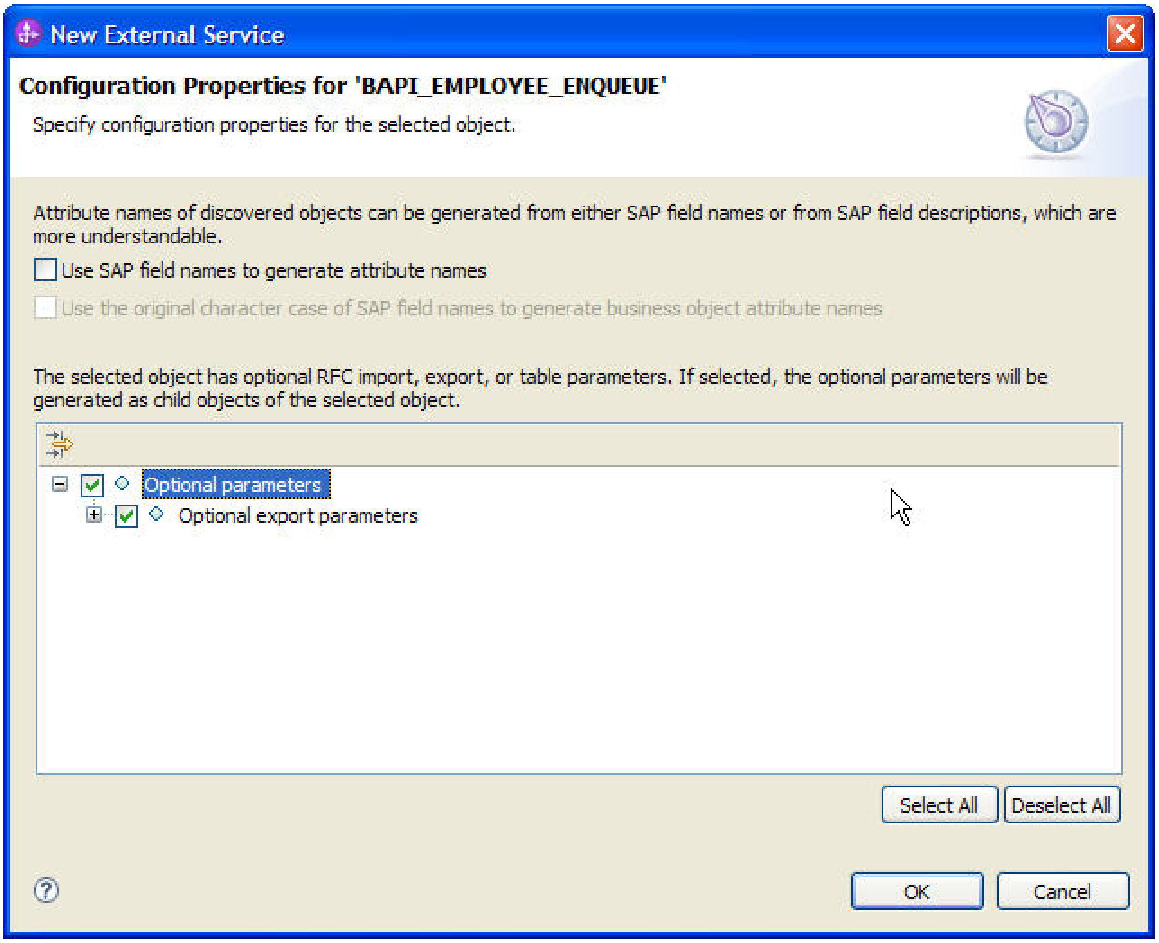
6. Click the > button.

7. A popup will appear containing the Configuration properties for the BAPI_EMPLOYEE_ENQUEUE object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

8. You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

9. Click **OK**.



New External Service

Configuration Properties for 'BAPI_EMPLOYEE_ENQUEUE'

Specify configuration properties for the selected object.

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

☑ Optional parameters
- ☑ Optional export parameters

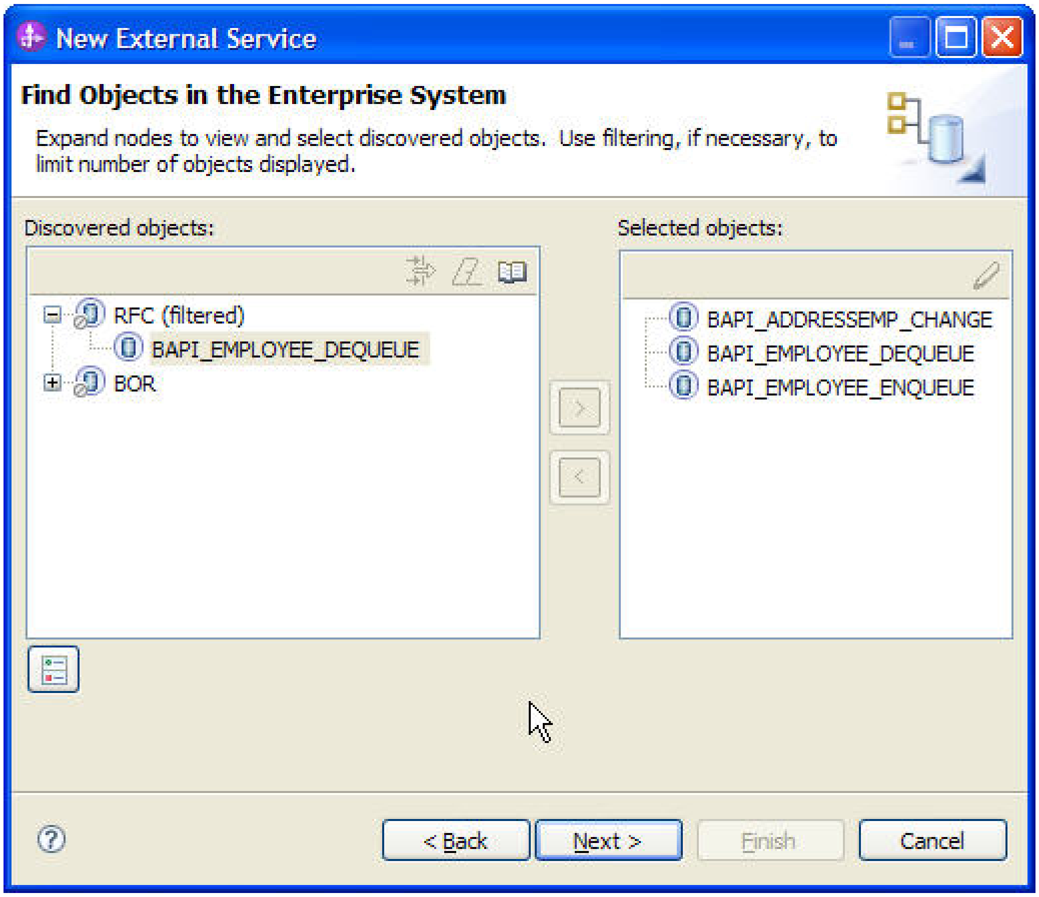
Figure: Setting configuration parameters for the BAPIs selected

10. Click **OK**.

11. Repeat steps 1 to 6 for the following BAPIs –

BAPI_ADDRESSEMP_CHANGE

BAPI_EMPLOYEE_DEQUEUE



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

- RFC (filtered)
  - BAPI_EMPLOYEE_DEQUEUE
- BOR

Selected objects:

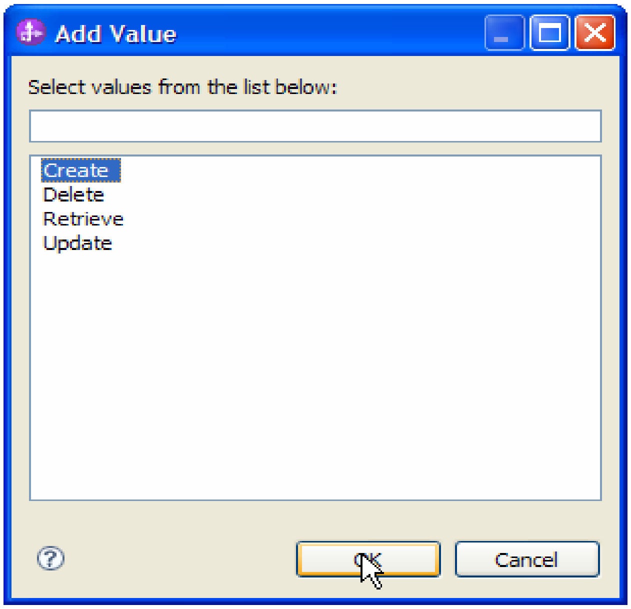
- BAPI_ADDRESSEMP_CHANGE
- BAPI_EMPLOYEE_DEQUEUE
- BAPI_EMPLOYEE_ENQUEUE

12. Click **Next**.

Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen, enter the Business Object name for service operations as BAPI_EMPLOYEE_ENQUEUE.

Under **Service Operations**, click Add and add the **Create** as an operation

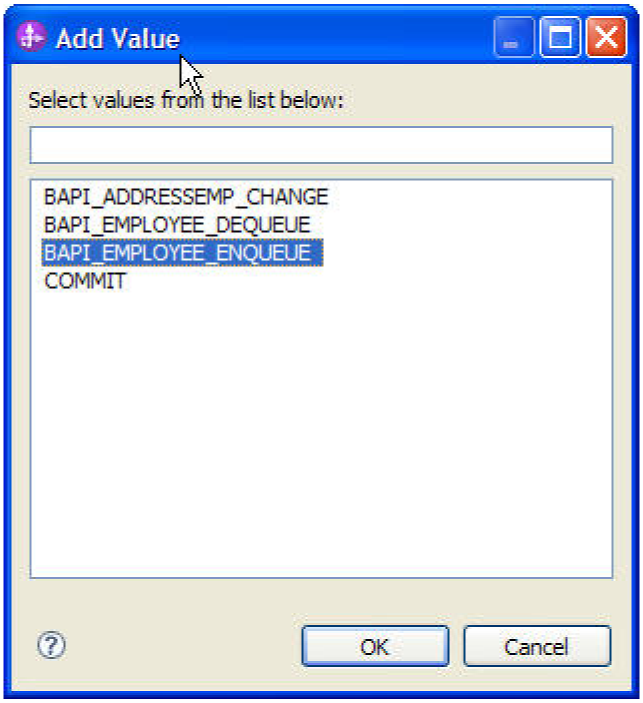


Add Value

Select values from the list below:

Create
Delete
Retrieve
Update

Associate the Business Object BAPI_ADDRESSSEMP_REQUEST to the Create operation by clicking **Add** under **Sequence of RFC functions for the selected operation**.

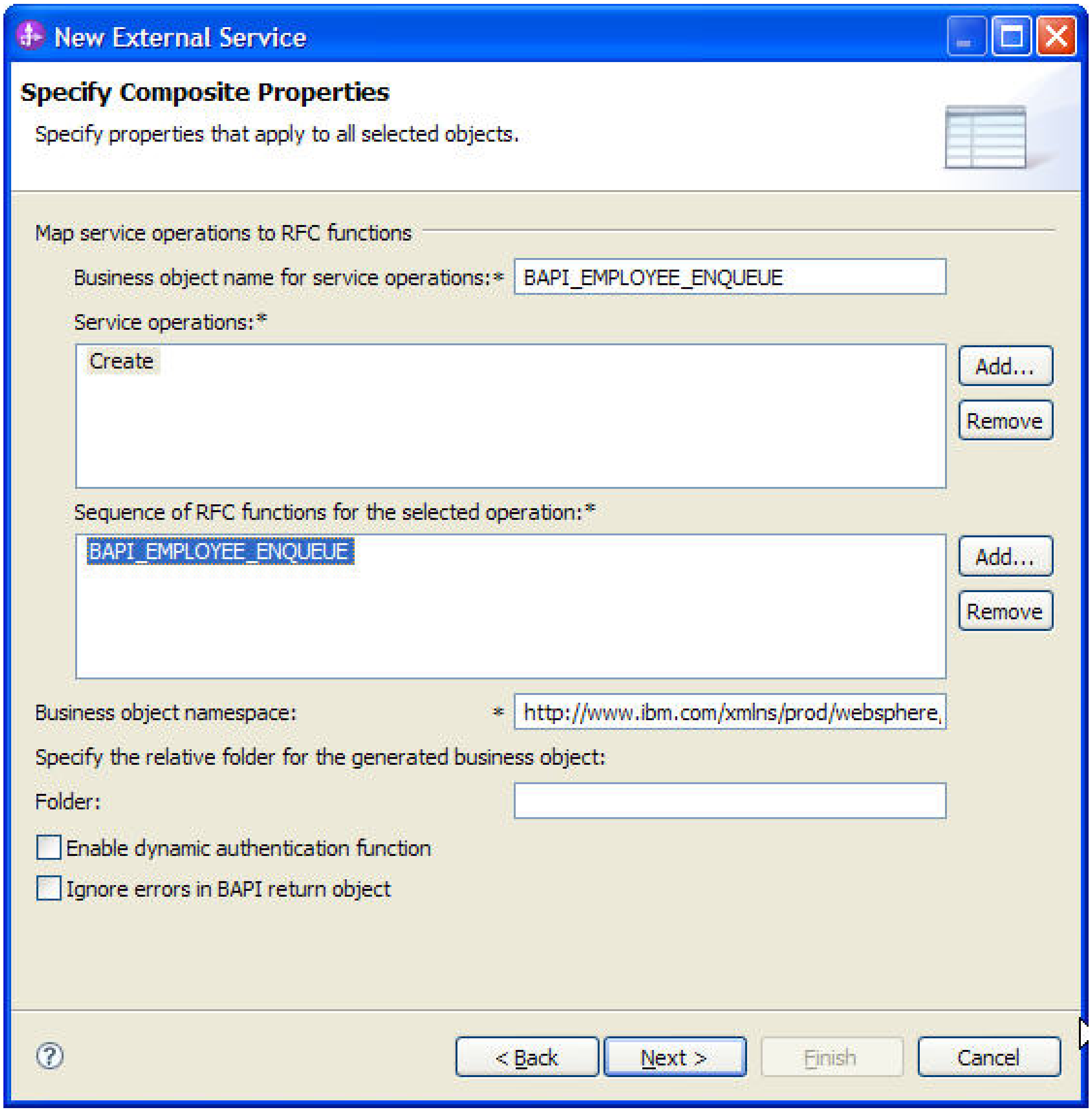


Add Value

Select values from the list below:

BAPI_ADDRESSEMP_CHANGE
BAPI_EMPLOYEE_DEQUEUE
BAPI_EMPLOYEE_ENQUEUE
COMMIT

The **Specify Composite Properties** screen will now look like the following screen.



Specify Composite Properties

Specify properties that apply to all selected objects.

Map service operations to RFC functions

Business object name for service operations:* BAPI_EMPLOYEE_ENQUEUE

Service operations:*

Create

Sequence of RFC functions for the selected operation:*

BAPI_EMPLOYEE_ENQUEUE

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere,

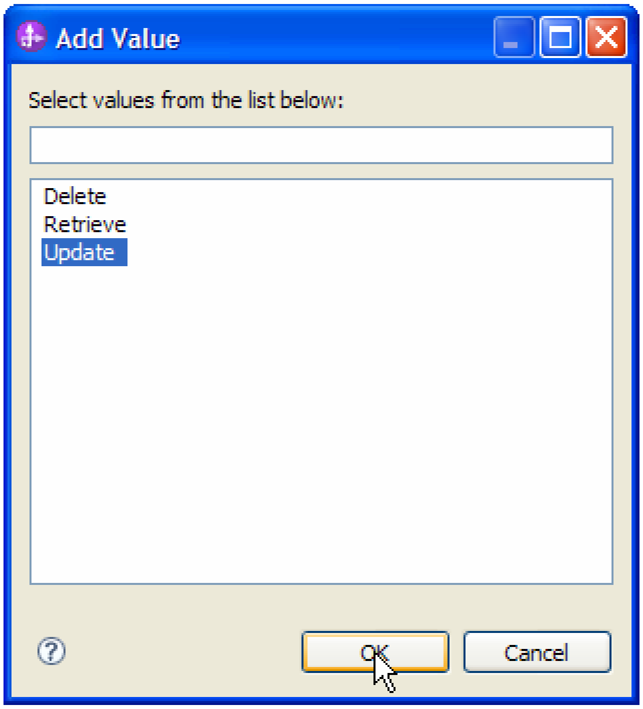
Specify the relative folder for the generated business object:

Folder:

□ Enable dynamic authentication function

□ Ignore errors in BAPI return object

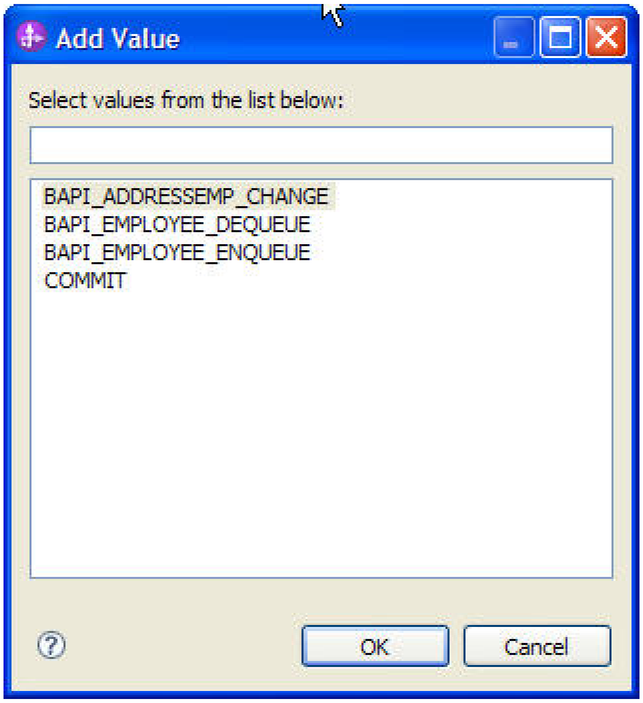
Under **Service Operations**, click Add and add the **Update** as an operation



Add Value

Select values from the list below:

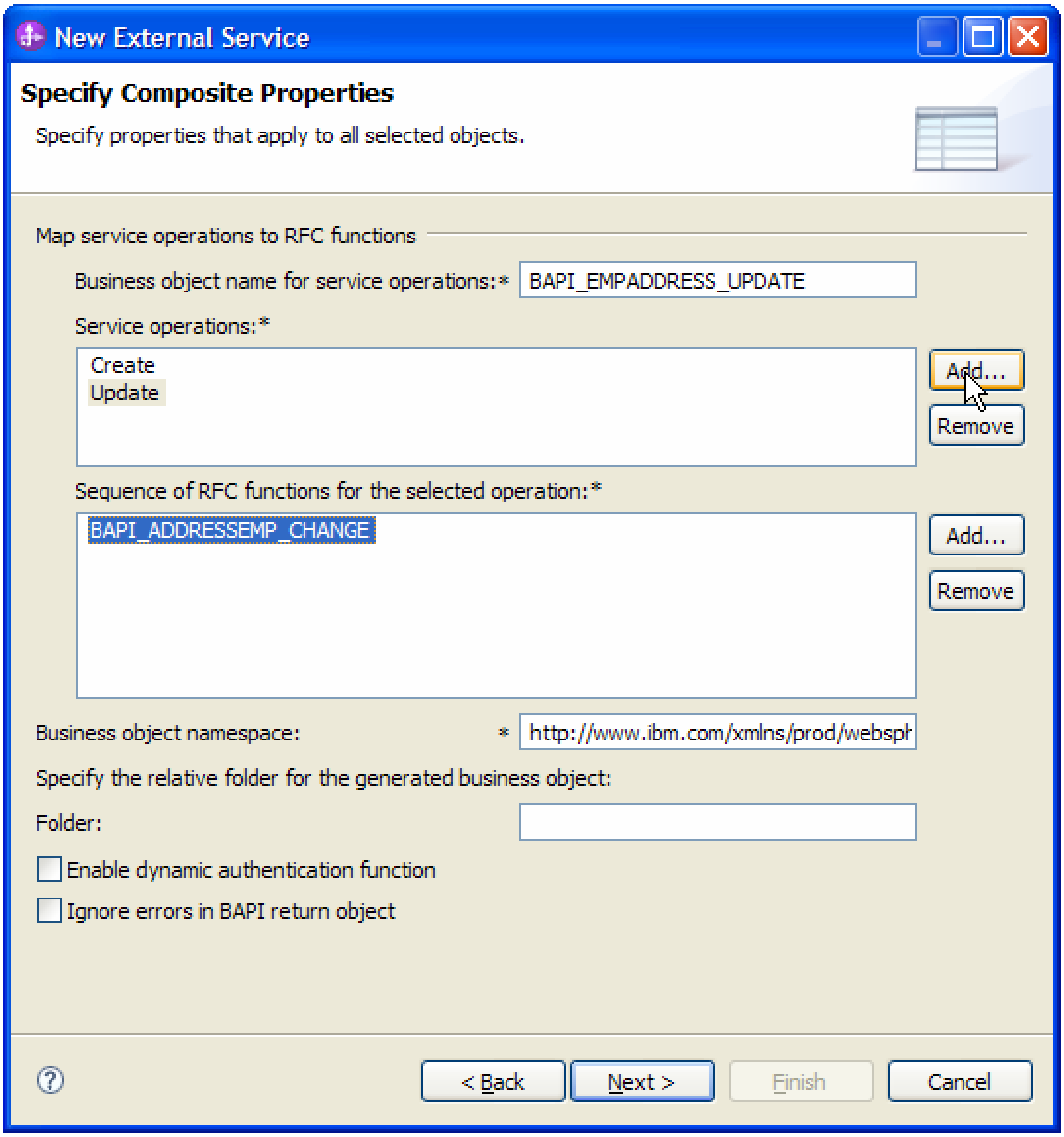
Associate the Business Object BAPI_ADDRESSSEMP_CHANGE to the **Update** operation by clicking **Add** under **Sequence of RFC functions for the selected operation.**



Add Value

Select values from the list below:

The **Specify Composite Properties** screen will now look like –



Specify Composite Properties

Specify properties that apply to all selected objects.

Map service operations to RFC functions

Business object name for service operations:* BAPI_EMPADDRESS_UPDATE

Service operations:*

Create
Update

Sequence of RFC functions for the selected operation:*

BAPI_ADDRESSEMP_CHANGE

Business object namespace: * http://www.ibm.com/xmlns/prod/websph

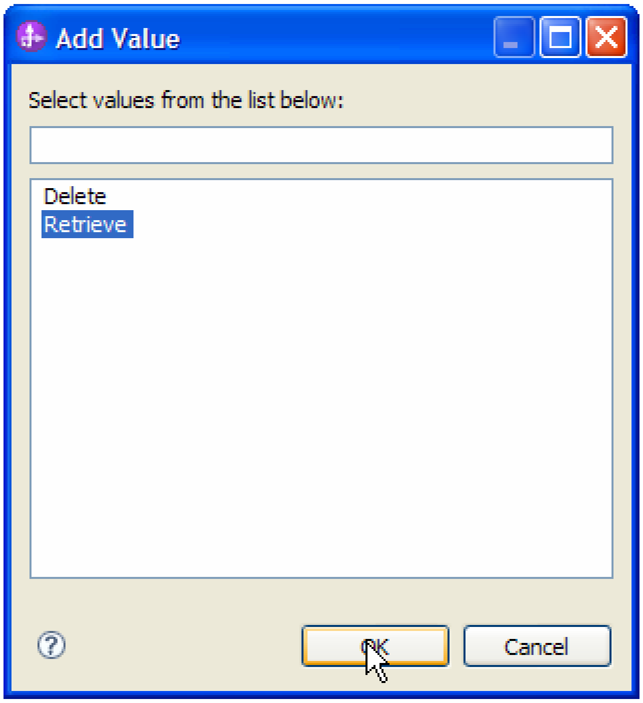
Specify the relative folder for the generated business object:

Folder:

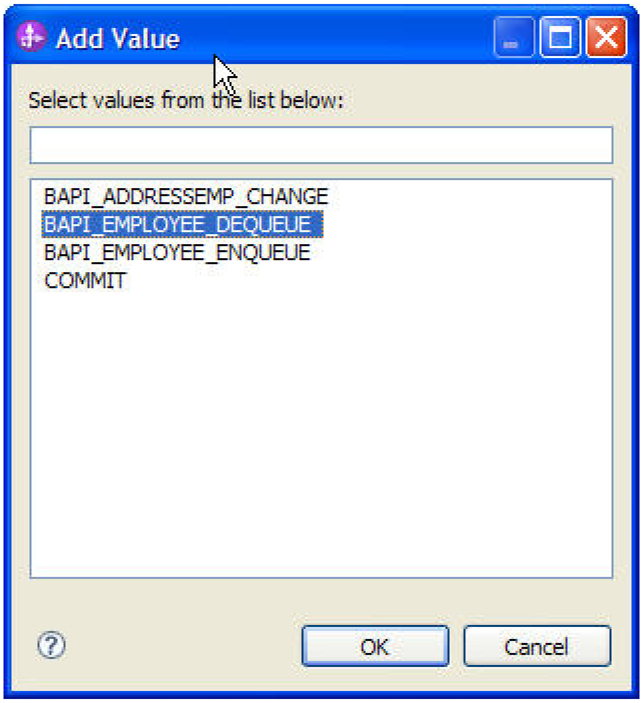
□ Enable dynamic authentication function

□ Ignore errors in BAPI return object

Under **Service Operations**, click Add and add the **Retrieve** as an Operation.

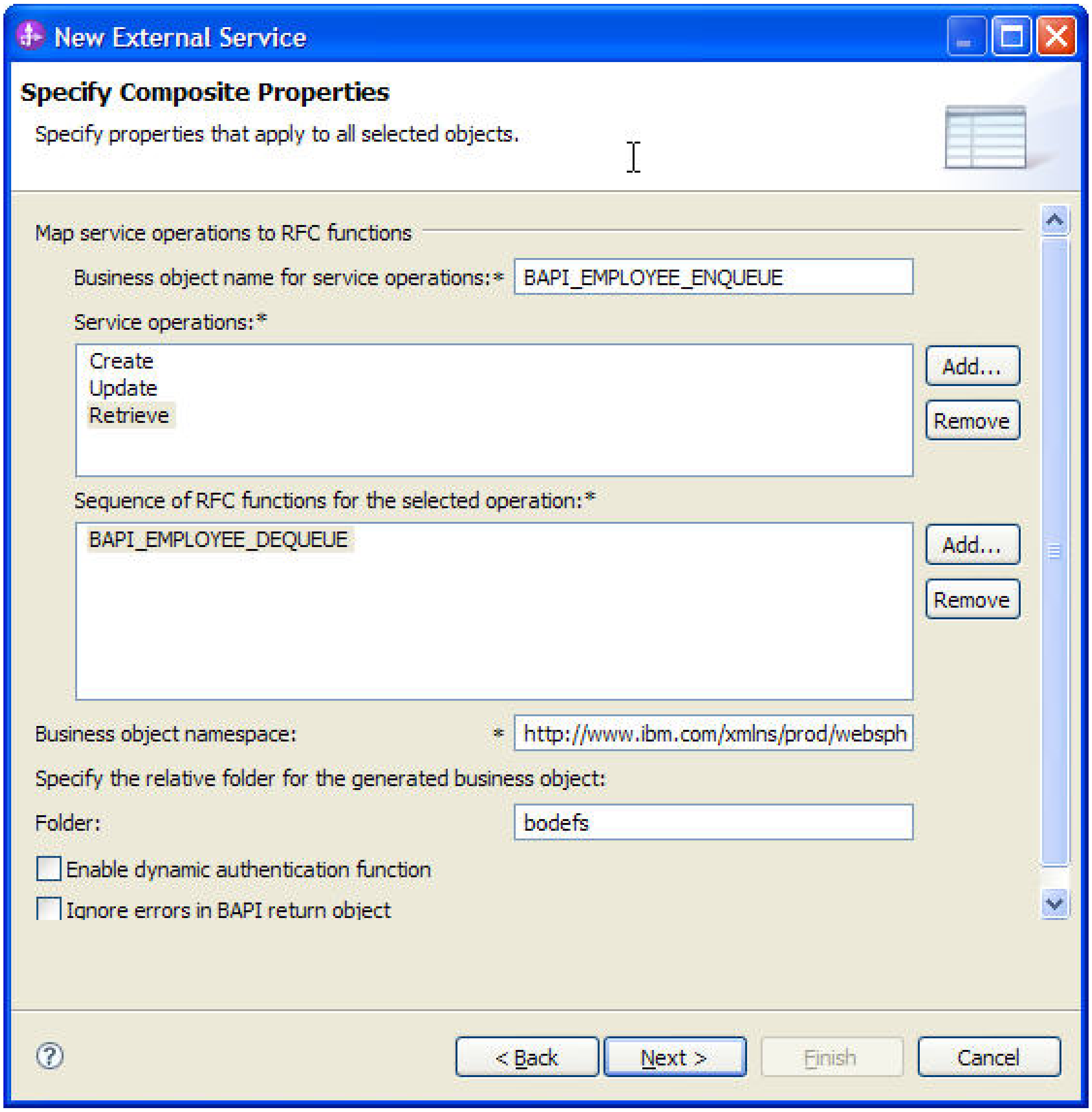


Associate the Business Object BAPI_ADDRESSSEMP_APPROVE to the Retrieve operation by clicking Add under **Sequence of RFC functions for the selected operation.**



Optionally, enter the Business Object folder name for the folder in which the business objects are created. **bodefs** has been used as the folder name for this example.

The **Specify Composite Properties** screen will now look like –



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Map service operations to RFC functions

Business object name for service operations:* BAPI_EMPLOYEE_ENQUEUE

Service operations:*

Create
Update
Retrieve

Sequence of RFC functions for the selected operation:*

BAPI_EMPLOYEE_DEQUEUE

Business object namespace: * http://www.ibm.com/xmlns/prod/websph

Specify the relative folder for the generated business object:

Folder: bodefs

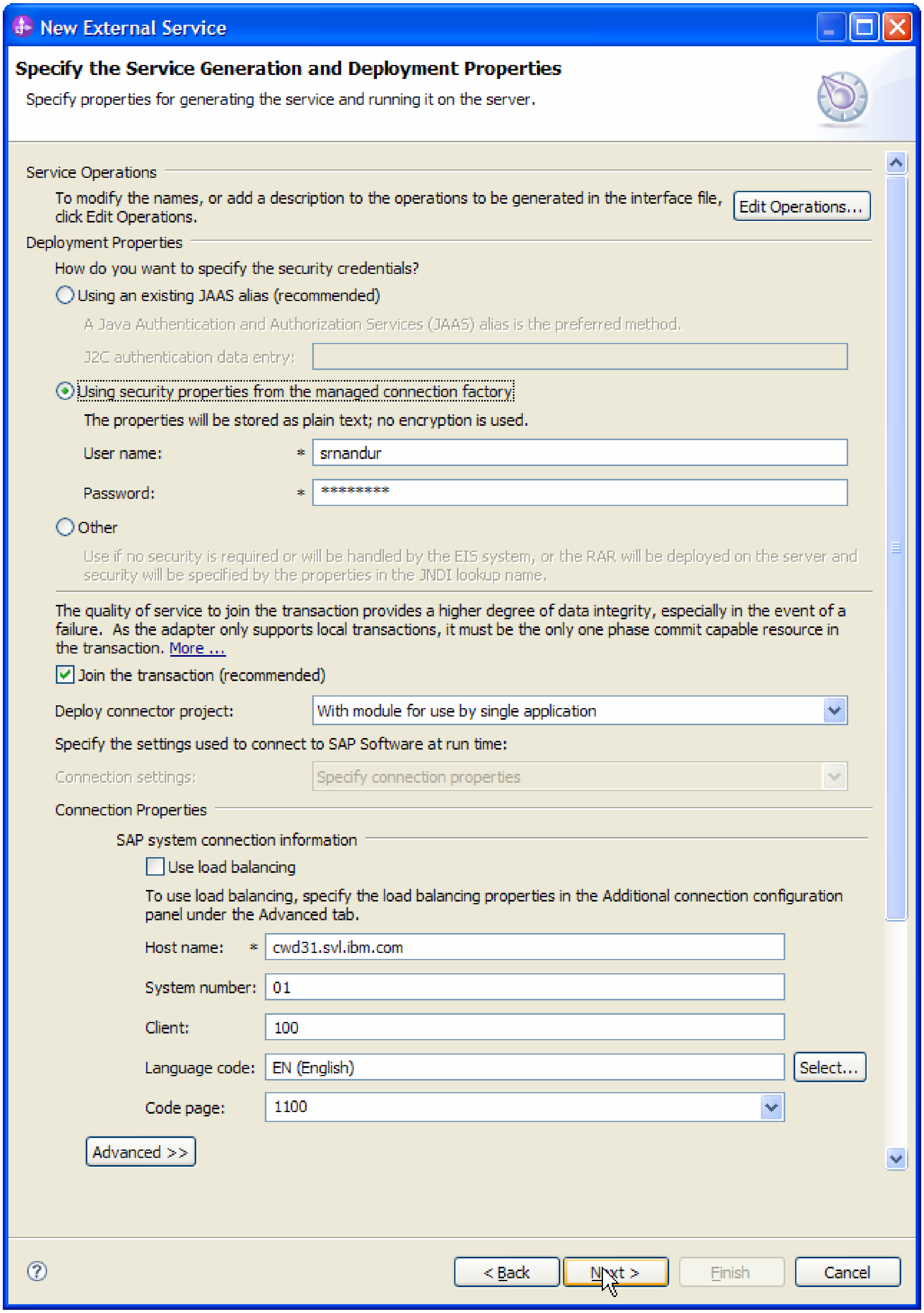
□ Enable dynamic authentication function

□ Ignore errors in BAPI return object

To verify the selections, click any service operation selected and its corresponding Business Object should be displayed automatically in the text box below it.

Click **Next**.

In the **Service Generation and Deployment Configuration** screen, enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

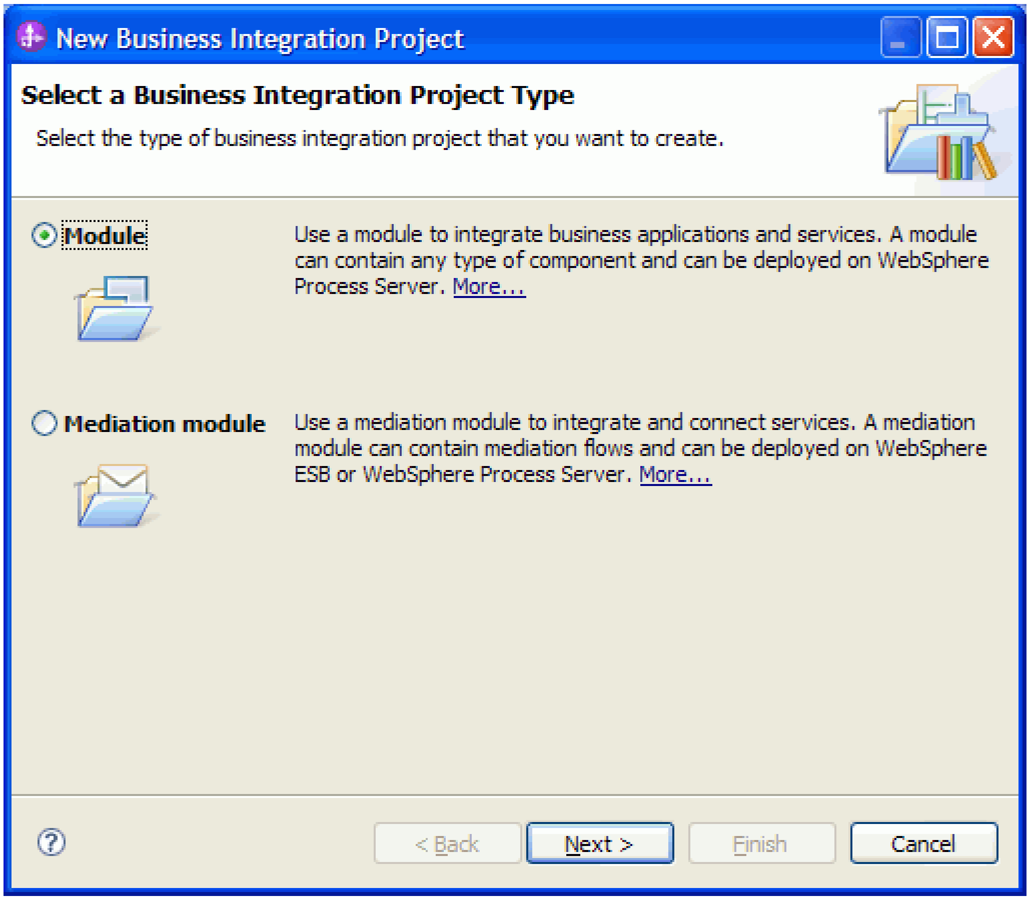
Figure: Service Generation and Deployment Configuration

Note: You can either enter an Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

Click **Next**.

In the **Specify the Location Properties** screen, click the **New** next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

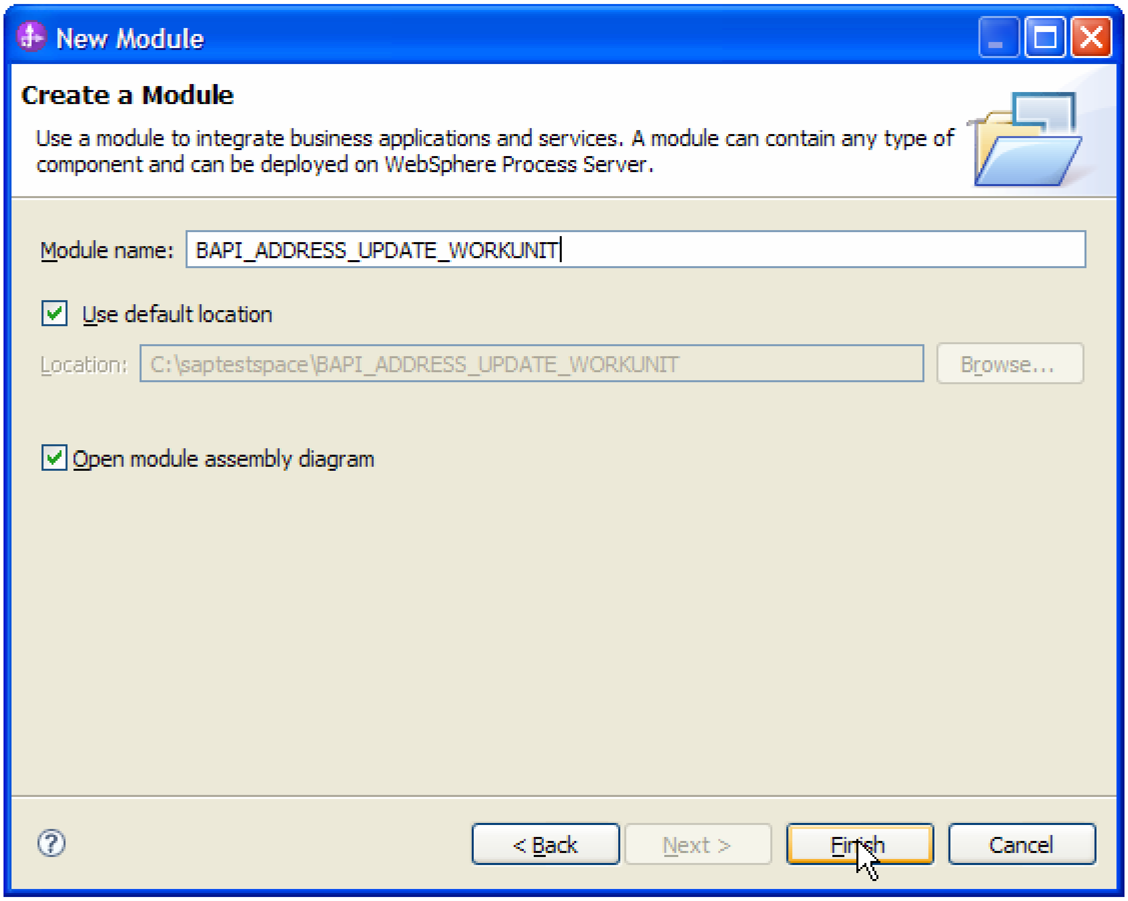
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_ADDRESS_UPDATE_WORKUNIT** in the Module Name field, and click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

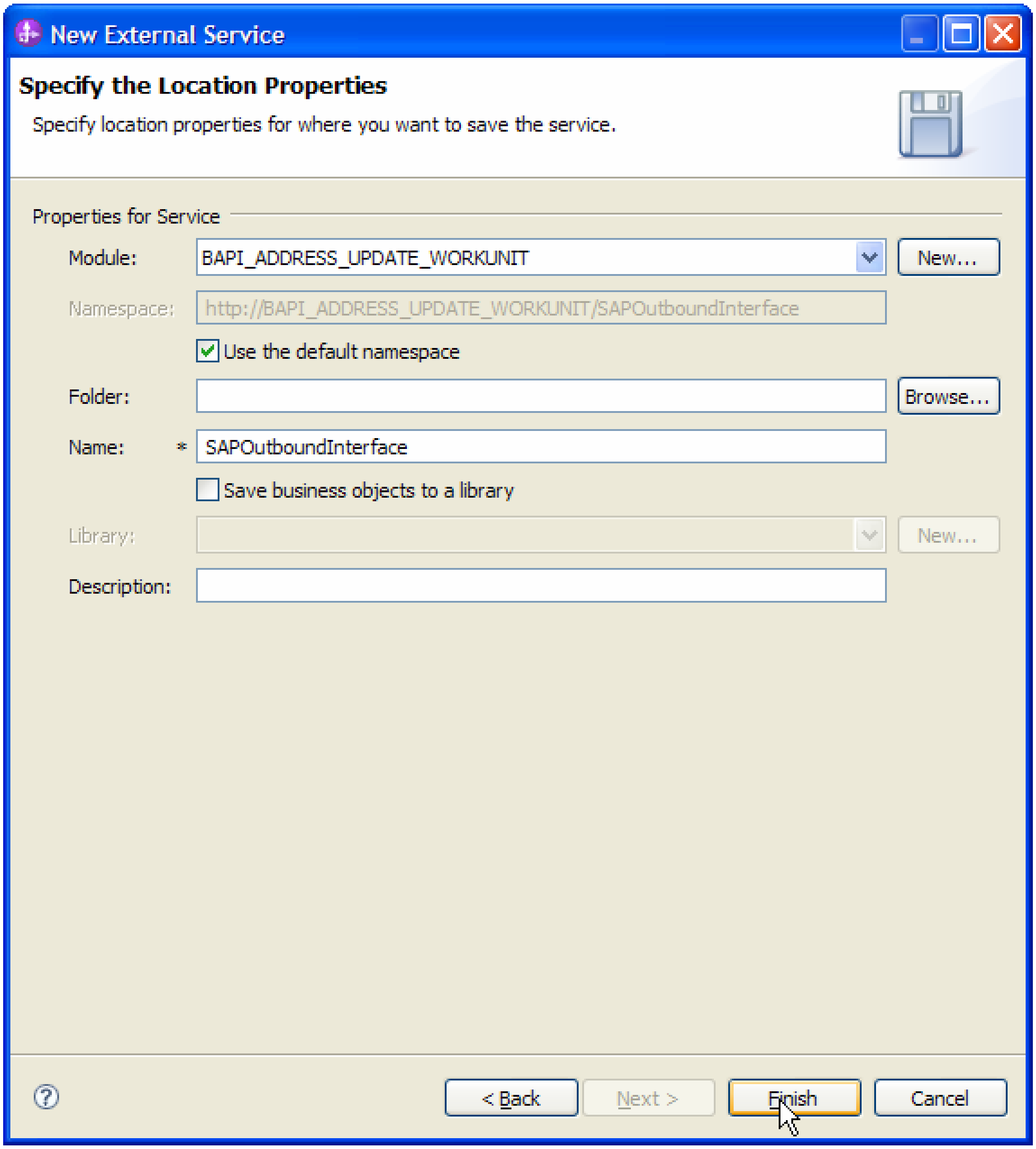
Module name: BAPI_ADDRESS_UPDATE_WORKUNIT

☑ Use default location

Location: C:\saptestspace\BAPI_ADDRESS_UPDATE_WORKUNIT

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: BAPI_ADDRESS_UPDATE_WORKUNIT

Namespace: http://BAPI_ADDRESS_UPDATE_WORKUNIT/SAPOutboundInterface

☑ Use the default namespace

Folder:

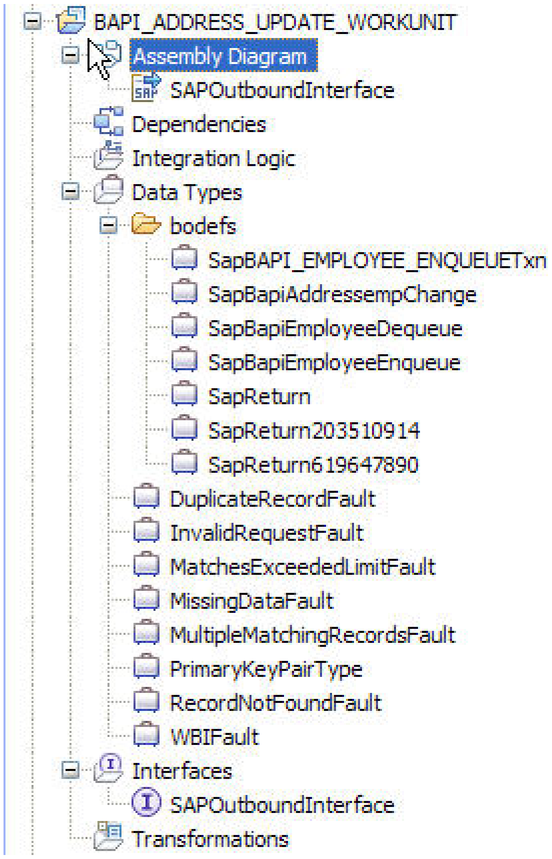
Name: * SAPOutboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



- BAPI_ADDRESS_UPDATE_WORKUNIT
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapBAPI_EMPLOYEE_ENQUEUETxn
      - SapBapiAddressempChange
      - SapBapiEmployeeDequeue
      - SapBapiEmployeeEnqueue
      - SapReturn
      - SapReturn203510914
      - SapReturn619647890
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

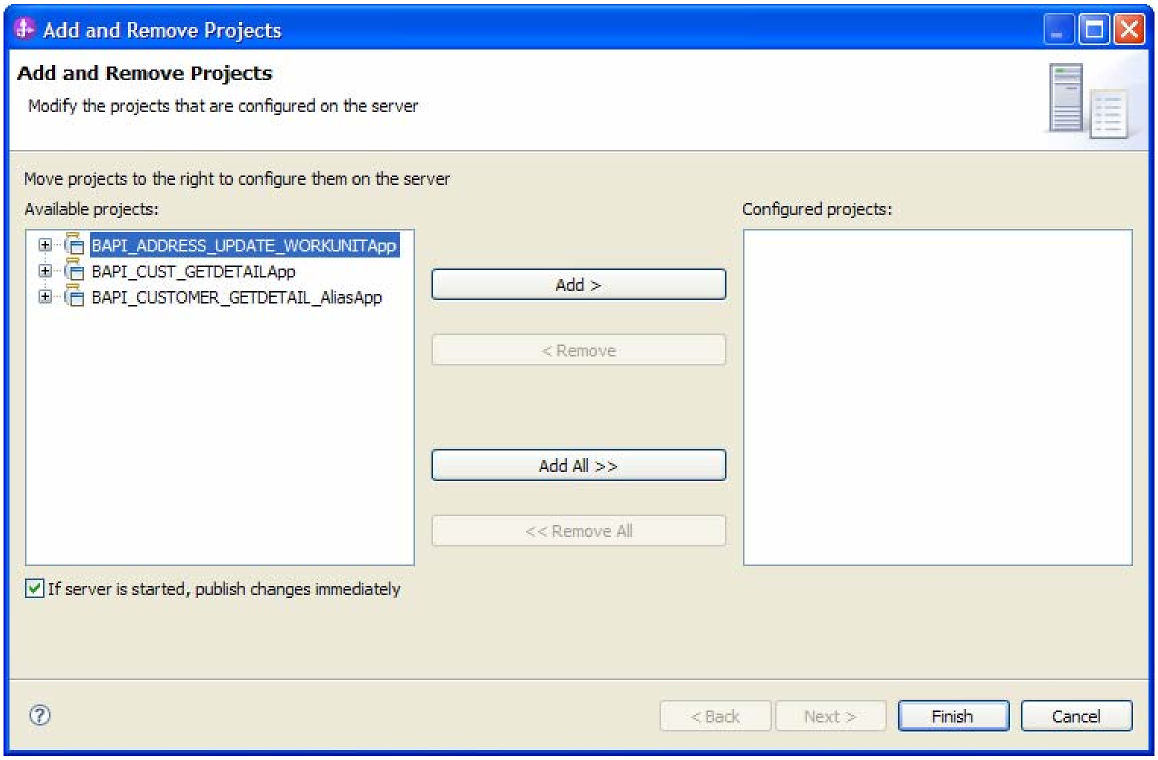
Figure: Artifacts created after the EMD run for BAPI Work Unit Tutorial

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_ADDRESS_UPDATE_WORKUNIT by selecting **Add and Remove Projects**.

The project BAPI_ADDRESS_UPDATE_WORKUNIT App will be listed under **Available projects**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

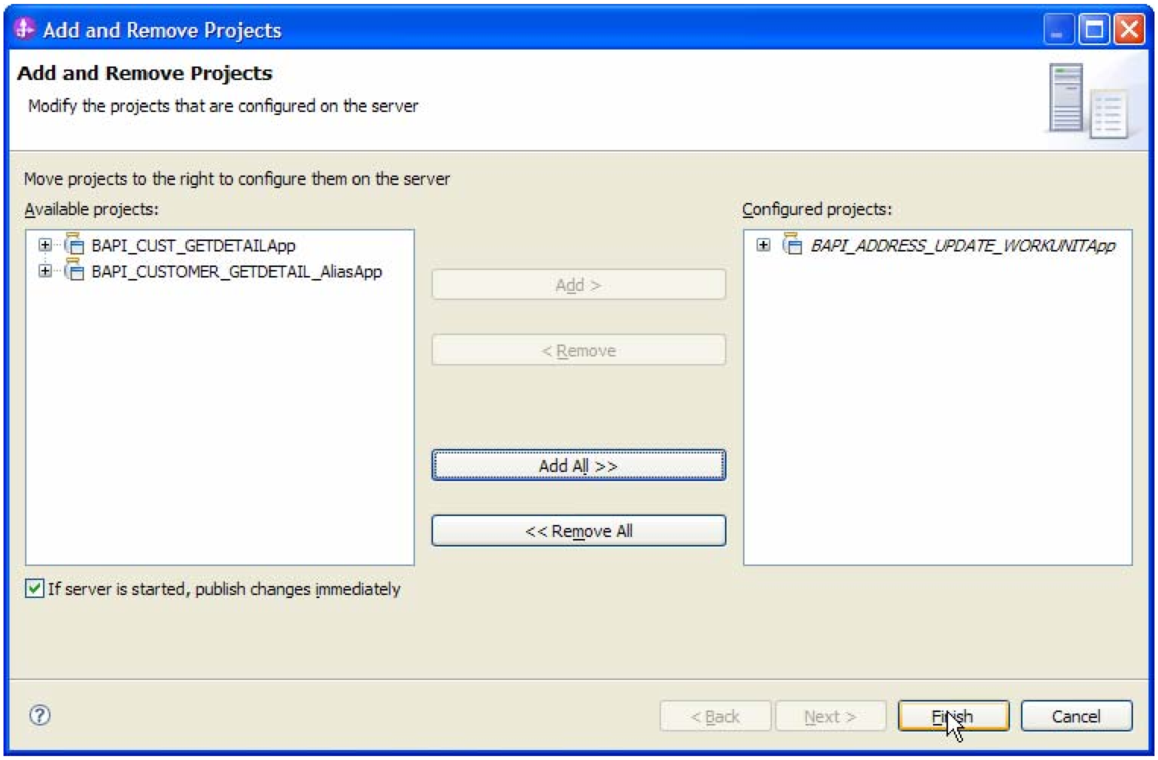
Available projects:

- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAILApp
- BAPI_CUSTOMER_GETDETAIL_AliasApp

Configured projects:

☑ If server is started, publish changes immediately

The project you added will appear under the Configured projects. Add the SCA module to the server by clicking **Finish.**



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- BAPI_CUST_GETDETAILApp
- BAPI_CUSTOMER_GETDETAIL_AliasApp

Configured projects:

- *BAPI_ADDRESS_UPDATE_WORKUNITApp*

☑ If server is started, publish changes immediately

Testing the assembled adapter application

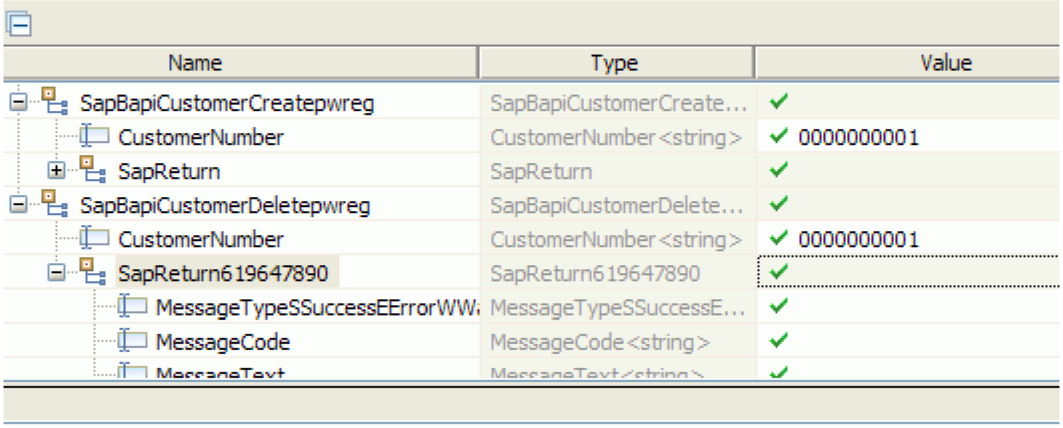
Test the assembled adapter application using the WebSphere Integration Developer's Test Client.

1. Once the module is deployed to the Server, right click the module BAPI_ADDRESS_UPDATE_WORKUNIT from the Projects view and select **Test > Test Module** from the pop-up menu.

2. Enter values in the **Test Client** as shown below.

3. Navigate to the SapBapiCustomerCreatepwreg node of **Initial request**

parameters field and expand it if it is not expanded. Enter the customer number **0000000001**.

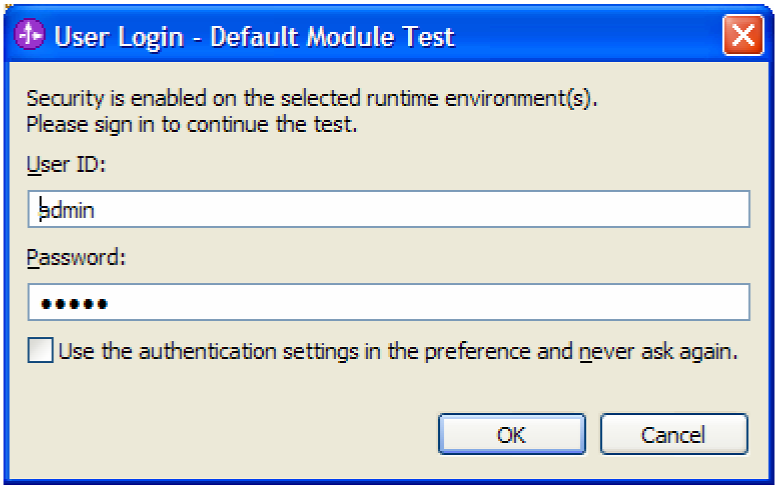


Name	Type	Value
SapBapiCustomerCreatepwreg	SapBapiCustomerCreate...	✓
CustomerNumber	CustomerNumber<string>	✓ 0000000001
SapReturn	SapReturn	✓
SapBapiCustomerDeletepwreg	SapBapiCustomerDelete...	✓
CustomerNumber	CustomerNumber<string>	✓ 0000000001
SapReturn619647890	SapReturn619647890	✓
MessageTypeSSuccessEErrorWW	MessageTypeSSuccessE...	✓
MessageCode	MessageCode<string>	✓
MessageText	MessageText<string>	✓

4. Click the **Continue** button ▶.

When the **Select Deployment** screen appears, select the WebSphere Process Server instance to which you added the project and click the **Finish** button.

5. If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK**.



User Login - Default Module Test

Security is enabled on the selected runtime environment(s).
Please sign in to continue the test.

User ID: admin

Password: •••••

□ Use the authentication settings in the preference and never ask again.

6. Check the output of the service, and check the data in the EIS to ensure it matches expected values.

Clearing the sample content

No clean up is required after this tutorial.

Chapter 6. Tutorial 3: Sending data to an SAP system (outbound processing) using the BAPI ResultSet Interface

Business Case

The Audit team requires details of all customers of the company. Every customer record has a unique customer number which should be used to lookup their details.

Scenario

The following scenario illustrates simple BAPI outbound processing using Synchronous RFC calls.

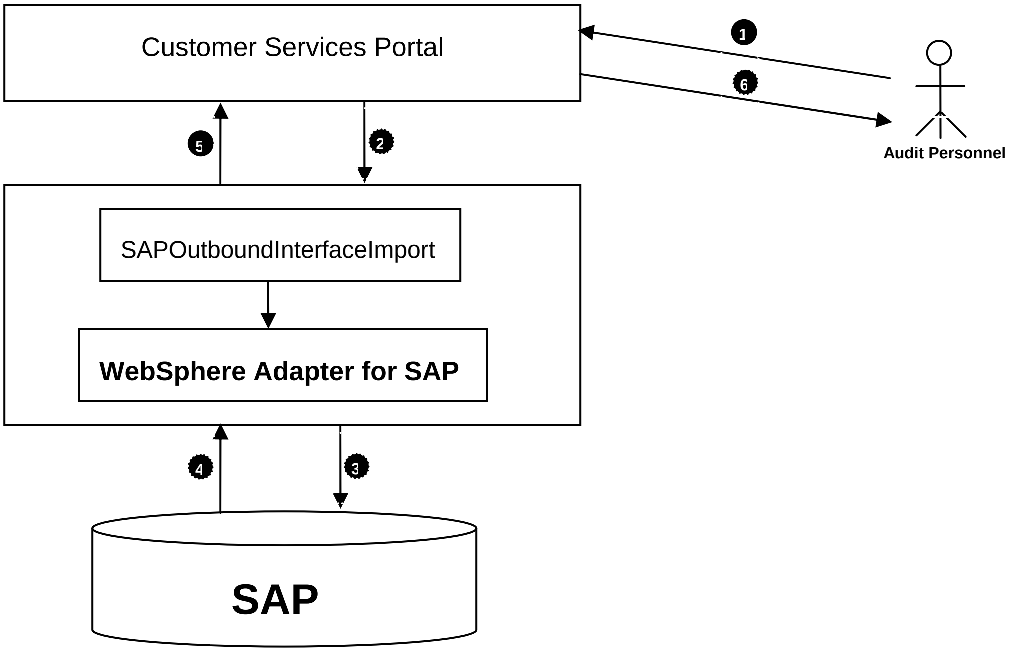


Figure: Scenario illustrating simple BAPI Result Set outbound processing

1. The Audit team logs in to the Customer Services portal and accesses the details of all the customers.

2. The Customer Services portal invokes the SCA Import configured to retrieve information of all the customers with WebSphere Adapter for SAP. This is accomplished by using the BAPI Result Set interface.

   BAPI Result Sets use the GetList and GetDetail functions to retrieve an array of data from the SAP server. The information returned from the GetList function is used as input to the GetDetail function.

   Here, the set of customers are retrieved using BAPI_CUSTOMER_GETLIST, which acts as a query BAPI, and BAPI_CUSTOMER_GETDETAIL, which acts as the result BAPI

   The BAPIs perform the following steps:

   i. BAPI_CUSTOMER_GETLIST call returns the list of Customer Numbers

   ii. Each Customer Number is mapped dynamically to the Business Object for BAPI_CUSTOMER_GETDETAIL

   iii. BAPI_CUSTOMER_GETDETAIL is processed multiple times for every Customer Number, so that an array of customer information is returned

3. The adapter receives a request from the client application in the form of a BAPI Result Set Business Object. The adapter sends this data to SAP server
4. The SAP server responds with the details of the customer records.
5. The adapter handles the response from SAP, converts it back to a Business Object format as required by the client application and is returned.
6. The Customer Services portal returns the response to the Auditing Personnel.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to
WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Application Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to
WAS_SERVER_ONLY_server_region_classpath.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory..

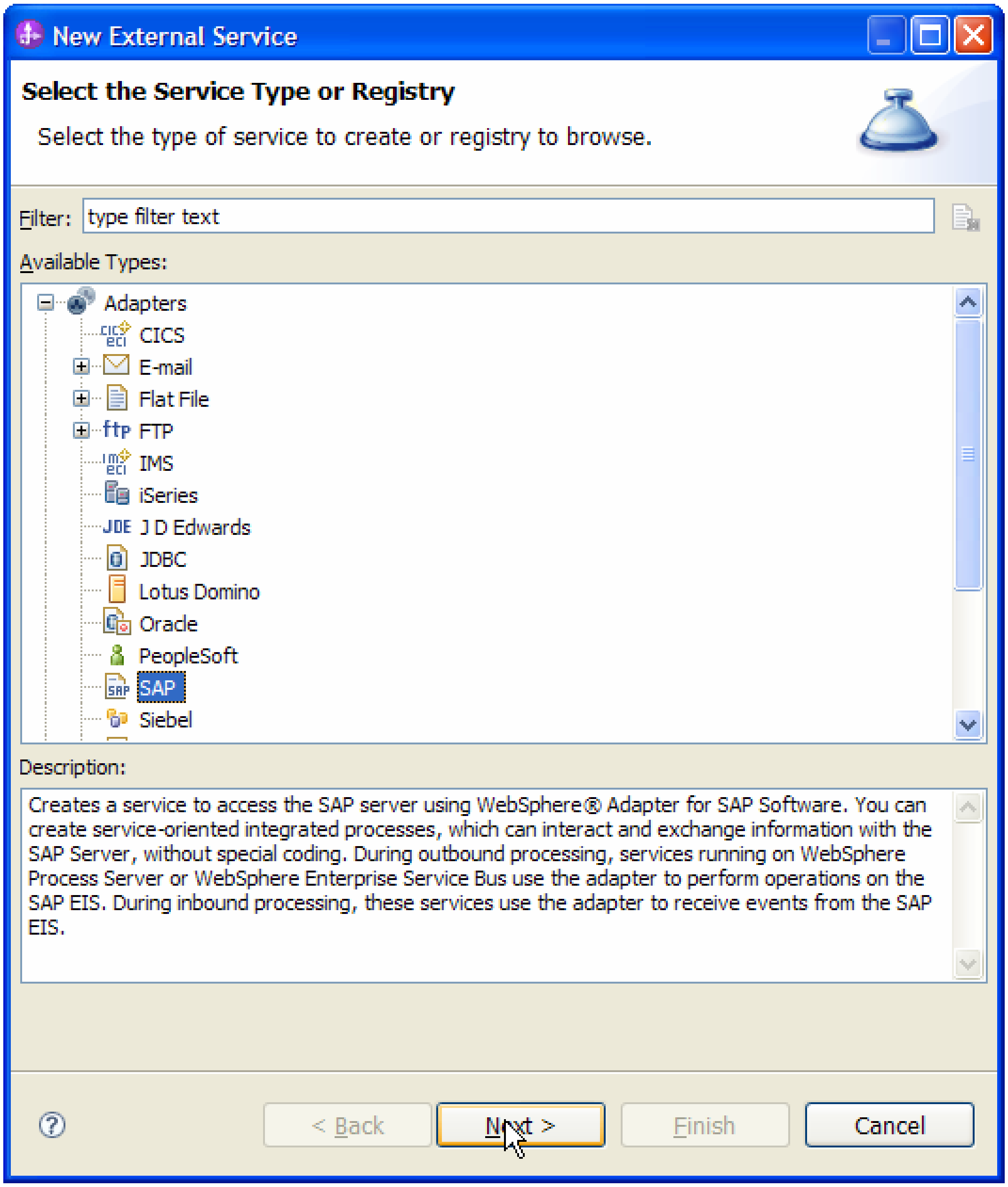
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters** > **SAP** from the **Select the Service Type of Registry** screen and click **Next.**



New External Service

Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

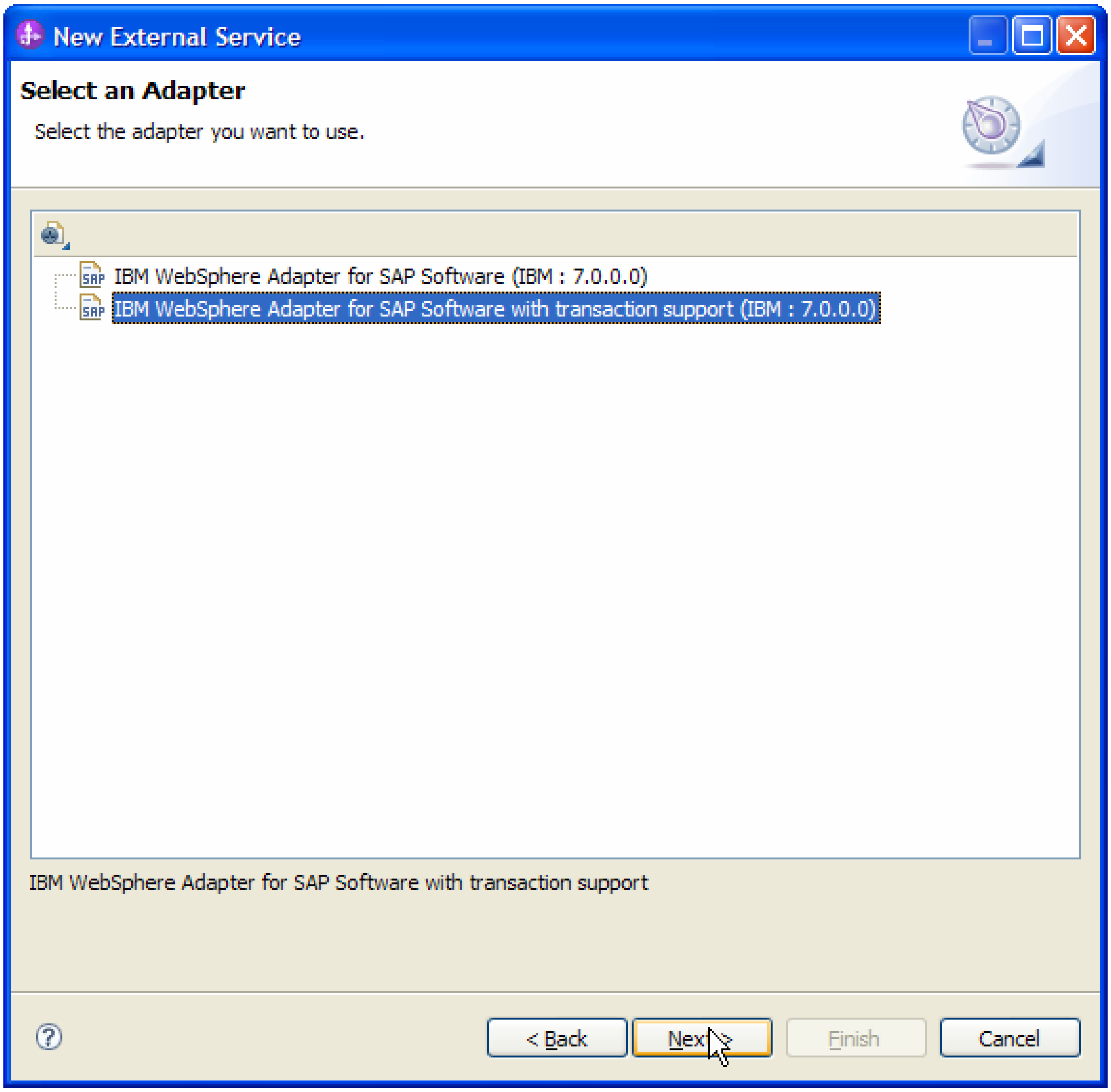
Available Types:

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



Select an Adapter

Select the adapter you want to use.

- IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
- IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

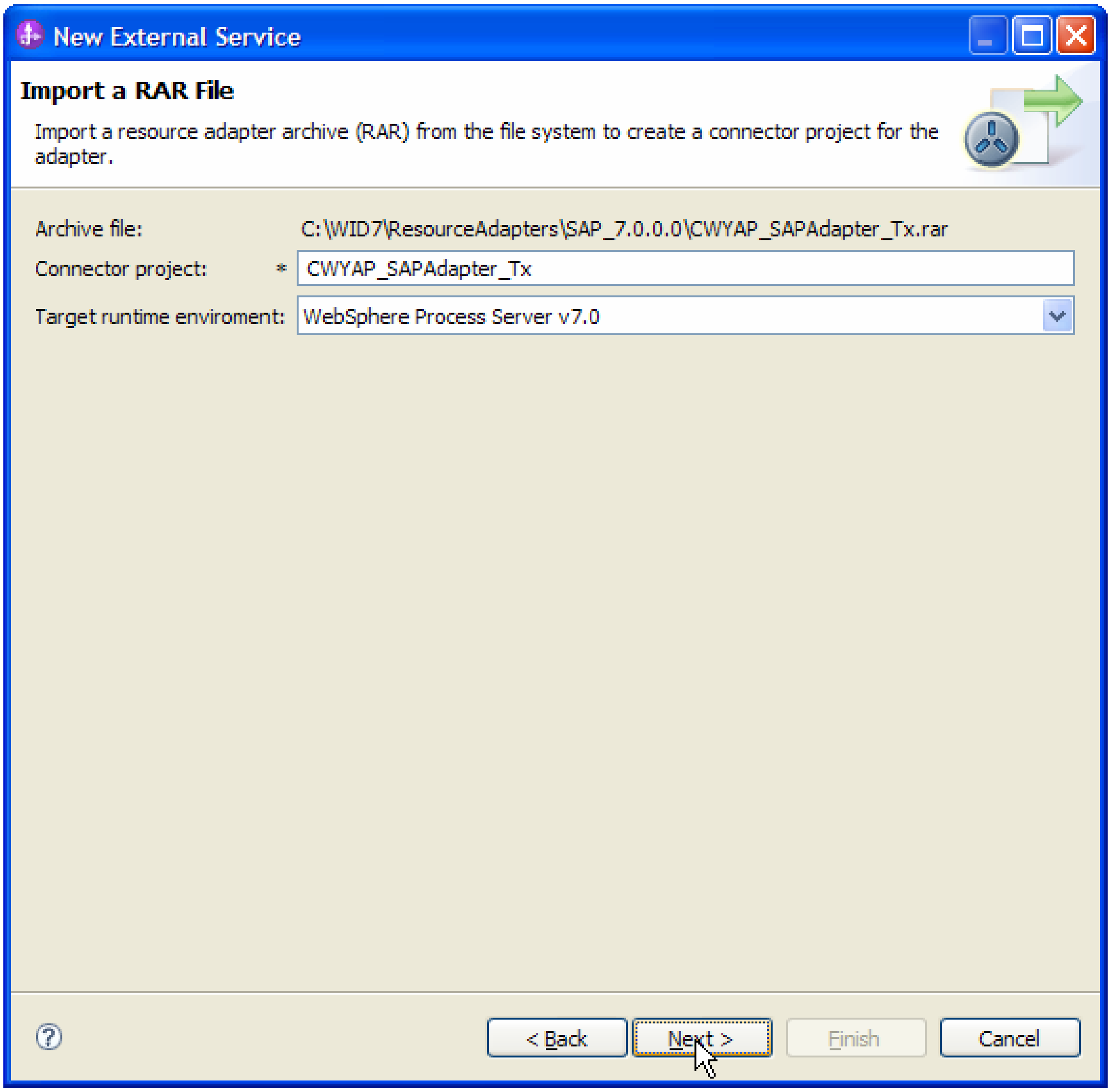
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node

3. Specify the Connector Project name in the **Import a RAR File** screen and proceed by clicking **Next**.



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

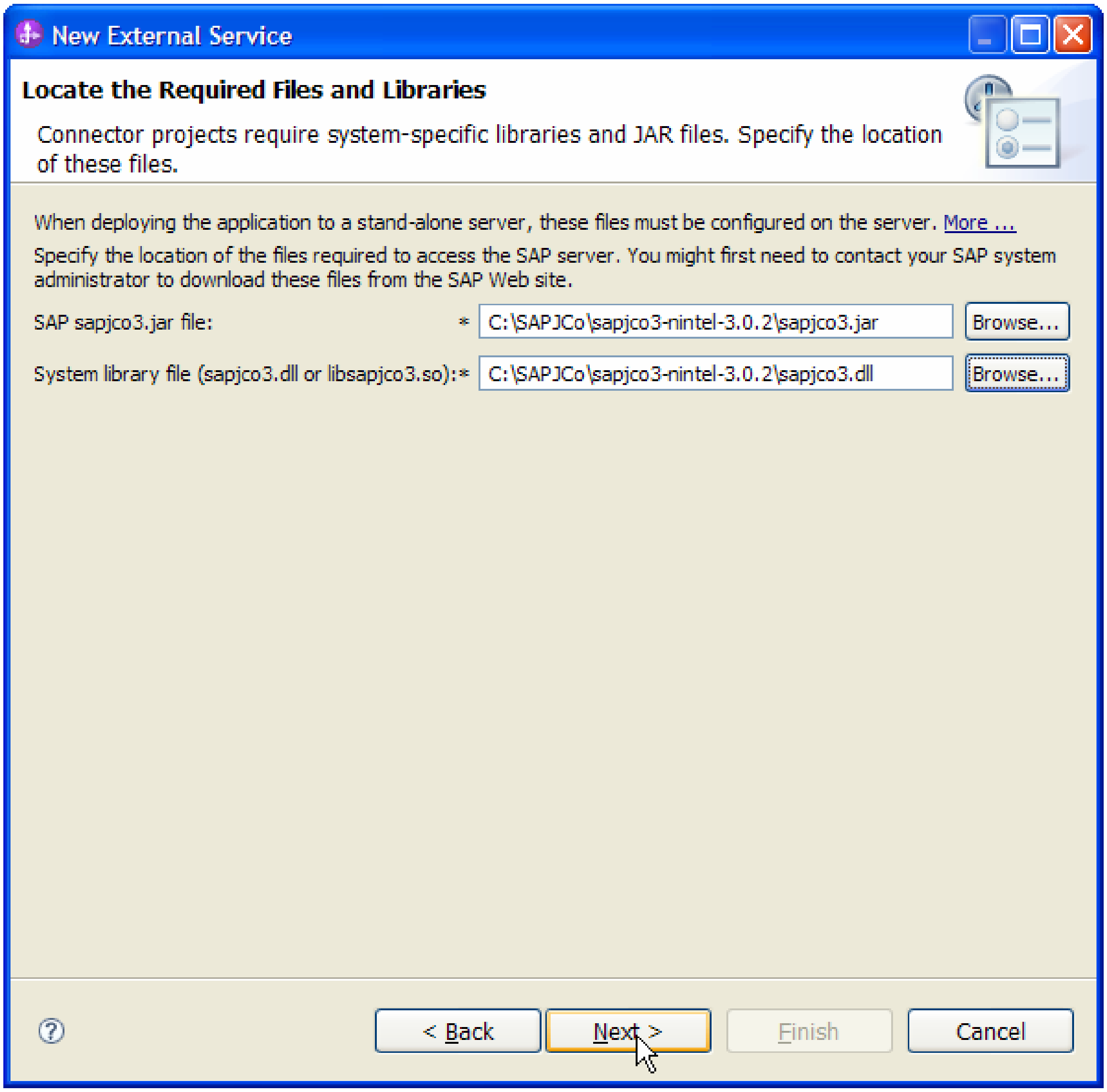
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the locations of **sapjco3.jar and sapjco3.dll** or **libsapjco3.so files**.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

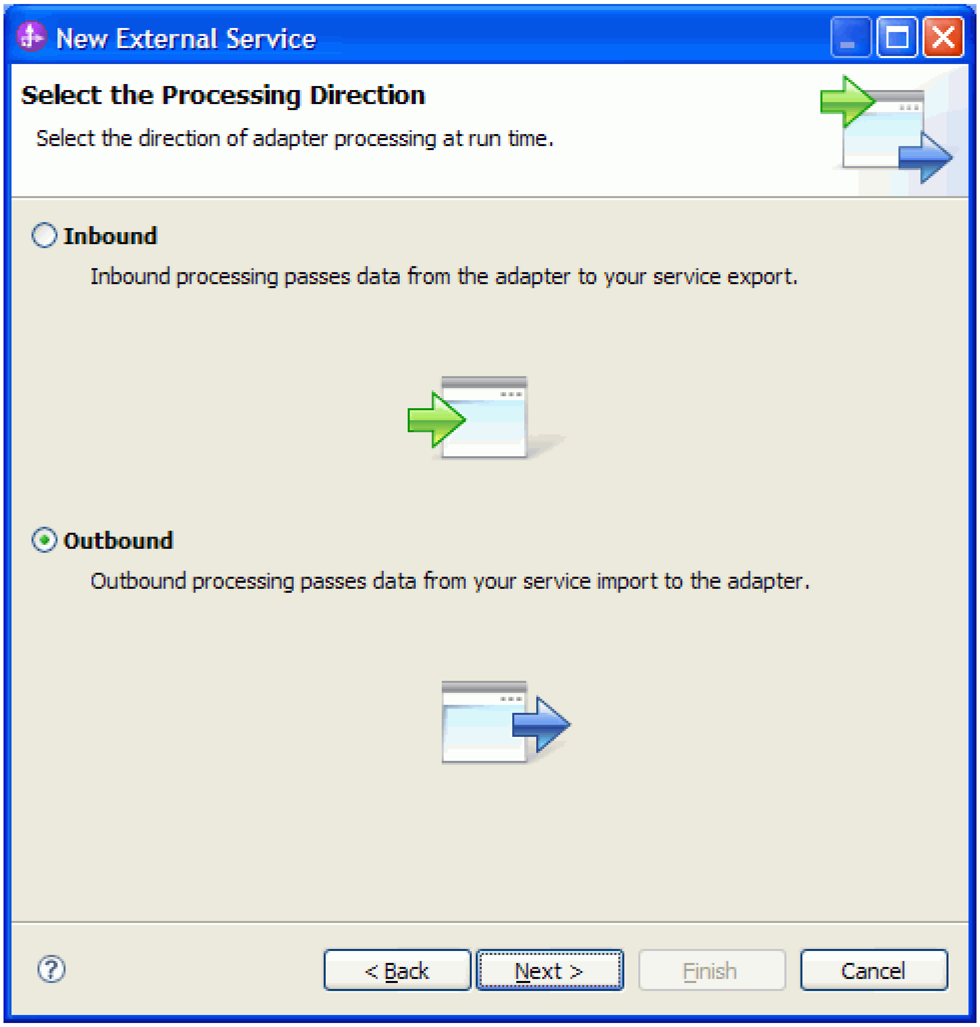
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

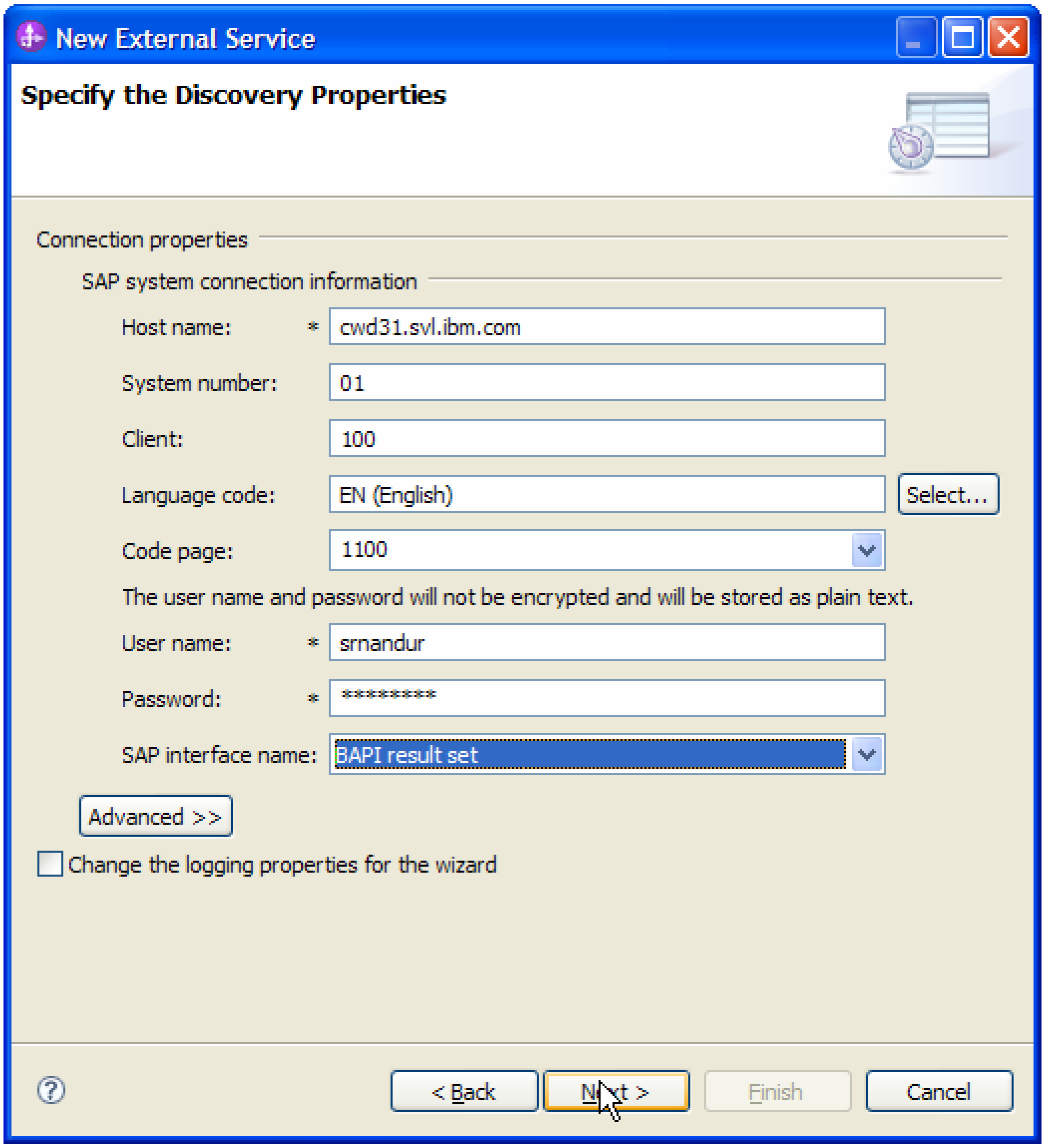
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select **BAPI result set** as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English) Select...

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

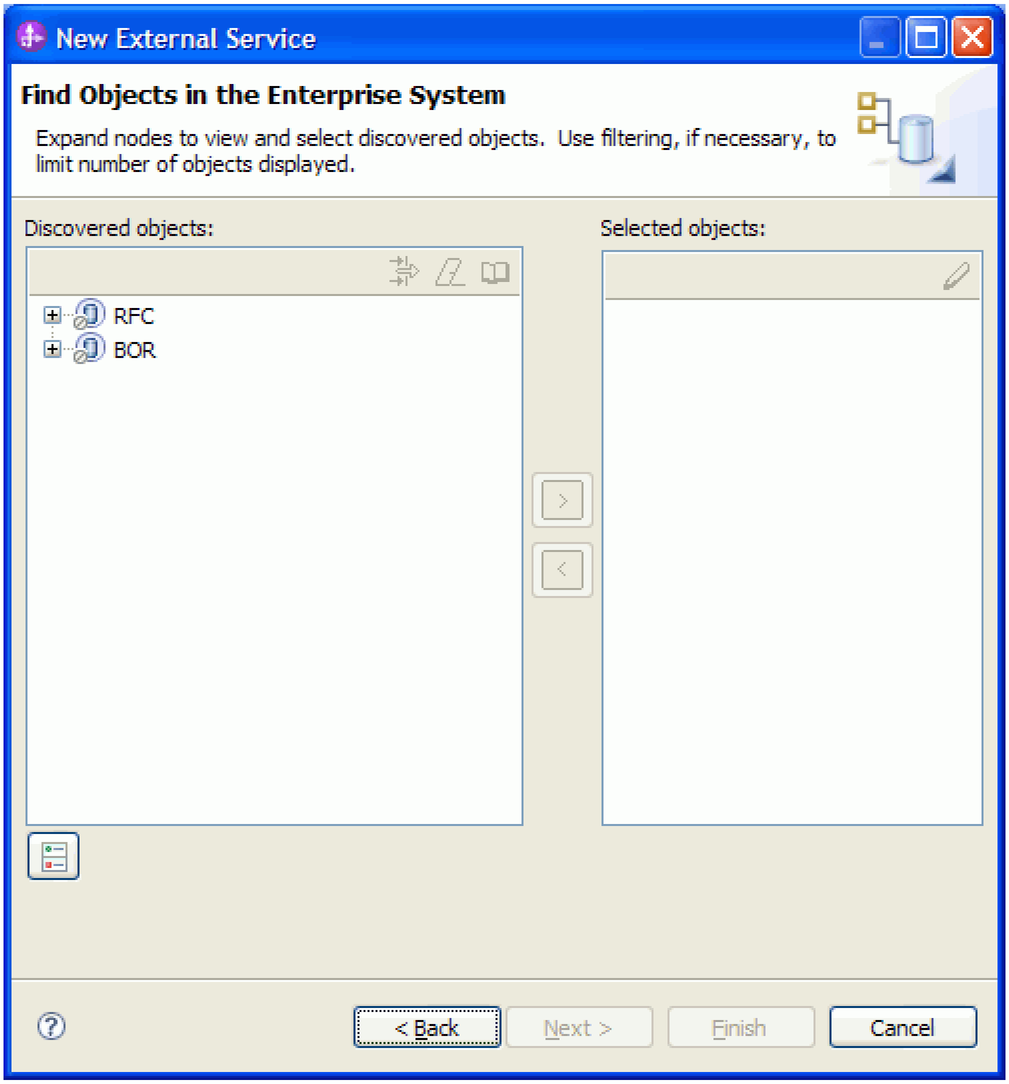
Password: * *********

SAP interface name: BAPI result set

Figure: Select BAPI Result Set as the interface

Selecting the Business Objects and services to be used with the adapter

1. In the **Find objects in the Enterprise System** screen, expand the RFC node. Then click the button.

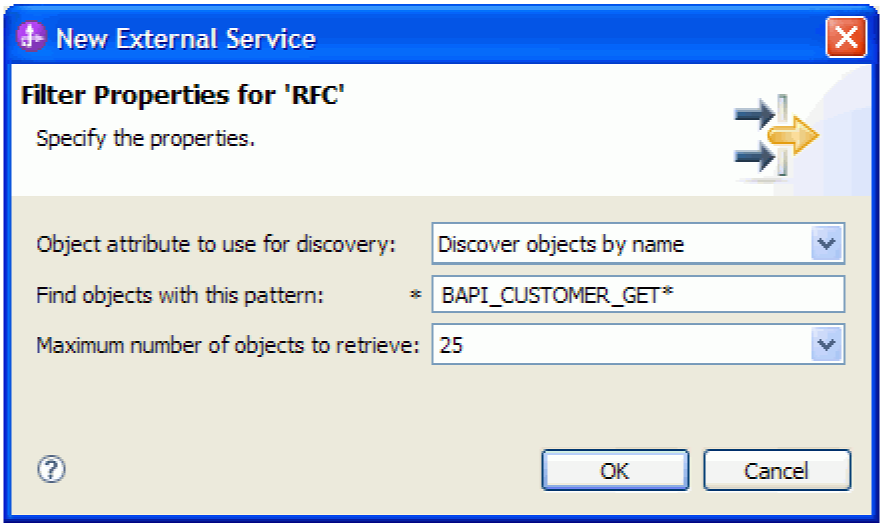


Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Figure: Object Discovery and Selection

Enter BAPI_CUSTOMER_GET* (the name of the BAPI in SAP and an asterisk as a wild card character) in the **Filter Properties for 'RFC'** screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

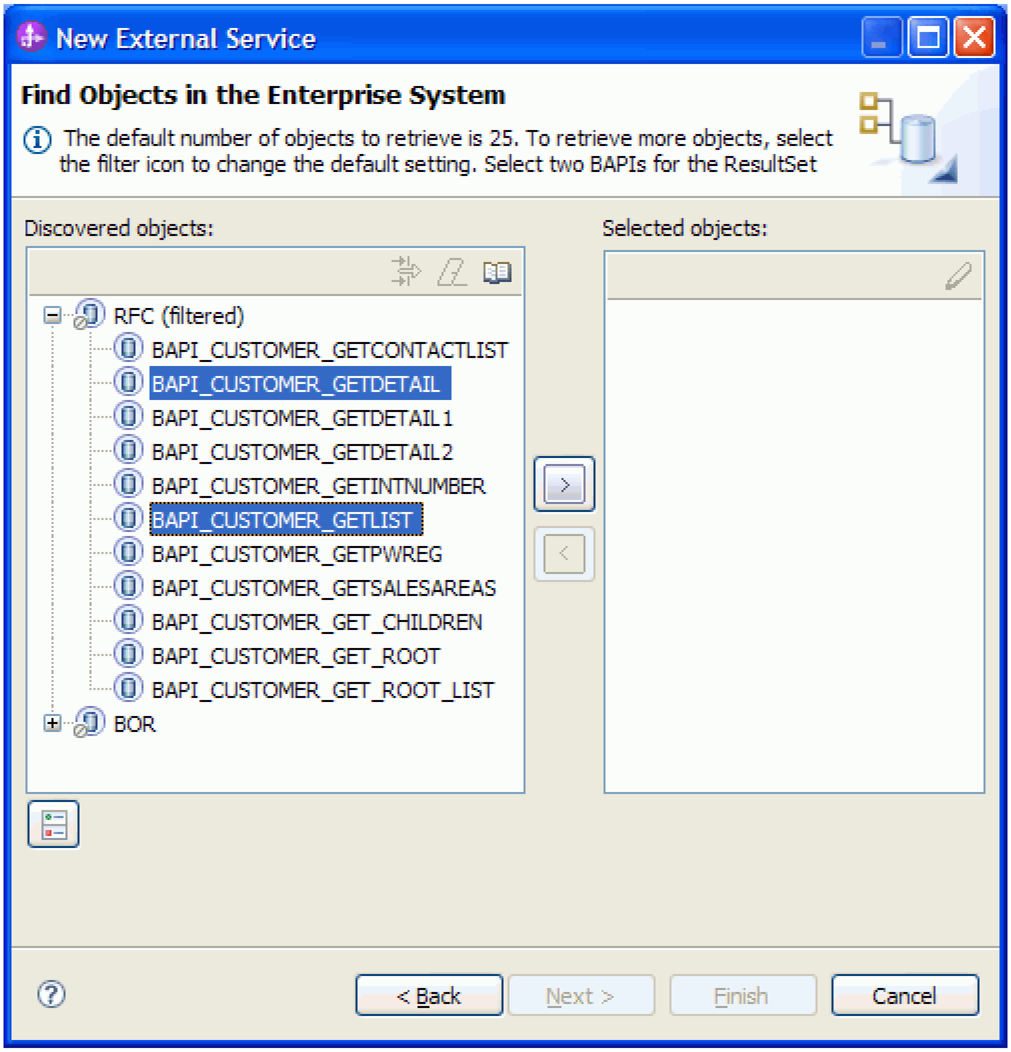
Find objects with this pattern: * BAPI_CUSTOMER_GET*

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **RFC** node.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting. Select two BAPIs for the ResultSet

Discovered objects:

- RFC (filtered)
  - BAPI_CUSTOMER_GETCONTACTLIST
  - BAPI_CUSTOMER_GETDETAIL
  - BAPI_CUSTOMER_GETDETAIL1
  - BAPI_CUSTOMER_GETDETAIL2
  - BAPI_CUSTOMER_GETINTNUMBER
  - BAPI_CUSTOMER_GETLIST
  - BAPI_CUSTOMER_GETPWREG
  - BAPI_CUSTOMER_GETSALESAREAS
  - BAPI_CUSTOMER_GET_CHILDREN
  - BAPI_CUSTOMER_GET_ROOT
  - BAPI_CUSTOMER_GET_ROOT_LIST
- BOR

Selected objects:

Figure: Retrieved BAPIs' based on search criteria

Select both the BAPI_CUSTOMER_GETDETAIL and BAPI_CUSTOMER_GETLIST BAPIs' from the list of discovered BAPIs'.

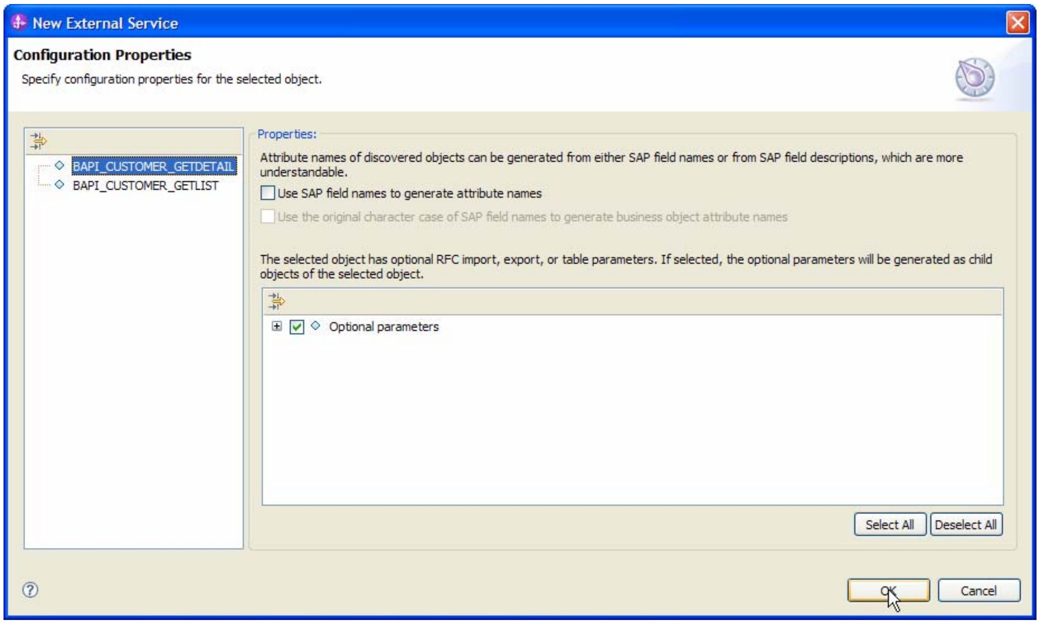
Click the > button.

A popup will appear containing the Configuration properties for the BAPI_CUSTOMER_GETDETAIL object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click **OK.**



New External Service

Configuration Properties

Specify configuration properties for the selected object.

- BAPI_CUSTOMER_GETDETAIL
- BAPI_CUSTOMER_GETLIST

Properties:

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

☐ Use SAP field names to generate attribute names

☐ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

☑ Optional parameters

Figure: Setting configuration parameters for the BAPIs selected

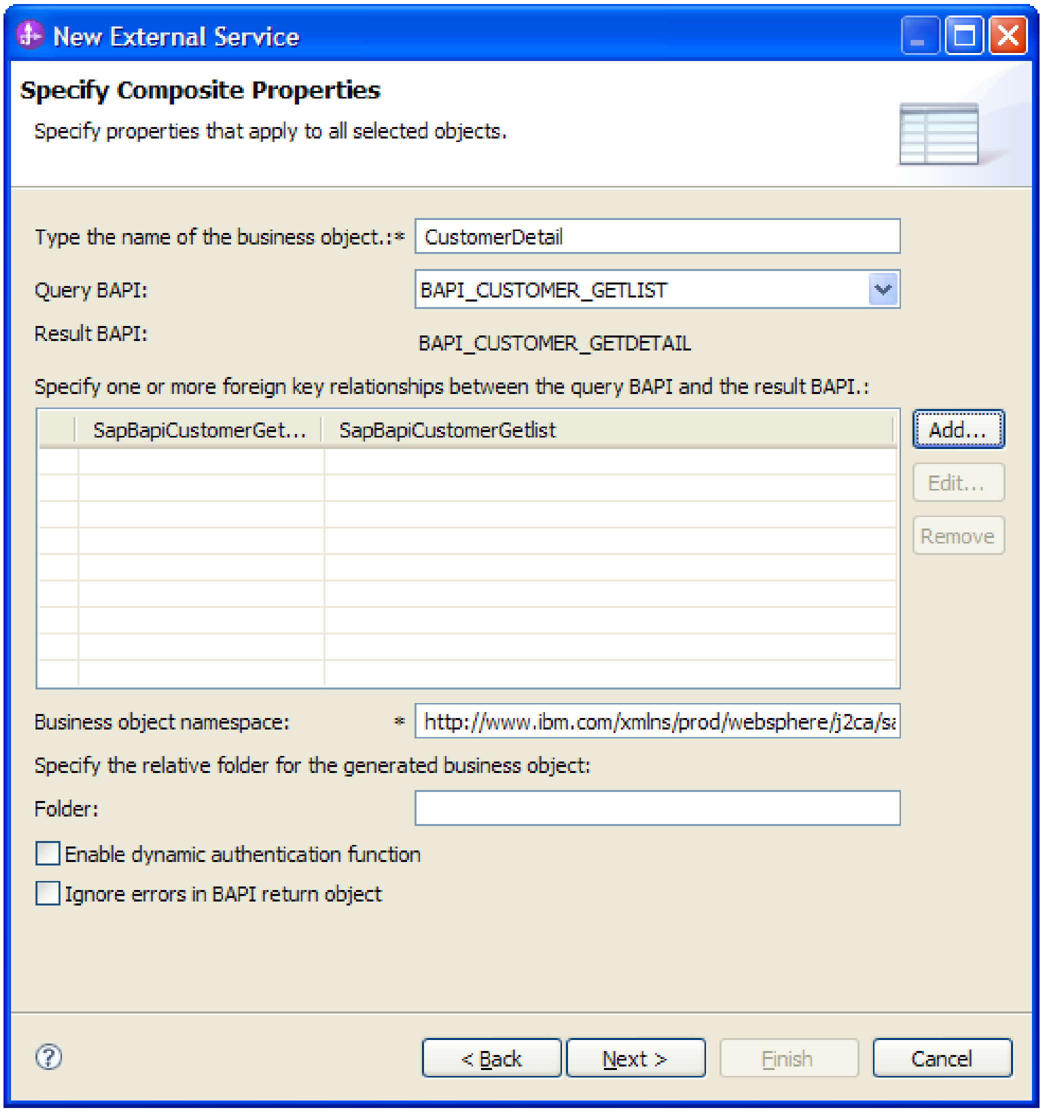
Click **Next**.

Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen,

a) Enter the name of the Business Object as **CustomerDetail**.

b) Map the field in **Query BAPI** to BAPI_CUSTOMER_GETLIST. The Result BAPI field will be mapped to BAPI_CUSTOMER_GETDETAIL



Specify Composite Properties

Specify properties that apply to all selected objects.

Type the name of the business object.:* CustomerDetail

Query BAPI: BAPI_CUSTOMER_GETLIST

Result BAPI: BAPI_CUSTOMER_GETDETAIL

Specify one or more foreign key relationships between the query BAPI and the result BAPI.:

SapBapiCustomerGet...	SapBapiCustomerGetlist

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sa

Specify the relative folder for the generated business object:

Folder:

☐ Enable dynamic authentication function

☐ Ignore errors in BAPI return object

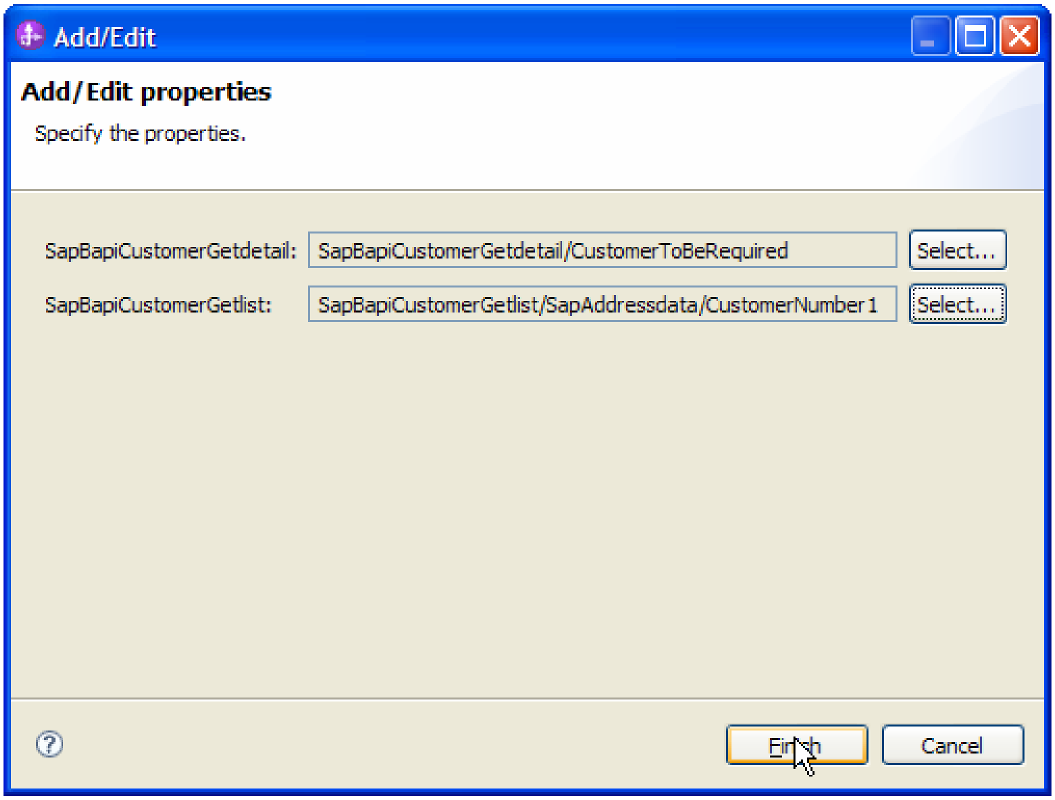
Figure: Specify Composite Properties

c) Click **Add** button. This brings up a pop-up screen, Add/Edit properties in which both the BAPIs required for the result set are displayed.

Click the Select button corresponding to SapBapiCustomerGetdetail and choose SapBapiCustomerGetdetail/CustomerToBeRequired.

Similarly click the Select button corresponding to SapBapiCustomerGetlist and choose SapBapiCustomerGetlist/SapAddressdata/CustomerNumber1.

Click Finish.



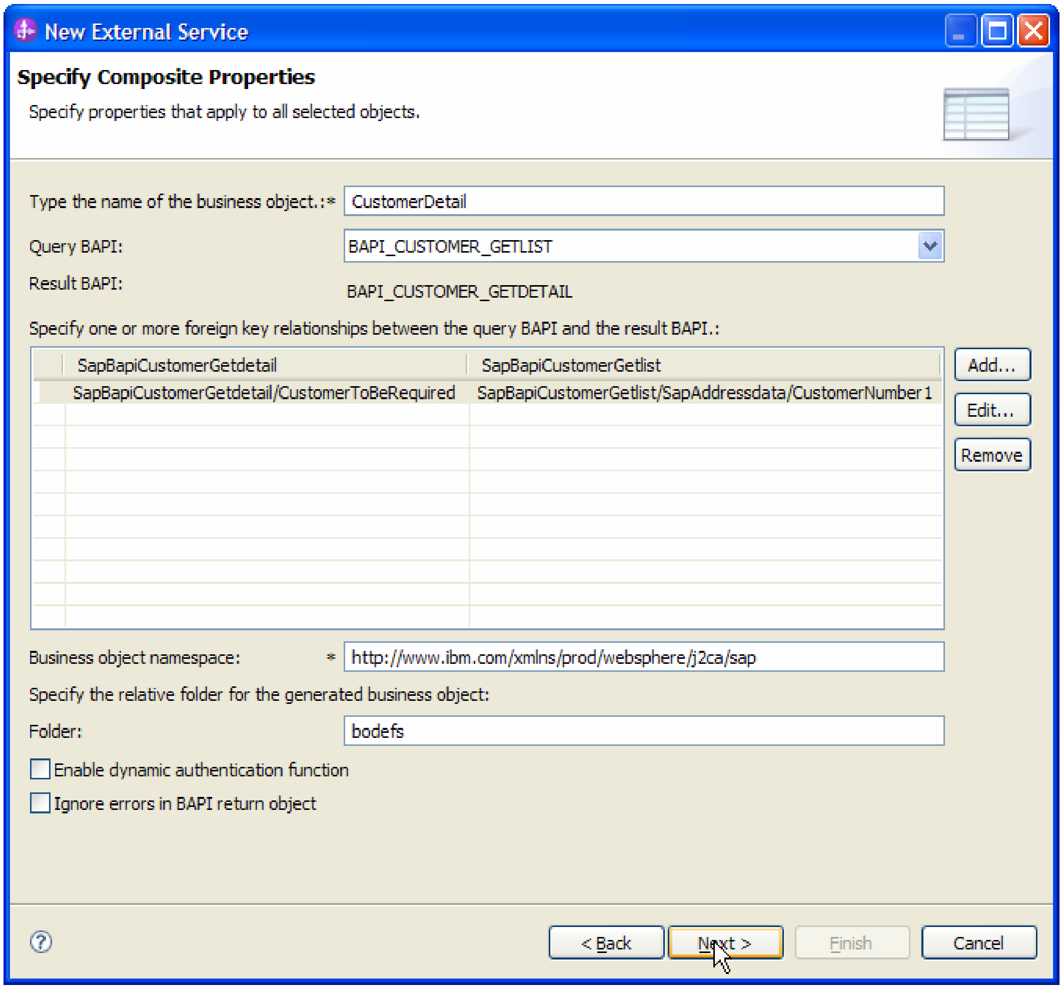
Add/Edit properties

Specify the properties.

SapBapiCustomerGetdetail: SapBapiCustomerGetdetail/CustomerToBeRequired

SapBapiCustomerGetlist: SapBapiCustomerGetlist/SapAddressdata/CustomerNumber1

d) Enter the folder name for the generated Business Object as **bodefs**.



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Type the name of the business object.:* CustomerDetail

Query BAPI: BAPI_CUSTOMER_GETLIST

Result BAPI: BAPI_CUSTOMER_GETDETAIL

Specify one or more foreign key relationships between the query BAPI and the result BAPI.:

SapBapiCustomerGetdetail	SapBapiCustomerGetlist
SapBapiCustomerGetdetail/CustomerToBeRequired	SapBapiCustomerGetlist/SapAddressdata/CustomerNumber1

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

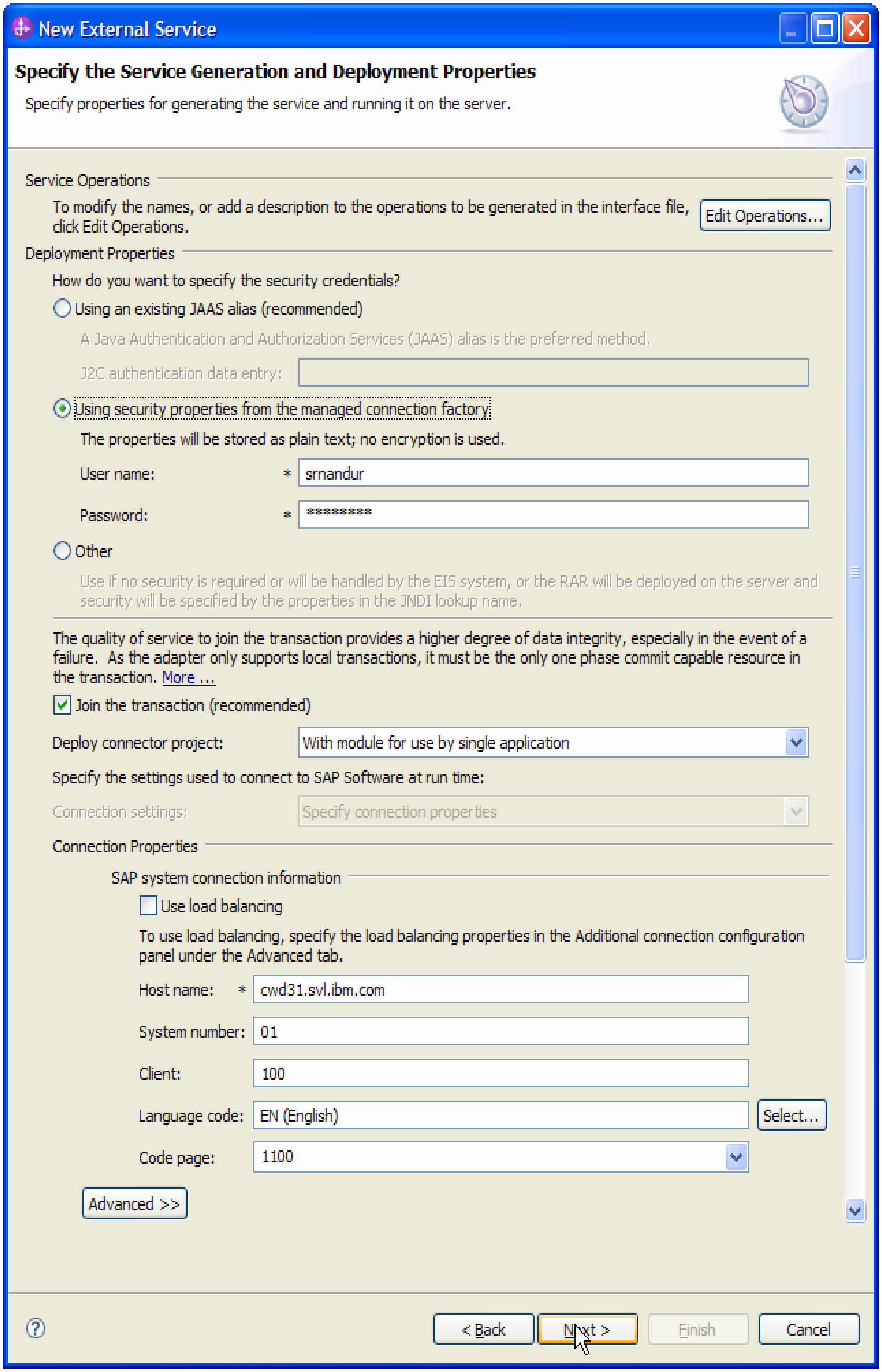
□ Enable dynamic authentication function

□ Ignore errors in BAPI return object

Figure: Specify Composite Properties

Click **Next**.

In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

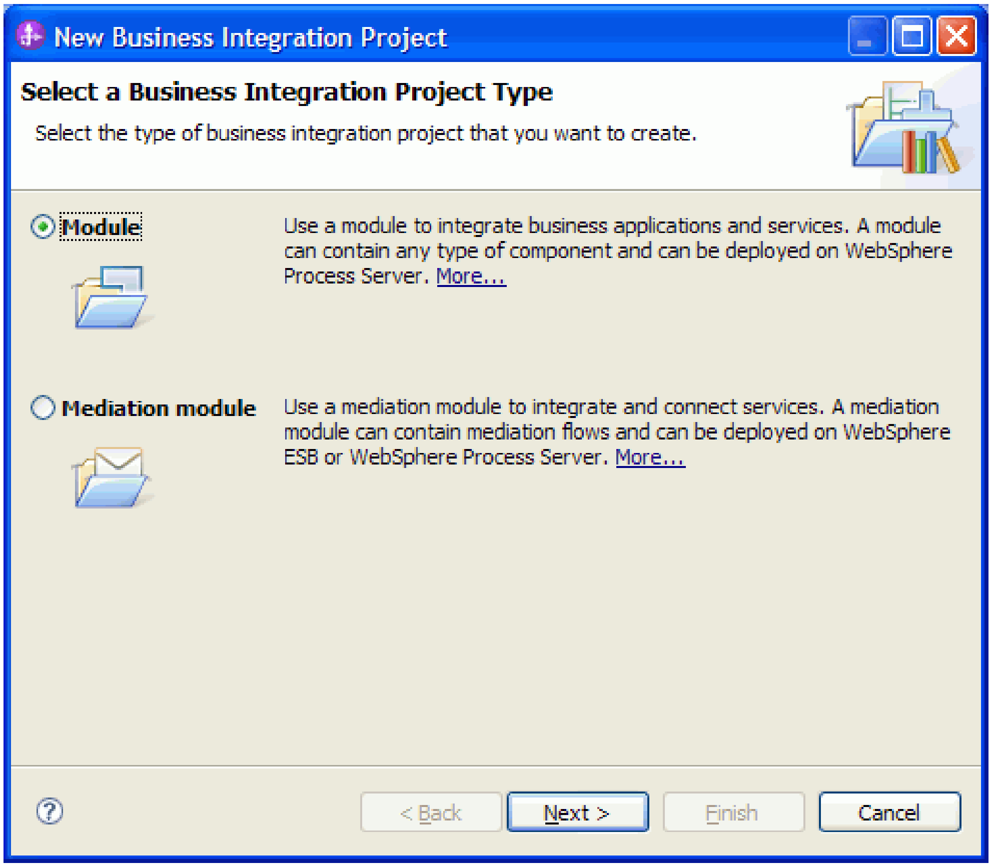
Figure: Service Generation and Deployment Configuration

Note: You can either enter an **Authentication Alias** previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

Click **Next.**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click on **Next.**



New Business Integration Project

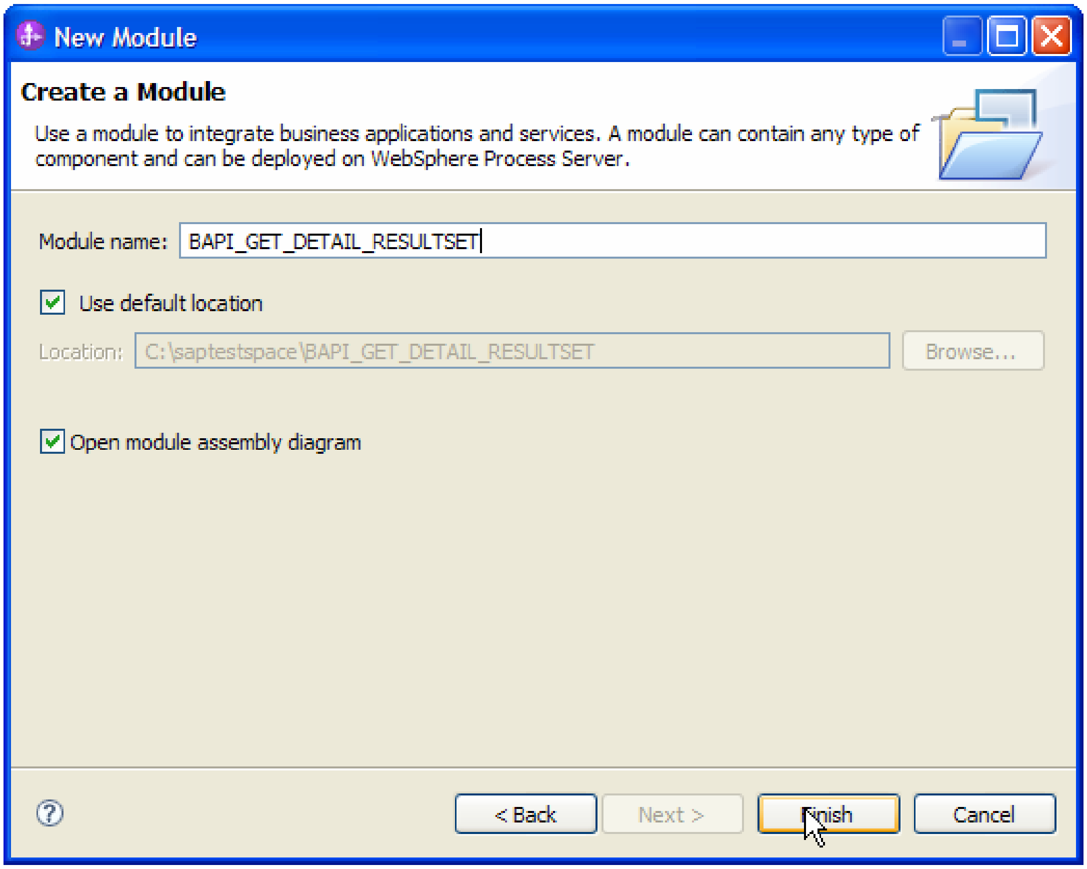
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_GET_DETAIL_RESULTSET** in the Module Name field, and then click **Finish**.



New Module

Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

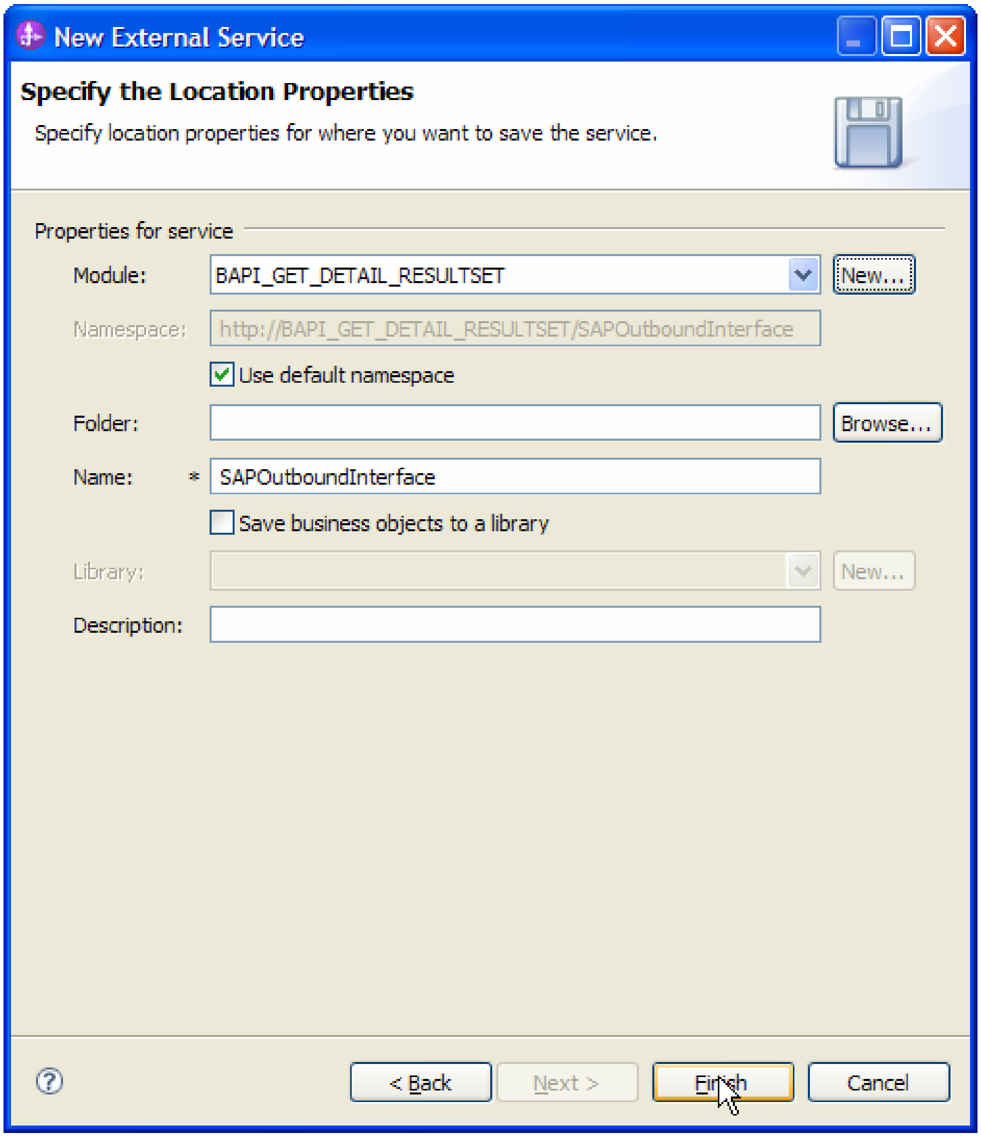
Module name: BAPI_GET_DETAIL_RESULTSET

☑ Use default location

Location: C:\saptestspace\BAPI_GET_DETAIL_RESULTSET

☑ Open module assembly diagram

Click Finish on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: BAPI_GET_DETAIL_RESULTSET

Namespace: http://BAPI_GET_DETAIL_RESULTSET/SAPOutboundInterface

☑ Use default namespace

Folder:

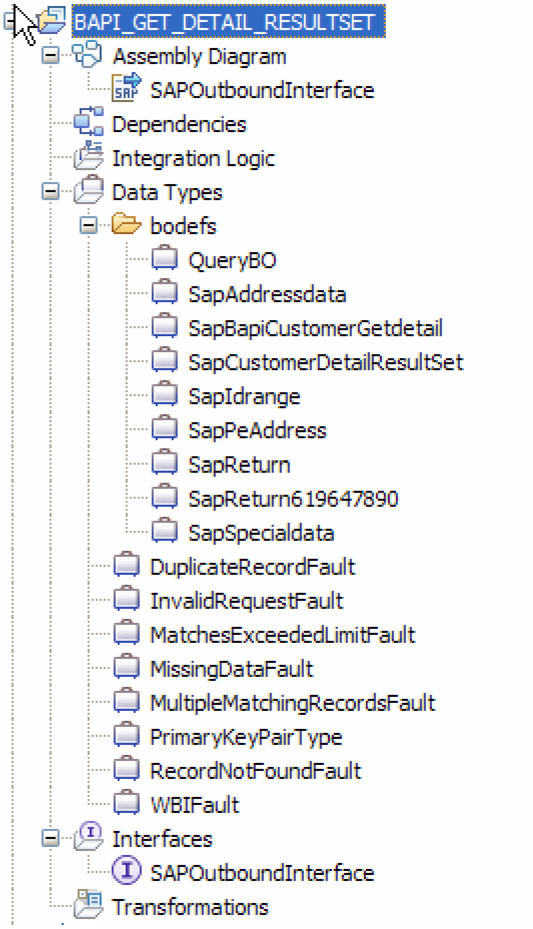
Name: * SAPOutboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



- BAPI_GET_DETAIL_RESULTSET
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - QueryBO
      - SapAddressdata
      - SapBapiCustomerGetdetail
      - SapCustomerDetailResultSet
      - SapIdrange
      - SapPeAddress
      - SapReturn
      - SapReturn619647890
      - SapSpecialdata
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

Figure: Artifacts created after the EMD run for the BAPI Result Set Module

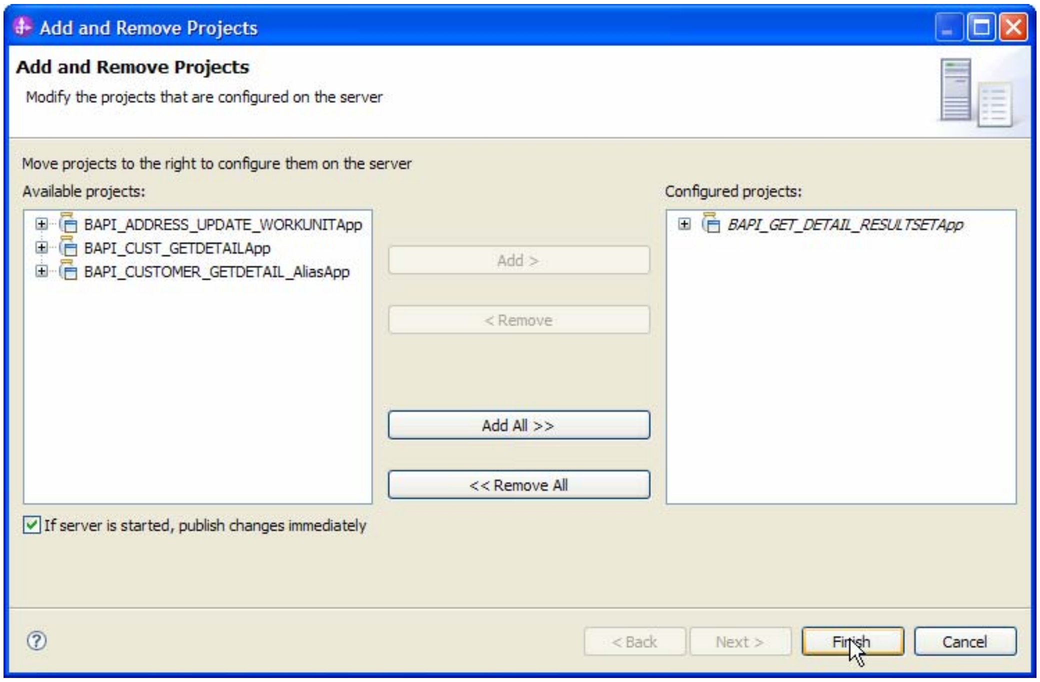
Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_GET_DETAIL_RESULTSET by selecting **Add and Remove Projects**.

The project BAPI_GET_DETAIL_RESULTSETApp will be listed under **Available projects**.

After adding the project, the added project should appear under the Configured projects. Add the SCA module to the server. Click **Finish**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAILApp
- BAPI_CUSTOMER_GETDETAIL_AliasApp

Configured projects:
- *BAPI_GET_DETAIL_RESULTSETApp*

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Test the assembled adapter application using the WebSphere Integration Developer integration test client.

1. Right click the module “BAPI_GET_DETAIL_RESULTSET” and select **Test > Test Module** from the pop-up menu.

2. Enter values as shown in the figure below:

3. Right click SapBapiCustomerGetDetail and select **AddElements** and enter **1** as the value in the popup screen.

a)Enter the following values for the added element SapBapiCustomerGetDetail[0]

CustomerToBeRequired= 0000000001 DistributionChannel=01 Division=01 SalesOrganization=0001

b) Under QueryBO set the following data

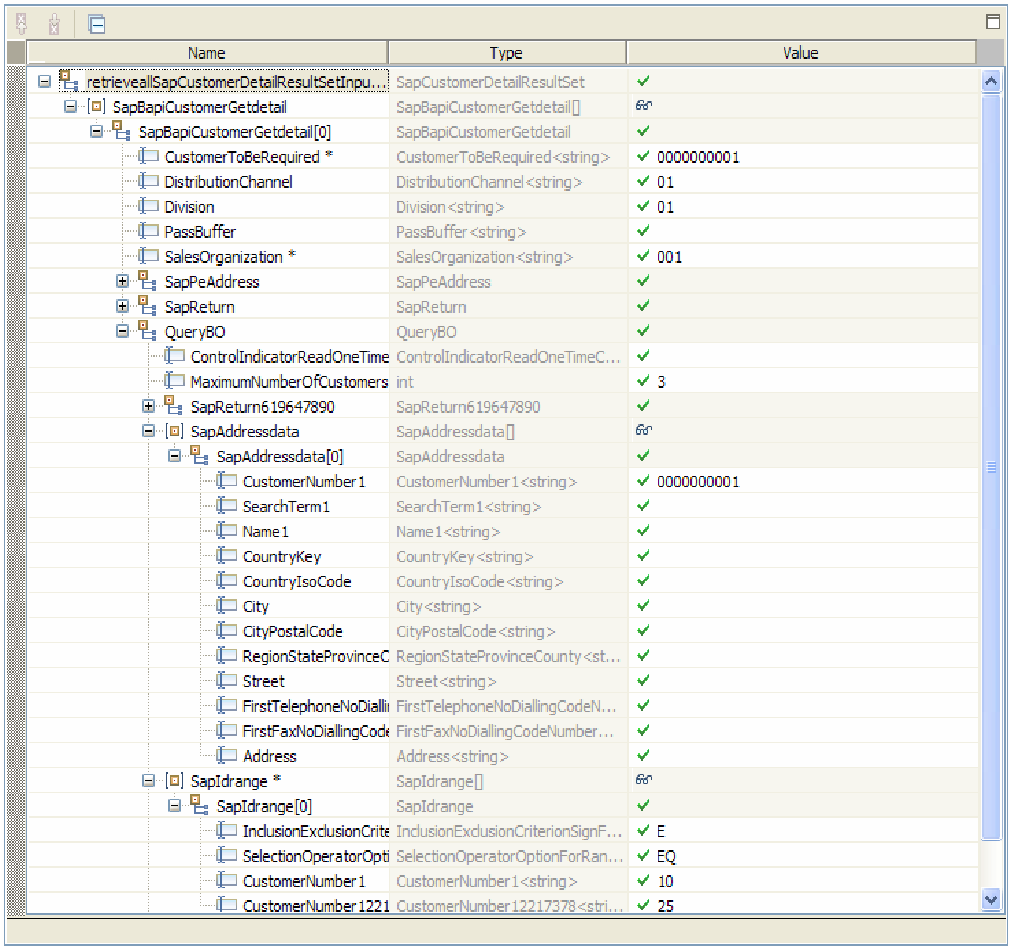
MaximumNumberOfCustomers= 3

c) In QueryBO we have another element with name SapIdRange. Right click SapIdRange and select AddElements and enter 1 as the value in the popup screen.

InclusionExclusionCriterionSignForRangeTables= E SelectionOperatorOptionForRangeTables= EQ CustomerNumber1=10   CustomerNumber2217378=25

d) Under the QueryBO we also have SapAddressData. Right click SapAddressData and select AddElements and enter 1.

CustomerNumber=0000000001

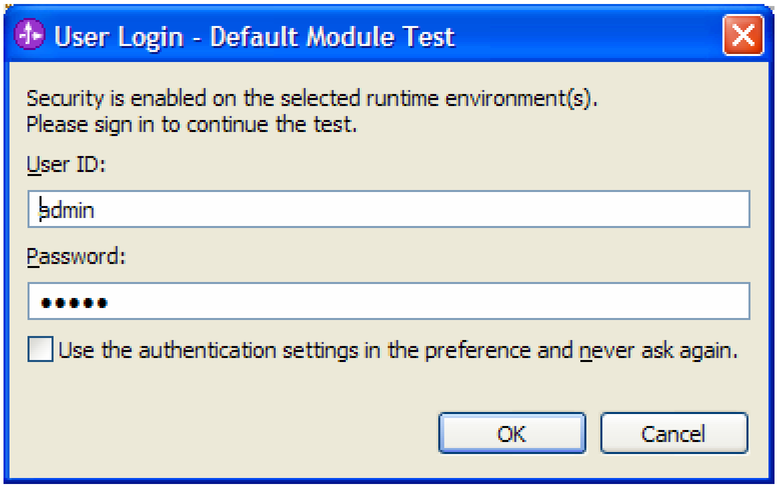


Name	Type	Value
retrieveallSapCustomerDetailResultSetInpu...	SapCustomerDetailResultSet	✓
SapBapiCustomerGetdetail	SapBapiCustomerGetdetail[]	
SapBapiCustomerGetdetail[0]	SapBapiCustomerGetdetail	✓
CustomerToBeRequired *	CustomerToBeRequired<string>	✓ 0000000001
DistributionChannel	DistributionChannel<string>	✓ 01
Division	Division<string>	✓ 01
PassBuffer	PassBuffer<string>	✓
SalesOrganization *	SalesOrganization<string>	✓ 001
SapPeAddress	SapPeAddress	✓
SapReturn	SapReturn	✓
QueryBO	QueryBO	✓
ControlIndicatorReadOneTime	ControlIndicatorReadOneTimeC...	✓
MaximumNumberOfCustomers	int	✓ 3
SapReturn619647890	SapReturn619647890	✓
SapAddressdata	SapAddressdata[]	
SapAddressdata[0]	SapAddressdata	✓
CustomerNumber1	CustomerNumber1<string>	✓ 0000000001
SearchTerm1	SearchTerm1<string>	✓
Name1	Name1<string>	✓
CountryKey	CountryKey<string>	✓
CountryIsoCode	CountryIsoCode<string>	✓
City	City<string>	✓
CityPostalCode	CityPostalCode<string>	✓
RegionStateProvinceC	RegionStateProvinceCounty<st...	✓
Street	Street<string>	✓
FirstTelephoneNoDialli	FirstTelephoneNoDiallingCodeN...	✓
FirstFaxNoDiallingCode	FirstFaxNoDiallingCodeNumber...	✓
Address	Address<string>	✓
SapIdrange *	SapIdrange[]	
SapIdrange[0]	SapIdrange	✓
InclusionExclusionCrite	InclusionExclusionCriterionSignF...	✓ E
SelectionOperatorOpti	SelectionOperatorOptionForRan...	✓ EQ
CustomerNumber1	CustomerNumber1<string>	✓ 10
CustomerNumber1221	CustomerNumber12217378<stri...	✓ 25

4. Click the **Continue** button .

When the **Select Deployment** screen appears, select the WebSphere Process Server instance to which you added the project and click the **Finish** button.

5 .If security is enabled, type in the username and password in the popup User Login screen that appears and click **OK**.



User Login - Default Module Test

Security is enabled on the selected runtime environment(s).
Please sign in to continue the test.

User ID: admin

Password: •••••

□ Use the authentication settings in the preference and never ask again.

6. Check the output of the service, and check the data in the EIS to ensure it matches expected values.

Clearing the sample content

No clean up is required after this tutorial.

Chapter 7. Tutorial 4: Sending data from SAP (INBOUND processing) using BAPI

Business Case

The Sales department of an organization stores the information related to new customers in their SAP system and later updates the Accounts department after verifying the details.

Scenario

The following scenario illustrates BAPI inbound processing synchronously (in which both the client application and the adapter must be available during processing). In synchronous processing, the client application waits for a response from the adapter.

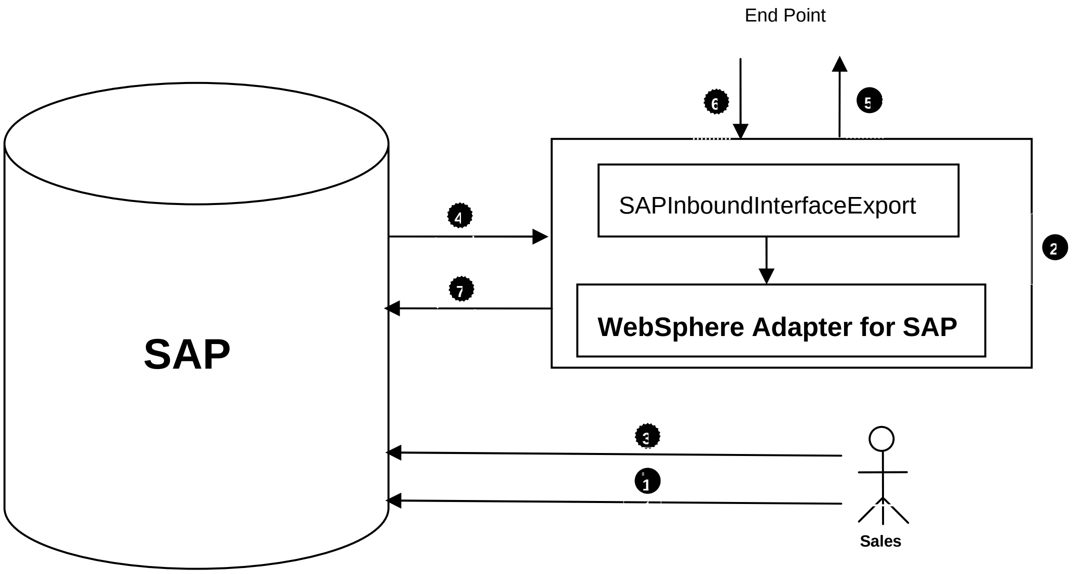


Figure: Scenario illustrating simple BAPI inbound processing

1. The Sales department of an organization stores the details of a new customer in SAP system.

2. The WebSphere Adapter for SAP is configured for synchronous BAPI Inbound processing. The adapter starts event listeners, which listen for RFC-enabled function events (specified with the RFCProgramID property) from the SAP server.

3. The customer details are to be fetched using BAPI_CUSTOMER_GETDETAIL by providing a customer number.

4. This RFC enabled function event is pushed to the adapter by the way of the event listeners. The adapter resolves the operation and Business Object name using the received RFC-enabled function name.

5. The adapter sends the Business Object to the configured end-point in a synchronous manner. The end point might be any application that updates the accounts department.

6. The adapter receives the response Business Object from the end point.

7. The adapter maps the response Business Object to an RFC-enabled function and returns it to the SAP Server

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the *<WPS_INSTALL>*/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

<WPS_INSTALL> represents the WebSphere Process Server installation directory..

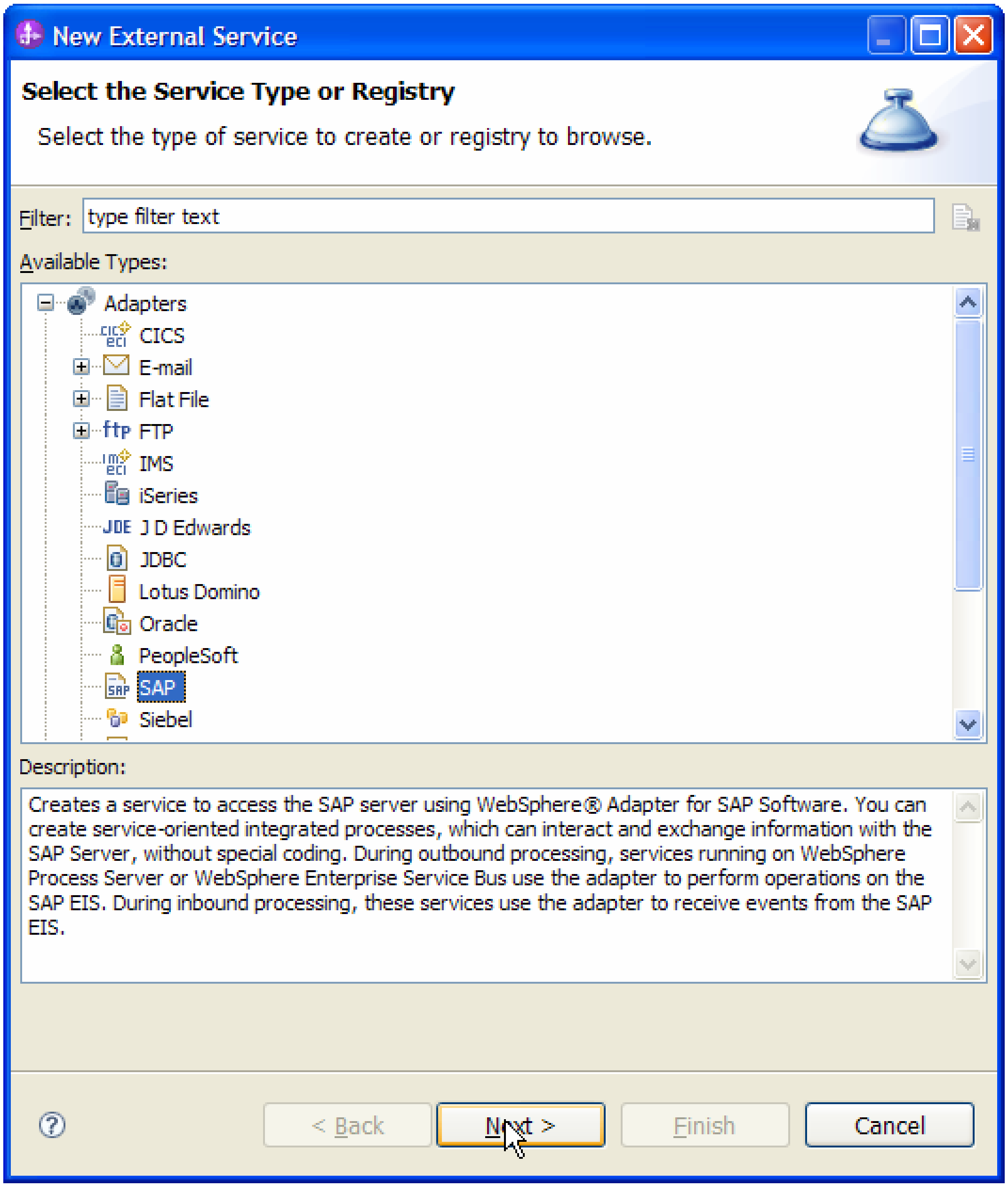
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters** > **SAP** from the **Select the Service Type of Registry** screen and click on **Next**.



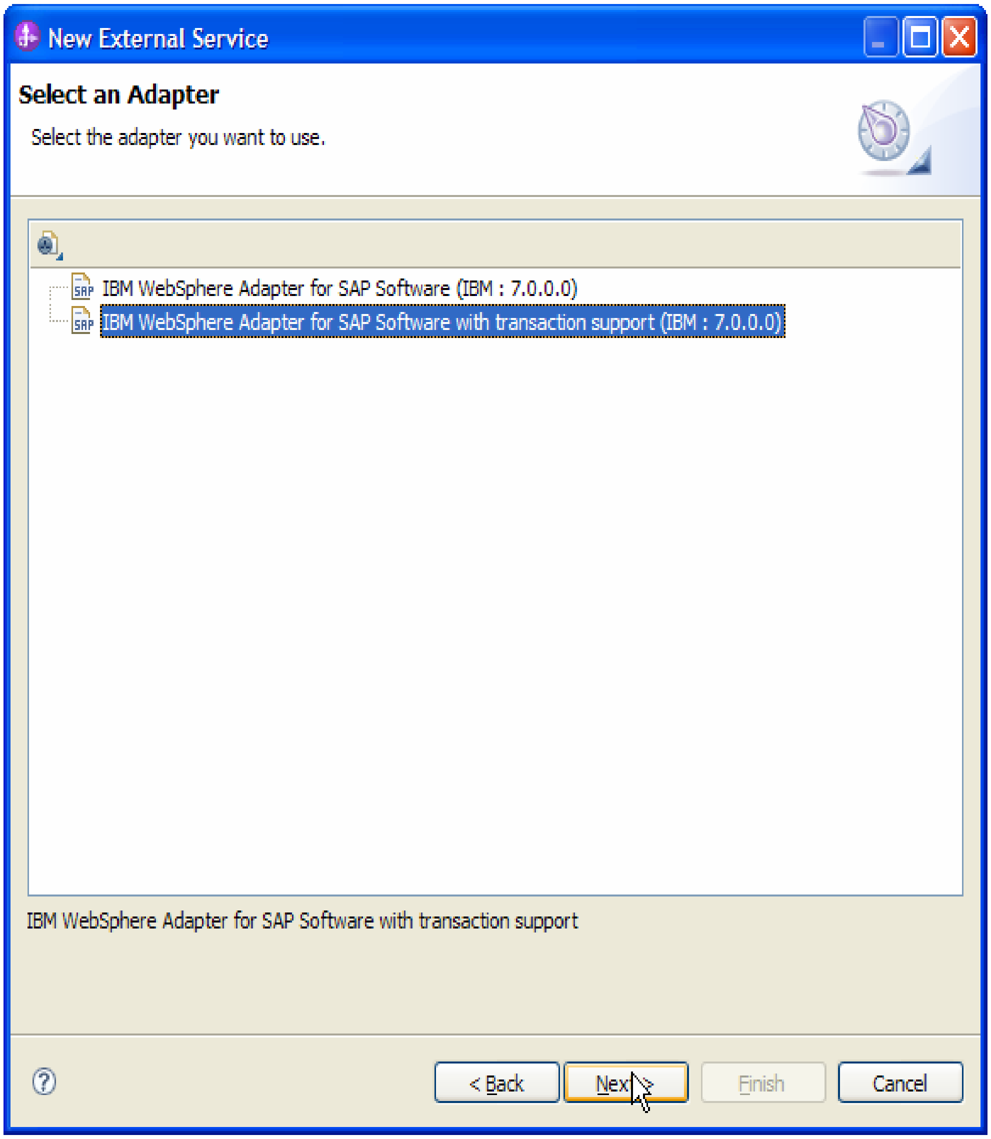
Select the Service Type or Registry

Select the type of service to create or registry to browse.

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



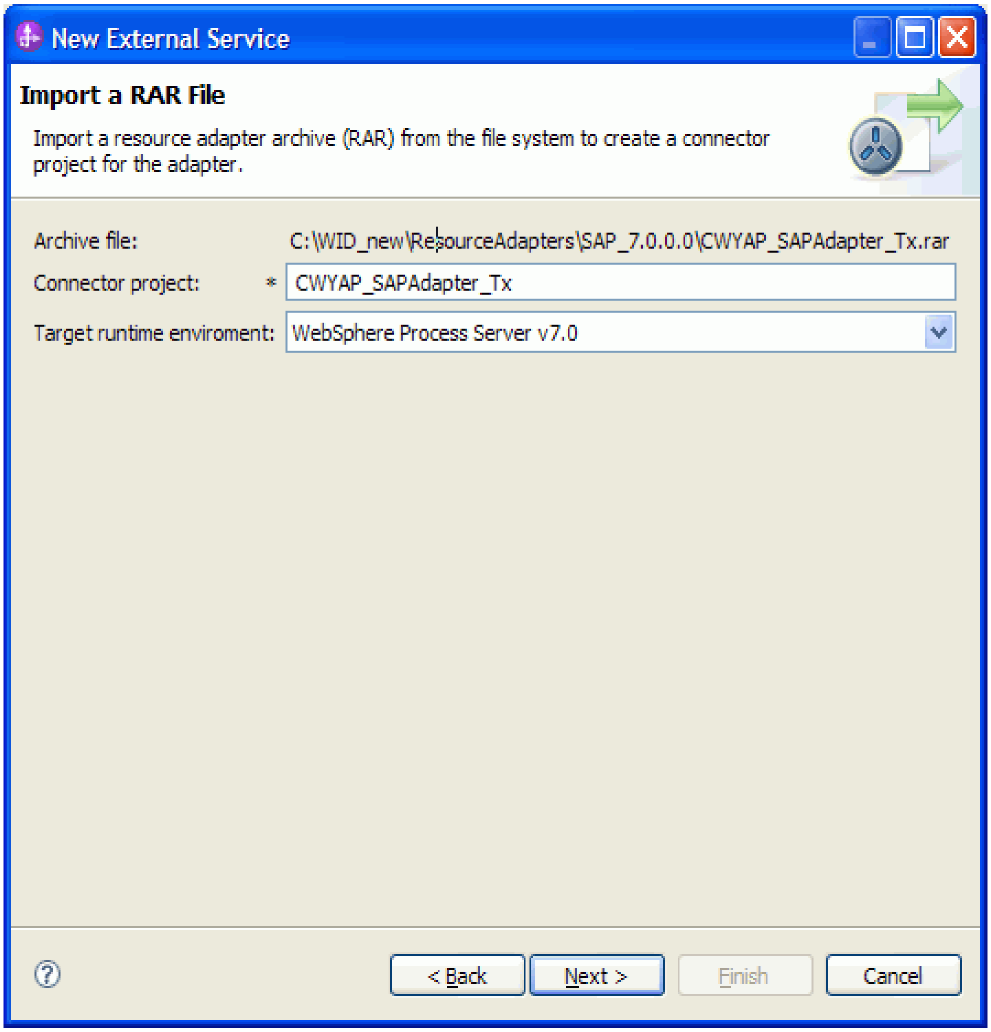
New External Service
Select an Adapter
Select the adapter you want to use.
IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)
IBM WebSphere Adapter for SAP Software with transaction support
< Back
Next >
Finish
Cancel

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and proceed by clicking **Next.**



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

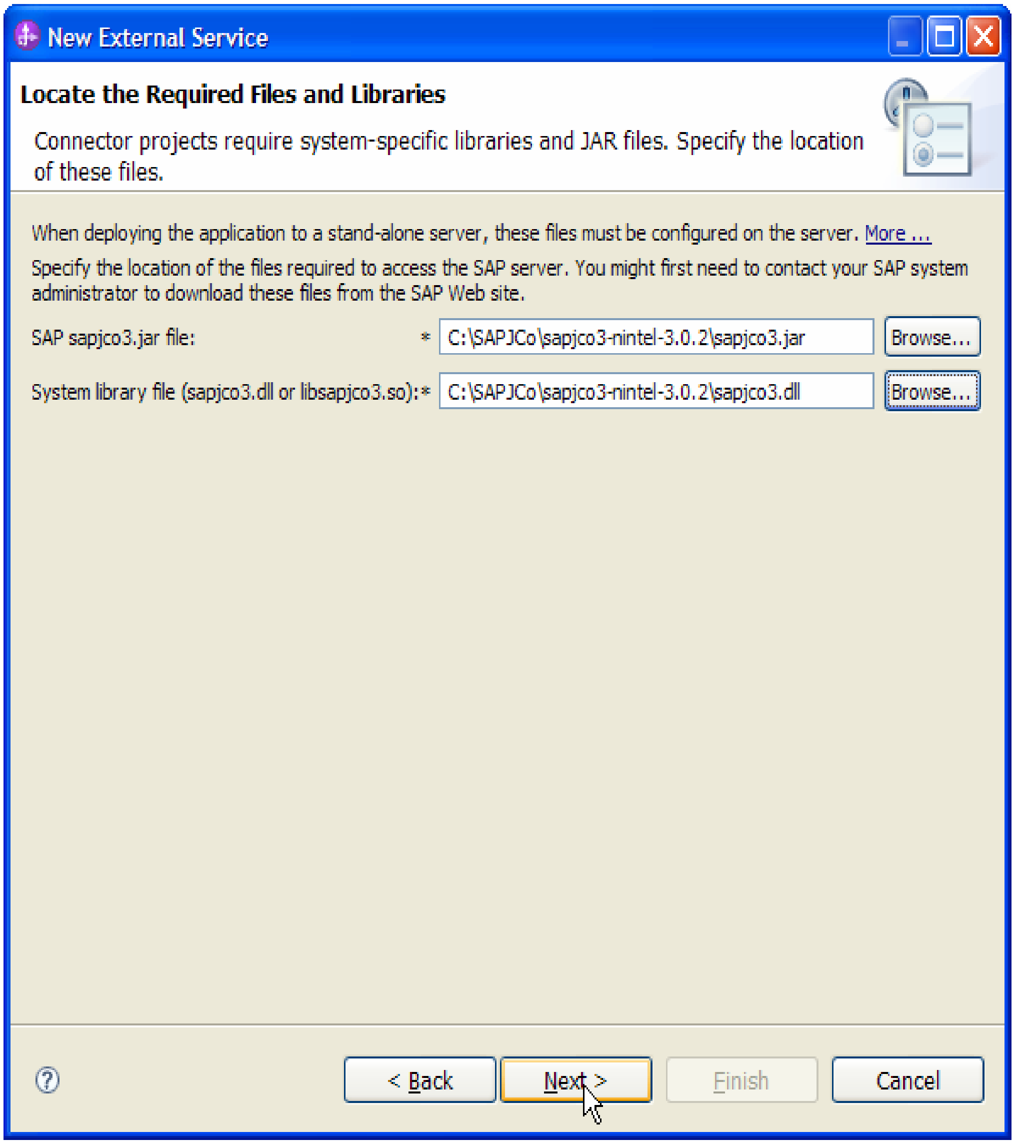
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** Screen, provide the locations of the **sapjco3.jar and sapjco3.dll** or **libsapjco3.so files**



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

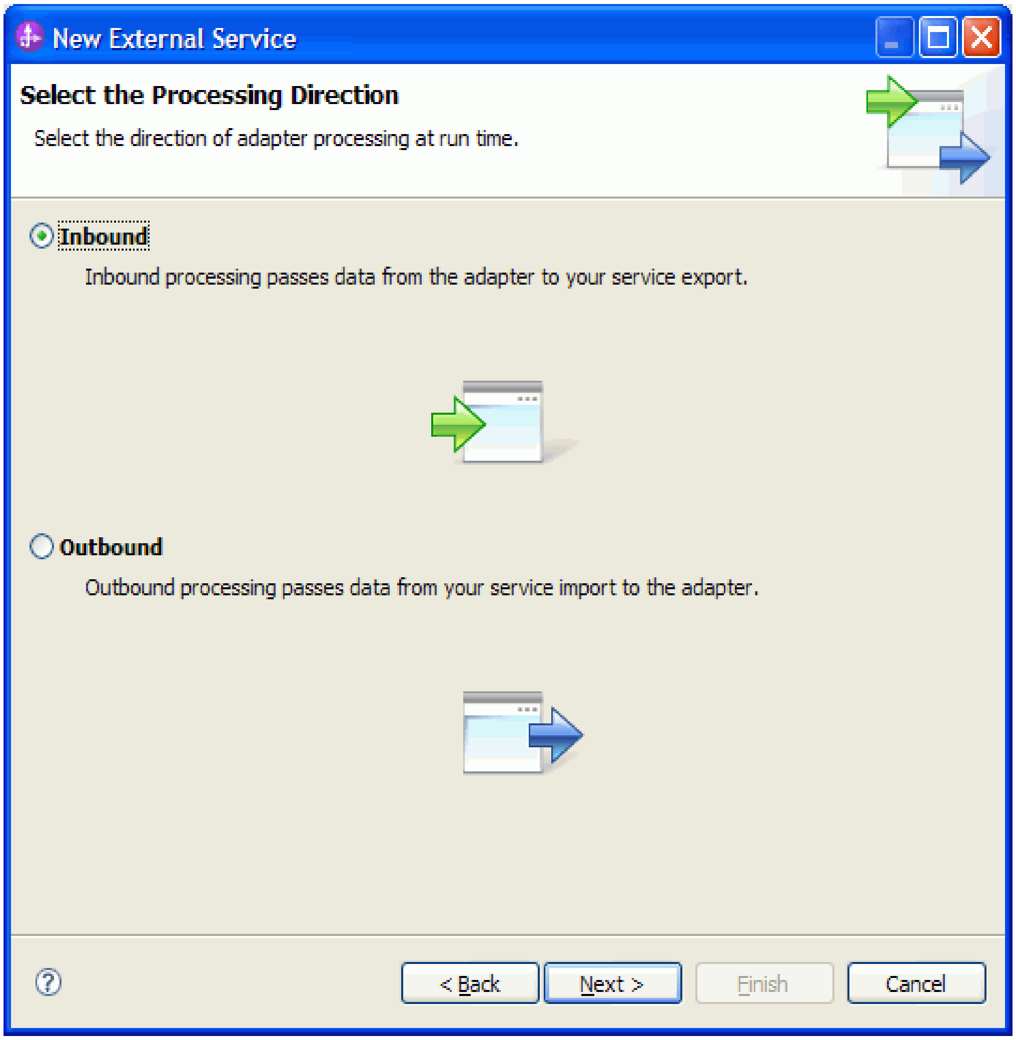
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select the **Inbound** radio button, then click **Next.**



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● Inbound

Inbound processing passes data from the adapter to your service export.

○ Outbound

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

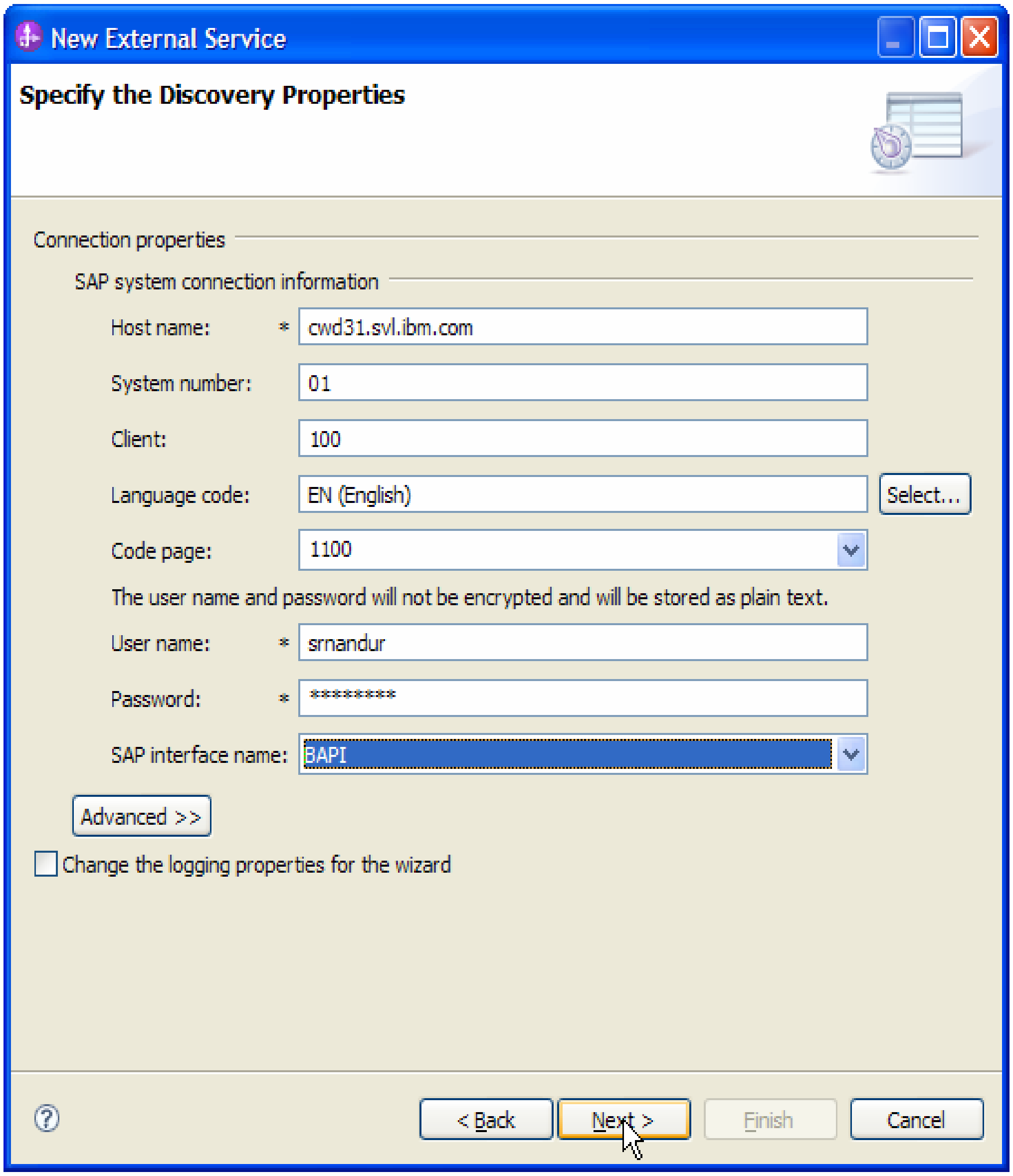
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Then click **Next**.



Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

SAP interface name: BAPI

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

Under **Find Objects in the Enterprise System**, click on RFC node. Then click the ⇉ button.

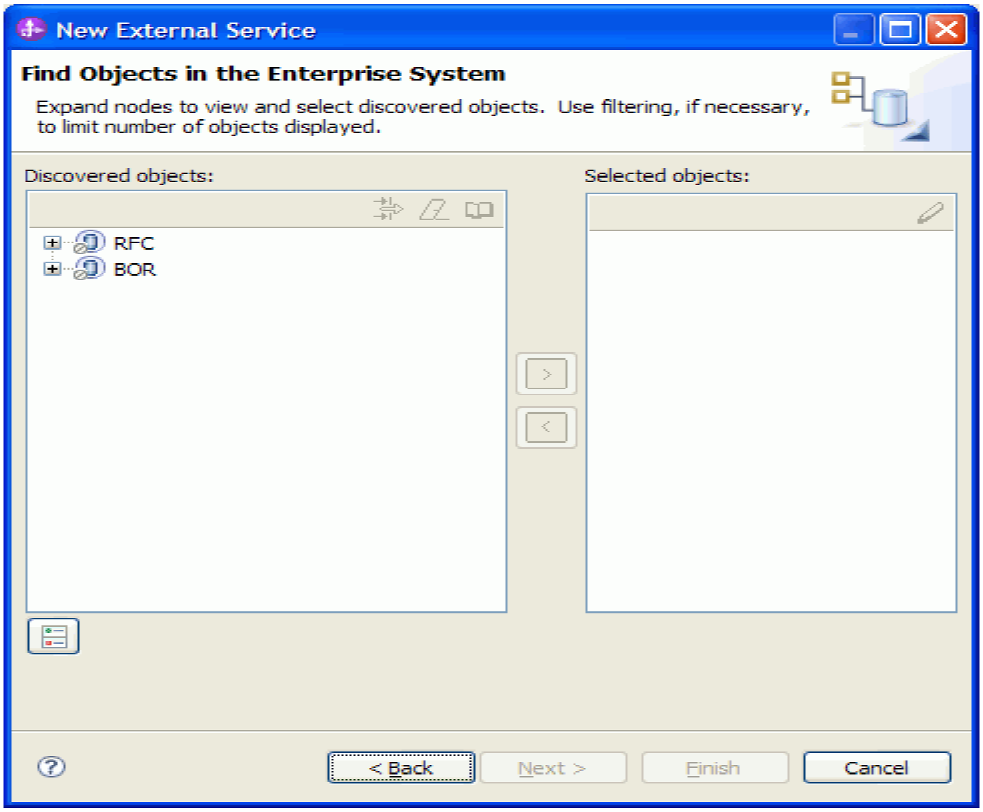
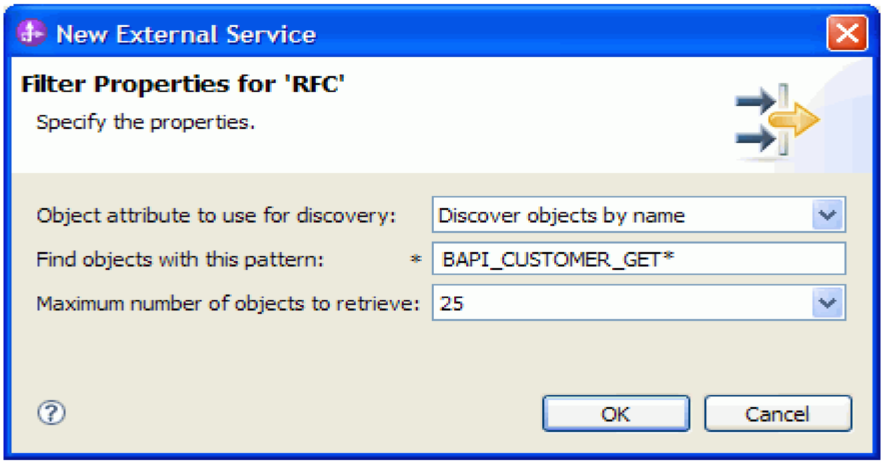

New External Service
Find Objects in the Enterprise System
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.
Discovered objects:
Selected objects:
RFC
BOR
>
<
< Back
Next >
Finish
Cancel

Figure: Object Discovery and Selection

Enter BAPI_CUSTOMER_GET* (the name of the BAPI in SAP and an asterisk as a wild card character) in the **Filter Properties for 'RFC'** screen.


New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

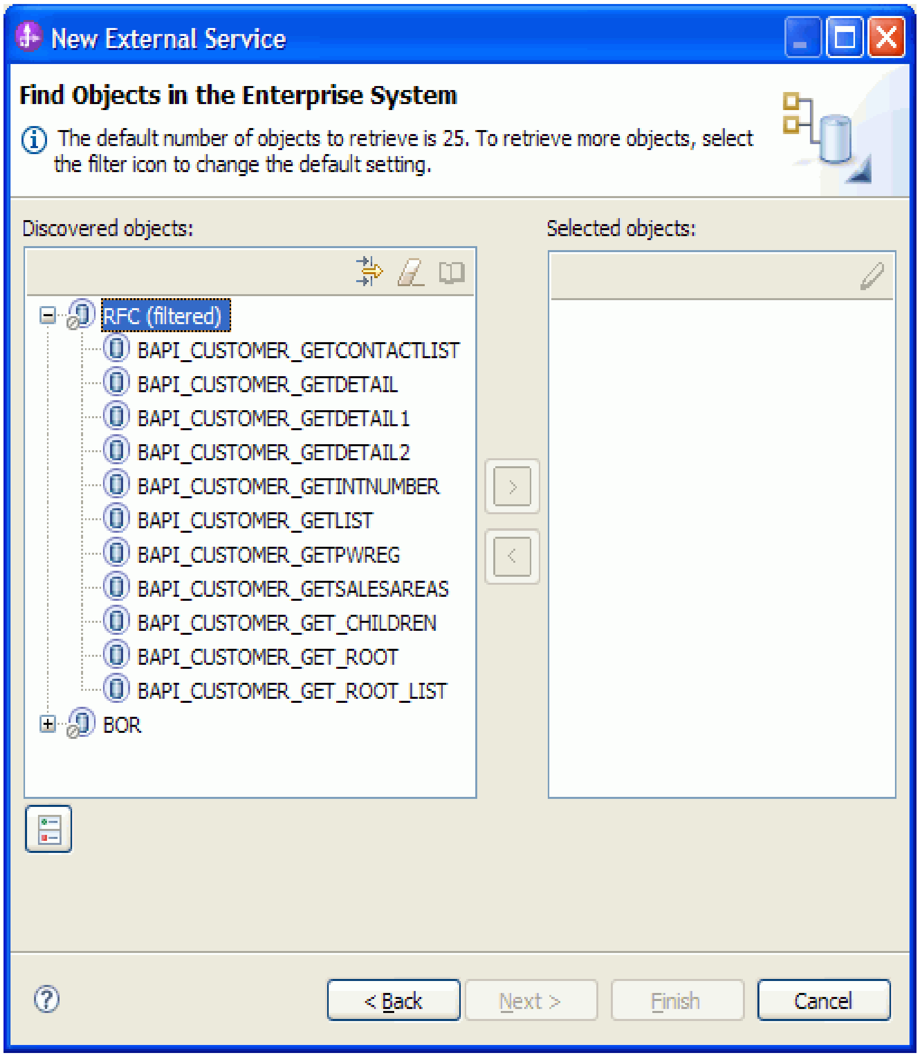
Find objects with this pattern: * BAPI_CUSTOMER_GET*

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand **RFC** node.



New External Service

Find Objects in the Enterprise System

ⓘ The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- RFC (filtered)
  - BAPI_CUSTOMER_GETCONTACTLIST
  - BAPI_CUSTOMER_GETDETAIL
  - BAPI_CUSTOMER_GETDETAIL1
  - BAPI_CUSTOMER_GETDETAIL2
  - BAPI_CUSTOMER_GETINTNUMBER
  - BAPI_CUSTOMER_GETLIST
  - BAPI_CUSTOMER_GETPWREG
  - BAPI_CUSTOMER_GETSALESAREAS
  - BAPI_CUSTOMER_GET_CHILDREN
  - BAPI_CUSTOMER_GET_ROOT
  - BAPI_CUSTOMER_GET_ROOT_LIST
- BOR

Selected objects:

Figure: Retrieved BAPIs' based on search criteria

Select the BAPI_CUSTOMER_GETDETAIL from metadata tree.

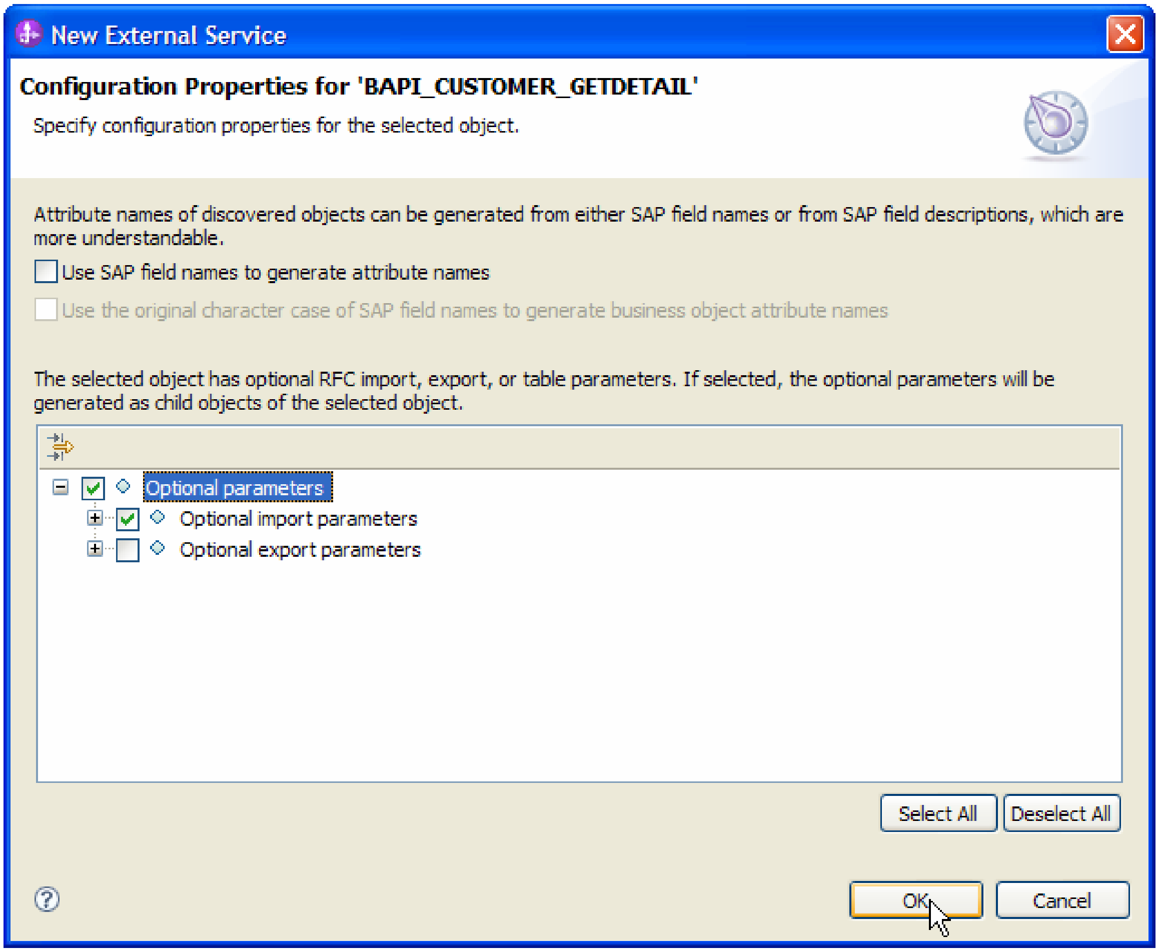
Click the > button.

A popup will appear containing the Configuration properties for the BAPI_CUSTOMER_GETDETAIL object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click OK to go back to Find Objects in the Enterprise System screen.



New External Service

Configuration Properties for 'BAPI_CUSTOMER_GETDETAIL'

Specify configuration properties for the selected object.

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

- ☑ Optional parameters
  - ☑ Optional import parameters
  - □ Optional export parameters

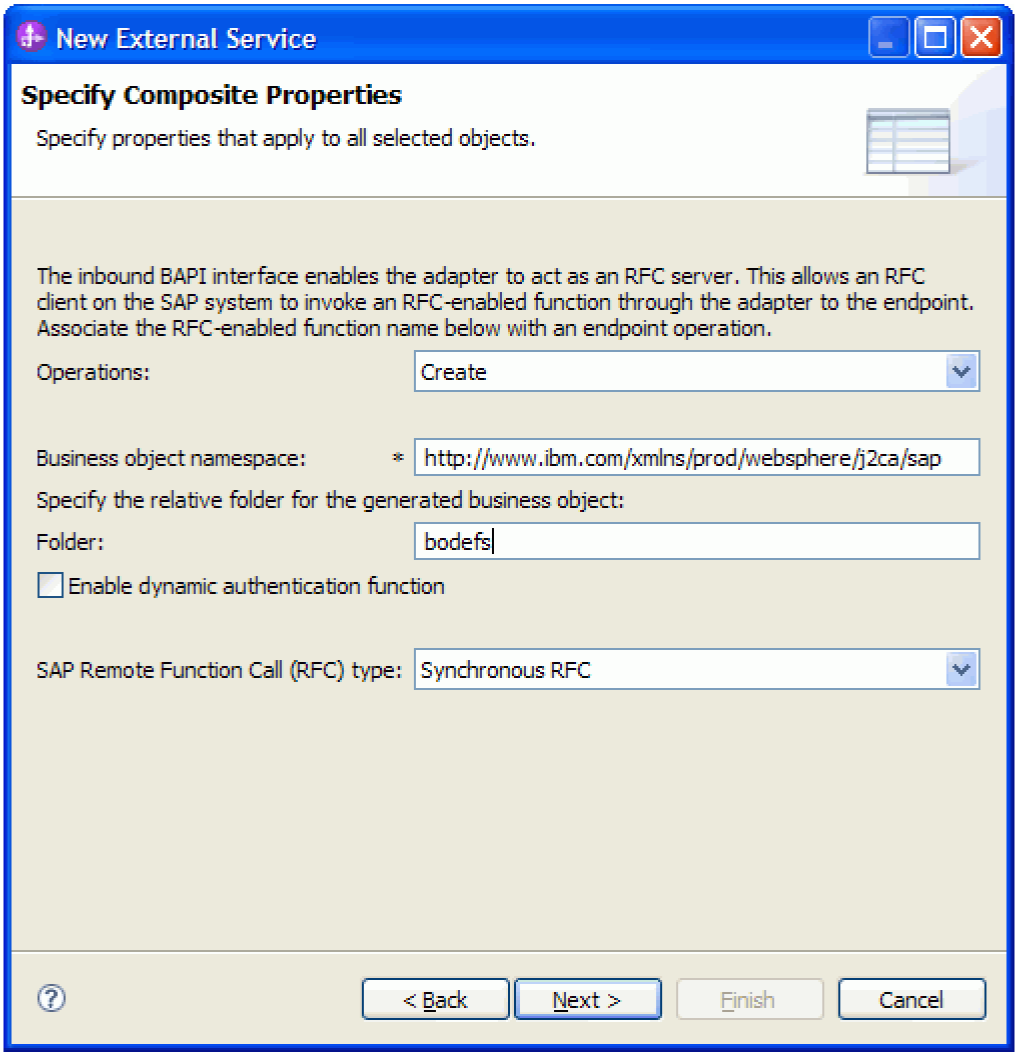
Figure: Setting configuration parameters for the BAPI selected

Click **Next**.

Generating Business Object definitions and related artifacts

In the **Specify Composite Properties** screen, associate the RFC-enabled function name with an end-point operation **Create**.

Enter the name of the folder where the Business Objects are to be created as **bodefs**.



Specify Composite Properties

Specify properties that apply to all selected objects.

The inbound BAPI interface enables the adapter to act as an RFC server. This allows an RFC client on the SAP system to invoke an RFC-enabled function through the adapter to the endpoint. Associate the RFC-enabled function name below with an endpoint operation.

Operations: Create

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

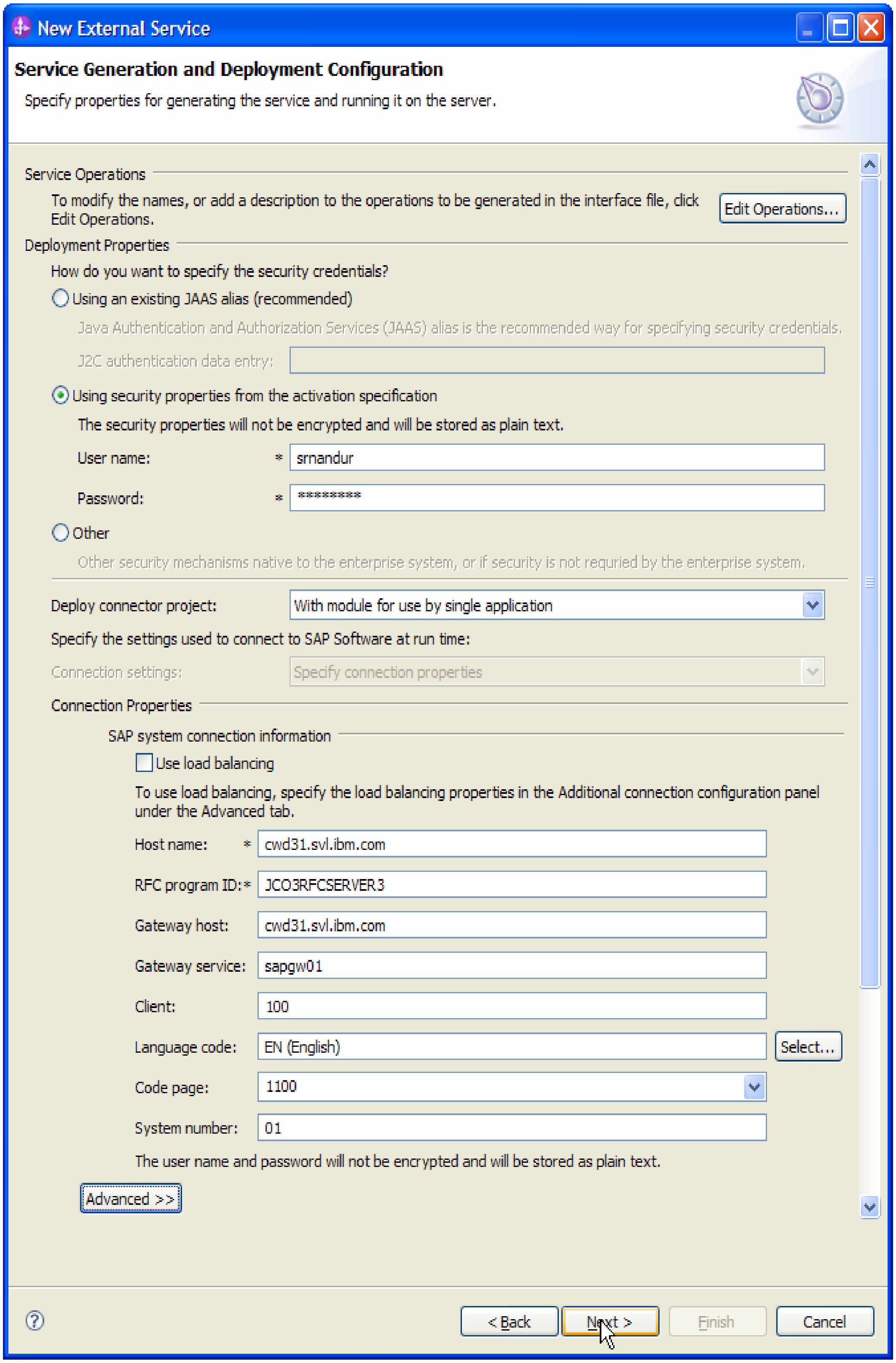
□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Synchronous RFC

Figure: Specify Composite Properties

Click **Next**.

In the Service Generation and Deployment Configuration screen enter the connection properties and deployment properties. Click **Next.**



New External Service

Service Generation and Deployment Configuration

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

Java Authentication and Authorization Services (JAAS) alias is the recommended way for specifying security credentials.

J2C authentication data entry:

● Using security properties from the activation specification

The security properties will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

○ Other

Other security mechanisms native to the enterprise system, or if security is not requried by the enterprise system.

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID:* JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English)

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

Figure: Service Generation and Deployment Configuration

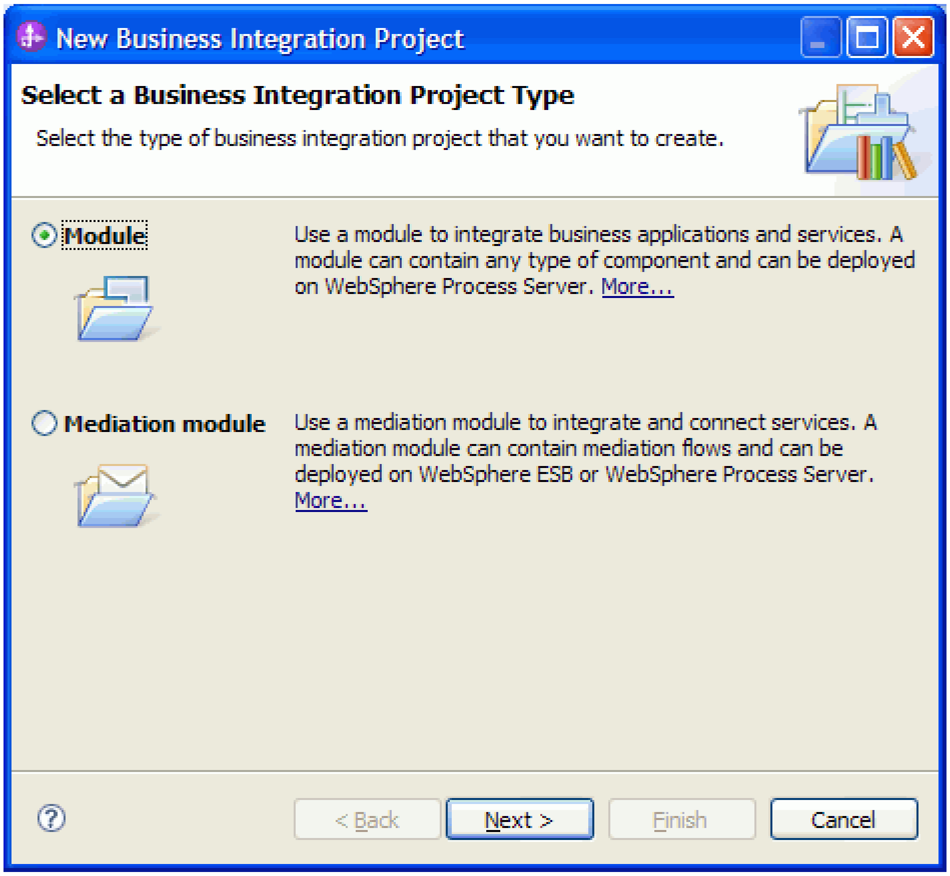
Note: You can either enter an **Authentication Alias** previously created using the **administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP.

Enter the RFCProgramID (as shown in figure). This must have been previously configured in the SAP system.

Click **Next.**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

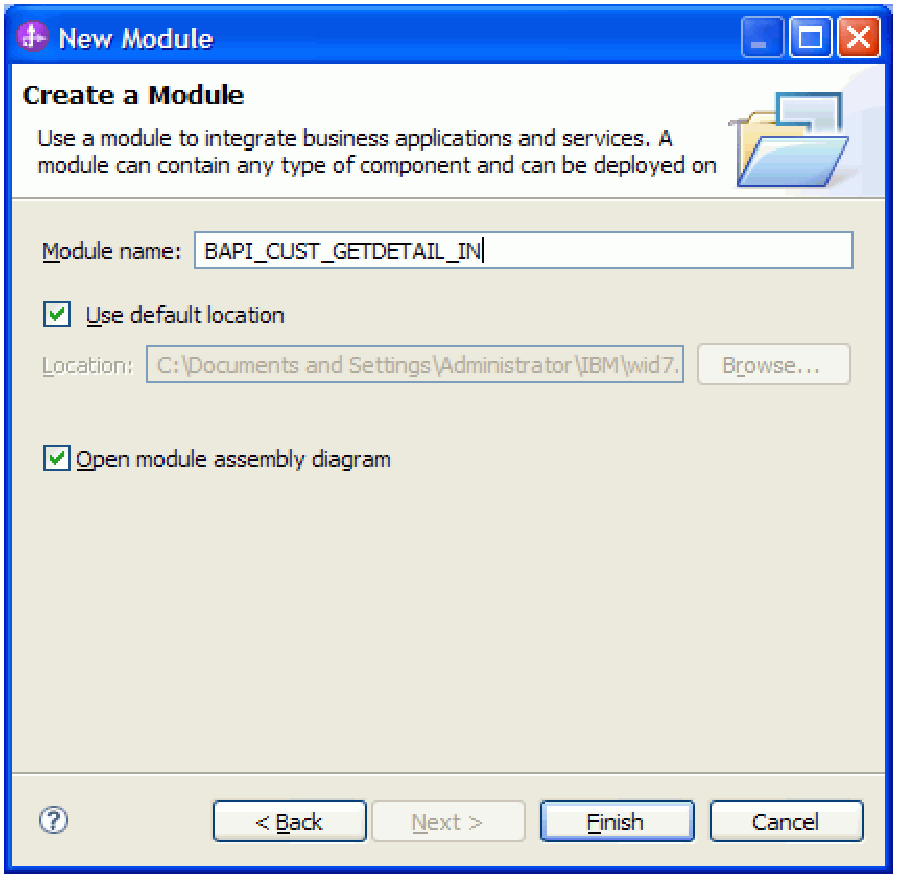
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_CUST_GETDETAIL_IN** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on

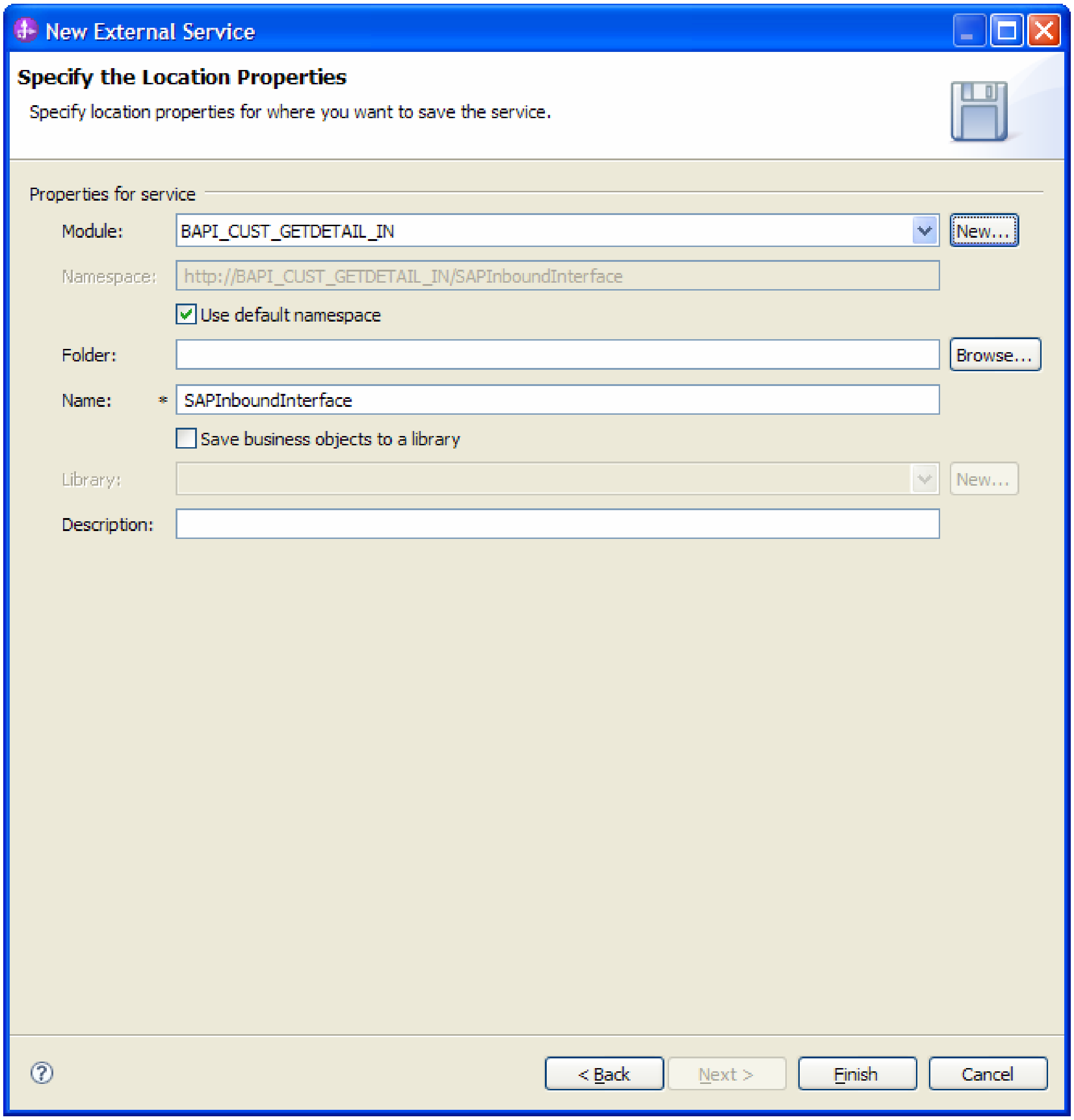
Module name: BAPI_CUST_GETDETAIL_IN

☑ Use default location

Location: C:\Documents and Settings\Administrator\IBM\wid7.

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: BAPI_CUST_GETDETAIL_IN

Namespace: http://BAPI_CUST_GETDETAIL_IN/SAPInboundInterface

☑ Use default namespace

Folder:

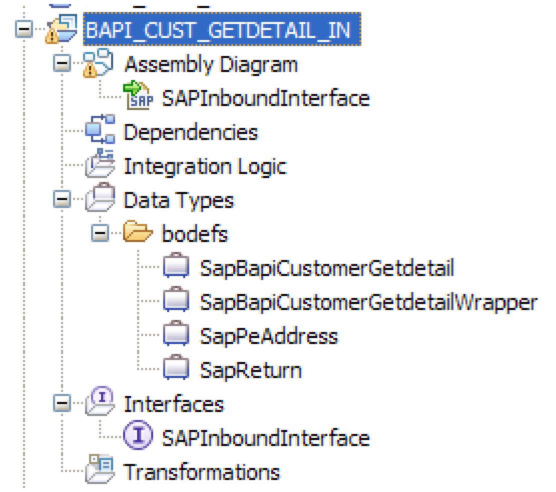
Name: * SAPInboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



- BAPI_CUST_GETDETAIL_IN
  - Assembly Diagram
    - SAPInboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapBapiCustomerGetdetail
      - SapBapiCustomerGetdetailWrapper
      - SapPeAddress
      - SapReturn
  - Interfaces
    - SAPInboundInterface
  - Transformations

Figure: Artifacts created after the EMD run fore BAPI Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the "**BAPI_CUST_GETDETAIL_IN**" SCA module, and double click the **Assembly Diagram**. The Assembly Diagram screen appears with the module's Export component in view.

1. To create a new component, click the button of the required java component from the **Palette**.

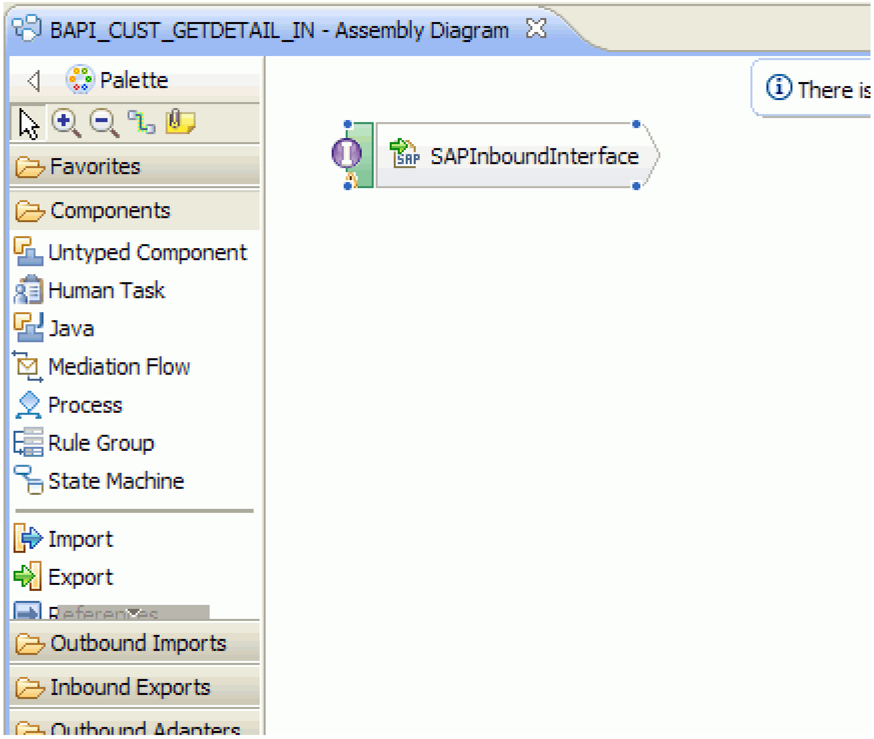


Figure: BAPI Inbound interface in the Assembly editor

Click and drag the Java component to add the new component to the Assembly Diagram screen.

Add a Wire between the **SAPInboundInterface** and the Java component.

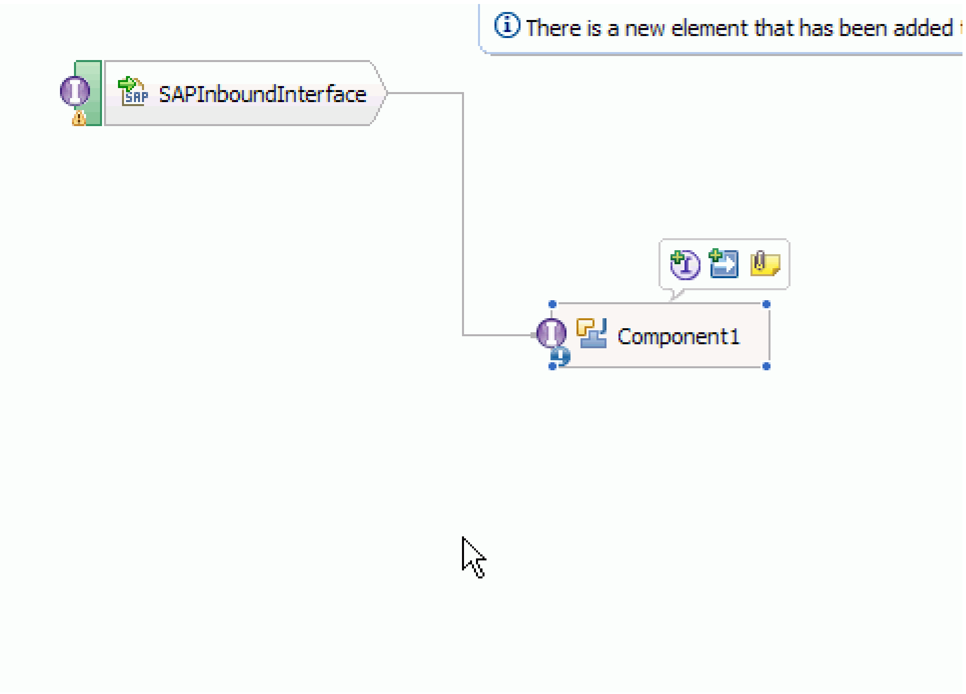
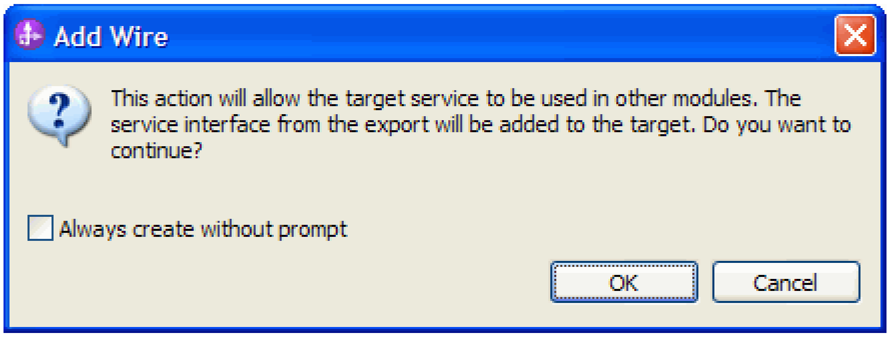


Figure: BAPI Inbound interface being wired to a target Component(end-point)

1. In the Add Wire screen, click OK.



This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Screen

2. Right-click the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

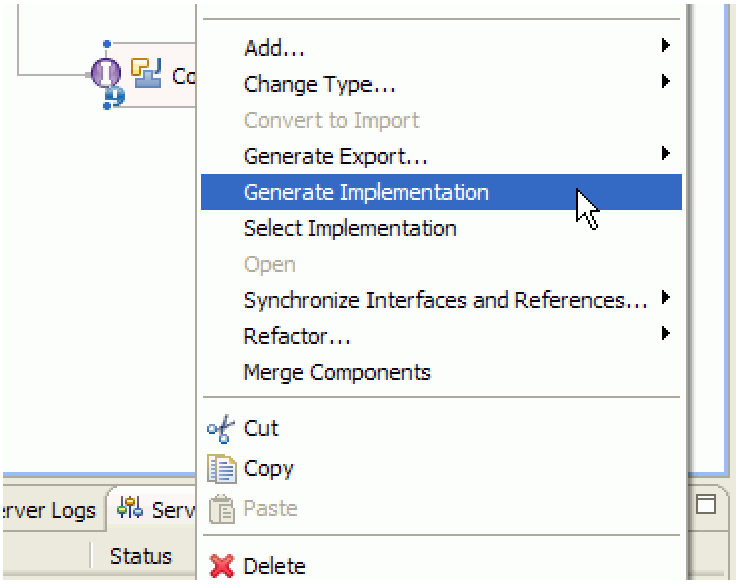
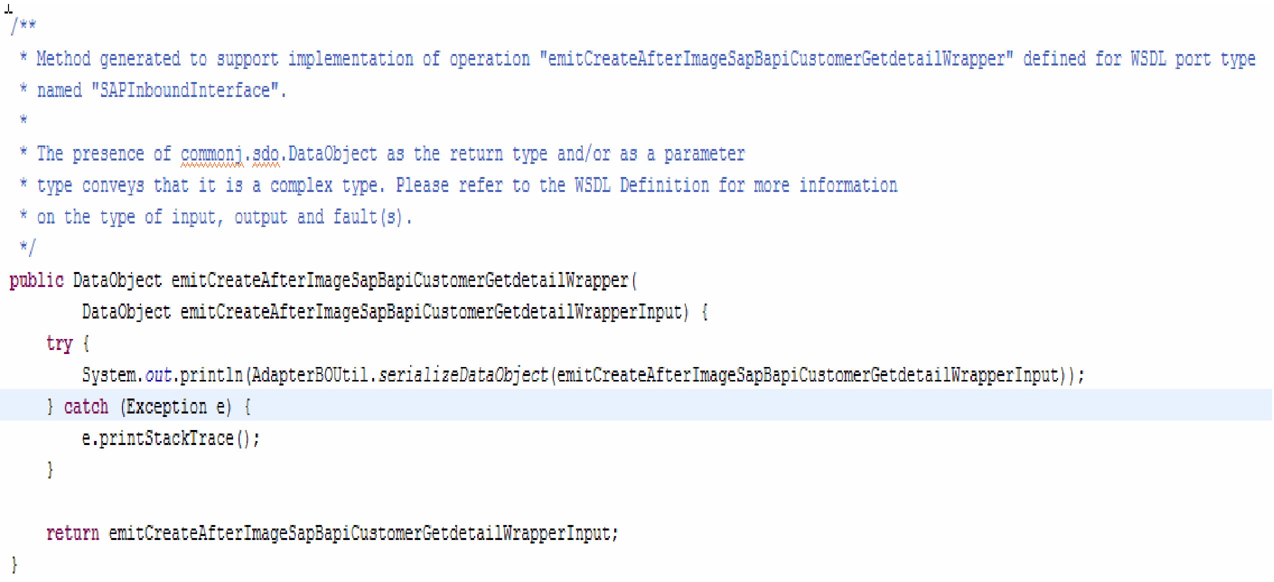


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapBapiCustomerGetdetailWrapper" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public DataObject emitCreateAfterImageSapBapiCustomerGetdetailWrapper(
        DataObject emitCreateAfterImageSapBapiCustomerGetdetailWrapperInput) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapBapiCustomerGetdetailWrapperInput));
    } catch (Exception e) {
        e.printStackTrace();
    }

    return emitCreateAfterImageSapBapiCustomerGetdetailWrapperInput;
}
```

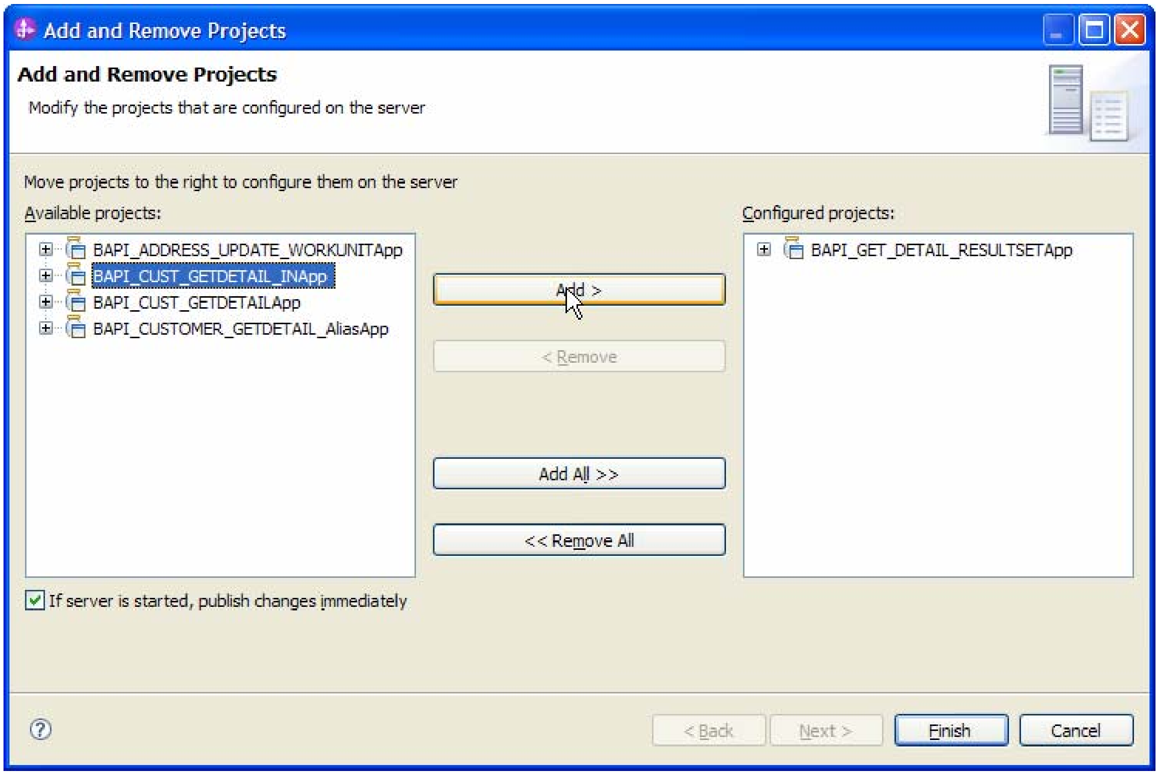
Save the Java file and the assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_CUST_GETDETAIL_INby selecting **Add and Remove Projects**.

The project BAPI_CUST_GETDETAIL_INApp will be listed under **Available projects**.



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

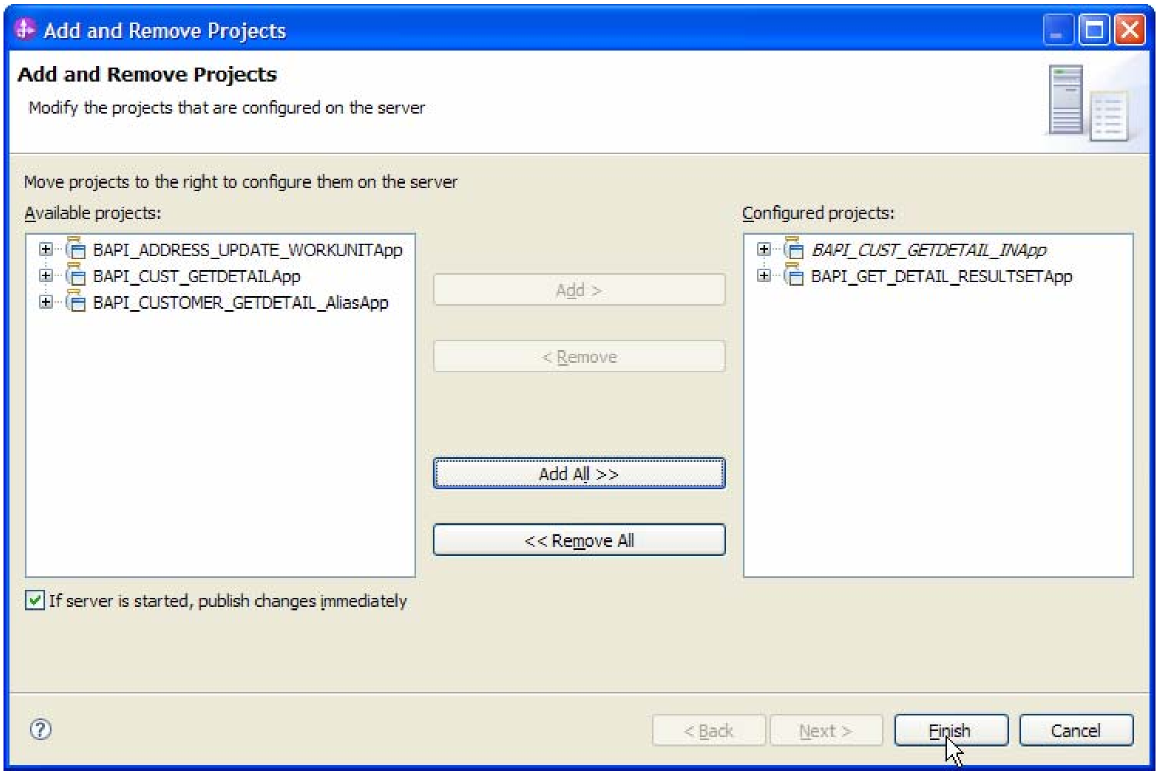
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_CUSTOMER_GETDETAIL_AliasApp

Configured projects:

- BAPI_GET_DETAIL_RESULTSETApp

☑ If server is started, publish changes immediately

The project that you added should appear under the **Configured projects**. Add the SCA module to the server by clicking **Finish**.



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAILApp
- BAPI_CUSTOMER_GETDETAIL_AliasApp

Configured projects:

- *BAPI_CUST_GETDETAIL_INApp*
- BAPI_GET_DETAIL_RESULTSETApp

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

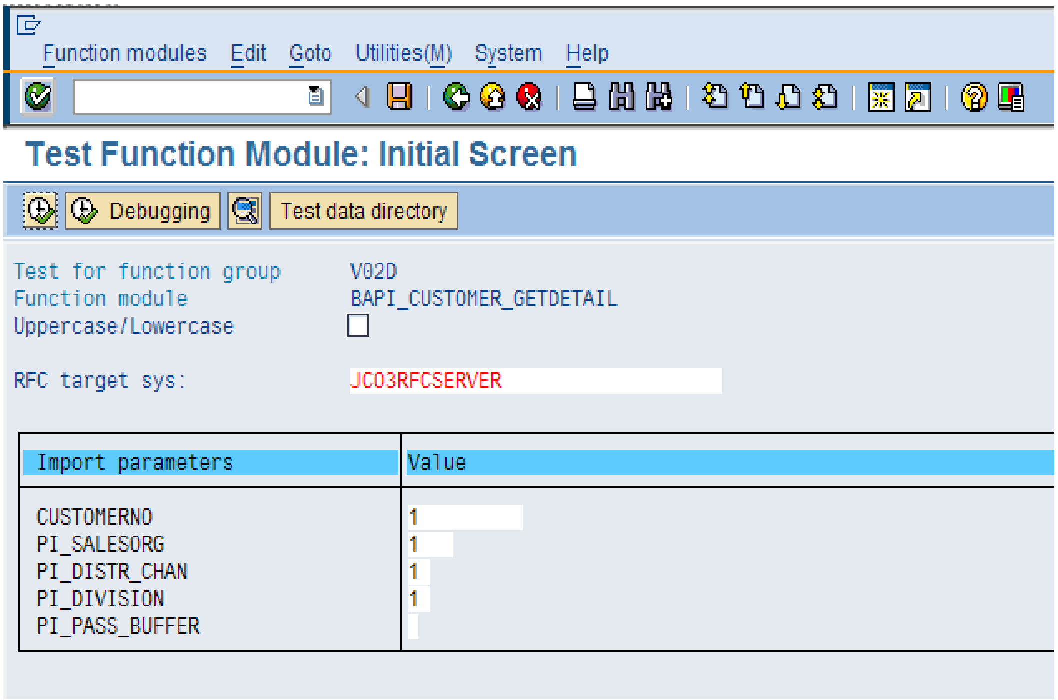
Start the Transaction SE37.

Enter the BAPI name as BAPI_CUSTOMER_GETDETAIL and execute the BAPI

Enter the RFC target sys as 'JCO3RFCSERVER' (as this is the RFC Program ID used when we configured the module)

Enter the other data as shown in the figure below

Execute the BAPI



Test Function Module: Initial Screen

Test for function group V02D
Function module BAPI_CUSTOMER_GETDETAIL
Uppercase/Lowercase □

RFC target sys: JCO3RFCSERVER

Import parameters	Value
CUSTOMERNO	1
PI_SALESORG	1
PI_DISTR_CHAN	1
PI_DIVISION	1
PI_PASS_BUFFER	

In the console of WebSphere Integration Developer, you could see the BAPI_CUSTOMER_GETDETAIL Business Object dump.

Clearing the sample content

No clean up is required after this tutorial.

Chapter 8. Tutorial 5 Sending Structured Query to SAP – Query Outbound Processing

This tutorial demonstrates how the WebSphere Adapter for SAP Software's QISS interface can be used to retrieve data from tables directly (in this example, we will retrieve data from SAP's table Kna1).

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the *<WPS_INSTALL>*/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

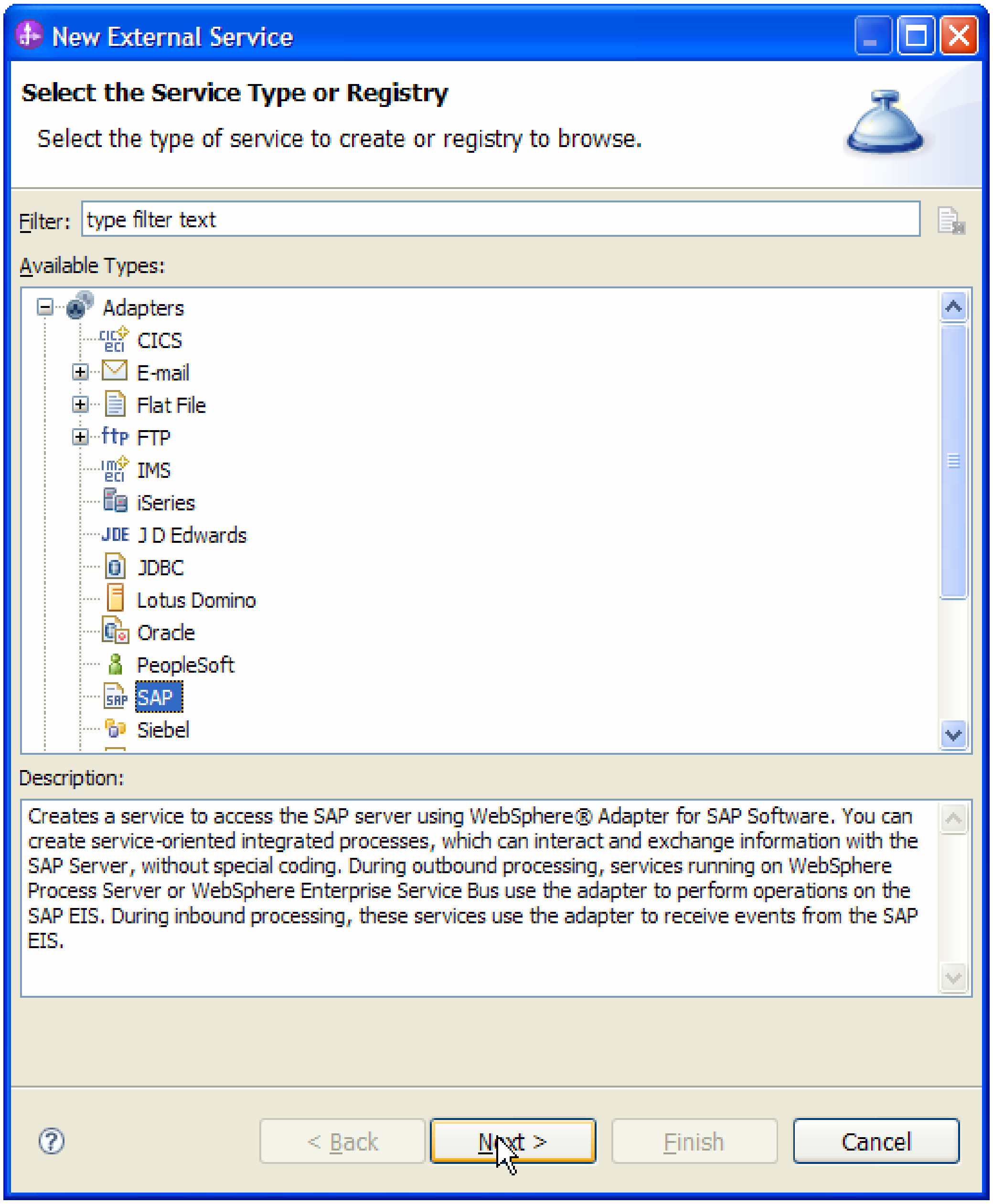
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

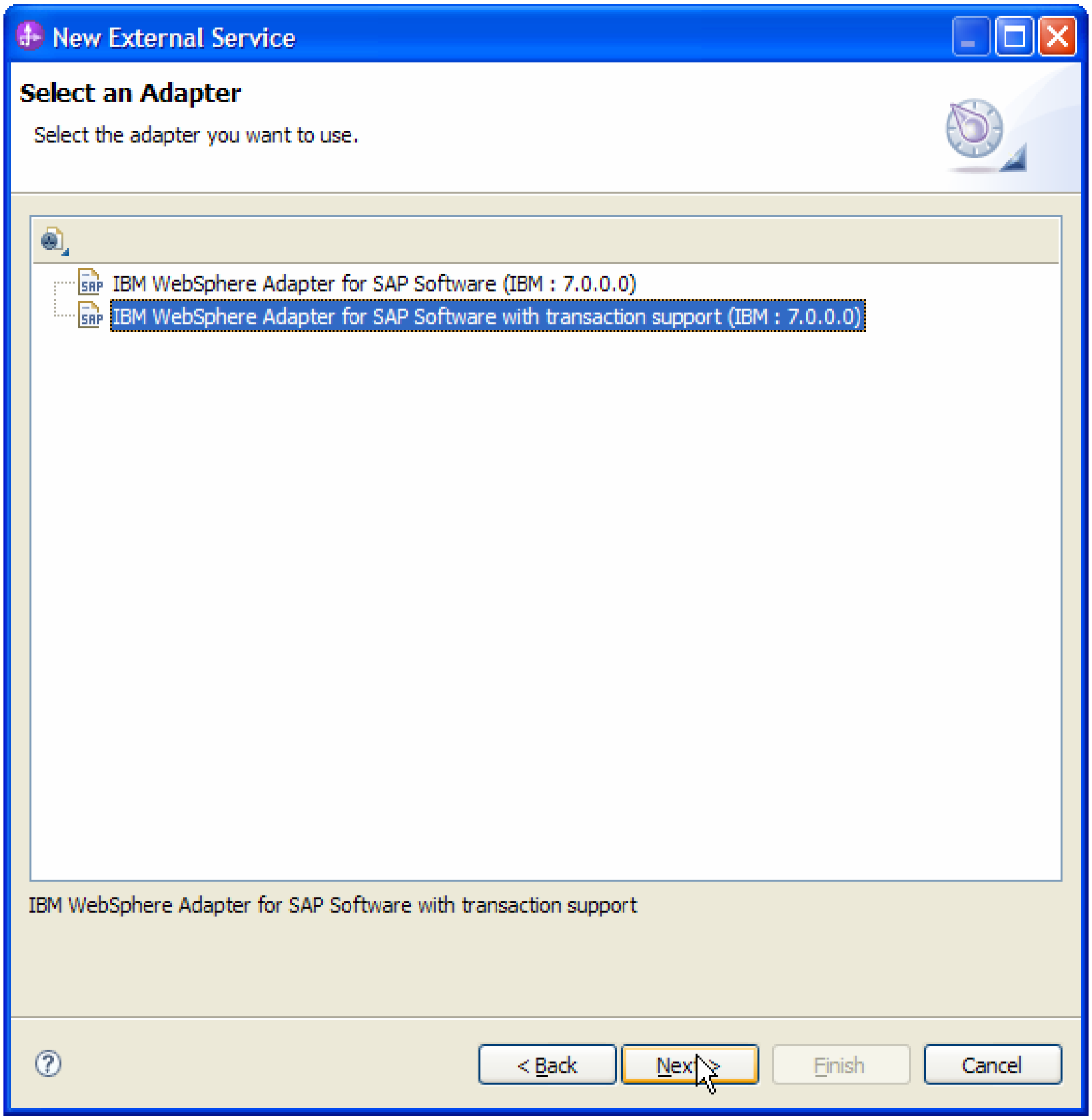
1. Select **Adapters** > **SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



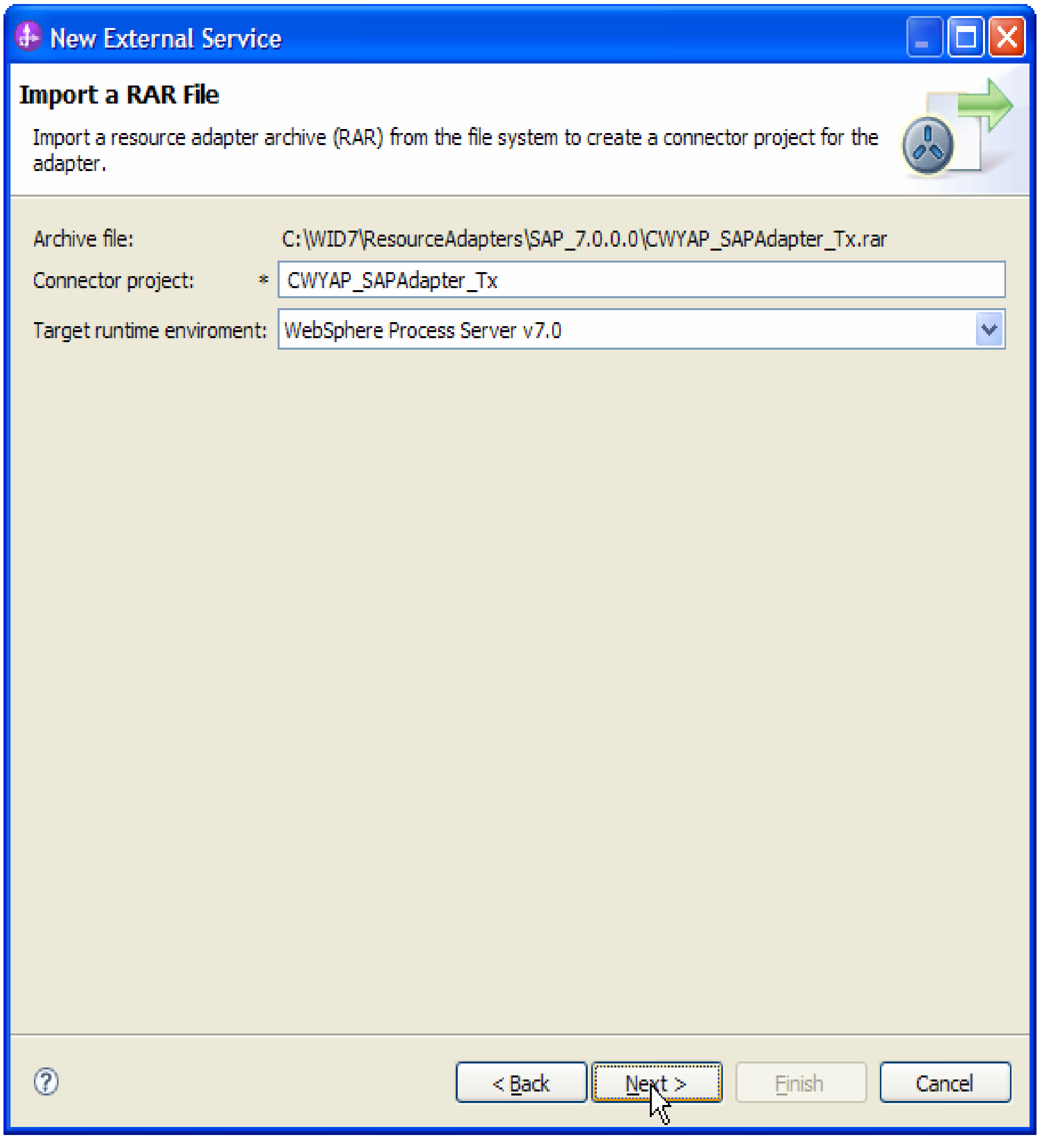
New External Service
Select an Adapter
Select the adapter you want to use.
IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)
IBM WebSphere Adapter for SAP Software with transaction support
< Back
Next >
Finish
Cancel

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next.**



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

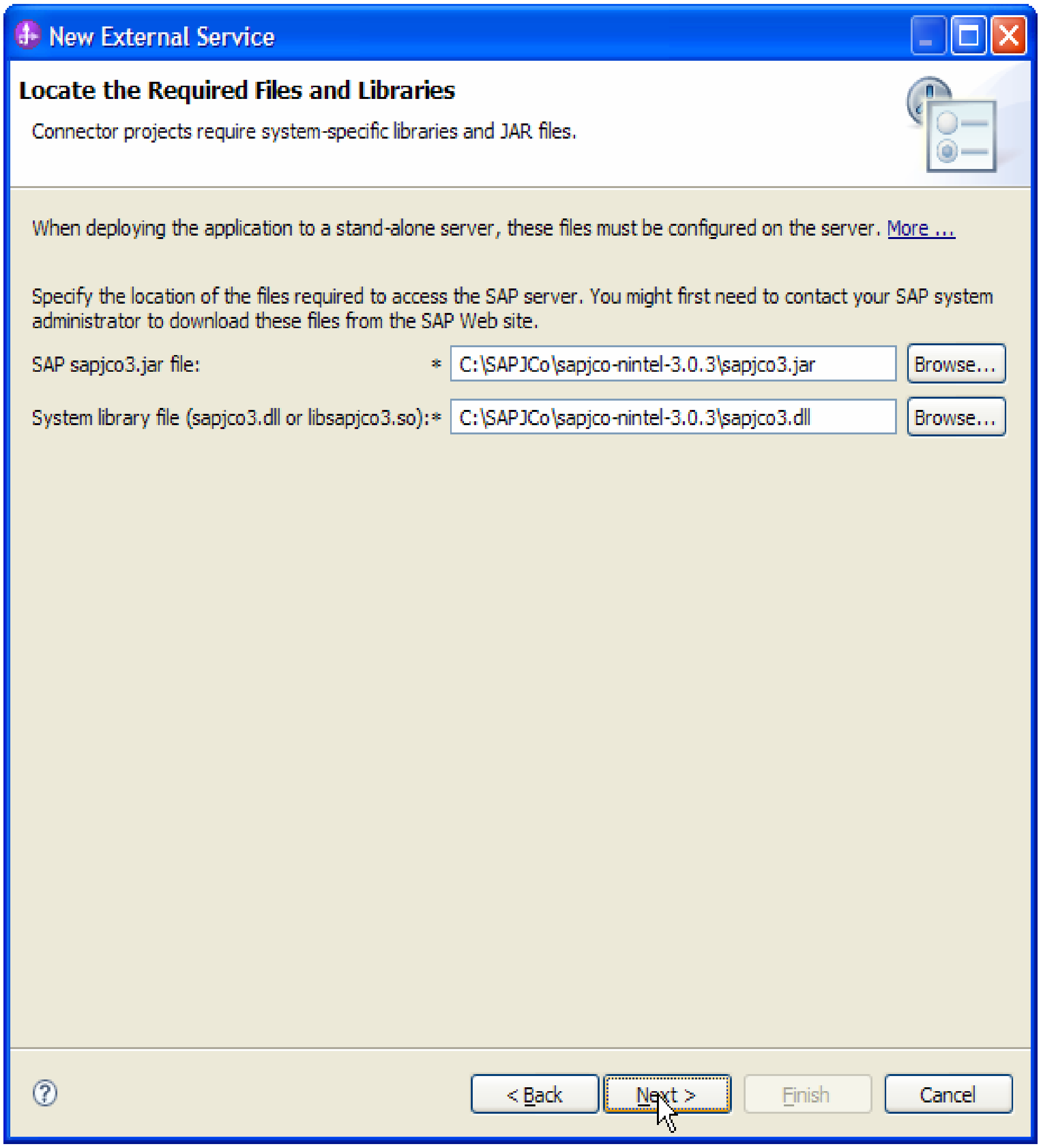
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** Screen, provide the locations of the **sapjco3.jar and sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

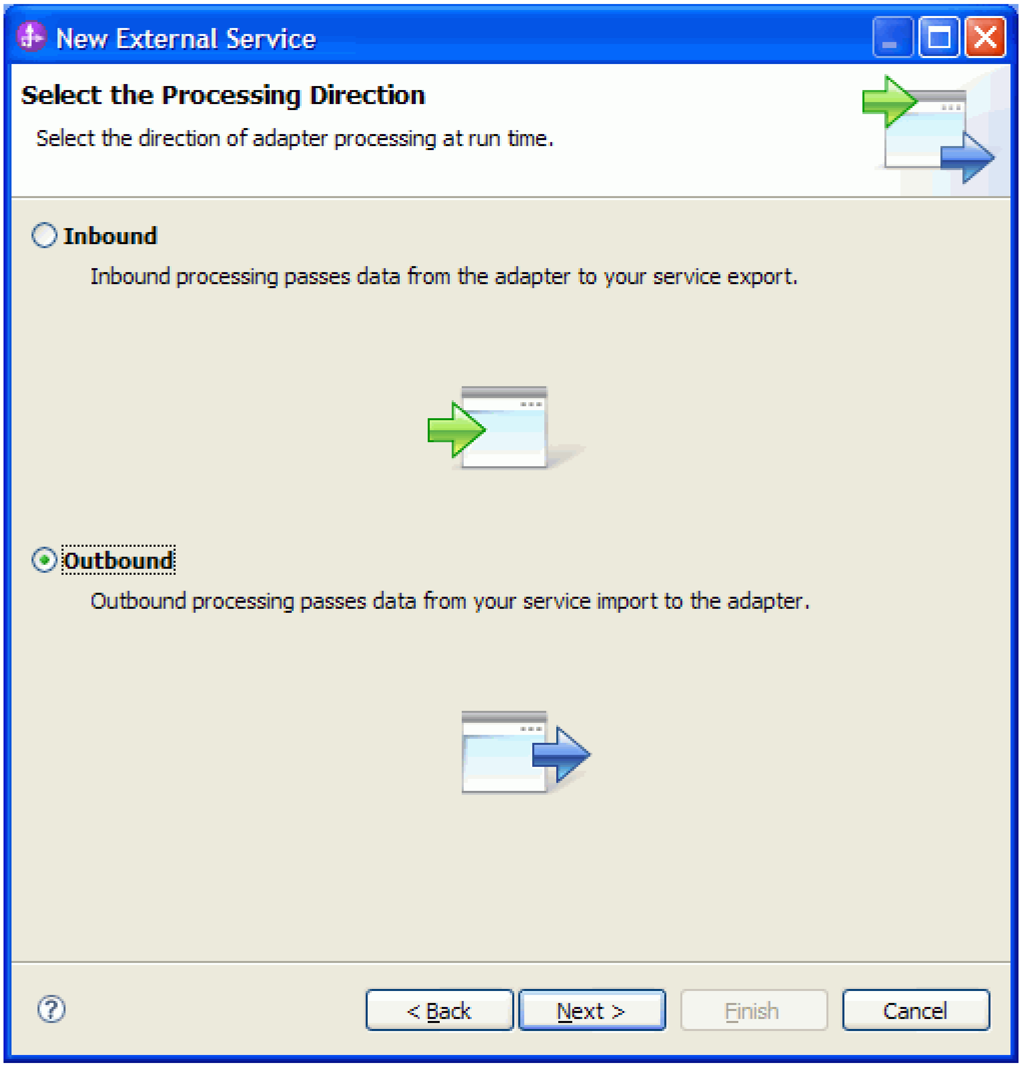
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next.**

6. In the **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

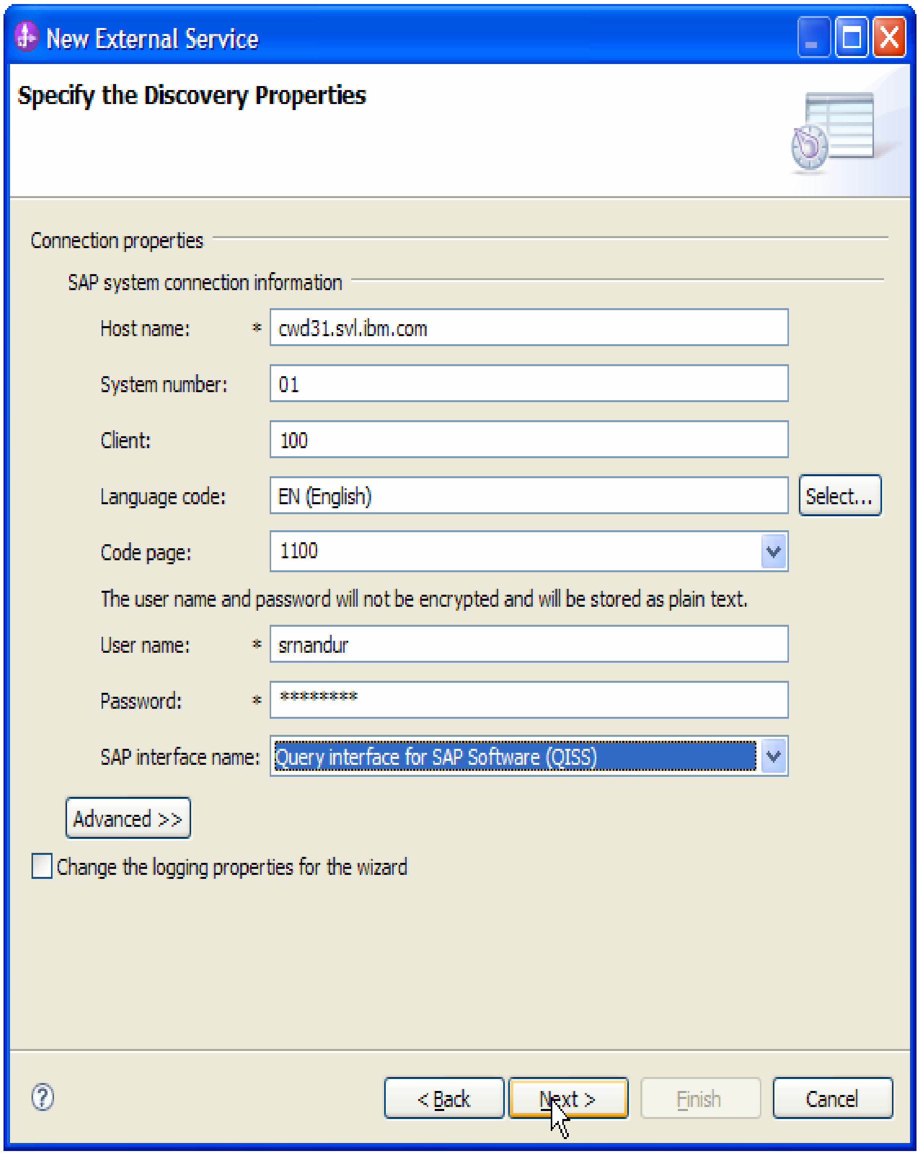
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select Query interface for SAP Software (QISS) as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English) Select...

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

SAP interface name: Query interface for SAP Software (QISS)

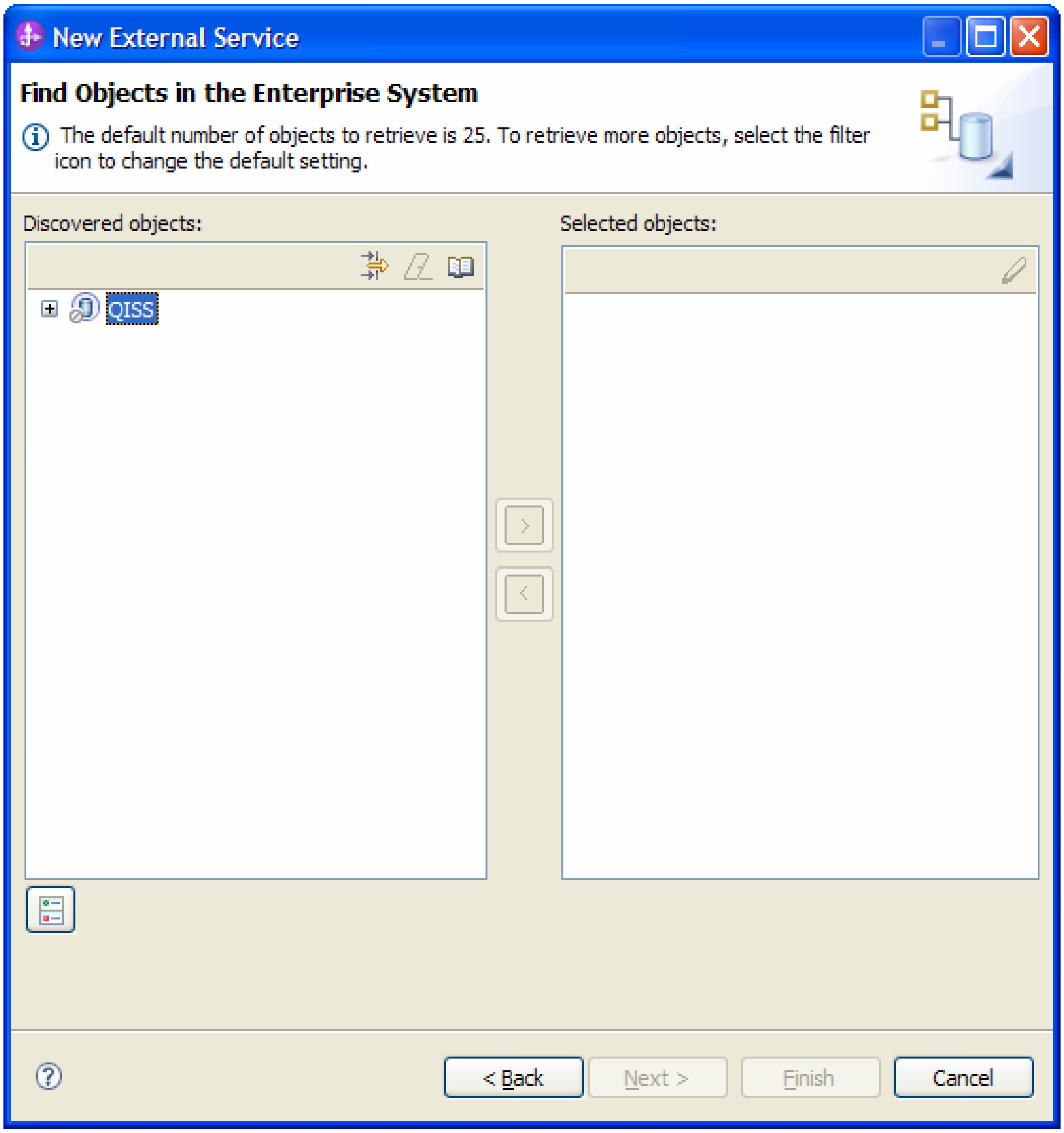
Advanced >>

□ Change the logging properties for the wizard

Figure: Select QISS as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find objects in the Enterprise System** screen, click the QISS node. Then click the button.



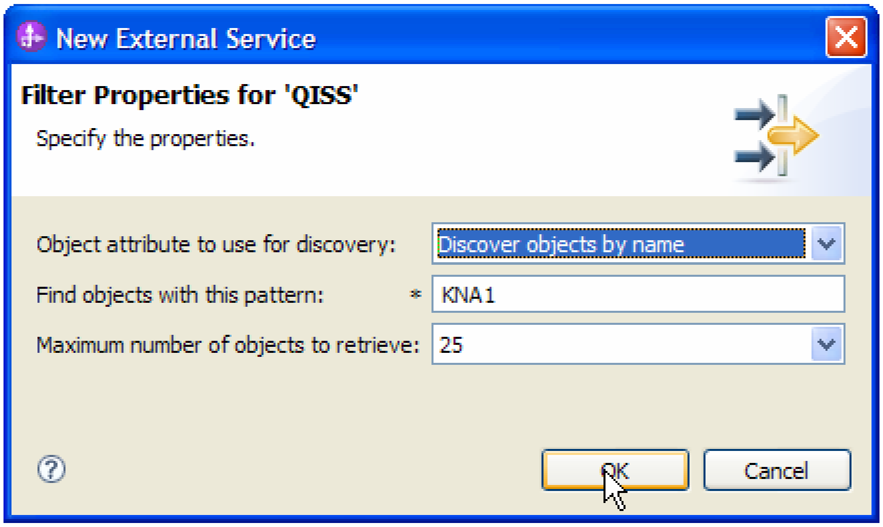
New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Figure: Object Discovery and Selection

Enter KNA1 (the name of the QISS object) in the **Filter Properties for 'QISS'** screen.



Filter Properties for 'QISS'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

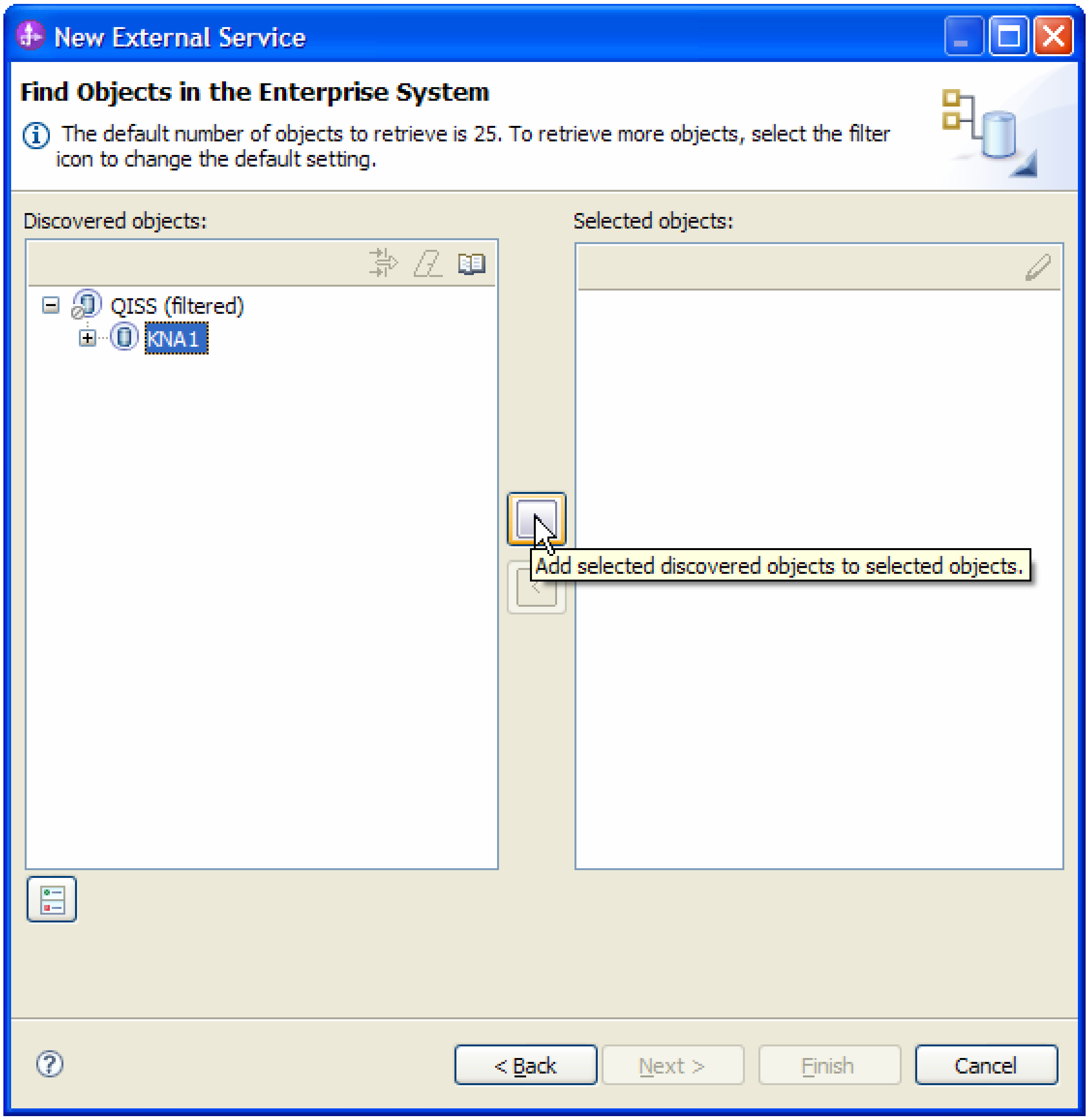
Find objects with this pattern: * KNA1

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **QISS** node.



Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

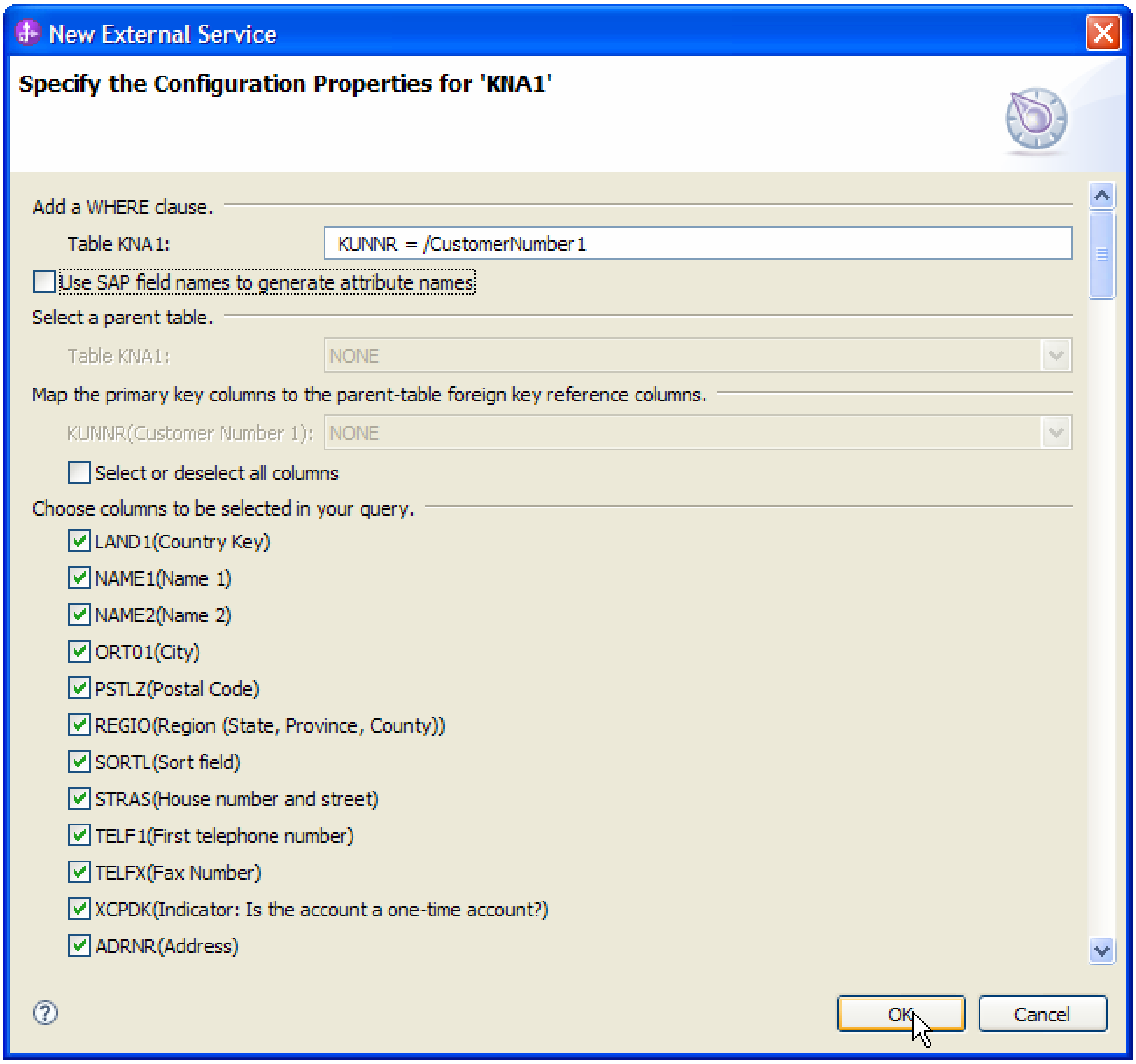
- QISS (filtered)
  - KNA1

Selected objects:

Add selected discovered objects to selected objects.

Figure: Retrieved QISS interface based on search criteria

Click > to select KNA1 into **Selected Objects**.



Specify the Configuration Properties for 'KNA1'

Add a WHERE clause.

Table KNA1: KUNNR = /CustomerNumber1

☐ Use SAP field names to generate attribute names

Select a parent table.

Table KNA1: NONE

Map the primary key columns to the parent-table foreign key reference columns.

KUNNR(Customer Number 1): NONE

☐ Select or deselect all columns

Choose columns to be selected in your query.

☑ LAND1(Country Key)
☑ NAME1(Name 1)
☑ NAME2(Name 2)
☑ ORT01(City)
☑ PSTLZ(Postal Code)
☑ REGIO(Region (State, Province, County))
☑ SORTL(Sort field)
☑ STRAS(House number and street)
☑ TELF1(First telephone number)
☑ TELFX(Fax Number)
☑ XCPDK(Indicator: Is the account a one-time account?)
☑ ADRNR(Address)

Accept the defaults and click **OK**.

Click the **QISS** node and then the button again.

Repeat Steps 4-7above for the pattern **ADRC**.

In Specify the Configuration Properties for **ADRC** -

Under **Select a Parent Table** for Table ADRC, select KNA1 from the drop down list.

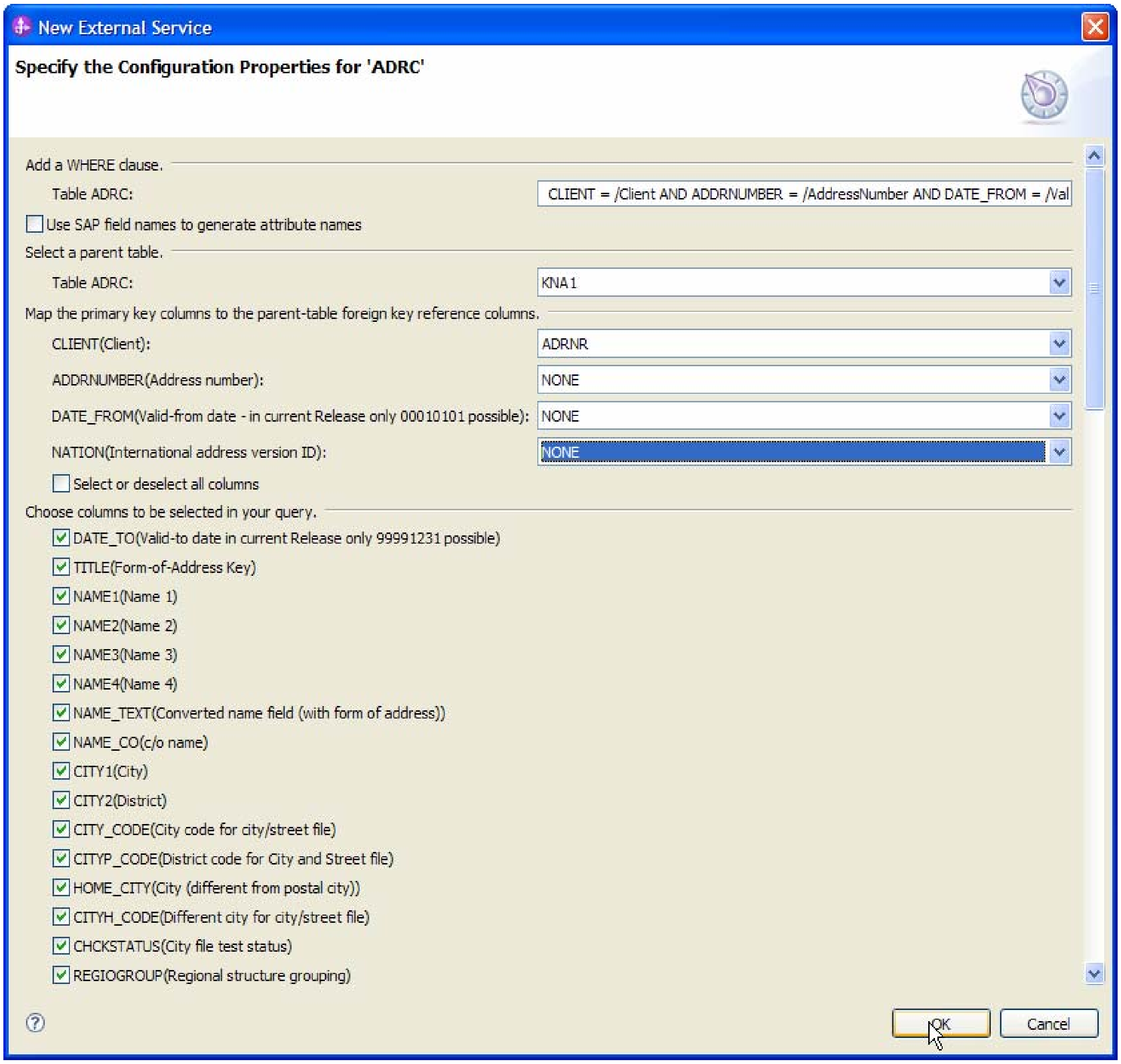
Under the Map the primary key columns to the parent-table foreign key reference columns section, choose the following from the drop down list:

CLIENT	ADRNR

ADDRNUMBER	NONE
DATE_FROM	NONE
NATION	NONE

Select the defaults for Choose columns to be selected in your query.

Click **OK**.



New External Service

Specify the Configuration Properties for 'ADRC'

Add a WHERE clause.

Table ADRC: CLIENT = /Client AND ADDRNUMBER = /AddressNumber AND DATE_FROM = /Val

☐ Use SAP field names to generate attribute names

Select a parent table.

Table ADRC: KNA1

Map the primary key columns to the parent-table foreign key reference columns.

CLIENT(Client): ADRNR

ADDRNUMBER(Address number): NONE

DATE_FROM(Valid-from date - in current Release only 00010101 possible): NONE

NATION(International address version ID): NONE

☐ Select or deselect all columns

Choose columns to be selected in your query.

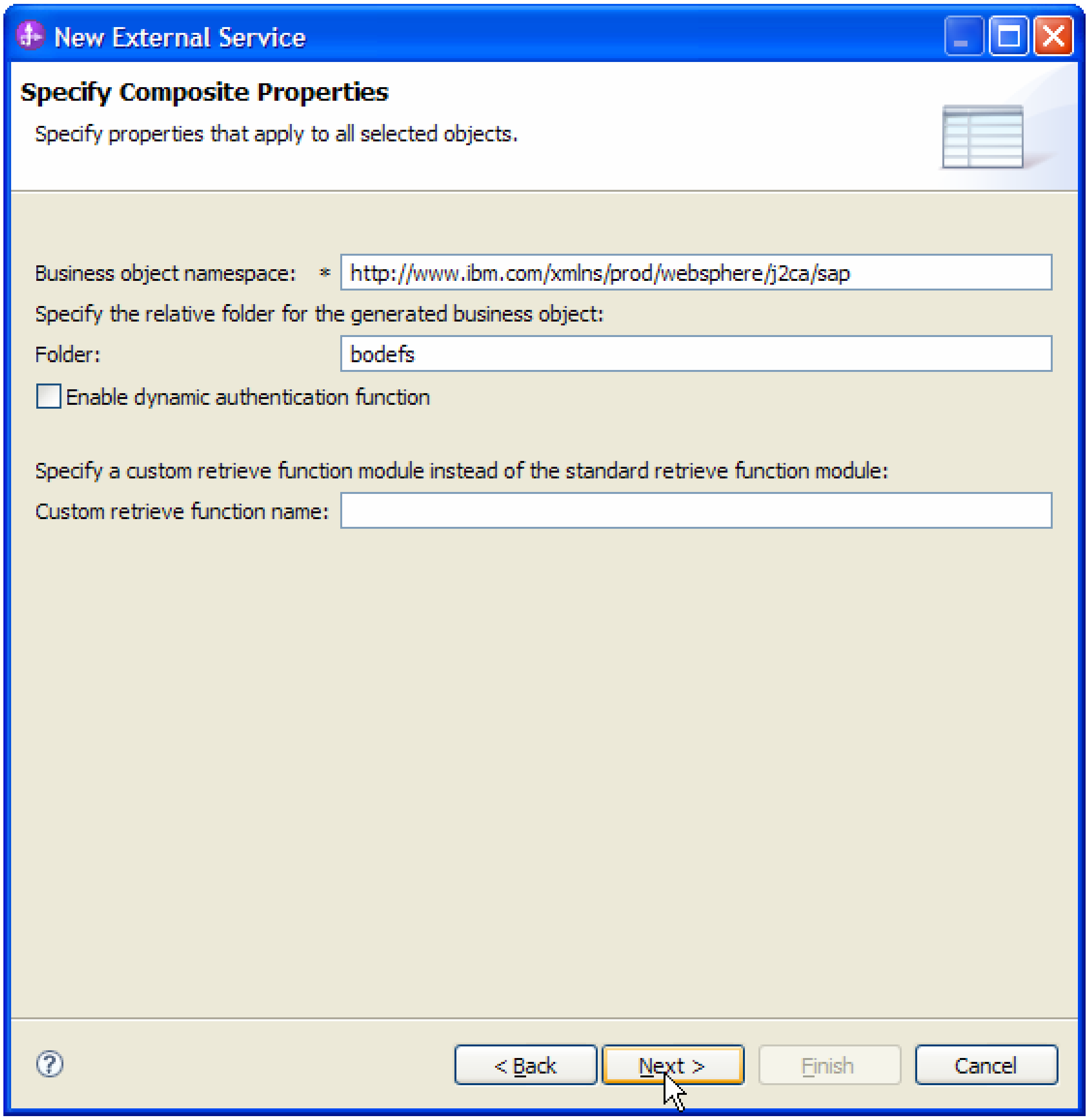
☑ DATE_TO(Valid-to date in current Release only 99991231 possible)
☑ TITLE(Form-of-Address Key)
☑ NAME1(Name 1)
☑ NAME2(Name 2)
☑ NAME3(Name 3)
☑ NAME4(Name 4)
☑ NAME_TEXT(Converted name field (with form of address))
☑ NAME_CO(c/o name)
☑ CITY1(City)
☑ CITY2(District)
☑ CITY_CODE(City code for city/street file)
☑ CITYP_CODE(District code for City and Street file)
☑ HOME_CITY(City (different from postal city))
☑ CITYH_CODE(Different city for city/street file)
☑ CHCKSTATUS(City file test status)
☑ REGIOGROUP(Regional structure grouping)

Click **Next**.

Generating Business Object definitions and related artifacts

In the **Specify Composite Properties** screen, use the default value for the Business object namespace.

Name the relative folder name for generated Business Objects as **bodefs.**



Specify Composite Properties

Specify properties that apply to all selected objects.

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

□ Enable dynamic authentication function

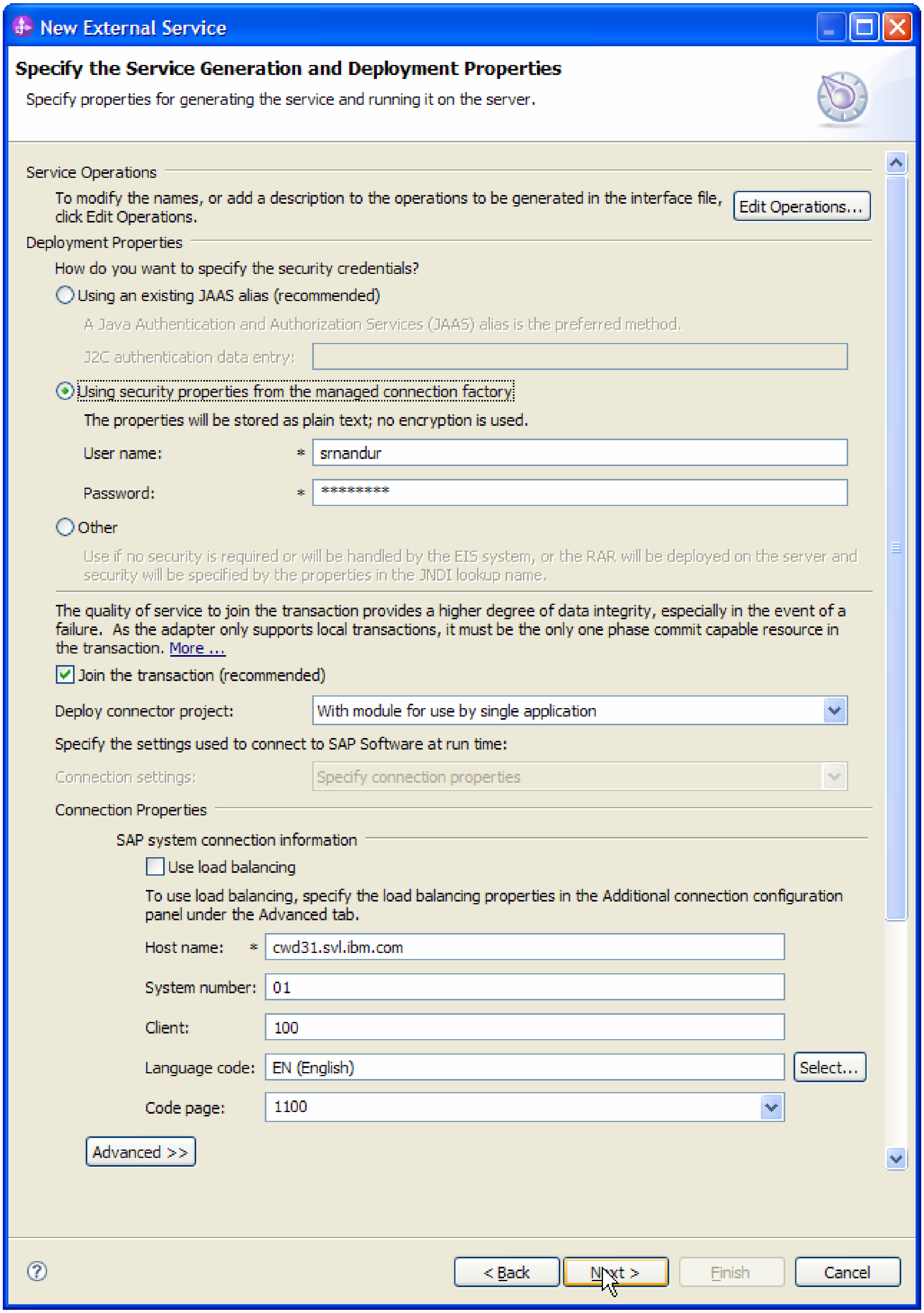
Specify a custom retrieve function module instead of the standard retrieve function module:

Custom retrieve function name:

Figure: Specify Composite Properties

Click **Next**

In **Specify the Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

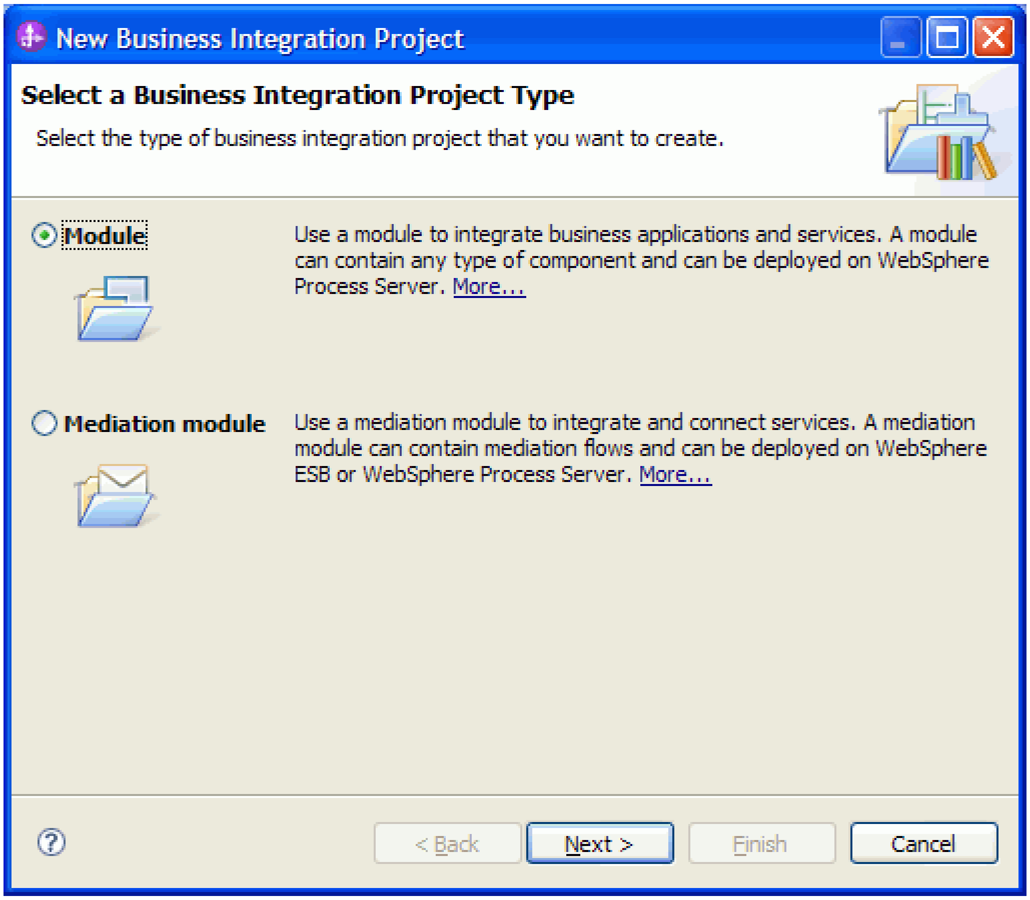
Figure: Service Generation and Deployment Configuration

Note: You can enter an Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

Click **Next**.

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

In the **New Business Integration Project** screen, select **Module** radio button and click **Next.**



New Business Integration Project

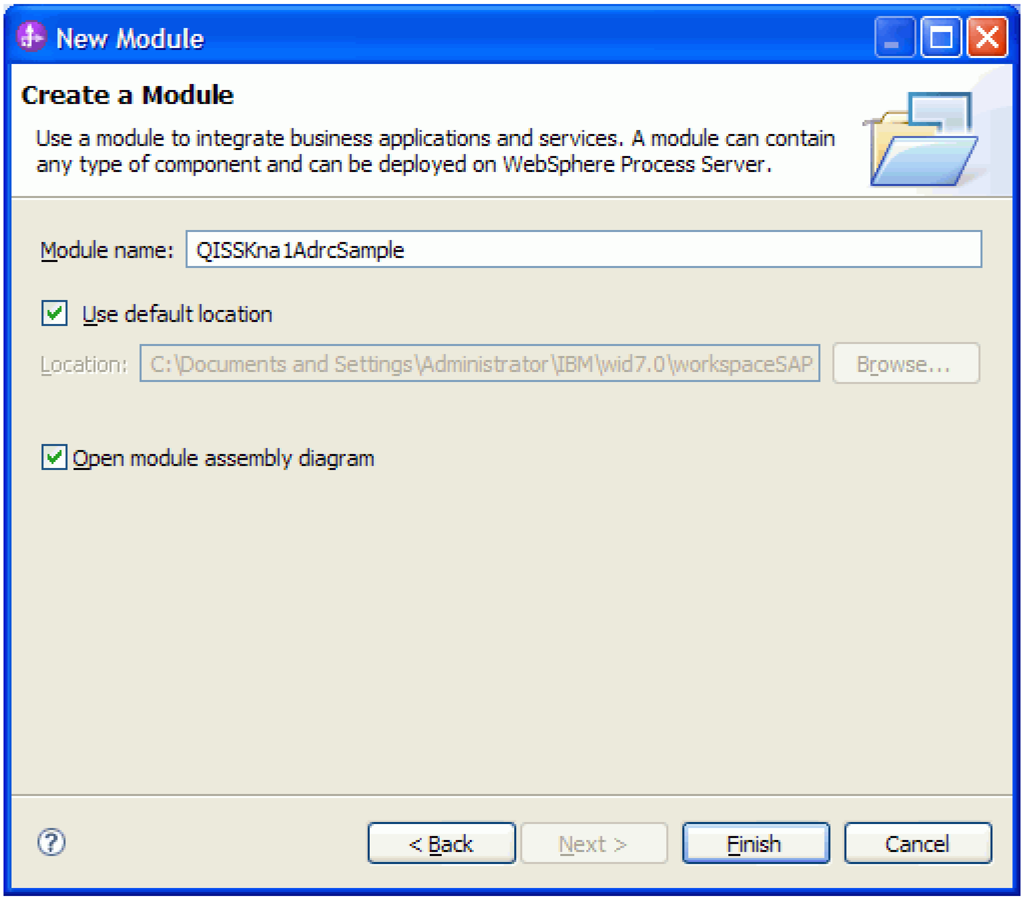
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **QISSKna1AdrcSample** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

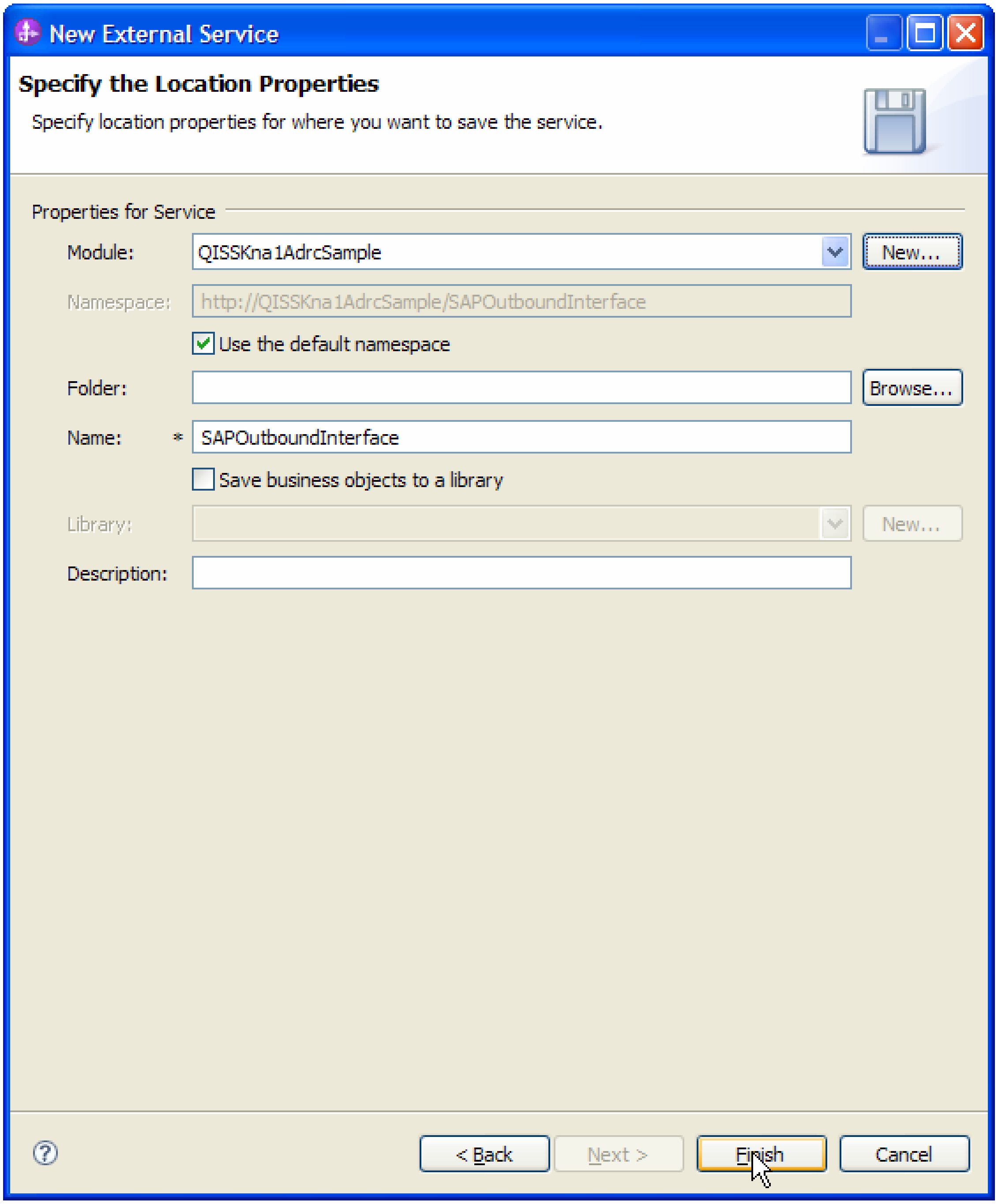
Module name: QISSKna1AdrcSample

☑ Use default location

Location: C:\Documents and Settings\Administrator\IBM\wid7.0\workspaceSAP

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: QISSKna1AdrcSample

Namespace: http://QISSKna1AdrcSample/SAPOutboundInterface

☑ Use the default namespace

Folder:

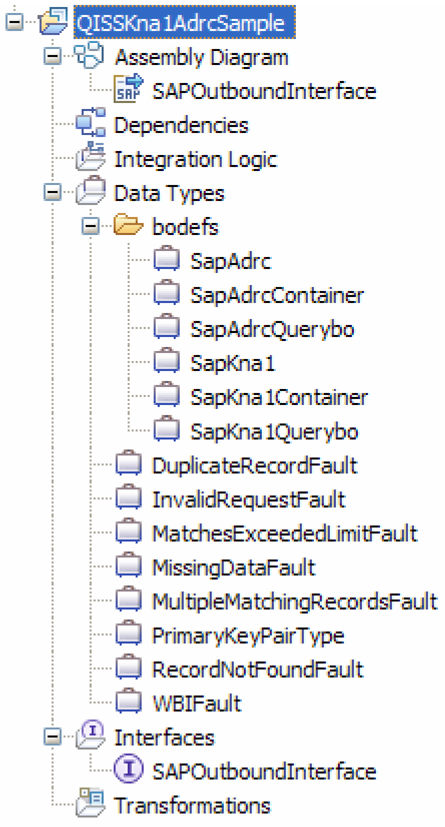
Name: * SAPOutboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



- QISSKna1AdrcSample
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapAdrc
      - SapAdrcContainer
      - SapAdrcQuerybo
      - SapKna1
      - SapKna1Container
      - SapKna1Querybo
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

Figure: Artifacts created after the EMD run for the QISS outbound module

---

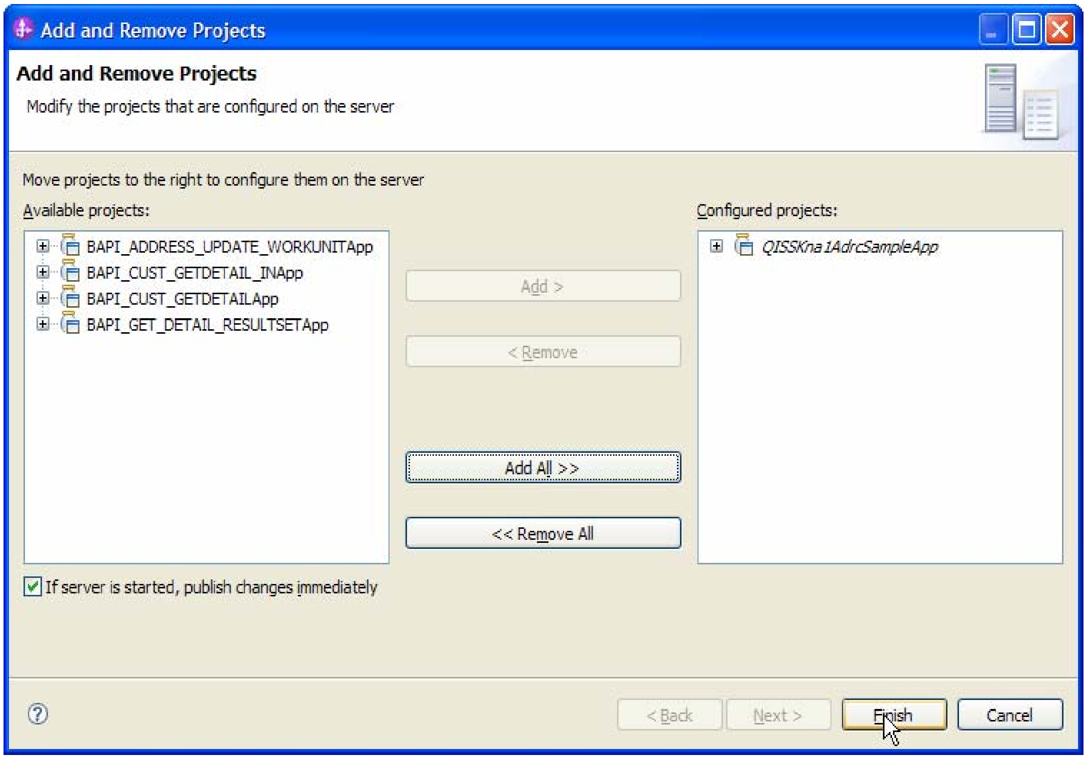
Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer’s Test Client.

Right click on your server node in the Server tab and add the module QISSKna1AdrcSample by selecting **Add and Remove Projects**.

The project QISSKna1AdrcSampleApp will be listed under **Available projects**.

After adding the project, the added project will appear under the Configured projects. Add the SCA module to the server by clicking **Finish.**



Add and Remove Projects
Add and Remove Projects
Modify the projects that are configured on the server
Move projects to the right to configure them on the server
Available projects:
BAPI_ADDRESS_UPDATE_WORKUNITApp
BAPI_CUST_GETDETAIL_INApp
BAPI_CUST_GETDETAILApp
BAPI_GET_DETAIL_RESULTSETApp
Add >
< Remove
Add All >>
<< Remove All
Configured projects:
QISSKna1AdrcSampleApp
☑ If server is started, publish changes immediately
< Back
Next >
Finish
Cancel

Testing the assembled adapter application

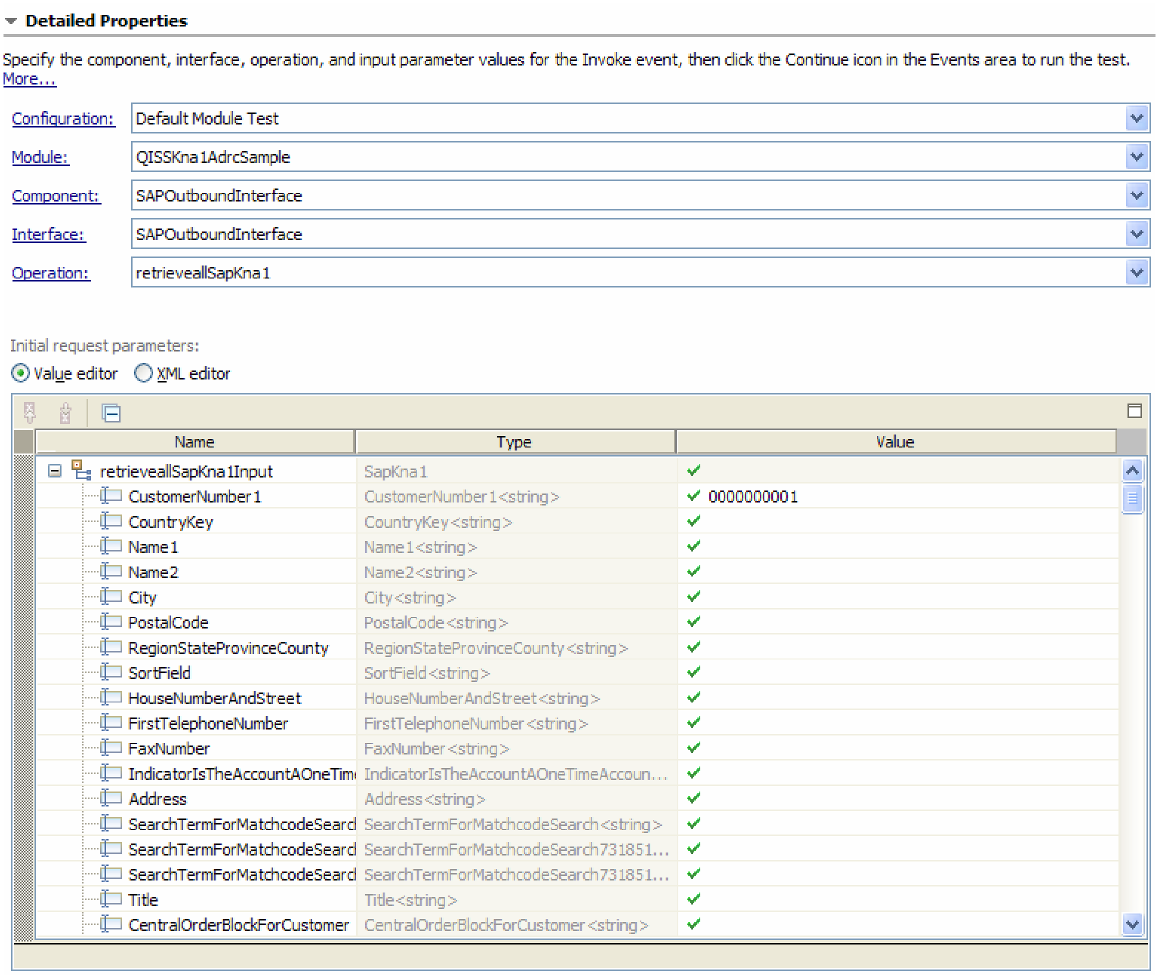
Test the assembled adapter application using the WebSphere Integration Developer's Test Client.

Once the module is deployed to the Server, right click the module **QISSKna1AdrcSample** from the Projects view and select **Test > Test Module** from the pop-up menu.

Enter the values for the input Business Objects as below –

Select the **Operation** as retrieveallSapkna1

Set the value of **CustomerNumber1** as 0000000001



Detailed Properties

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

Configuration: Default Module Test

Module: QISSKna1AdrcSample

Component: SAPOutboundInterface

Interface: SAPOutboundInterface

Operation: retrieveallSapKna1

Initial request parameters:

● Value editor ○ XML editor

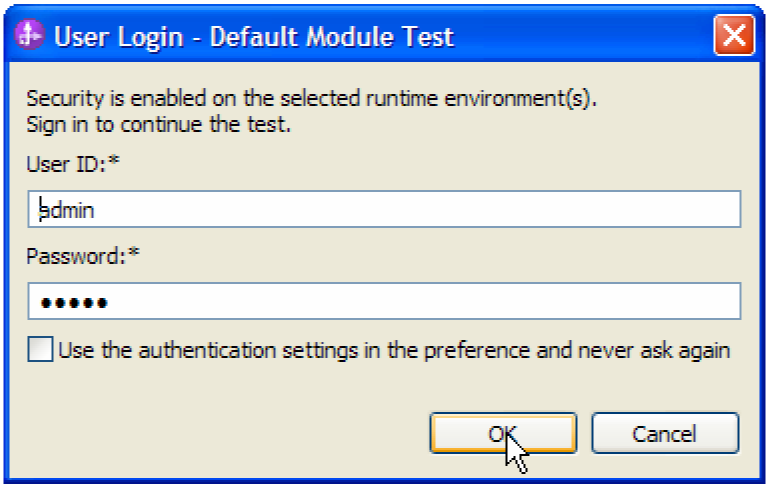
Name	Type	Value
retrieveallSapKna1Input	SapKna1	✓
CustomerNumber1	CustomerNumber1<string>	✓ 0000000001
CountryKey	CountryKey<string>	✓
Name1	Name1<string>	✓
Name2	Name2<string>	✓
City	City<string>	✓
PostalCode	PostalCode<string>	✓
RegionStateProvinceCounty	RegionStateProvinceCounty<string>	✓
SortField	SortField<string>	✓
HouseNumberAndStreet	HouseNumberAndStreet<string>	✓
FirstTelephoneNumber	FirstTelephoneNumber<string>	✓
FaxNumber	FaxNumber<string>	✓
IndicatorIsTheAccountAOneTim	IndicatorIsTheAccountAOneTimeAccoun...	✓
Address	Address<string>	✓
SearchTermForMatchcodeSearcl	SearchTermForMatchcodeSearch<string>	✓
SearchTermForMatchcodeSearcl	SearchTermForMatchcodeSearch731851...	✓
SearchTermForMatchcodeSearcl	SearchTermForMatchcodeSearch731851...	✓
Title	Title<string>	✓
CentralOrderBlockForCustomer	CentralOrderBlockForCustomer<string>	✓

Add a child object ADRC by right clicking on SapAdrc Business Object and adding 1 element by clicking **Add Elements.**

Click the Continue button ▷.

When the **Select Deployment** screen appears, select the WebSphere Process Server instance to which you added the project and click the **Finish** button.

If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK**.



User Login - Default Module Test

Security is enabled on the selected runtime environment(s).
Sign in to continue the test.

User ID:*

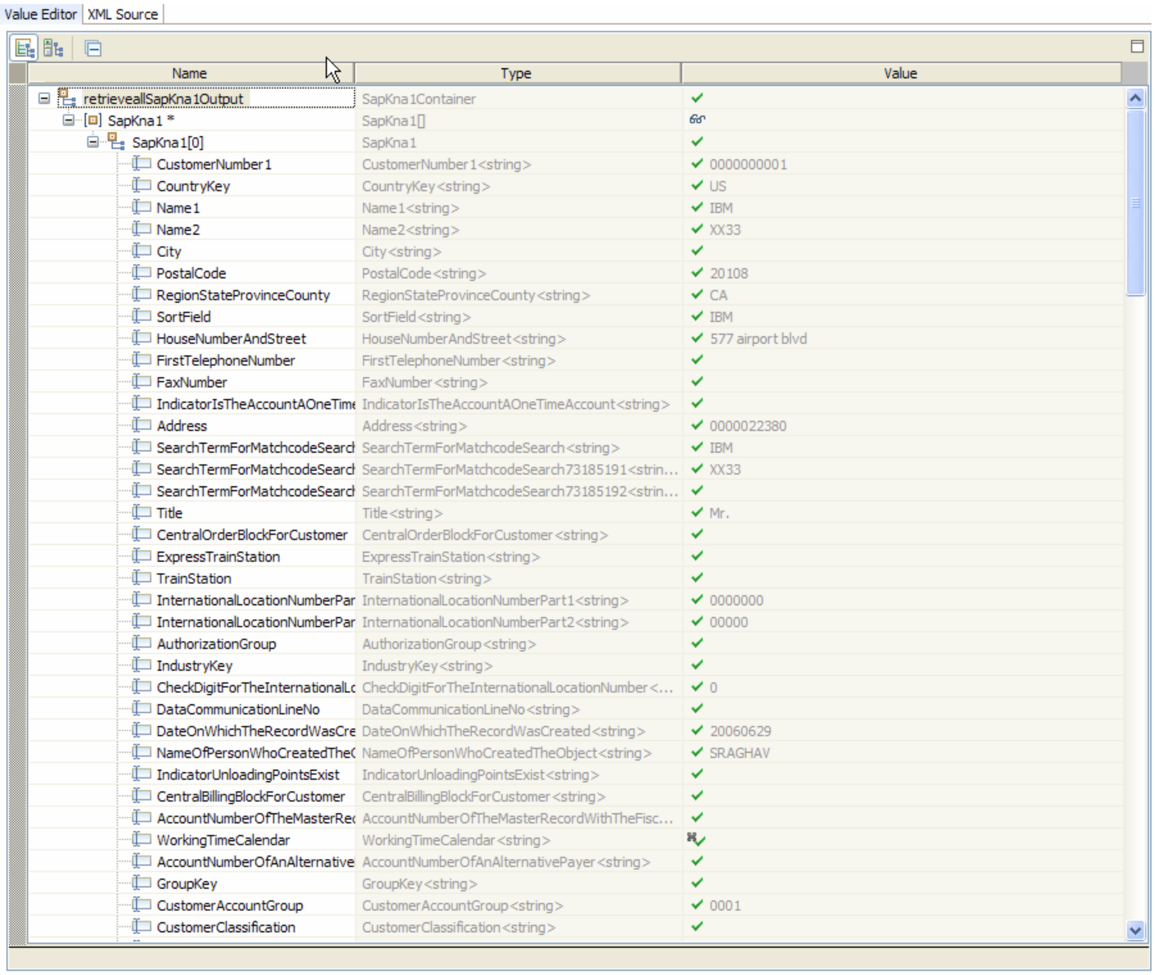
admin

Password:*

•••••

□ Use the authentication settings in the preference and never ask again

Check the output of the service in the test client



Name	Type	Value
retrieveallSapKna1Output	SapKna1Container	✓
SapKna1 *	SapKna1[]	
SapKna1[0]	SapKna1	✓
CustomerNumber1	CustomerNumber1<string>	✓ 0000000001
CountryKey	CountryKey<string>	✓ US
Name1	Name1<string>	✓ IBM
Name2	Name2<string>	✓ XX33
City	City<string>	✓
PostalCode	PostalCode<string>	✓ 20108
RegionStateProvinceCounty	RegionStateProvinceCounty<string>	✓ CA
SortField	SortField<string>	✓ IBM
HouseNumberAndStreet	HouseNumberAndStreet<string>	✓ 577 airport blvd
FirstTelephoneNumber	FirstTelephoneNumber<string>	✓
FaxNumber	FaxNumber<string>	✓
IndicatorIsTheAccountAOneTime	IndicatorIsTheAccountAOneTimeAccount<string>	✓
Address	Address<string>	✓ 0000022380
SearchTermForMatchcodeSearch	SearchTermForMatchcodeSearch<string>	✓ IBM
SearchTermForMatchcodeSearch	SearchTermForMatchcodeSearch73185191<strin...	✓ XX33
SearchTermForMatchcodeSearch	SearchTermForMatchcodeSearch73185192<strin...	✓
Title	Title<string>	✓ Mr.
CentralOrderBlockForCustomer	CentralOrderBlockForCustomer<string>	✓
ExpressTrainStation	ExpressTrainStation<string>	✓
TrainStation	TrainStation<string>	✓
InternationalLocationNumberPar	InternationalLocationNumberPart1<string>	✓ 0000000
InternationalLocationNumberPar	InternationalLocationNumberPart2<string>	✓ 00000
AuthorizationGroup	AuthorizationGroup<string>	✓
IndustryKey	IndustryKey<string>	✓
CheckDigitForTheInternationalLc	CheckDigitForTheInternationalLocationNumber<...	✓ 0
DataCommunicationLineNo	DataCommunicationLineNo<string>	✓
DateOnWhichTheRecordWasCre	DateOnWhichTheRecordWasCreated<string>	✓ 20060629
NameOfPersonWhoCreatedThe(	NameOfPersonWhoCreatedTheObject<string>	✓ SRAGHAV
IndicatorUnloadingPointsExist	IndicatorUnloadingPointsExist<string>	✓
CentralBillingBlockForCustomer	CentralBillingBlockForCustomer<string>	✓
AccountNumberOfTheMasterRec	AccountNumberOfTheMasterRecordWithTheFisc...	✓
WorkingTimeCalendar	WorkingTimeCalendar<string>	✓
AccountNumberOfAnAlternative	AccountNumberOfAnAlternativePayer<string>	✓
GroupKey	GroupKey<string>	✓
CustomerAccountGroup	CustomerAccountGroup<string>	✓ 0001
CustomerClassification	CustomerClassification<string>	✓

Check that the data in the EIS matches the above output –

Login to the SAP GUI using the credentials for the given SAP server

Start the Transaction SE16N

Enter the table name as **KNA1**, Press Enter and Execute (F8). Double clicking on **CustomerNumber '1'** will display the Customer details.

Repeat the (c) above for table 'ADRC'.

Clearing the sample content

There is no clean up required after following this tutorial.

Chapter 9. Tutorial 6: Sending data from an SAP system (inbound processing) using the ALE Interface

Sending IDoc data From SAP – ALE Inbound Processing

This tutorial demonstrates how to use the **New External Service** to generate Business Objects based on the IDoc, and create an SCA module using the WebSphere Adapter for SAP Software 7.0.0.0 and deploy the module to the test environment of WebSphere Integration Developer 7.0.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the *<WPS_INSTALL>*/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

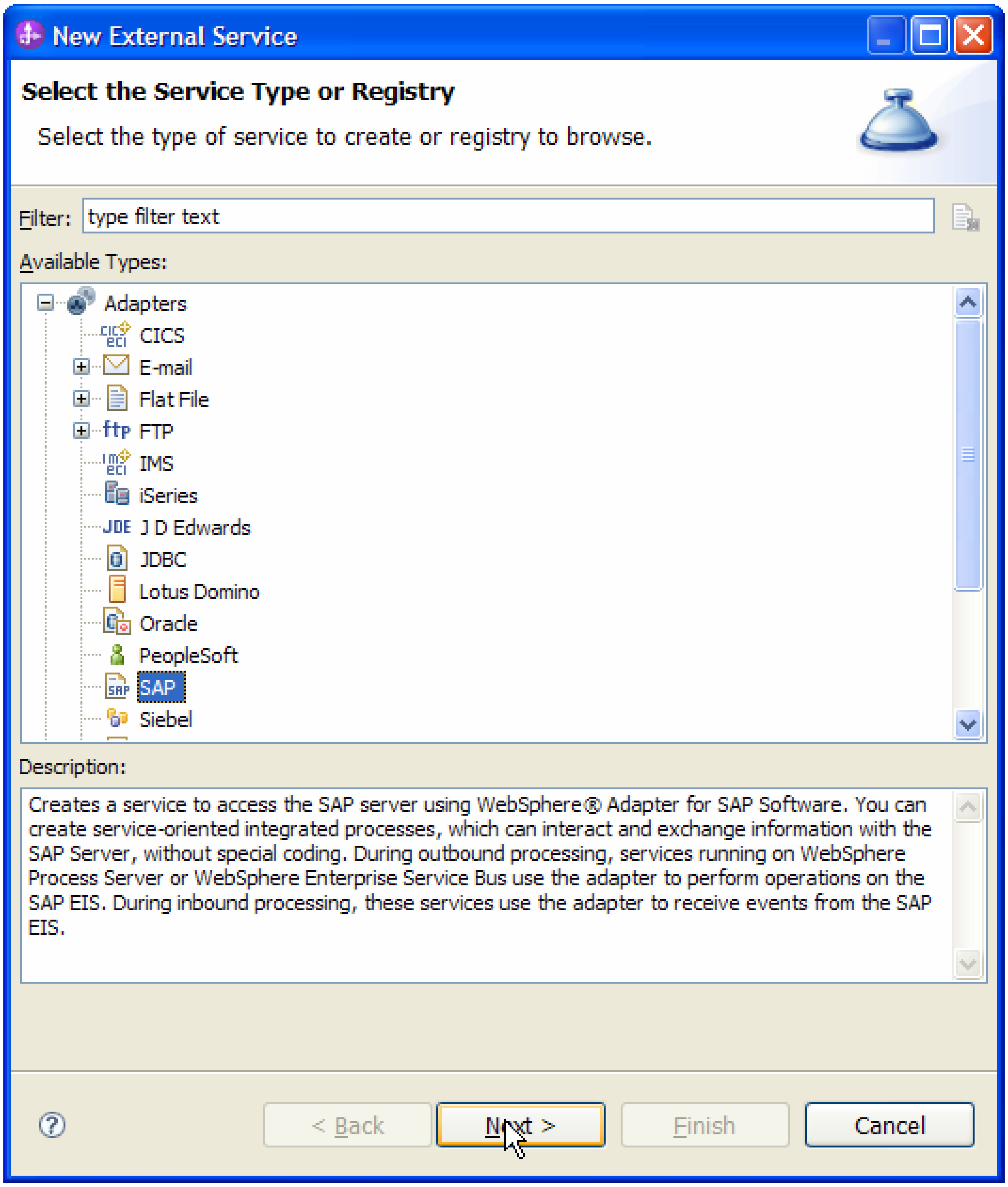
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

Available Types:

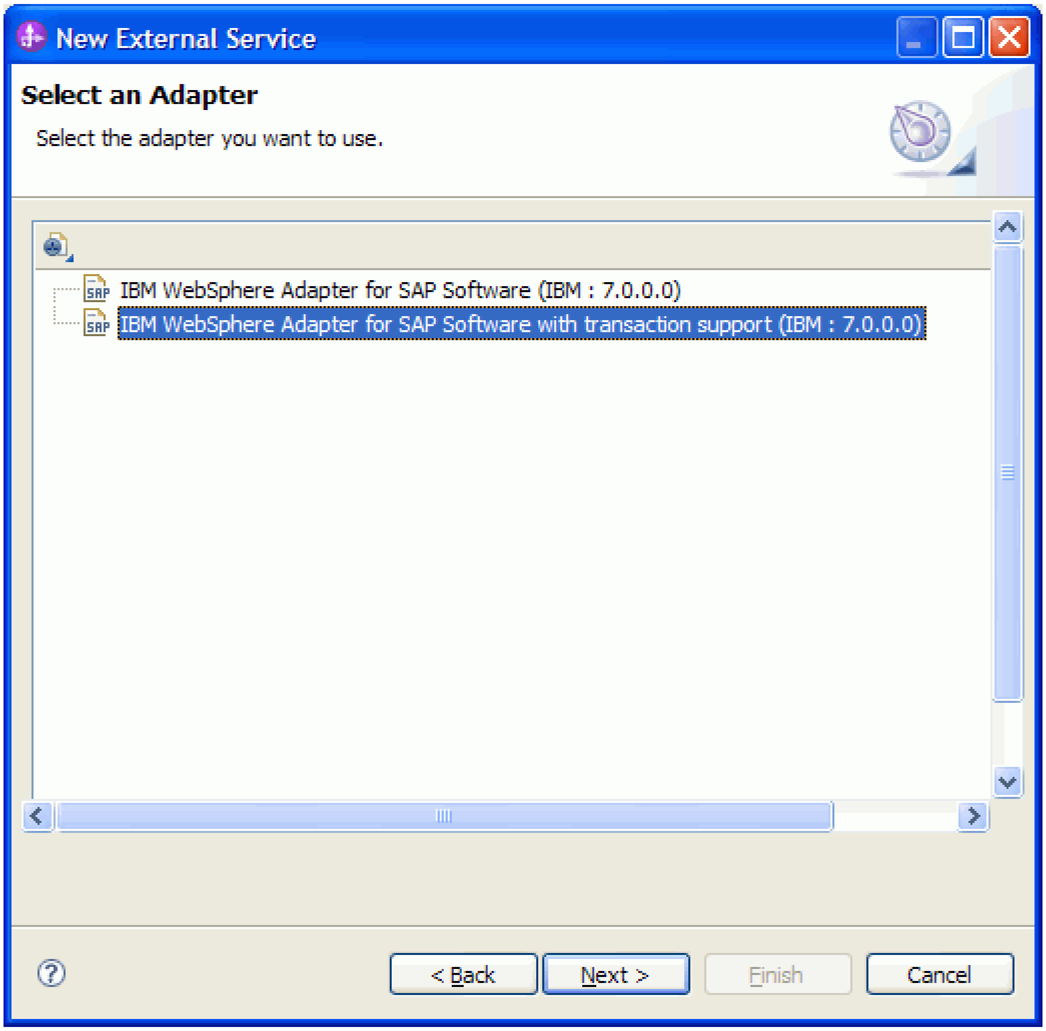
- Adapters
  - CICS
  - E-mail
  - Flat File
  - FTP
  - IMS
  - iSeries
  - J D Edwards
  - JDBC
  - Lotus Domino
  - Oracle
  - PeopleSoft
  - SAP
  - Siebel

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

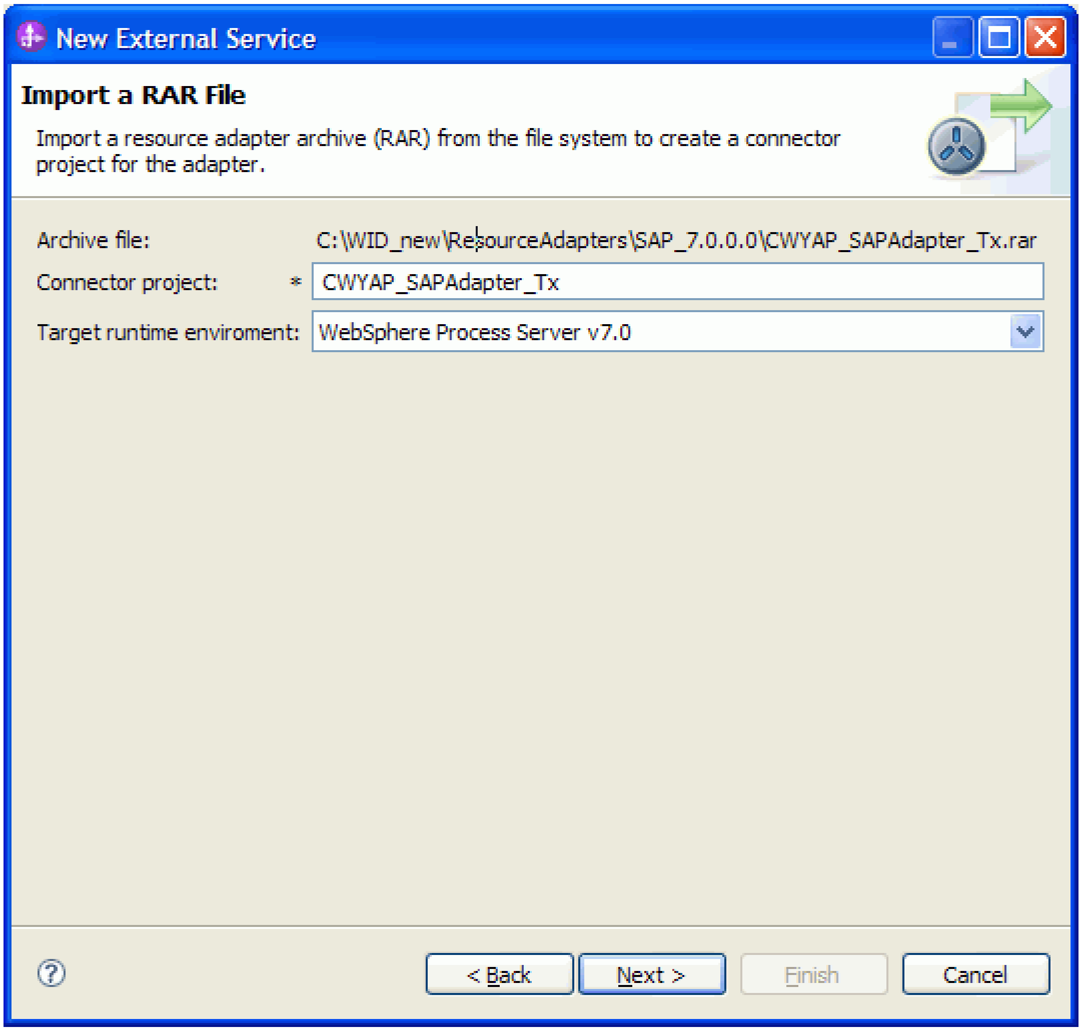
IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify the Connector Project name in the **Import a RAR File** screen and click **Next.**



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

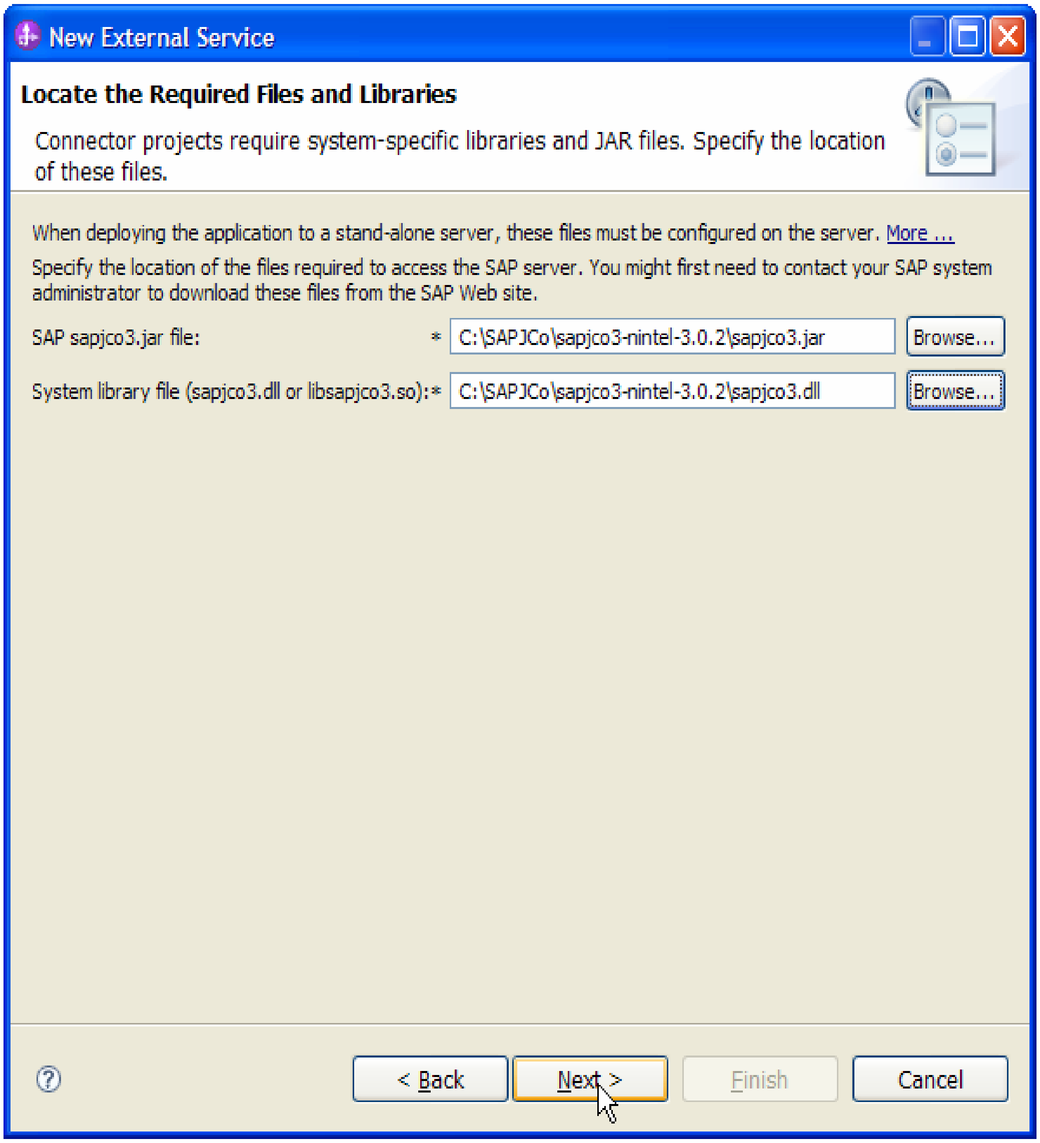
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

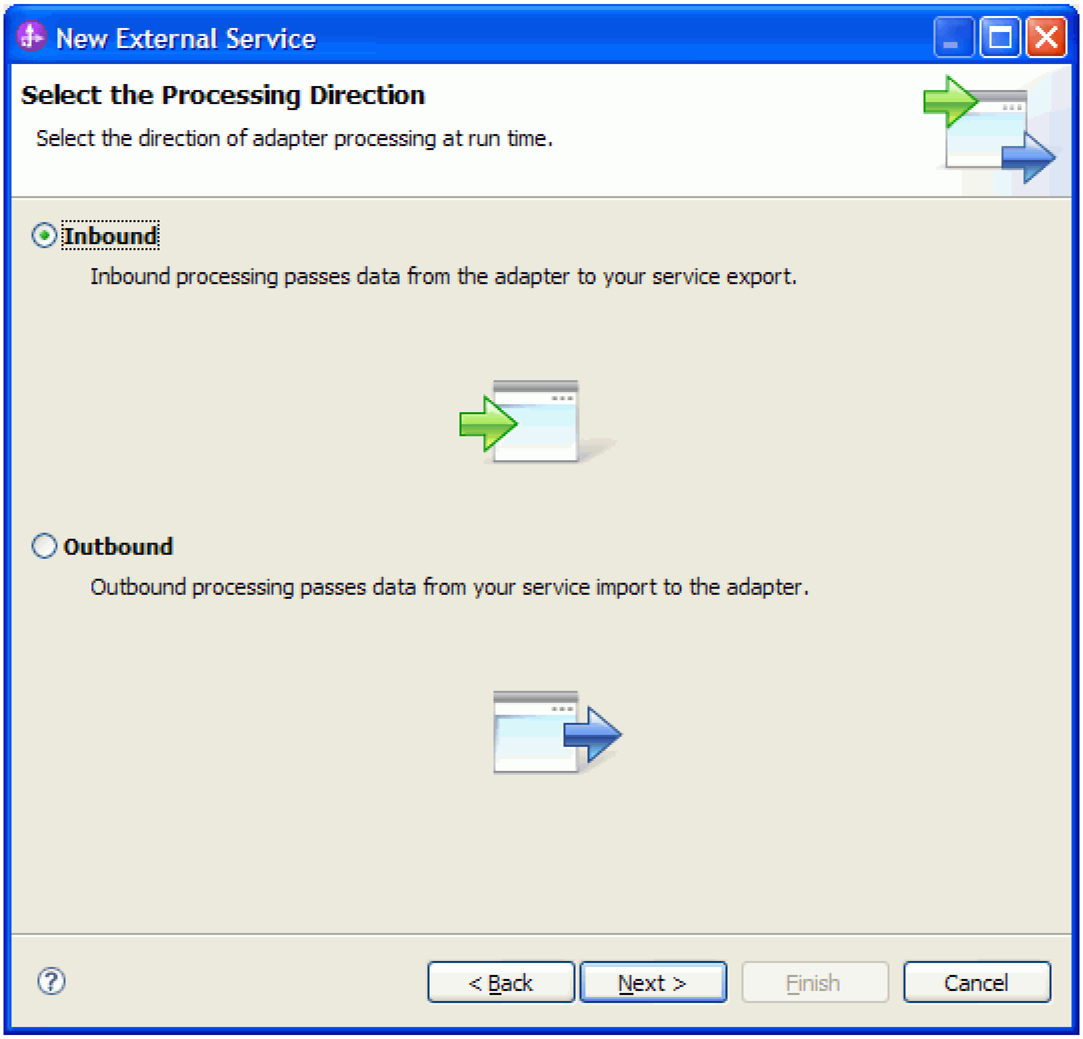
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

5. Click **Next.**

6. In the **Select the Processing Direction** screen, select **Inbound** radio button, then click **Next.**



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Figure: Select the processing direction

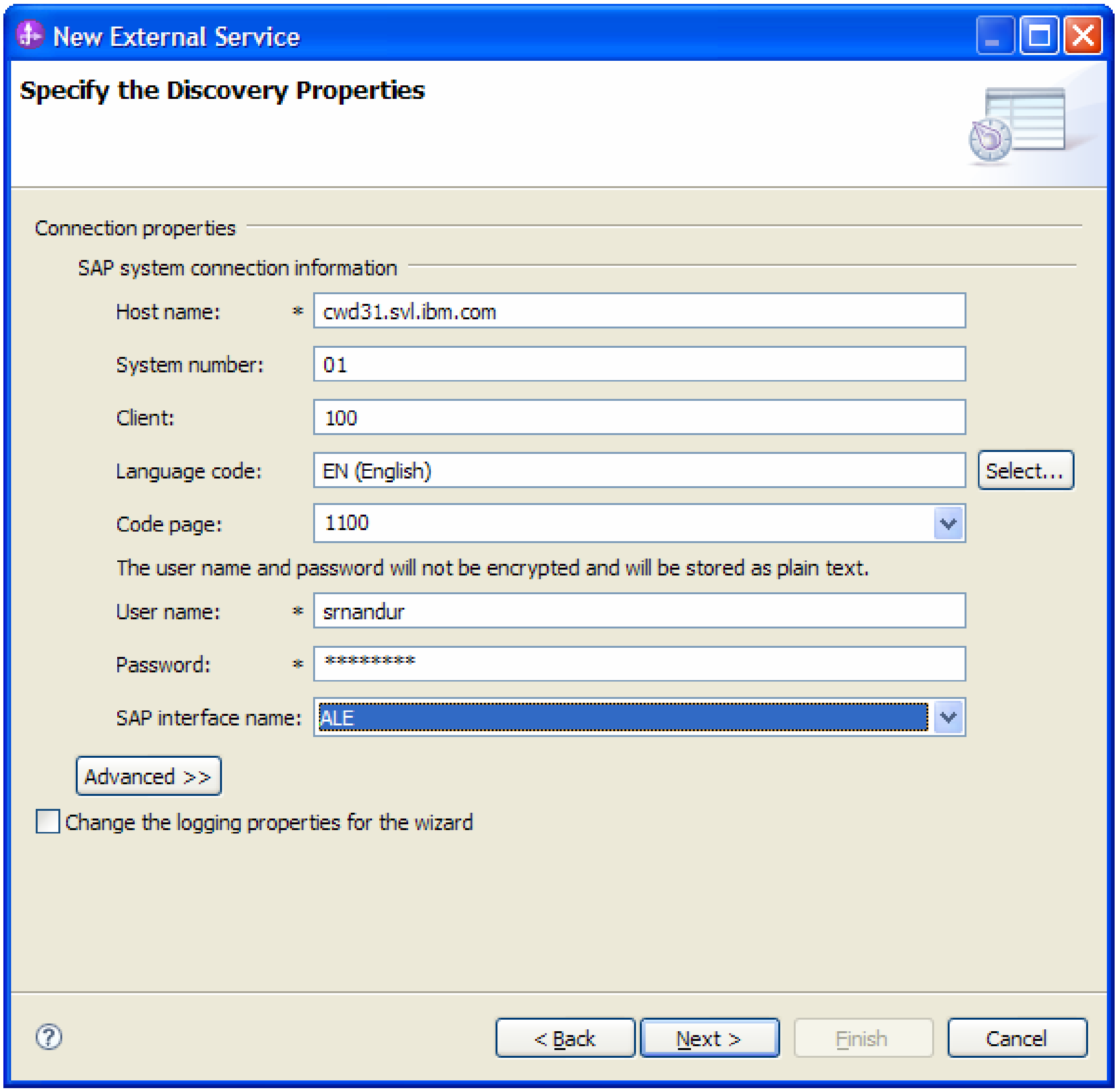
Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

- User name
- Password
- Host name
- System number
- SAP Client connection

- Click Select to change the default Language code from English
- Use the drop down option to change the default Code page from 1100.

Select **ALE** as the SAP Interface name.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

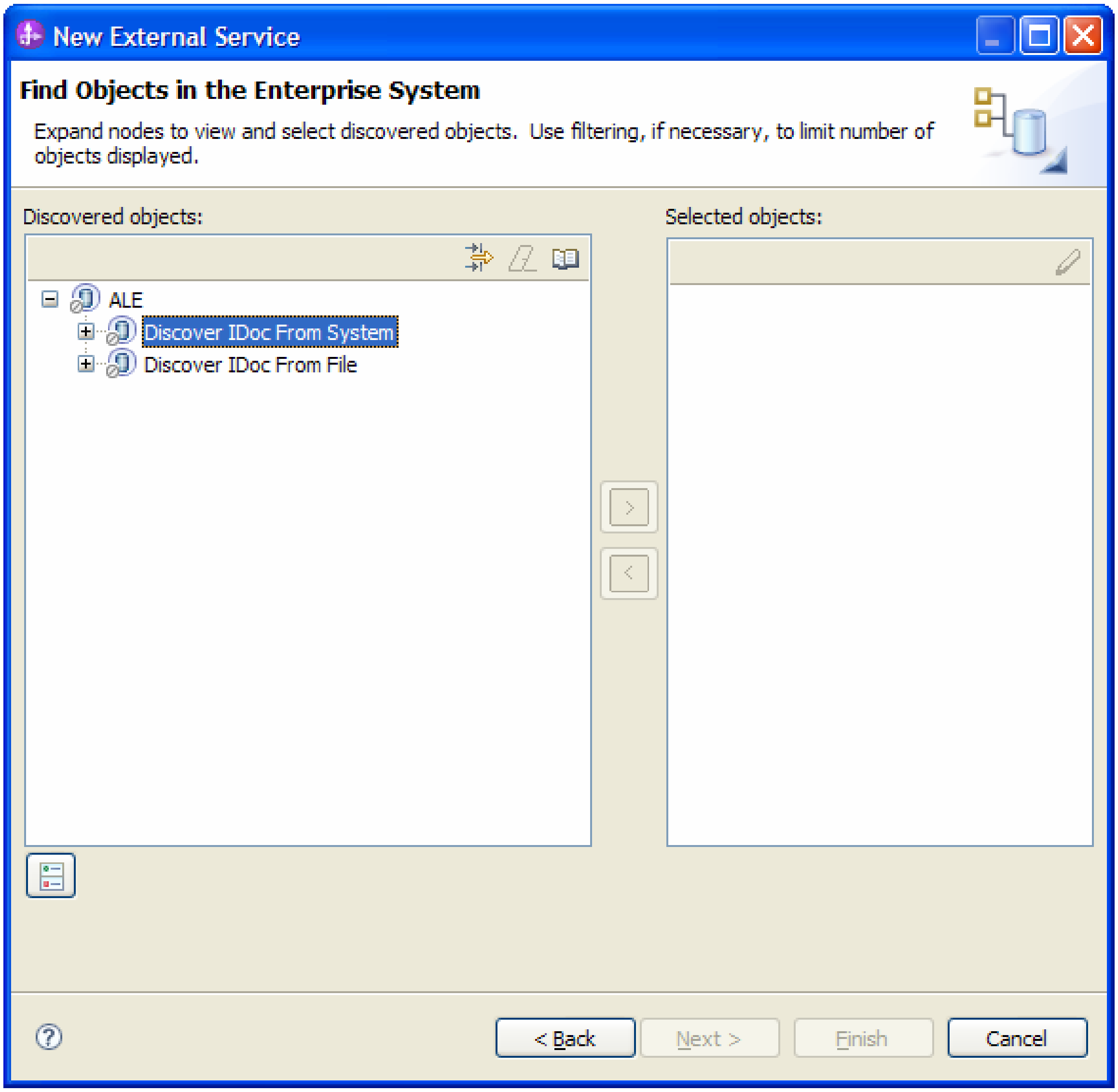
SAP interface name: ALE

□ Change the logging properties for the wizard

Figure: Select ALE as the interface

Selecting the Business Objects and services to be used with the adapter

Under Find Objects in the Enterprise System, expand the **ALE** node and click the **Discover IDoc From System**.



New External Service

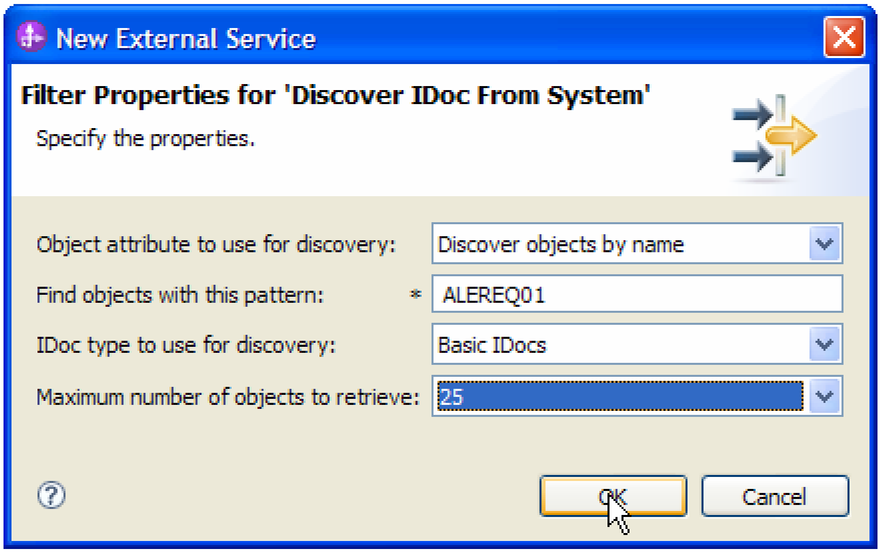
Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Figure: Object Discovery and Selection

Click the ⇉ button.

Enter **Alereq01** (the name of the ALE in SAP system) in the Filter Properties for **Discover IDoc From System** screen.



New External Service

Filter Properties for 'Discover IDoc From System'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: * ALEREQ01

IDoc type to use for discovery: Basic IDocs

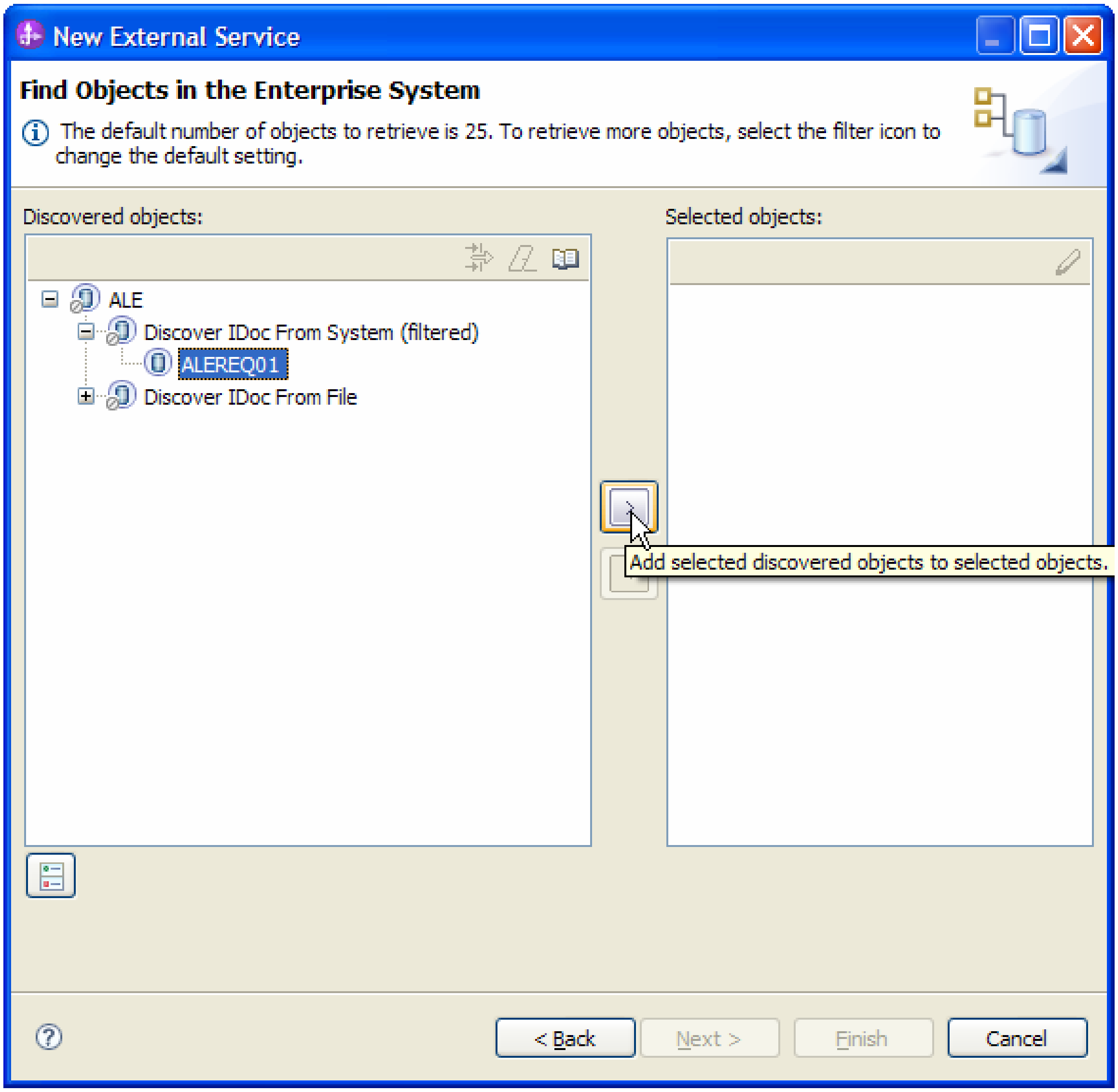
Maximum number of objects to retrieve: 25

Figure: Filter Properties for 'Discover IDoc from System'

Click **OK**.

Expand the Discover IDoc From System node.

Select **ALEREQ01** and click the > button



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

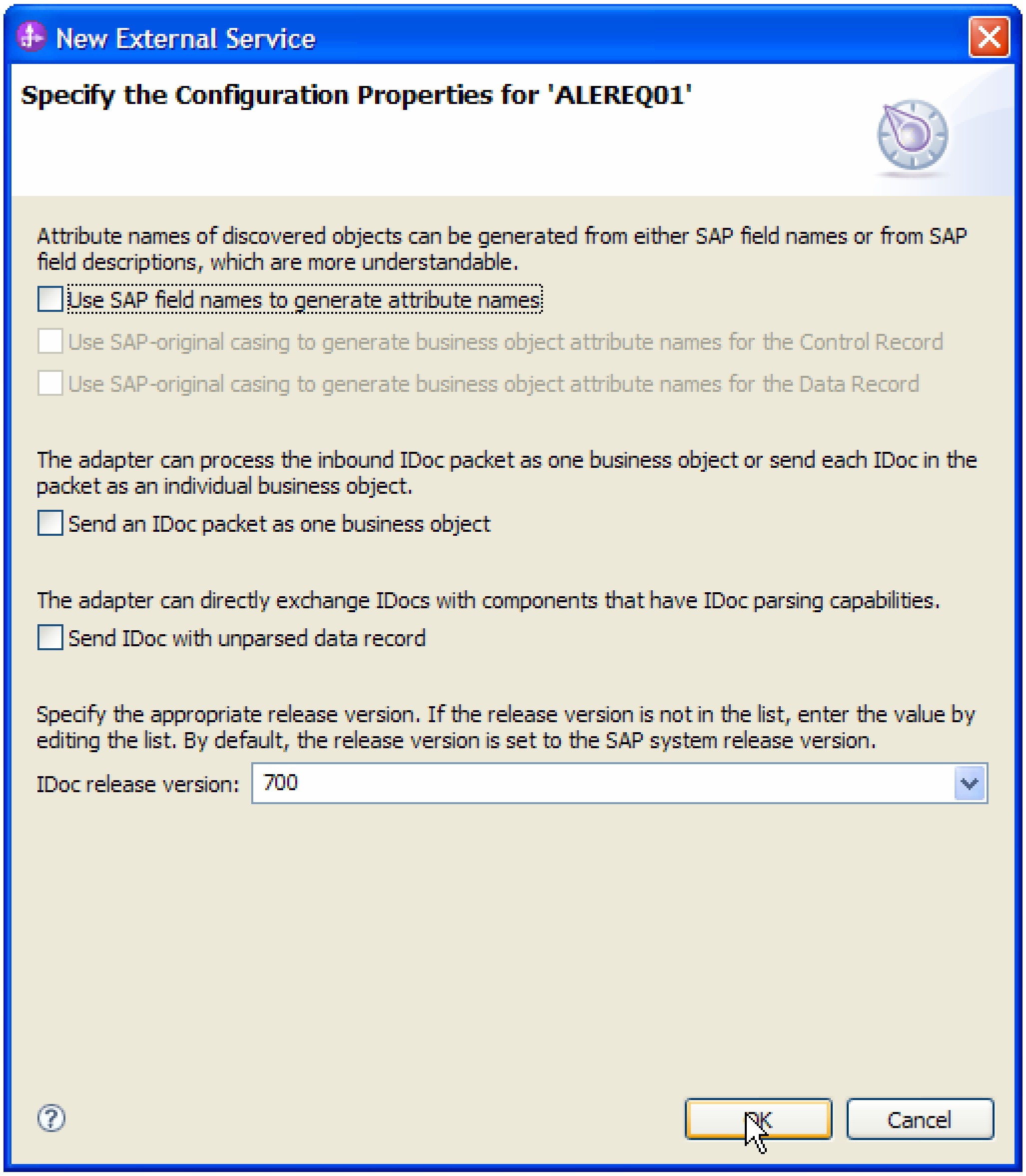
- ALE
  - Discover IDoc From System (filtered)
    - ALEREQ01
  - Discover IDoc From File

Selected objects:

Add selected discovered objects to selected objects.

Figure: Discovered ALEREQ01 IDoc

In the Configuration Parameters screen, choose the default values and click **OK**.



New External Service

Specify the Configuration Properties for 'ALEREQ01'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use SAP-original casing to generate business object attribute names for the Control Record

□ Use SAP-original casing to generate business object attribute names for the Data Record

The adapter can process the inbound IDoc packet as one business object or send each IDoc in the packet as an individual business object.

□ Send an IDoc packet as one business object

The adapter can directly exchange IDocs with components that have IDoc parsing capabilities.

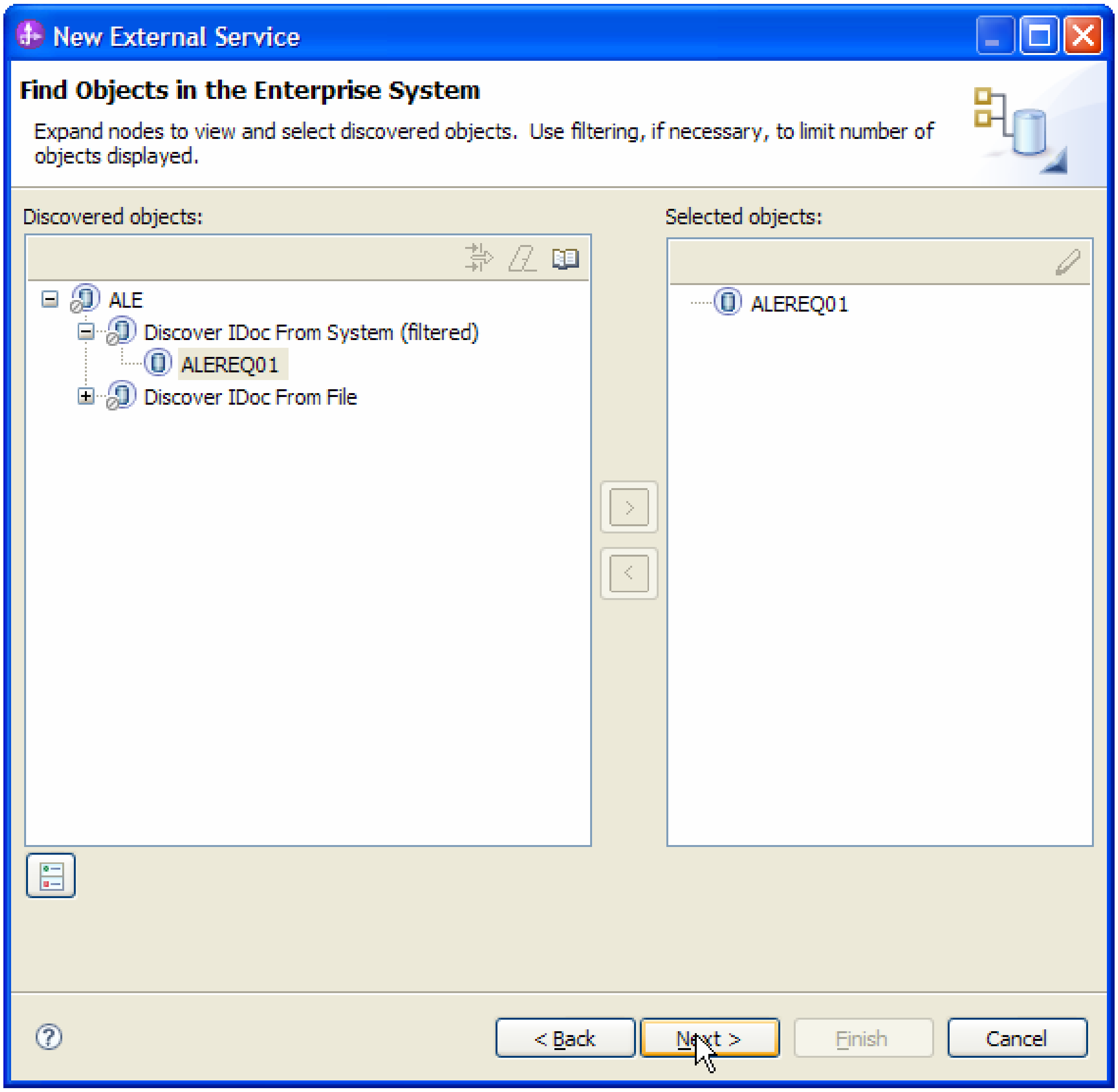
□ Send IDoc with unparsed data record

Specify the appropriate release version. If the release version is not in the list, enter the value by editing the list. By default, the release version is set to the SAP system release version.

IDoc release version: 700

Figure: Setting configuration parameters for the ALE selected

ALEREQ01 has now been added to the list of Business Objects to be imported.


New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

- ALE
  - Discover IDoc From System (filtered)
    - ALEREQ01
  - Discover IDoc From File

Selected objects:

- ALEREQ01

Figure: Selected ALE added to the Objects to be imported

Click **Next**.

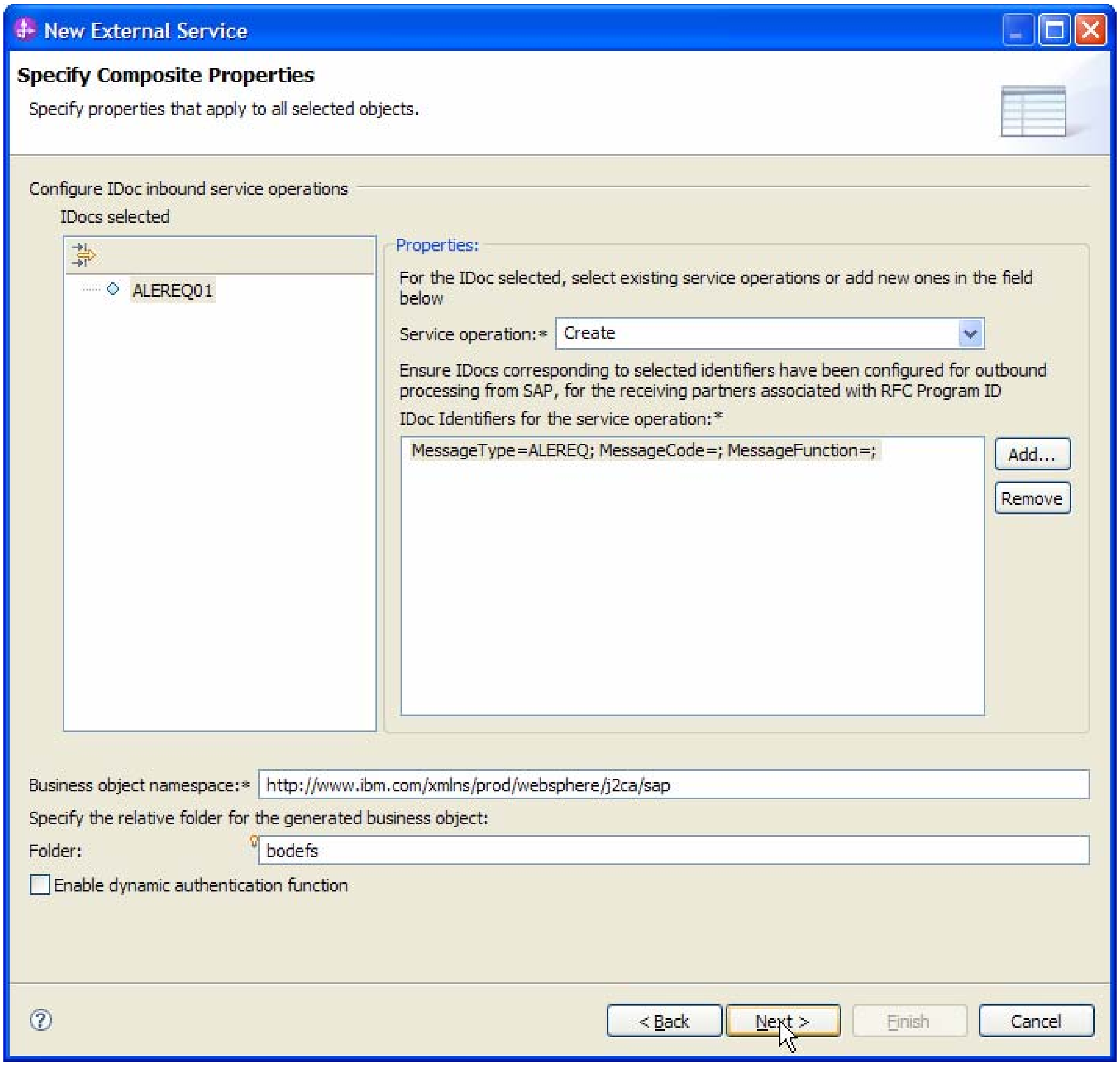
Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen –

Select the Service operation as **Create**

Add MessageType=ALEREQ; MessageCode=; MessageFunction=; as IDoc Identifiers for the service operation by clicking on **Add** button

Enter **bodefs** as the name of the relative folder for the generated Business Object.



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Configure IDoc inbound service operations

IDocs selected

ALEREQ01

Properties:

For the IDoc selected, select existing service operations or add new ones in the field below

Service operation:* Create

Ensure IDocs corresponding to selected identifiers have been configured for outbound processing from SAP, for the receiving partners associated with RFC Program ID

IDoc Identifiers for the service operation:*

MessageType=ALEREQ; MessageCode=; MessageFunction=;

Business object namespace:* http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

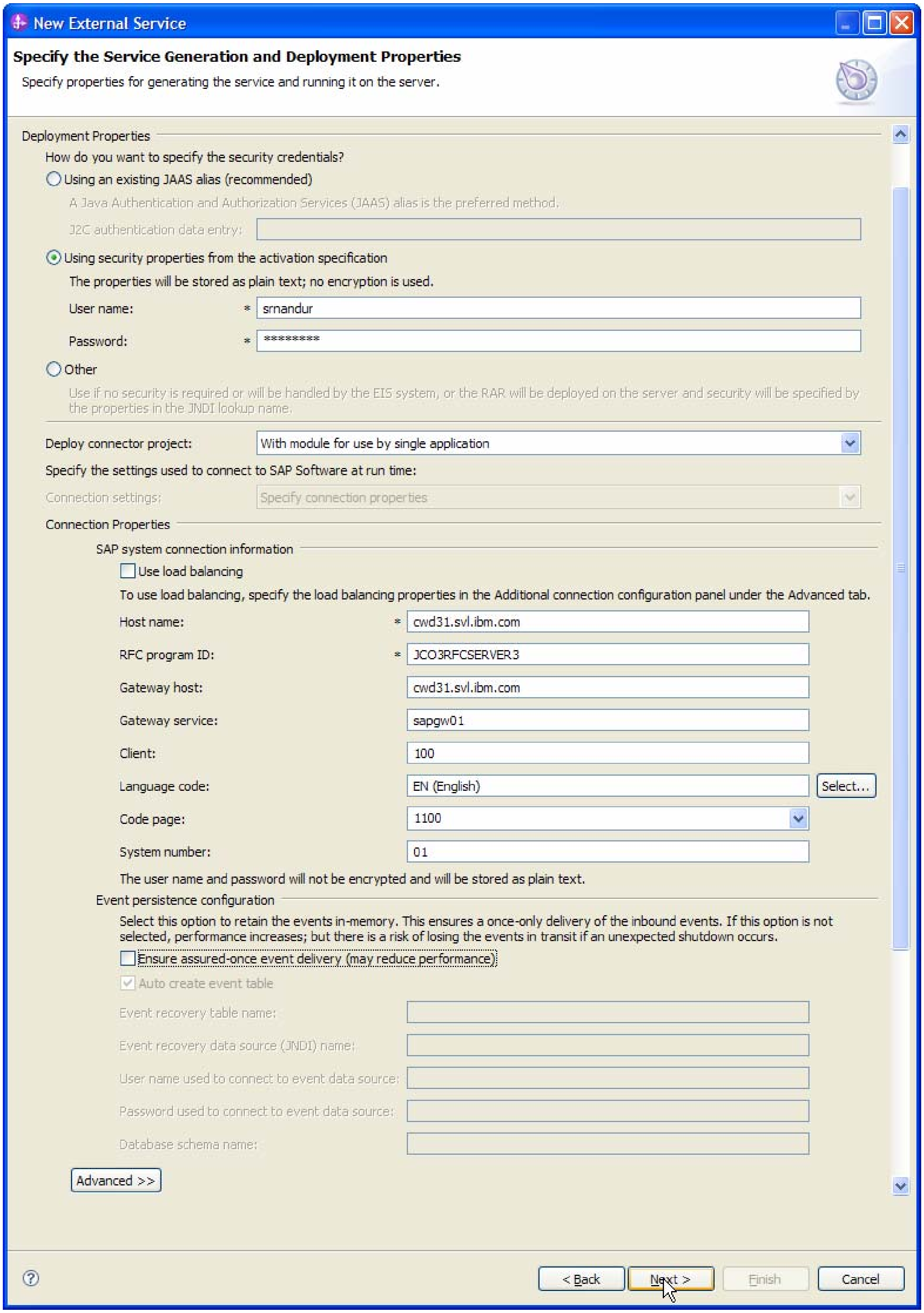
Folder: bodefs

□ Enable dynamic authentication function

Figure: Specify Composite properties

Click **Next**

In the Service Generation and Deployment Configuration screen enter the connection properties and deployment properties.



Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the activation specification

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID: * JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English) Select...

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

Event persistence configuration

Select this option to retain the events in-memory. This ensures a once-only delivery of the inbound events. If this option is not selected, performance increases; but there is a risk of losing the events in transit if an unexpected shutdown occurs.

□ Ensure assured-once event delivery (may reduce performance)

☑ Auto create event table

Event recovery table name:

Event recovery data source (JNDI) name:

User name used to connect to event data source:

Password used to connect to event data source:

Database schema name:

Figure: Service Generation and Deployment Configuration

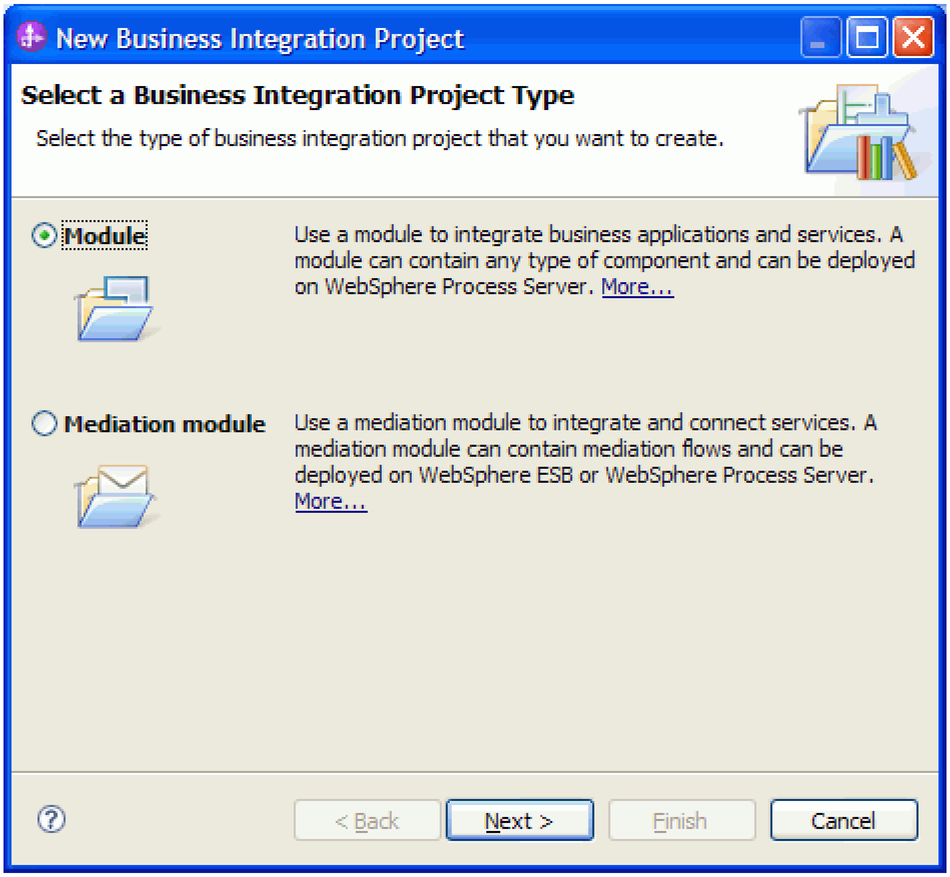
NOTE: You can enter an Authentication Alias already previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP.

Enter the RFCProgramID (as shown in figure). This must have been already configured in the SAP system.

Click **Next.**

In the Specify the Location Properties screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

Select a Business Integration Project Type

Select the type of business integration project that you want to create.

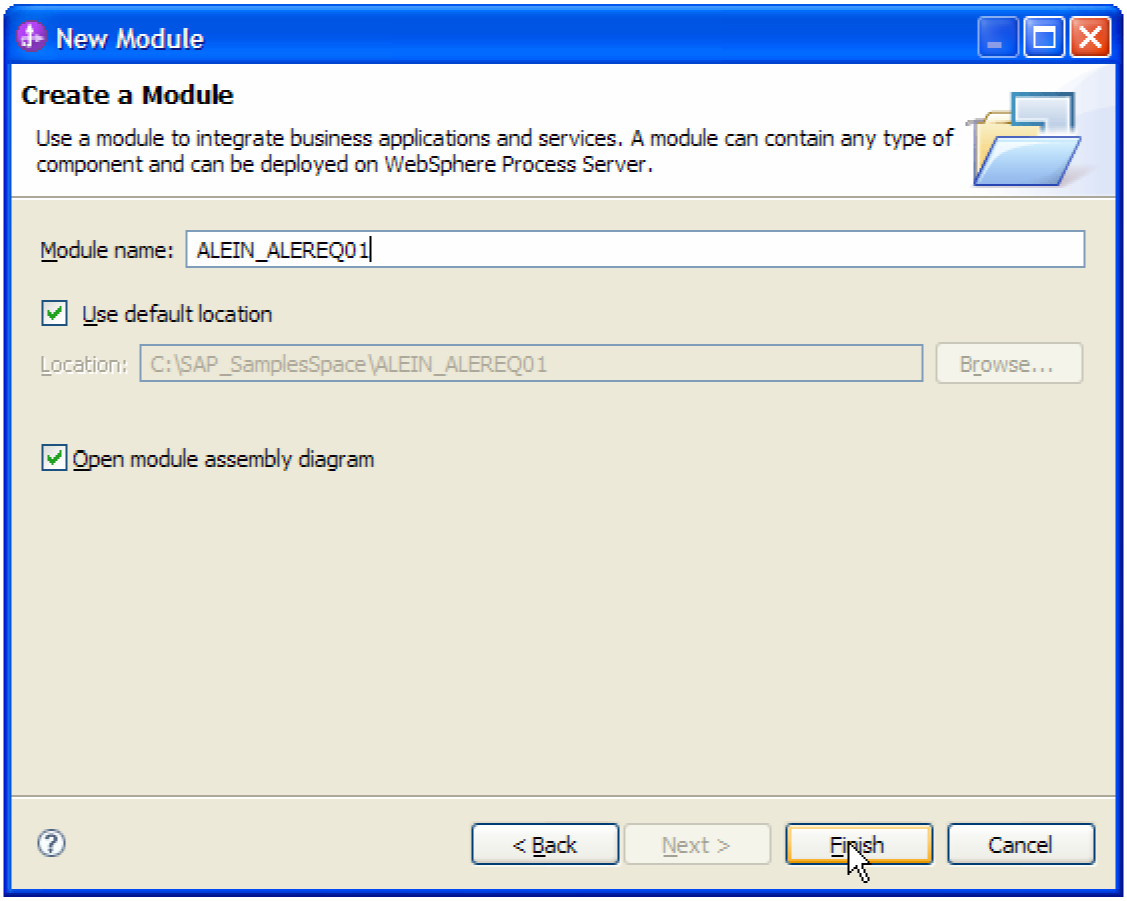
● Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module

Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

1. In the New Module screen, type **ALEIN_ALEREQ01** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

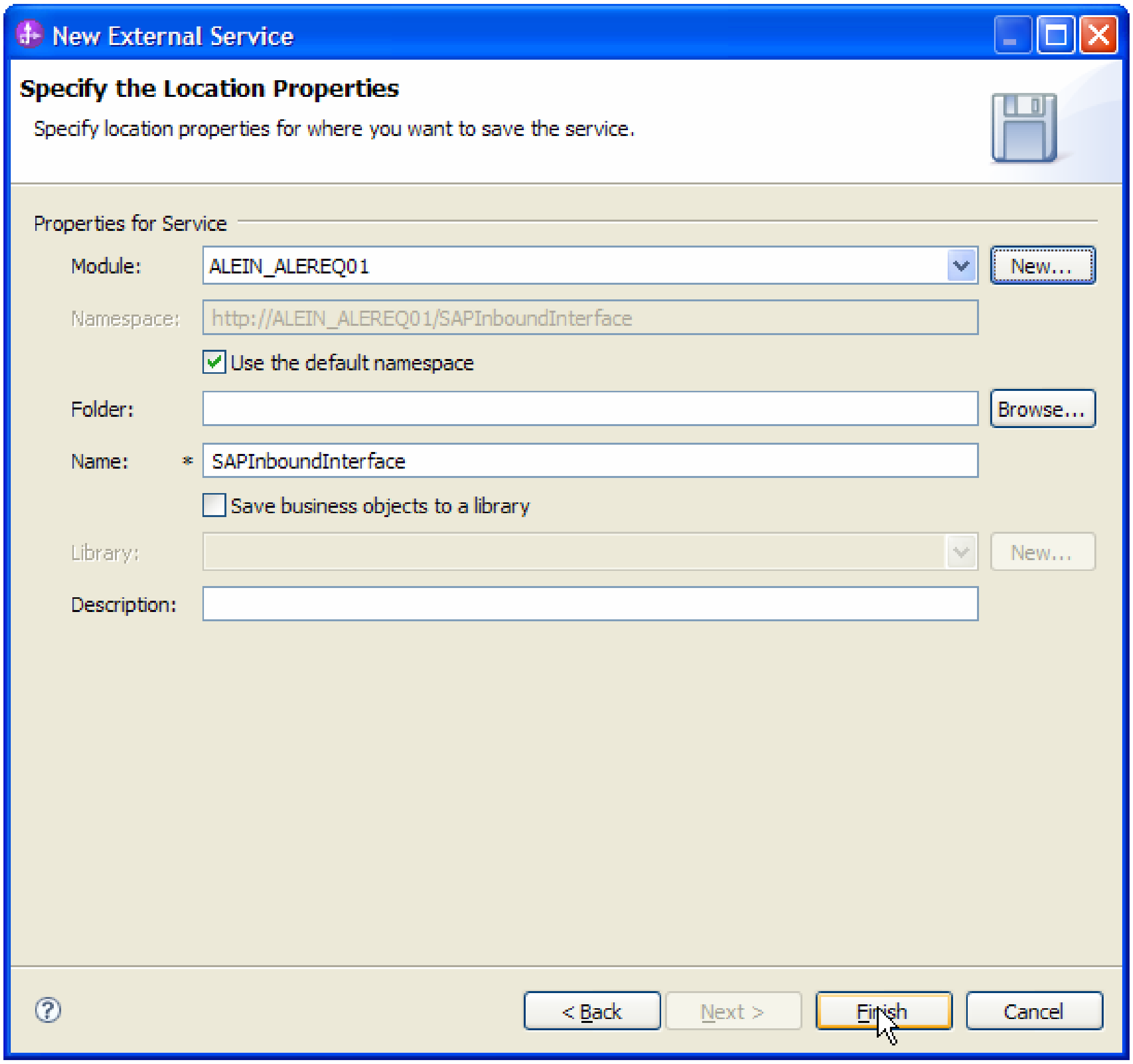
Module name: ALEIN_ALEREQ01

☑ Use default location

Location: C:\SAP_SamplesSpace\ALEIN_ALEREQ01

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: ALEIN_ALEREQ01

Namespace: http://ALEIN_ALEREQ01/SAPInboundInterface

☑ Use the default namespace

Folder:

Name: * SAPInboundInterface

☐ Save business objects to a library

Library:

Description:

Verify the results.

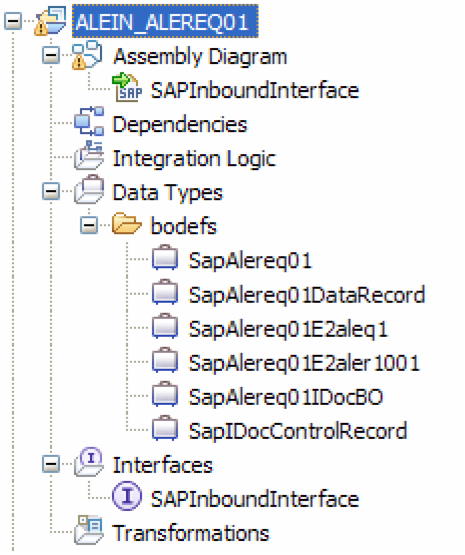


Figure: Artifacts created after the EMD run fore ALE Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **BAPI_CUST_GETDETAIL_IN** SCA module, and double click the **Assembly Diagram**. The Assembly Diagram screen appears with the module‘s Export component in view.

1. To create a new component, click the button of the Java component from the **Palette.**

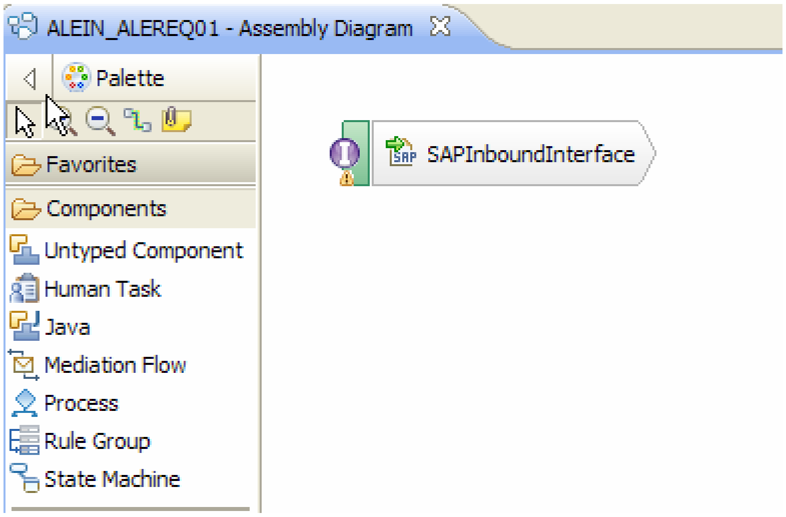


Figure: ALE Inbound interface in the Assembly editor

Click and drag the Java component to add the new component to the Assembly Diagram screen.

Add a Wire between the **SAPInboundInterface** and the Java component.

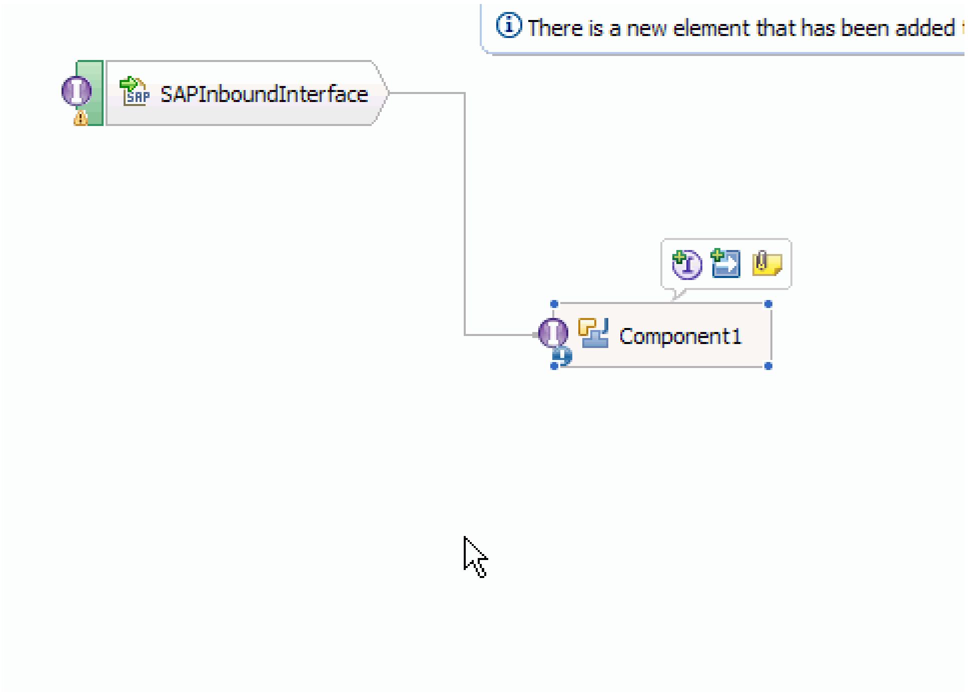
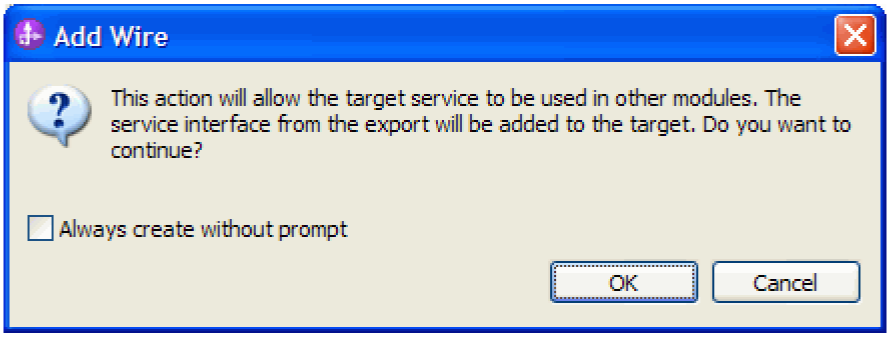


Figure: ALE Inbound interface being wired to a target Component (end-point)

In the Add Wire screen, click OK.


Add Wire

This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Confirmation Dialog

Right-click on the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

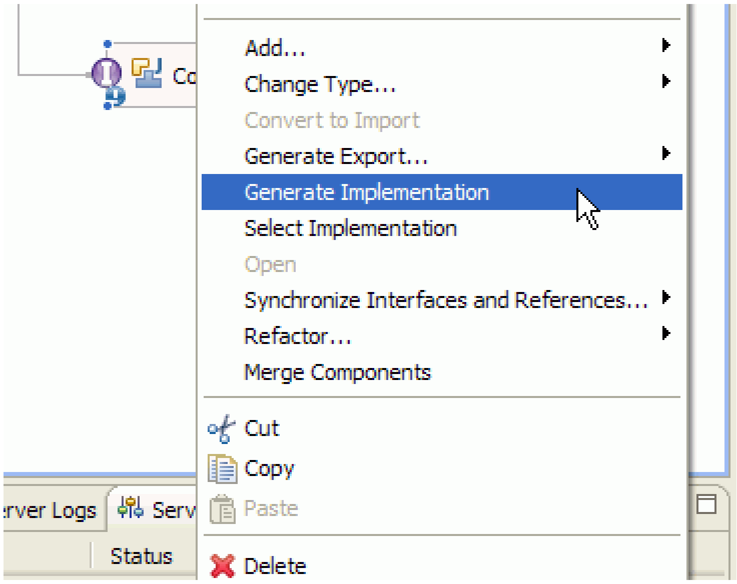
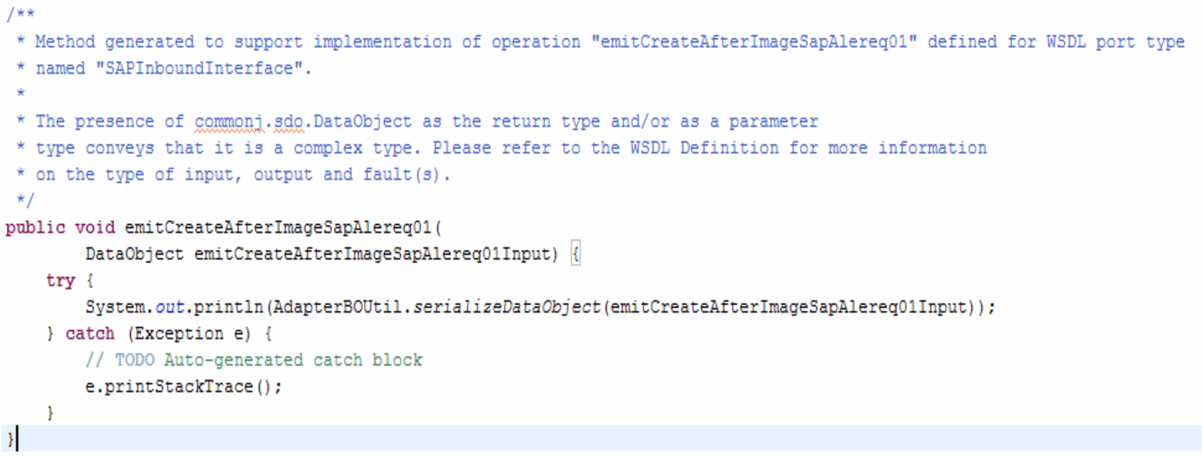


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapAlereq01" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void emitCreateAfterImageSapAlereq01(
        DataObject emitCreateAfterImageSapAlereq01Input) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapAlereq01Input));
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
}
```

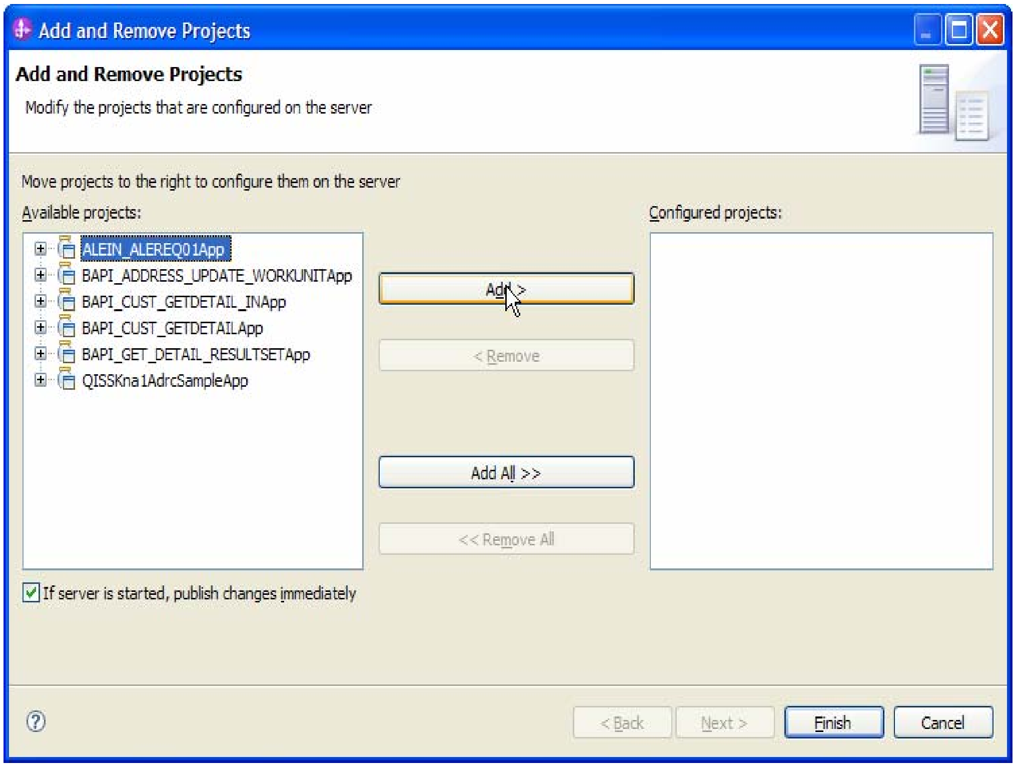
Save the Java file and the assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_CUST_GETDETAIL_INby selecting **Add and Remove Projects**.

The project BAPI_CUST_GETDETAIL_INApp will be listed under **Available projects**.



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

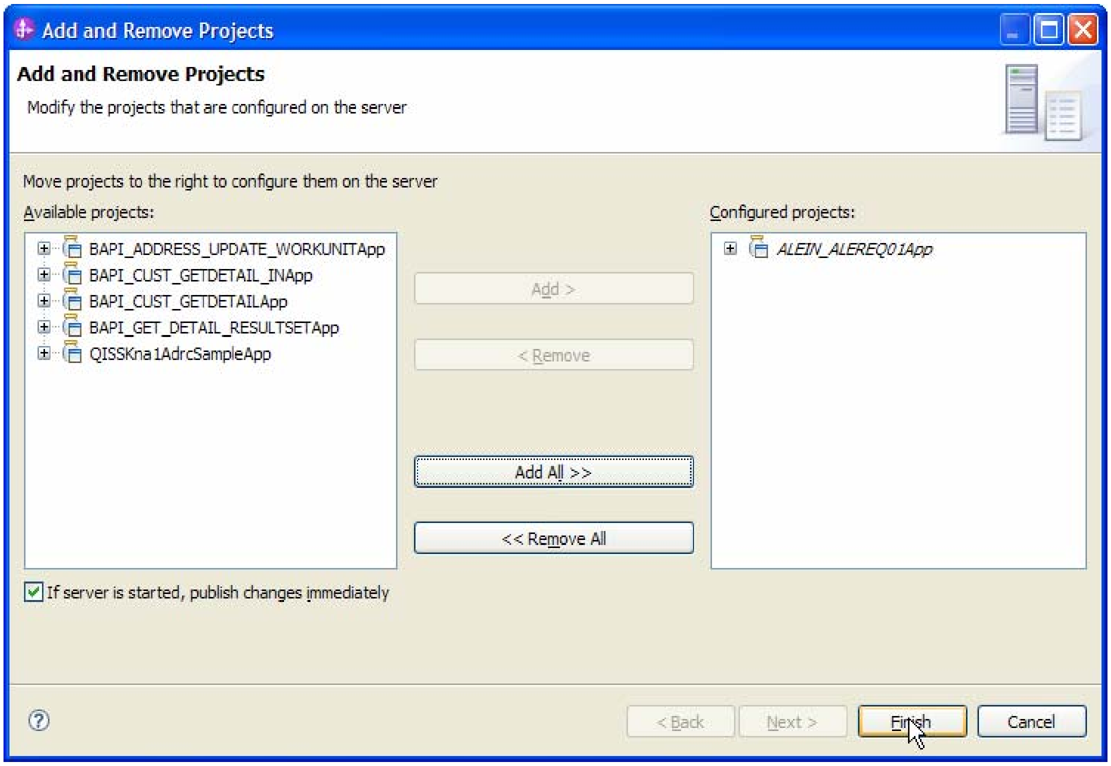
Available projects:

- ALEIN_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

☑ If server is started, publish changes immediately

The project that you added should appear under the Configured projects. Add the SCA module to the server by clicking **Finish.**



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

- *ALEIN_ALEREQ01App*

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

Start the Transaction WE19.

Choose the radio button **Existing IDoc**

Select an existing IDoc ALEREQ01 that you want to send

Set appropriate values in IDoc.

Click Standard Outbound Processing button

Select **Continue** in the pop-up box

This creates an ALE inbound event for the ALE inbound application deployed earlier.

In the console of WebSphere Integration Developer, you will see the ALEREQ01 Business Object printed (as we entered a print statement in the Component implementation above).

Chapter 10. Tutorial 7: Sending data to an SAP system (Outbound processing) using the ALE Interface

Sending IDoc data to SAP – ALE Outbound Processing

This tutorial demonstrates how to use the **New External Service** wizard to generate Business Objects based on the IDoc, and create an SCA module using WebSphere Adapter for SAP Software 7.0.0.0 deploy the module on to the WebServer Process Server to finally create IDoc in SAP system. This tutorial uses the Basic IDoc **ALEREQ01.**

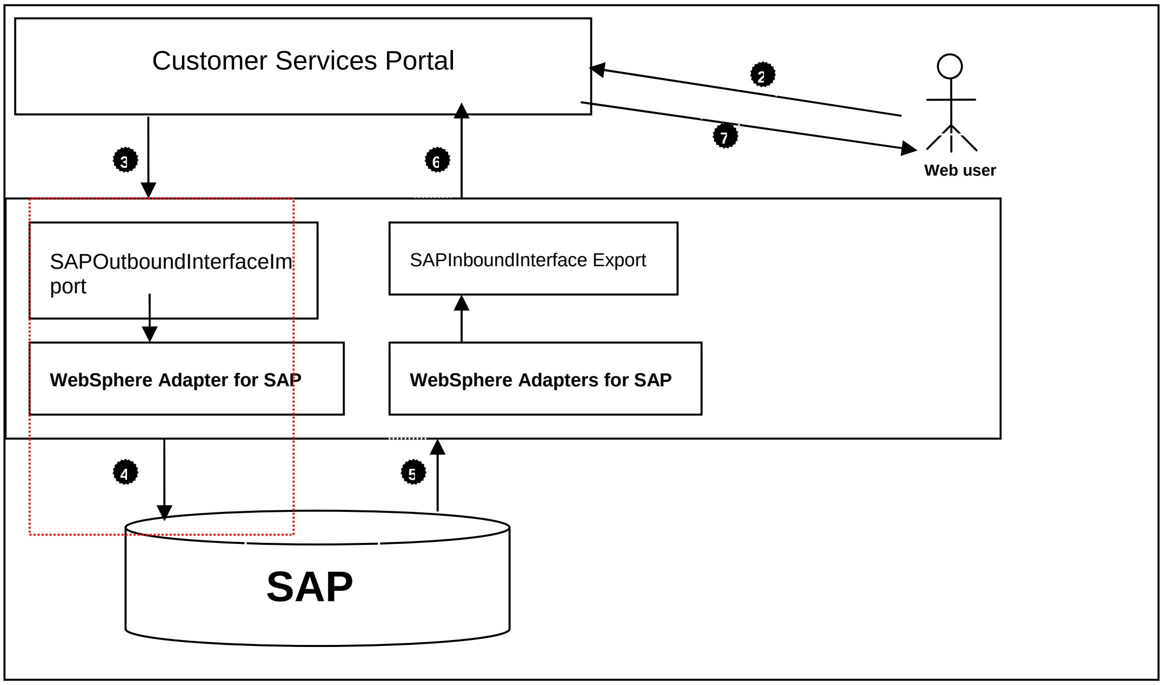
Scenario

The scenario explains how ALE outbound processing can be used in a real business case.

A user requests for information regarding a material through a website.

The website requires you to provide an email id to send the information to.

The whole communication model is asynchronous, and hence ALE interface is used.


Customer Services Portal
2
7
Web user
3
6
SAPOutboundInterfaceImport
SAPInboundInterface Export
WebSphere Adapter for SAP
WebSphere Adapters for SAP
4
5
SAP

Note: The tutorial only covers the part of the scenario marked in red colored rectangule in the above picture.

1. The user submit request for a Material information in the Customer Services Portal using Material number

2. The customer services portal will invoke the SCA Import using the with WebSphere Adapter for SAP Software for ALEREQ01 IDoc.

3. The adapter receives a request from the client application in the form of a Business Object. The adapter sends this data to SAP server in asynchronous form.

4. The SAP server after receiving the IDoc, tries to fetch the requested material Master data and responds with a transaction id. The one way transaction with the SAP server ends here.

5. Then SAP system later returns the requested data to the request sender asynchronously.

6. The SCA export configured with WebSphere Adapter for SAP Software listening for events pushed from the SAP system is active.

7. The adapter handles the response from SAP, converts it back to a Business Object format as required by the client application and sends it.

8. The Customer Services Portal returns the response to the user through email.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to
WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Application Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to
WAS_SERVER_ONLY_server_region_classpath

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

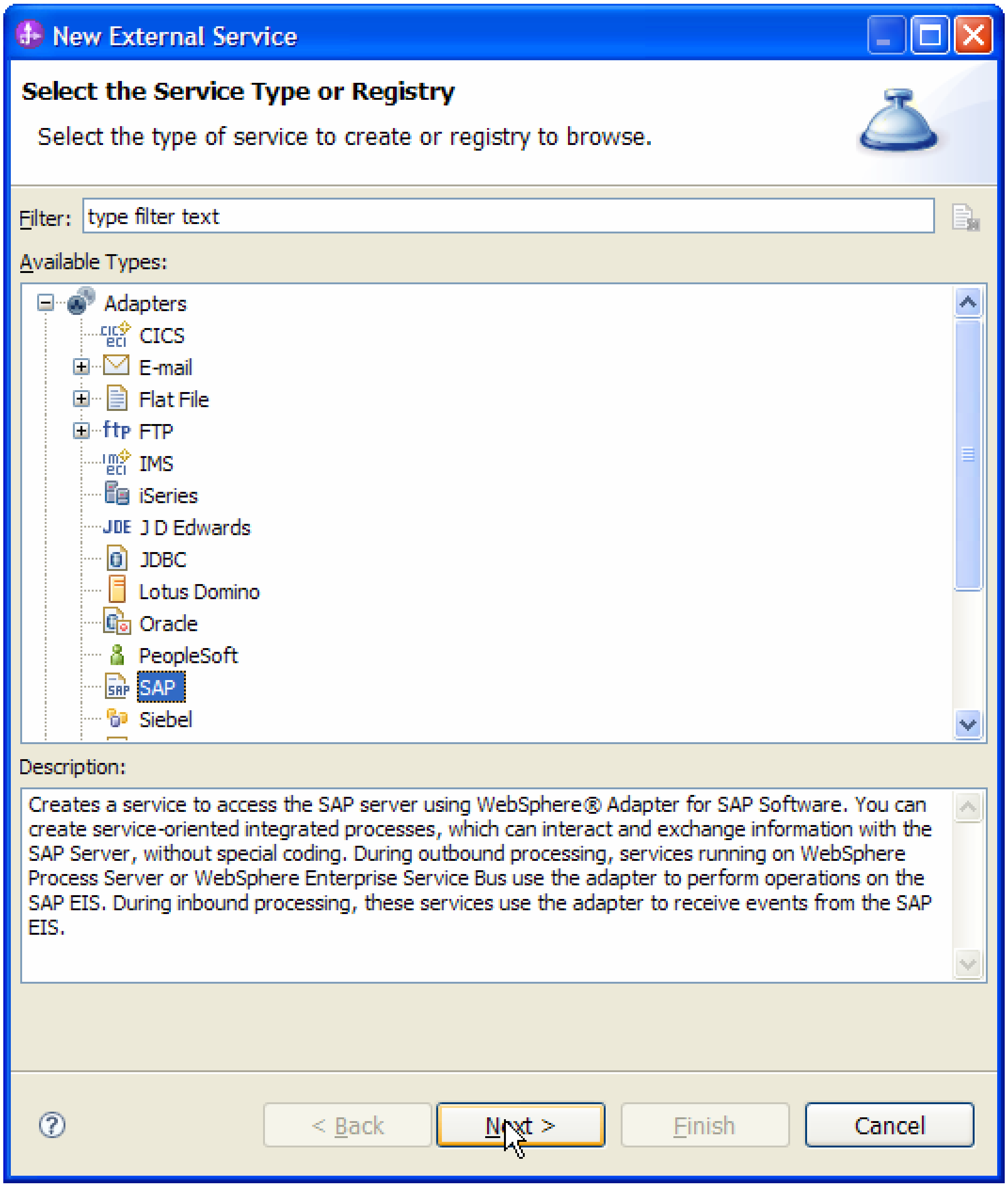
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

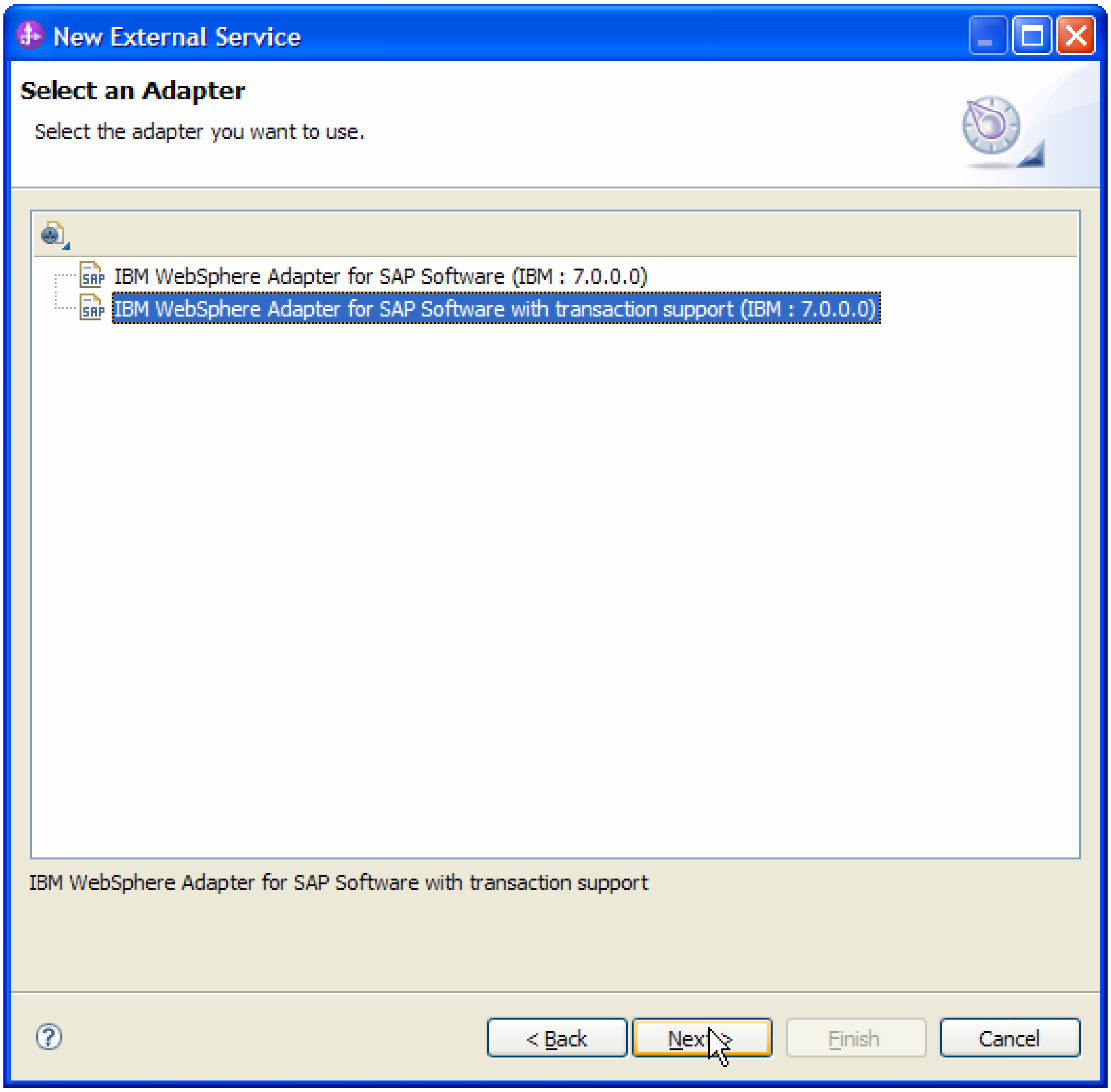
1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click on **Next.**



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

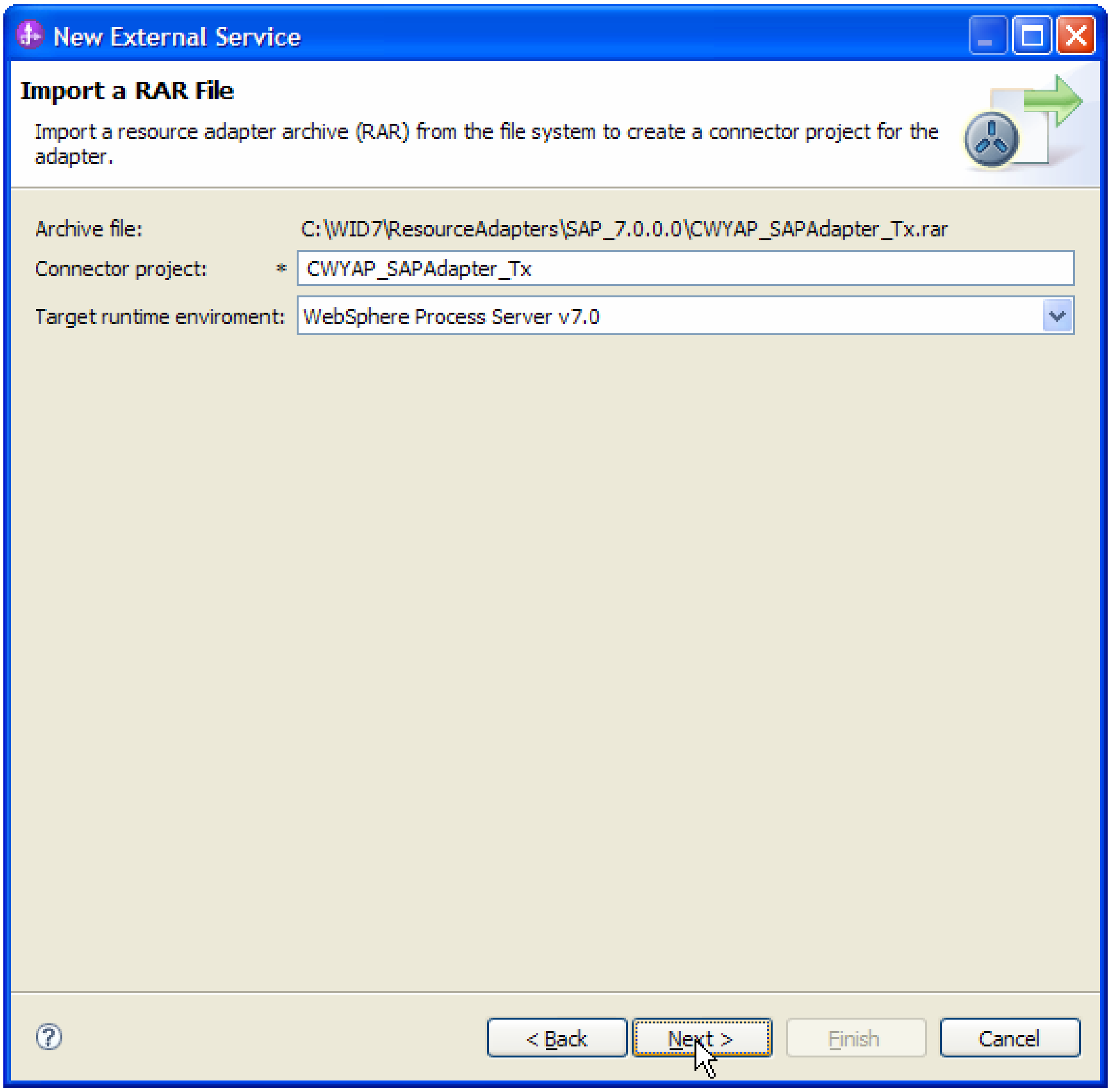
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next.**



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

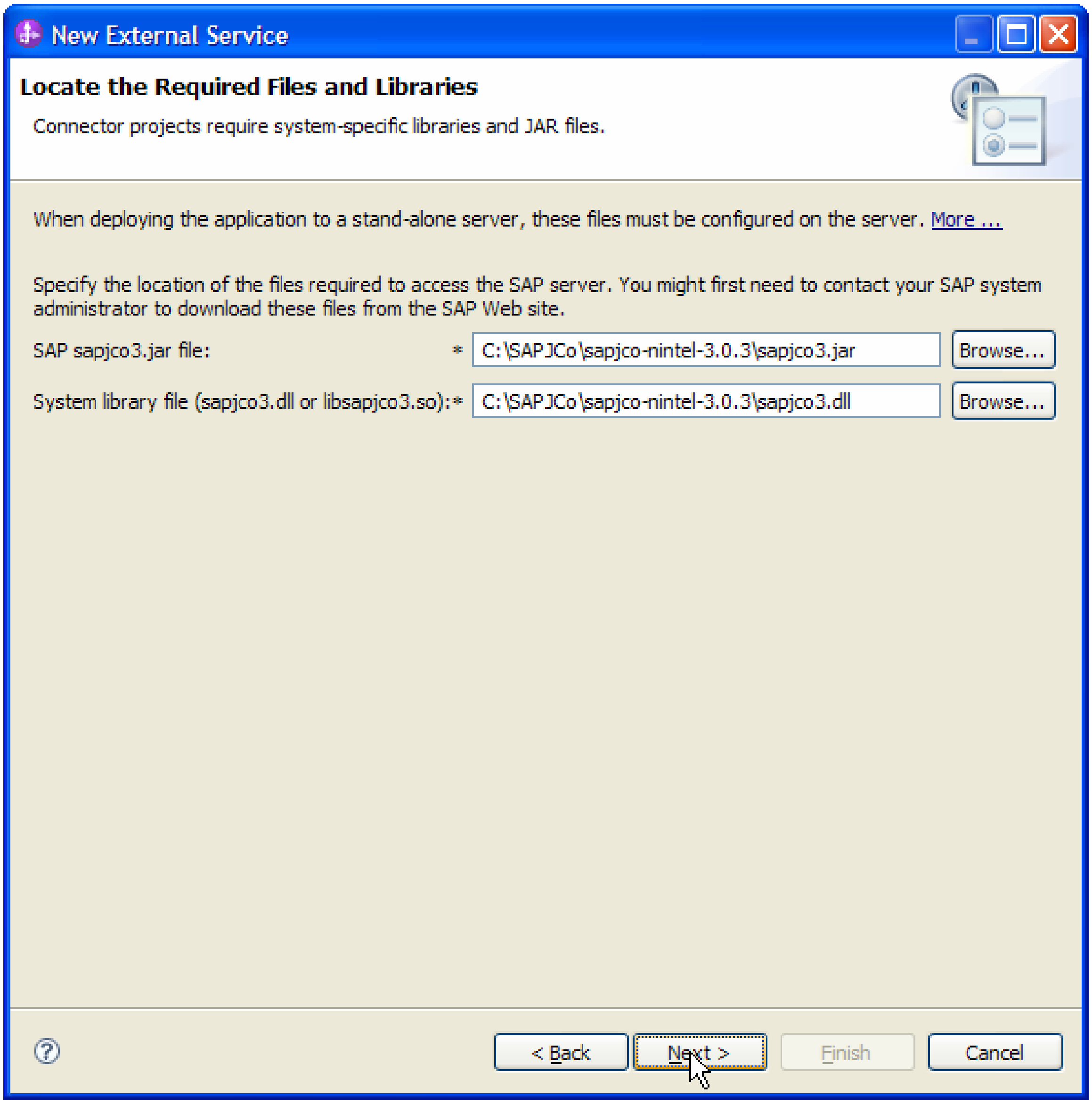
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

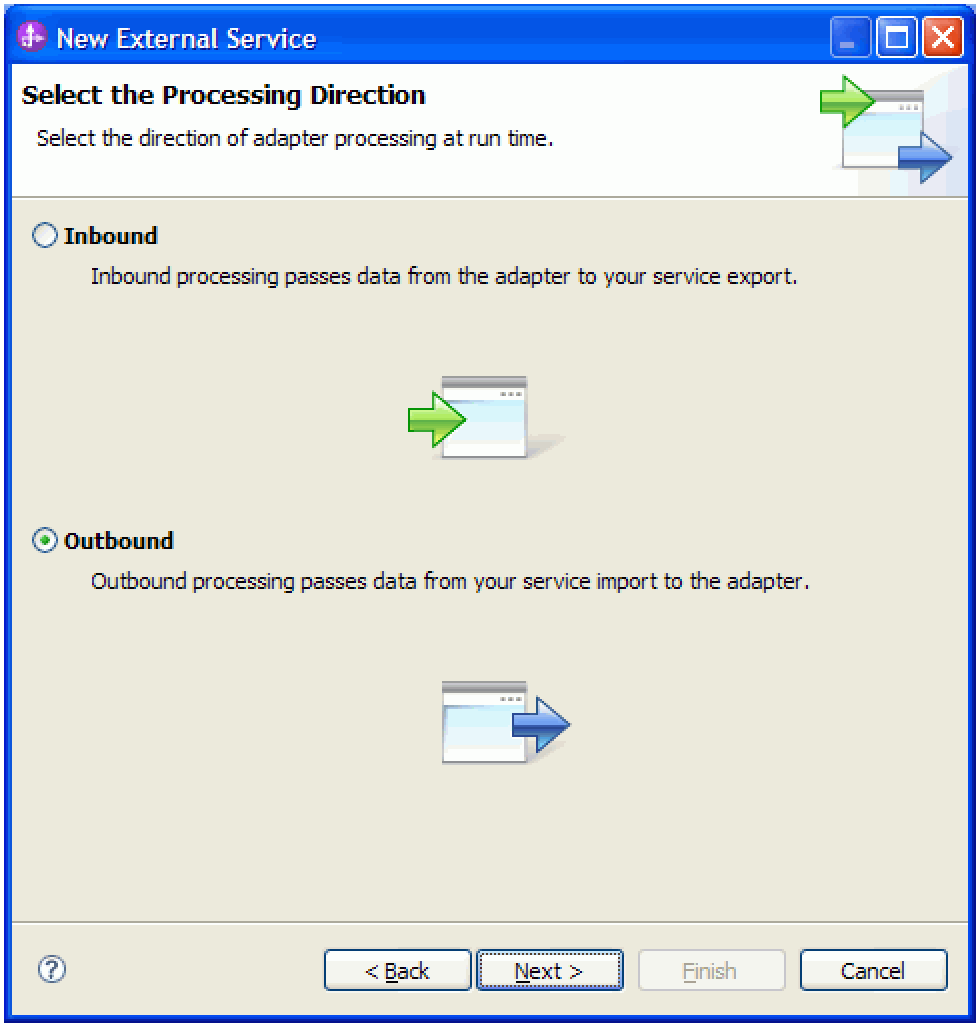
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next.**

6. In the **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

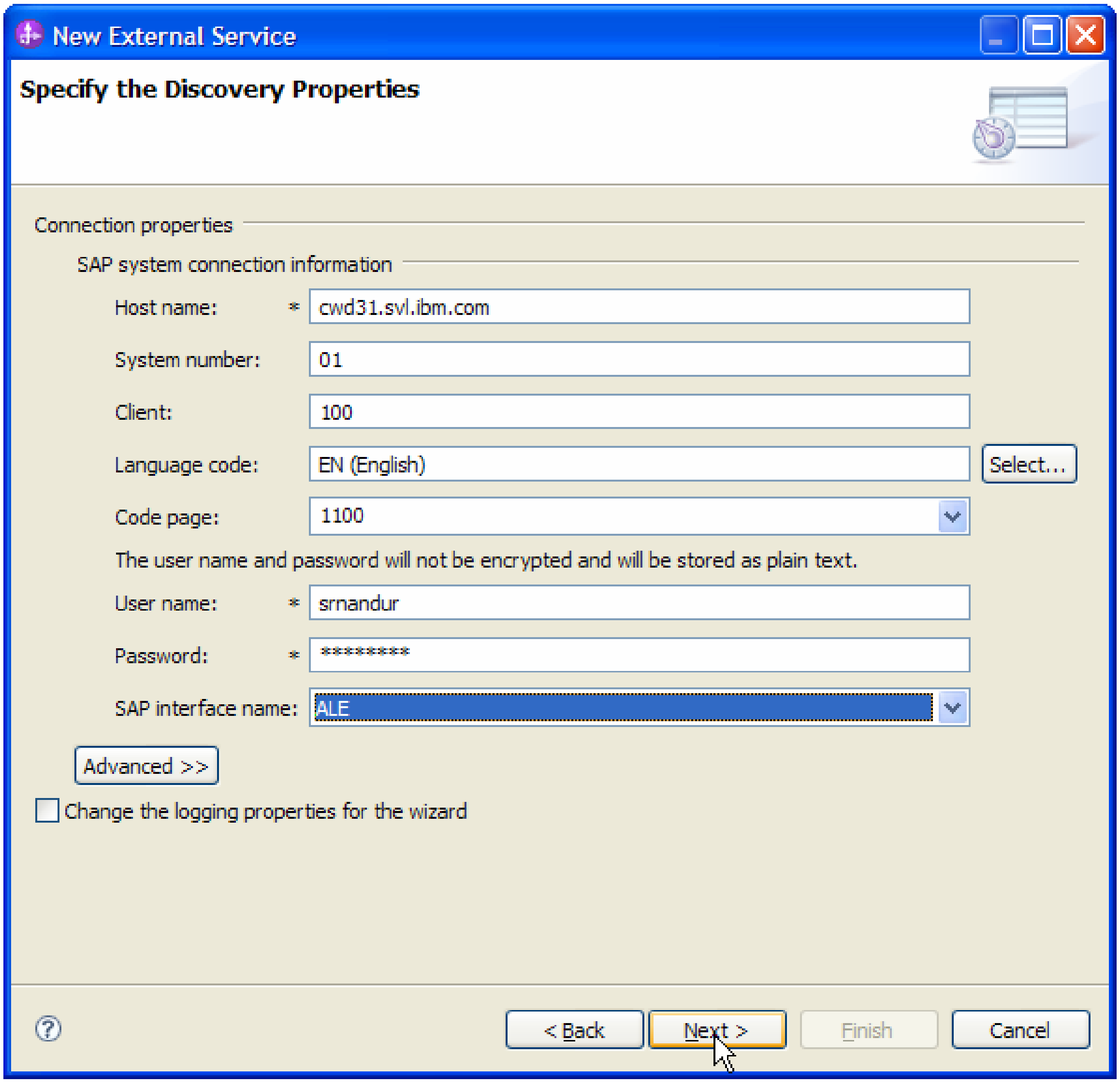
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select ALE as the interface name

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

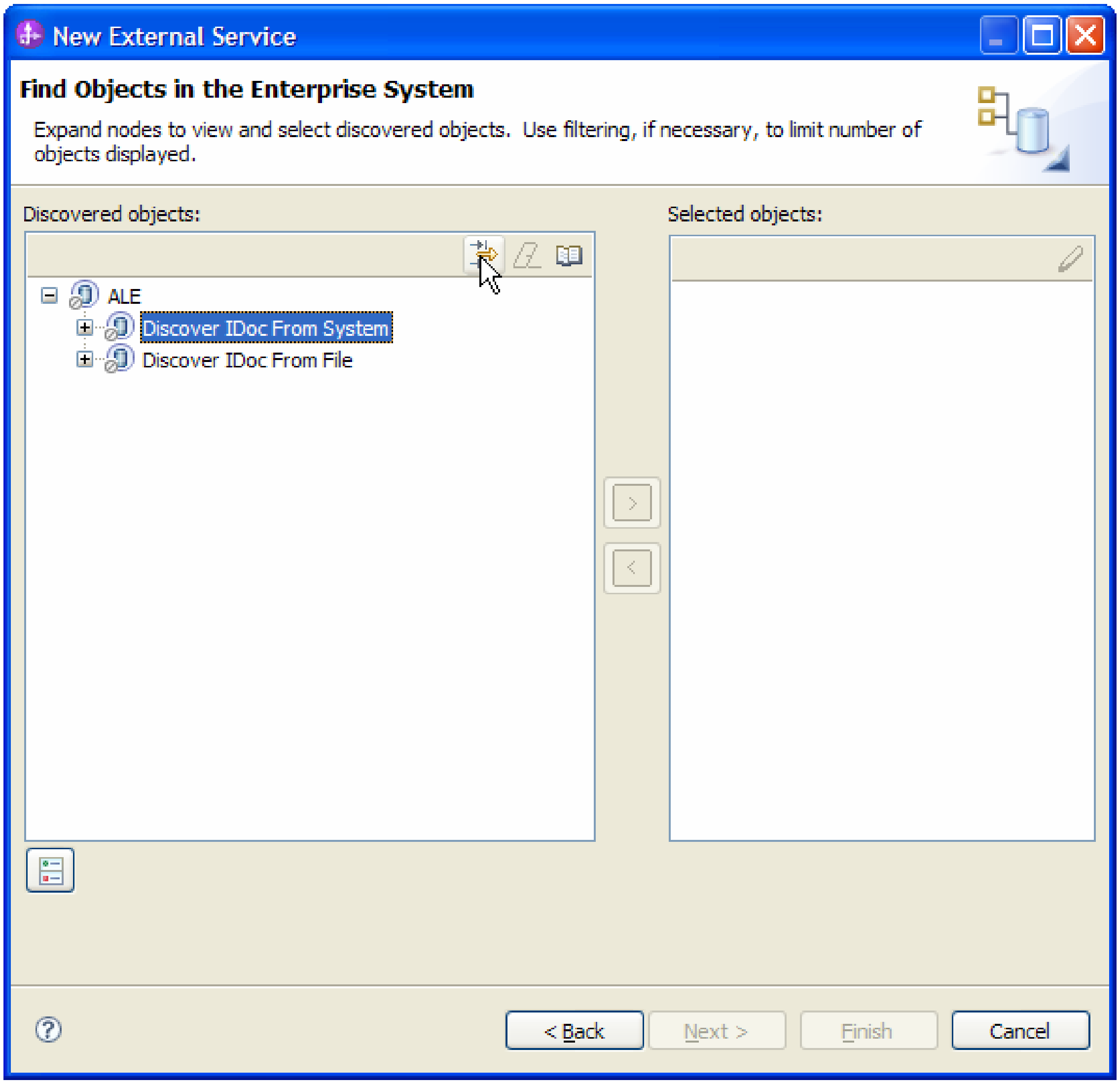
SAP interface name: ALE

□ Change the logging properties for the wizard

Figure: Select ALE as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find objects in the Enterprise System** screen, expand ALE under Discovered objects, click **Discover IDoc From System** and then click the button.



New External Service

Find Objects in the Enterprise System

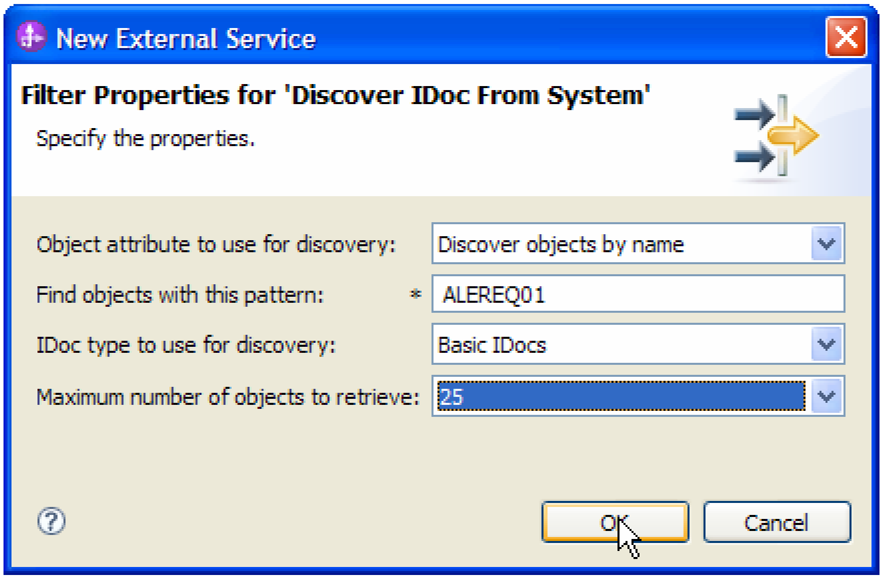
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

Selected objects:

Figure: Object Discovery and Selection

Enter Alereq01 (the name of the ALE in SAP system) in the **Filter Properties for Discover IDoc From System** screen.


New External Service

Filter Properties for 'Discover IDoc From System'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: * ALEREQ01

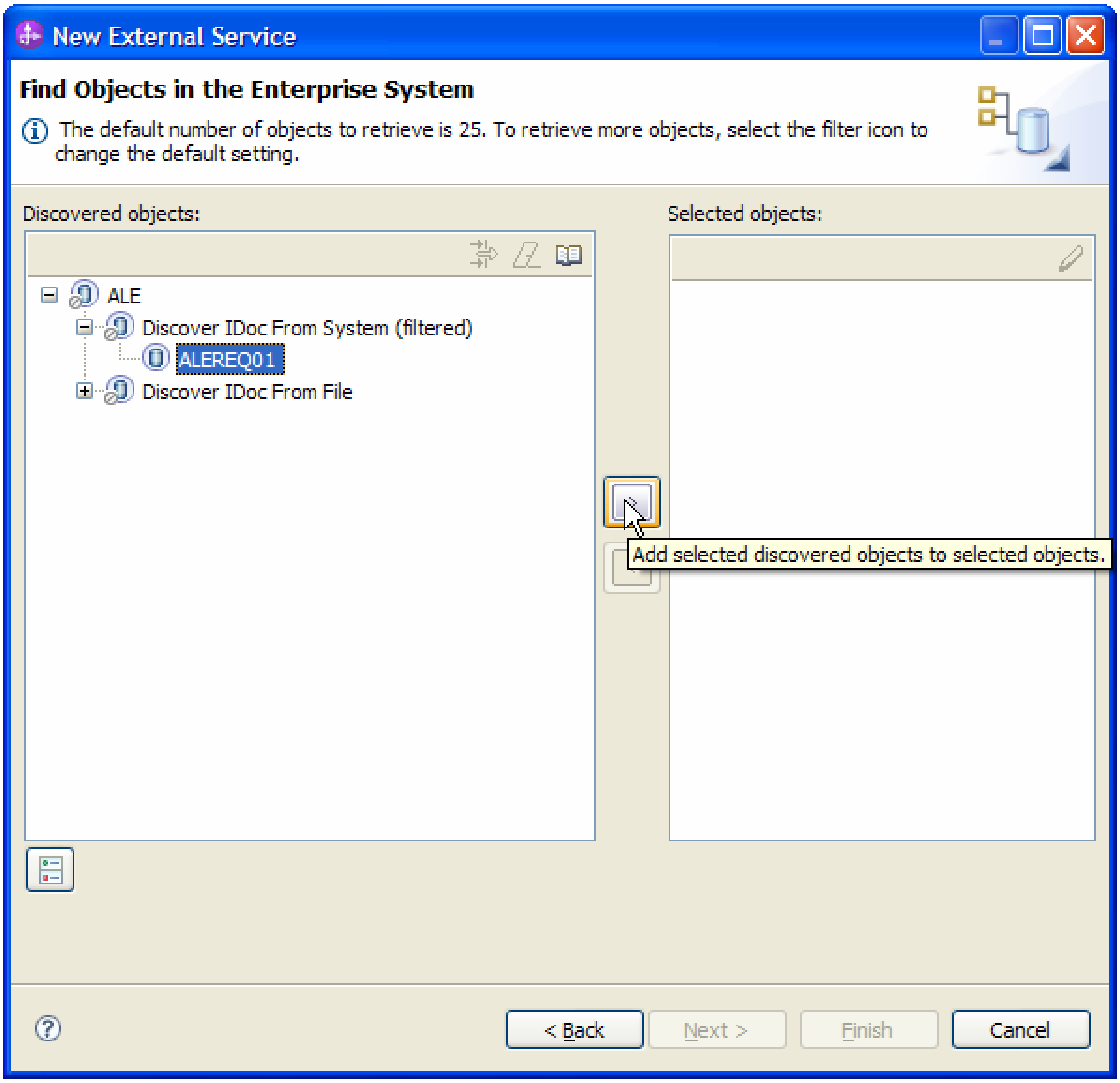
IDoc type to use for discovery: Basic IDocs

Maximum number of objects to retrieve: 25

Figure: Filter Properties for 'Discover IDoc From System'

Click **OK**.

Expand the **Discover IDoc From System** node and select ALEREQ01.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- ALE
  - Discover IDoc From System (filtered)
    - ALEREQ01
  - Discover IDoc From File

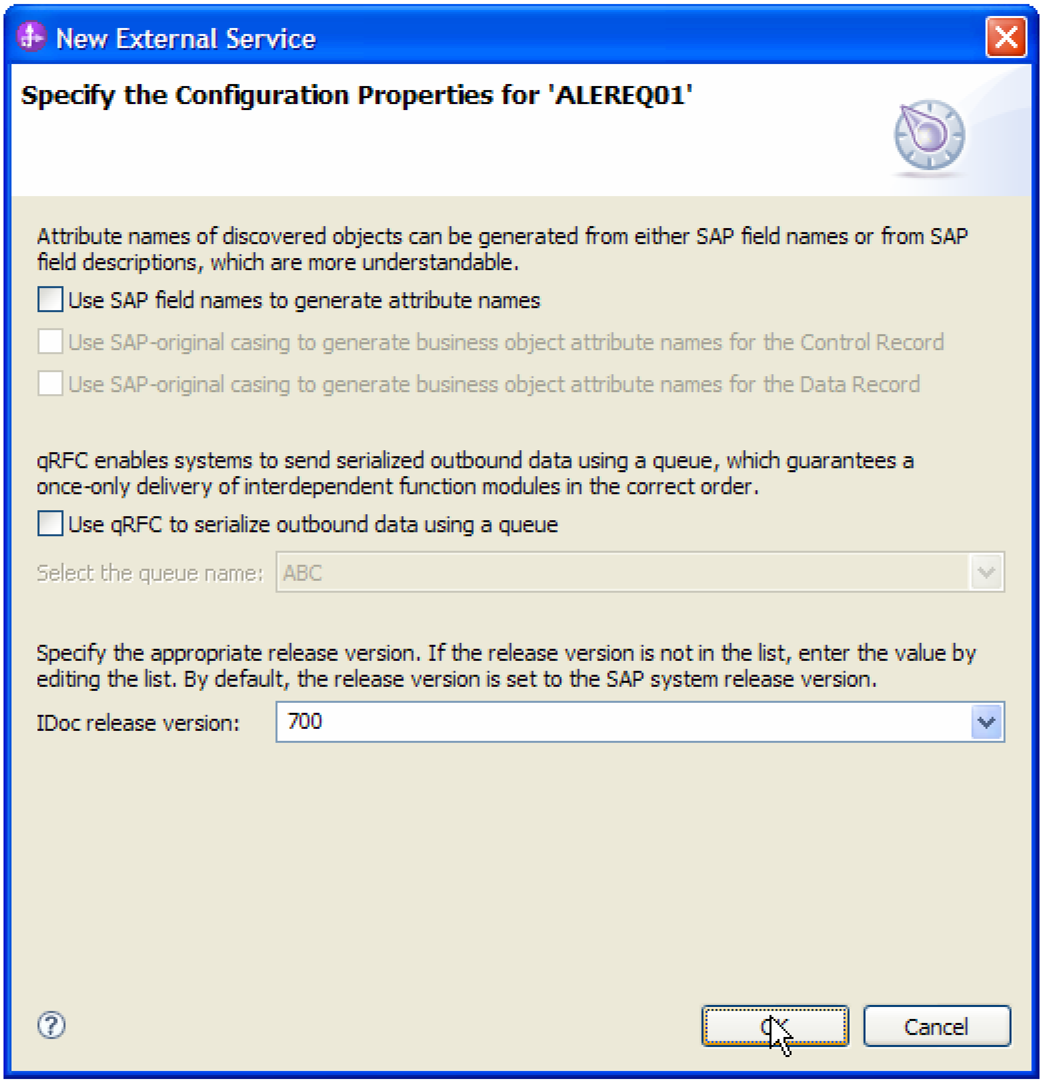
Selected objects:

Add selected discovered objects to selected objects.

Figure: Retrieved ALEREQ01 IDoc based on search criteria

Click the > button.

In the Configuration Properties screen, accept the default values by clicking on **OK**.



New External Service

Specify the Configuration Properties for 'ALEREQ01'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use SAP-original casing to generate business object attribute names for the Control Record

□ Use SAP-original casing to generate business object attribute names for the Data Record

qRFC enables systems to send serialized outbound data using a queue, which guarantees a once-only delivery of interdependent function modules in the correct order.

□ Use qRFC to serialize outbound data using a queue

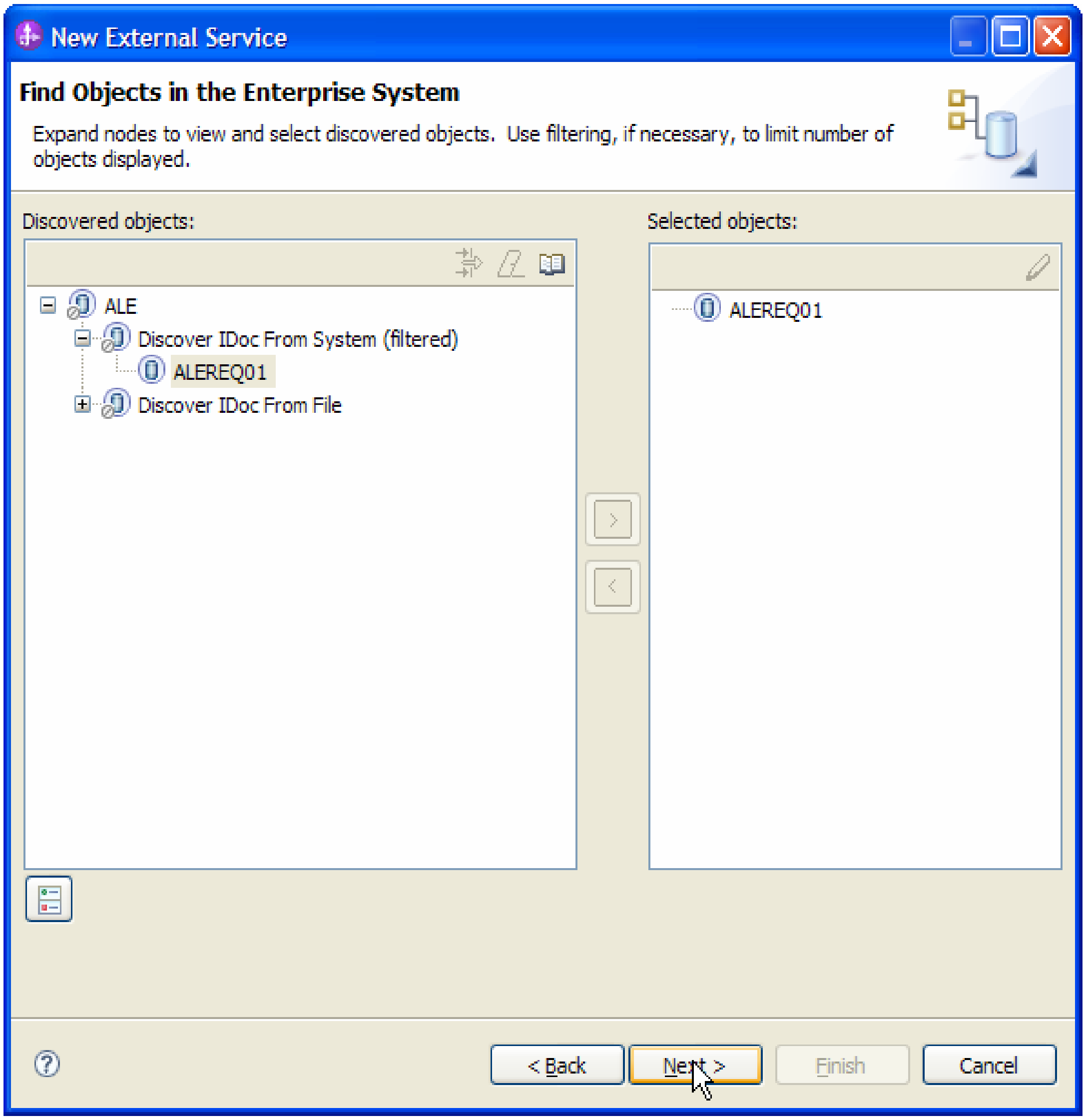
Select the queue name: ABC

Specify the appropriate release version. If the release version is not in the list, enter the value by editing the list. By default, the release version is set to the SAP system release version.

IDoc release version: 700

Figure: Setting configuration parameters for the IDoc ALEREQ01

ALEREQ01 has now been added to the list of Business Objects to be imported. Click **Next**.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

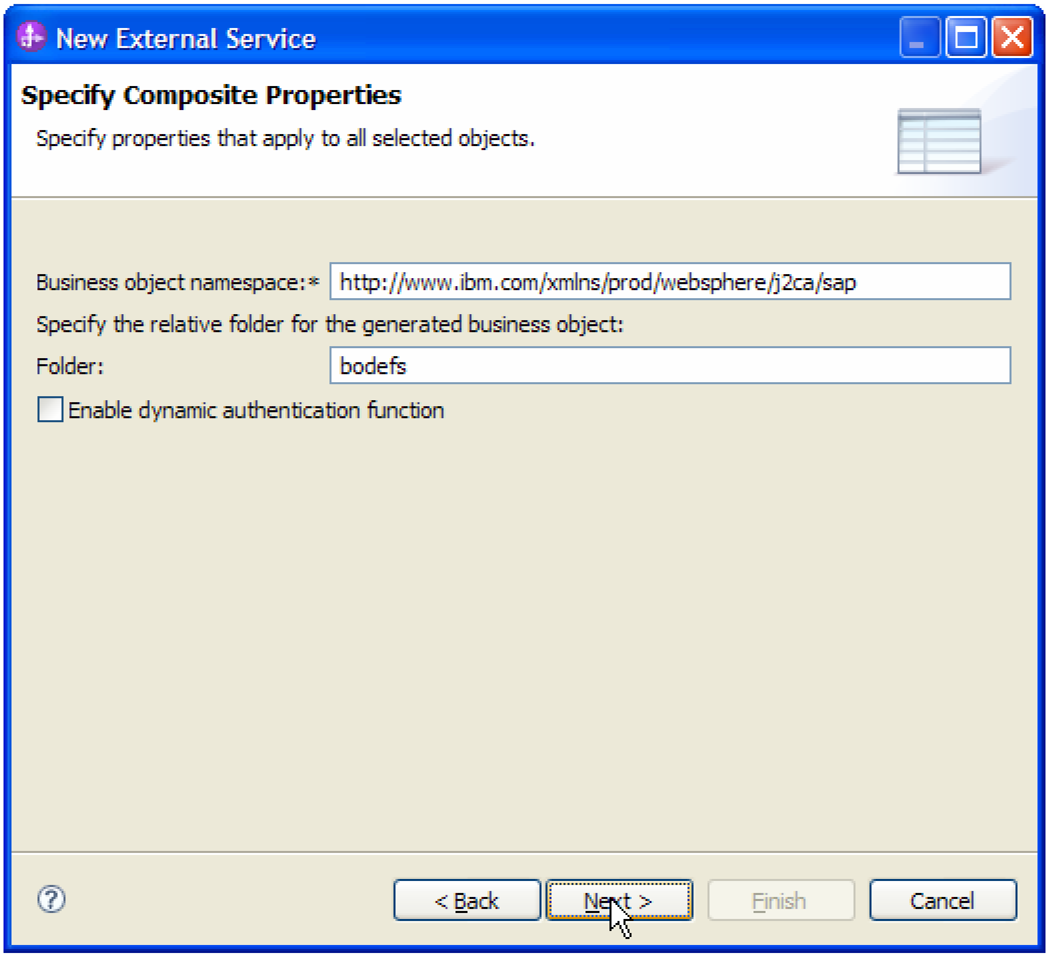
- ALE
  - Discover IDoc From System (filtered)
    - ALEREQ01
  - Discover IDoc From File

Selected objects:

- ALEREQ01

Figure: Selected ALEREQ01 added

In the **Specify Composite Properties** screen, enter **bodefs** as the name of the Folder Name for the generated Business Object.



Specify Composite Properties

Specify properties that apply to all selected objects.

Business object namespace:* http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

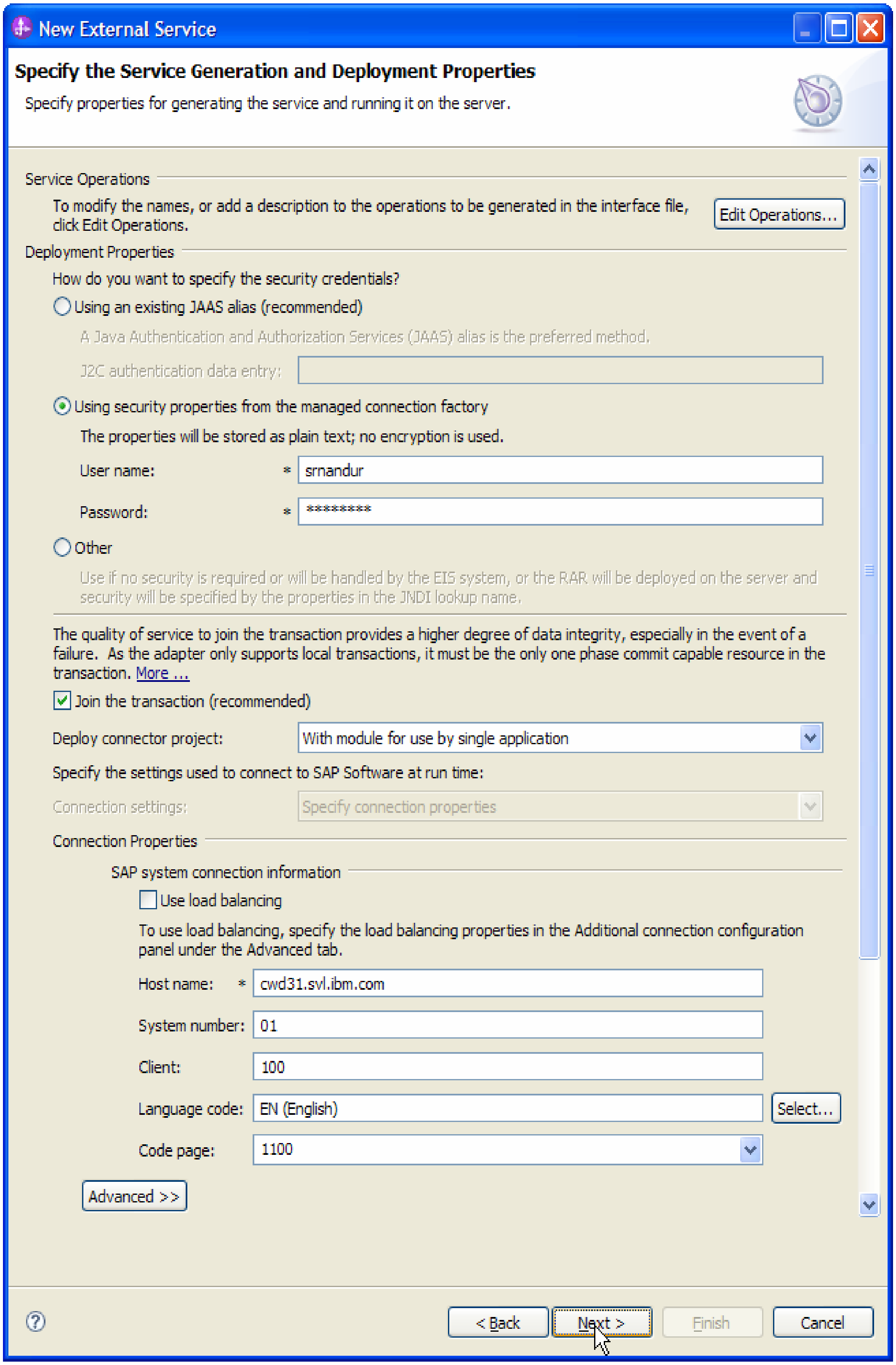
Folder: bodefs

□ Enable dynamic authentication function

Figure: Specify Composite Properties

Click **Next**.

In the **Service Generation and Deployment Configuration** screen enter the deployment and connection information.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

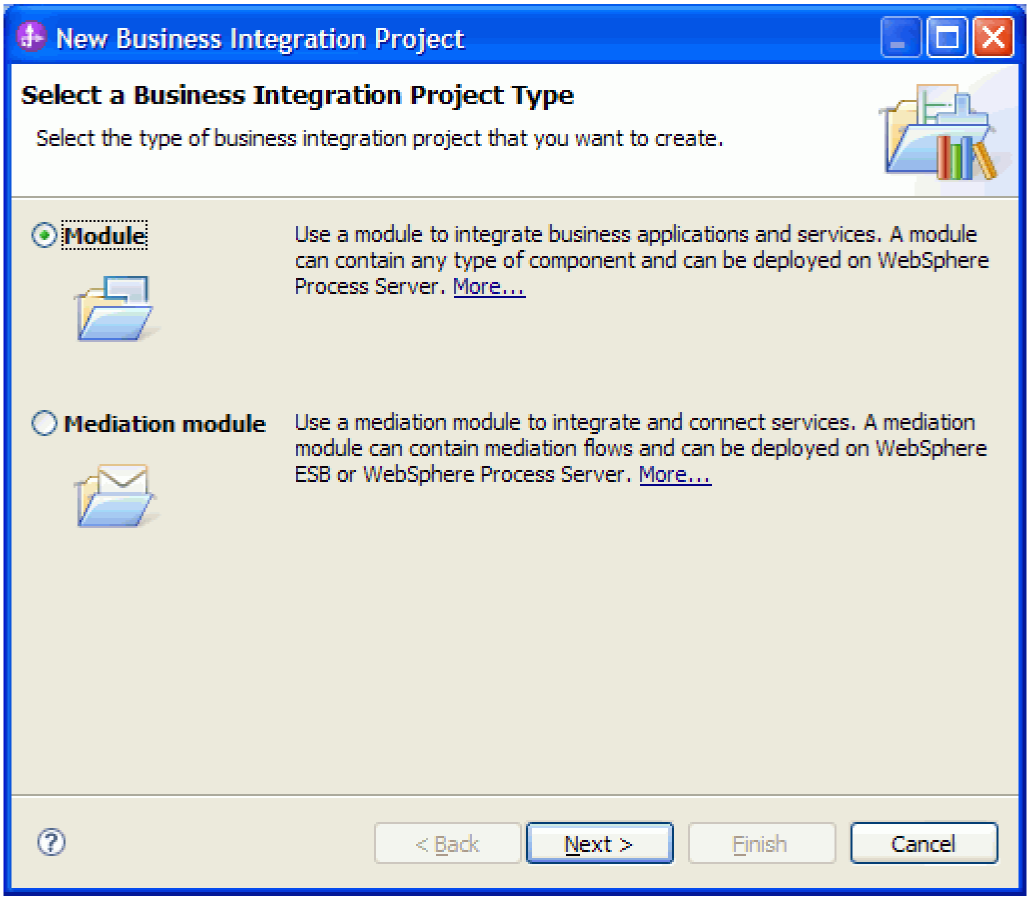
Figure: Service Generation and Deployment Configuration

Note: You can either enter an Authentication Alias previously created using the Administrative Console of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system**.**

Click **Next**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select the **Module** radio button and click **Next**



New Business Integration Project

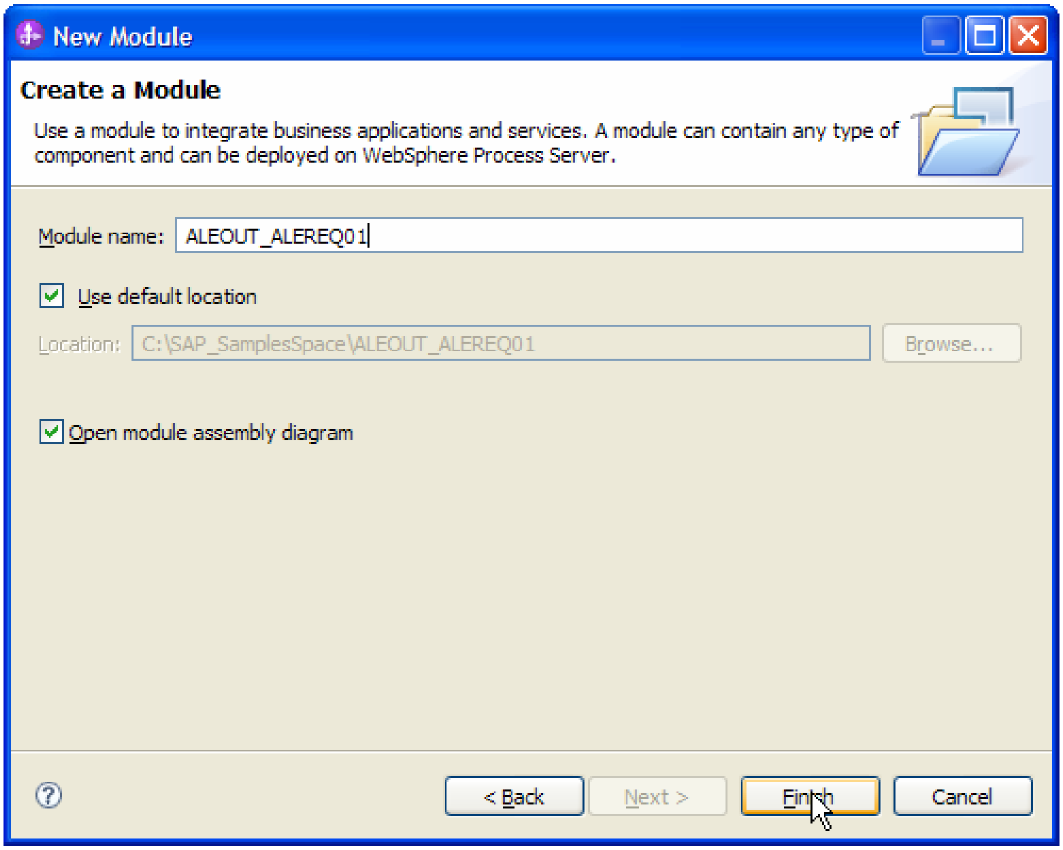
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type ALEOUT_ALEREQ01 in the Module Name field and click **Finish**.



New Module

Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

Module name: ALEOUT_ALEREQ01

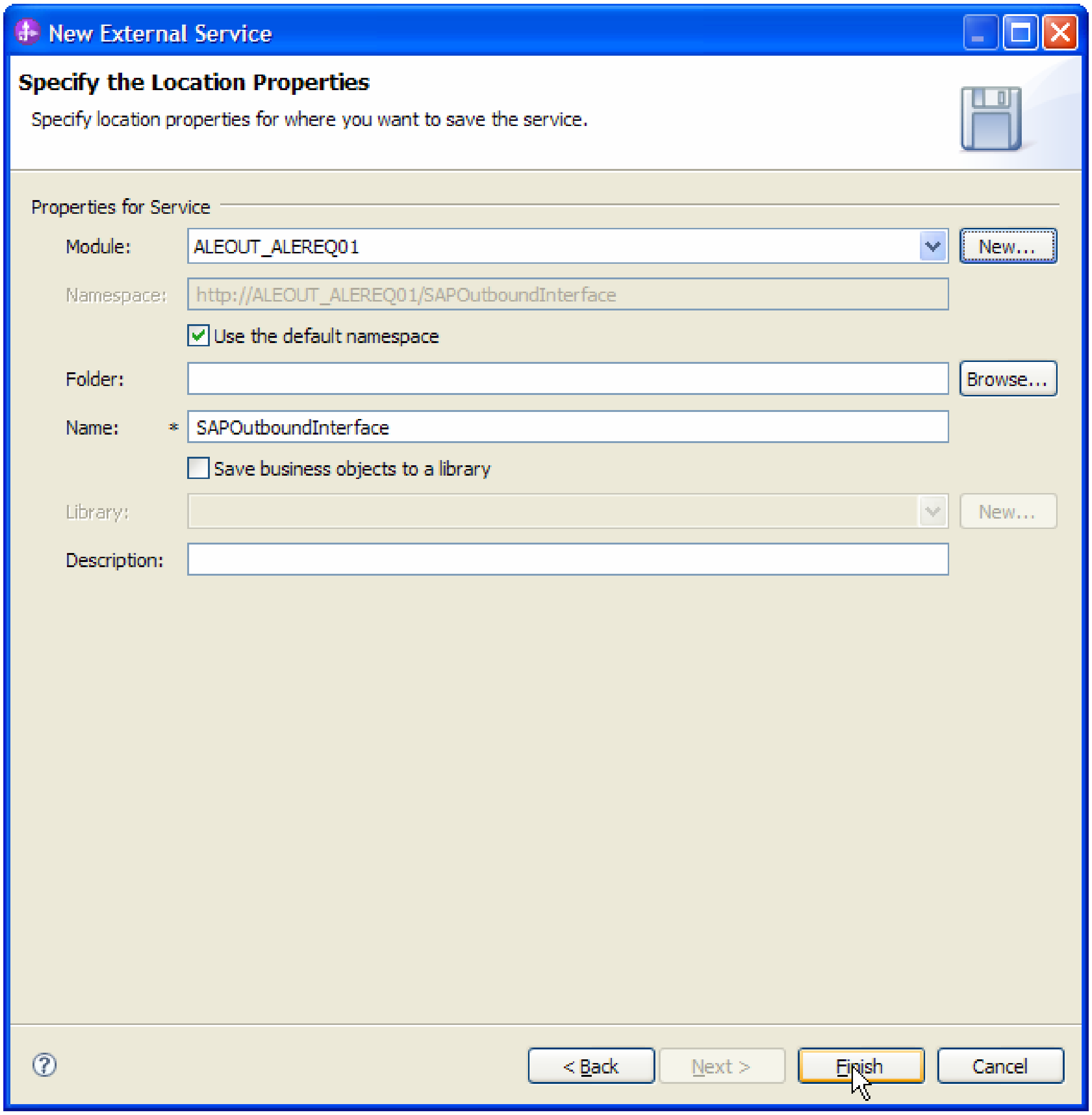
☑ Use default location

Location: C:\SAP_SamplesSpace\ALEOUT_ALEREQ01

☑ Open module assembly diagram

Figure: Specify the Location Properties

Click **Finish** on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: ALEOUT_ALEREQ01

Namespace: http://ALEOUT_ALEREQ01/SAPOutboundInterface

☑ Use the default namespace

Folder:

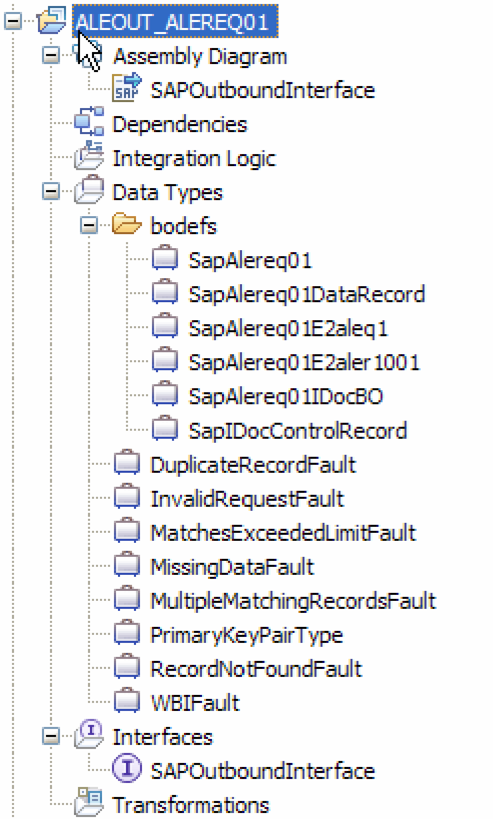
Name: * SAPOutboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results



- ALEOUT_ALEREQ01
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapAlereq01
      - SapAlereq01DataRecord
      - SapAlereq01E2aleq1
      - SapAlereq01E2aler1001
      - SapAlereq01IDocBO
      - SapIDocControlRecord
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

Figure: Artifacts created after the EMD run for the ALE outbound Module

Deploying the module in the test environment

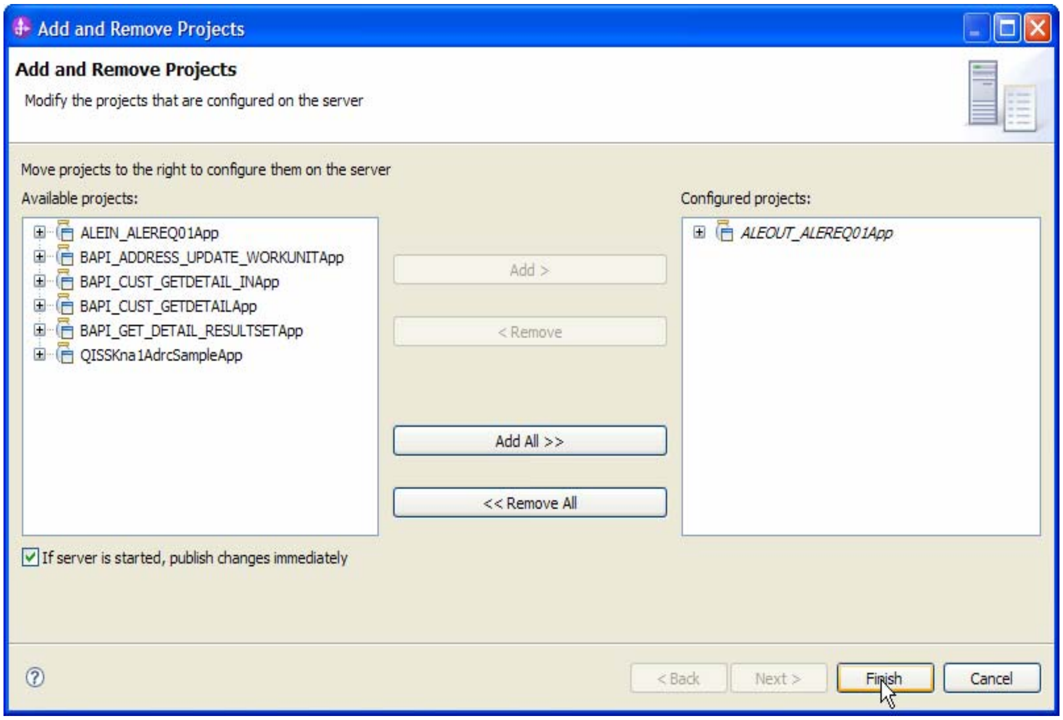
After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module ALEOUT_ALEREQ01 by selecting **Add and Remove Projects**.

The project ALEOUT_ALEREQ01App will be listed under **Available projects**.

After adding the project, it should appear under the Configured projects.

Add the SCA module to the server by clicking Finish.



Add and Remove Projects
Add and Remove Projects
Modify the projects that are configured on the server
Move projects to the right to configure them on the server
Available projects:
ALEIN_ALEREQ01App
BAPI_ADDRESS_UPDATE_WORKUNITApp
BAPI_CUST_GETDETAIL_INApp
BAPI_CUST_GETDETAILApp
BAPI_GET_DETAIL_RESULTSETApp
QISSKna1AdrcSampleApp
Add >
< Remove
Add All >>
<< Remove All
Configured projects:
ALEOUT_ALEREQ01App
☑ If server is started, publish changes immediately
< Back
Next >
Finish
Cancel

Testing the assembled adapter application

Test the assembled adapter application using the WebSphere Integration Developer's Test Client.

Once the module is deployed to the Server, right click the module ALEOUT_ALEREQ01 from the Projects view and select **Test > Test Module** from the pop-up menu.

To test this tutorial, you use data from your SAP server. If you have not already done so, obtain actual values for the following data. If necessary, contact your SAP administrator to obtain the data.

Client

IdocNumber

SenderPort

PartnerNumberofSender

ReceiverPort

PartnerNumberofRecipient

Enter values in the **Test Client** as follows –

a) Enter the IDoc Control record data - Right-click SapAlereq01IDocBO and click **Add Element**

b) Type the following values in the associated fields:

ReceiverPort

PartnerTypeOfSender

NameOfBasicType

PartnerNumberOfSender

NameOfTableStructure

Client

LogicalMessageType

PartnerNumberOfRecipient

SenderPort

IdocNumber

PartnerTypeOfRecipient

c) Set the IDoc Data Record level property values.
Logicalmessagetype - ALEREQ

Messagetype - ALEREQ

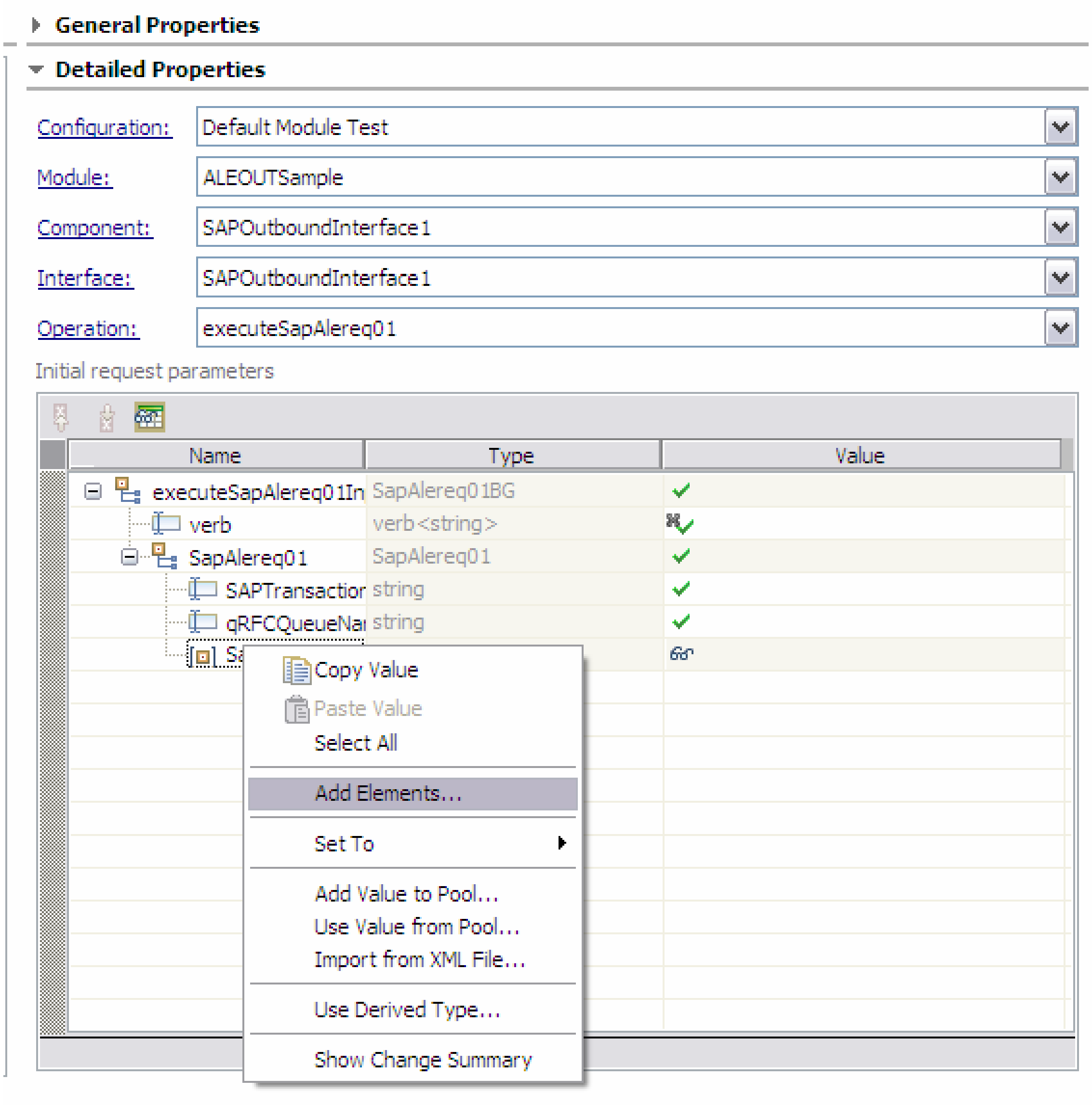
Right-click SapAlereq01E2aleq1 and click Add Element

IncludingExcludingindicator - E

RelationaloperatorEqNeGtLtGeLe - LT

Lowerlimitforfieldcontents - 0

Upperlimitforfieldcontents - 1



General Properties

Detailed Properties

Configuration: Default Module Test

Module: ALEOUTSample

Component: SAPOutboundInterface1

Interface: SAPOutboundInterface1

Operation: executeSapAlereq01

Initial request parameters

Name	Type	Value
executeSapAlereq01In	SapAlereq01BG	✓
verb	verb<string>	✓
SapAlereq01	SapAlereq01	✓
SAPTransactior	string	✓
qRFCQueueNa	string	✓
Sa		

Click the **Continue** button ▶.

When the **Select Deployment** screen appears, select the WebSphere Process Server instance to which you added the project and click the **Finish** button.

If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK**.

Chapter 11. Preparing to run through the AEP tutorial

Configuration prerequisites

Import the sample transports supplied along with the adapter into your SAP system.

The following is a list of the SAP R/3 version 4.7/ERP transport files necessary to support AEP module.

To ensure that all necessary tables are created before the data for those tables is added, the transports must be installed in the order listed. These files can be found in the directory <WID_INSTALLATION_DIRECTORY>\ResourceAdapters\SAP_7.0.0.0\transports

File name	Transport Number
47_Primary	VELK900031
47_Infrastructure	ERPK900137

The adapter requires the following libraries which are supplied by SAP.

Get the latest OS specific SAP JCO 3 libraries from the SAP Service Marketplace.

They should be copied to a folder on the system where the WebSphere Integration Developer's EMD will be executed.

SAP JCO files
sapjco3.jar
sapjco3.dll

Extracting the sample files

Replicas of the artifacts that you create when using the **New External Service** wizard are provided as sample files for your reference. Use these files to verify that the files you create with the **New External Service wizard** are correct.

Go to the **samples** folder and unzip **Tutorial_AEP.zip** into a directory of your choice (you may want to create a new directory).

File name	**Description**
AEPOutBoundSample/SAPOutboundInterface.import	Contains the SCA import for the resource adapter.
AEPOutBoundSample/SAPOutboundInterface.wsdl	Service interface to invoke the resource adapter.
AEPOutBoundSample/SapYxrv5b01.xsd	Business Object definition for the SapYxrv5b01.
AEPOutBoundSample/SapYxrv5b01BG.xsd	Business Object definition for the Business Object graph.
AEPOutBoundSample/SapYxrv5b01Z2xrv51000.xsd	Business Object definition for the SapYxrv5b01Z2xrv51000.
AEPOutBoundSample/SapYxrv5b01Z2xrv52000.xsd	Business Object definition for the SapYxrv5b01Z2xrv52000.
AEPOutBoundSample/SapYxrv5b01Z2xrv53000.xsd	Business Object definition for the SapYxrv5b01Z2xrv53000.
AEPOutBoundSample/SapYxrv5b01Z2xrv54000.xsd	Business Object definition for the SapYxrv5b01Z2xrv54000.

AEPOutBoundSample/ SapYxrv5b01Z2xrv55000.xsd	Business Object definition for the SapYxrv5b01Z2xrv55000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv56000.xsd	Business Object definition for the SapYxrv5b01Z2xrv56000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv57000.xsd	Business Object definition for the SapYxrv5b01Z2xrv57000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv58000.xsd	Business Object definition for the SapYxrv5b01Z2xrv58000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv59000.xsd	Business Object definition for the SapYxrv5b01Z2xrv59000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv5a000.xsd	Business Object definition for the SapYxrv5b01Z2xrv5a000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv5b000.xsd	Business Object definition for the SapYxrv5b01Z2xrv5b000.
AEPOutBoundSample/ SapYxrv5b01Z2xrv5c000.xsd	Business Object definition for the SapYxrv5b01Z2xrv5c000.
AEPOutBoundSample/ DuplicateRecordFault.xsd	Fault Schema
AEPOutBoundSample/ MatchesExceededLimitFault.xs	Fault Schema
AEPOutBoundSample/ MissingDataFault.xsd	Fault Schema

AEPOutBoundSample/MultipleMatchingRecordsFault.	Fault Schema
AEPOutBoundSample/PrimaryKeyPairType.xsd	Fault Schema
AEPOutBoundSample/RecordNotFoundFault.xsd	Fault Schema
AEPOutBoundSample/WBIFault.xsd	Fault Schema

Triggering of events in the SAP System

Chapter 12. Tutorial 8: AEP Interface outbound processing

This tutorial demonstrates how the WebSphere Adapter for SAP 7.0.0.0 uses the AEP interface to create, update, delete and retrieve a record from the Customer Master table. This tutorial explains how you can configure the adapter for outbound processing deploy and test the module for processing.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<*WPS_INSTALL*> represents the WebSphere Process Server installation directoryConfiguring.

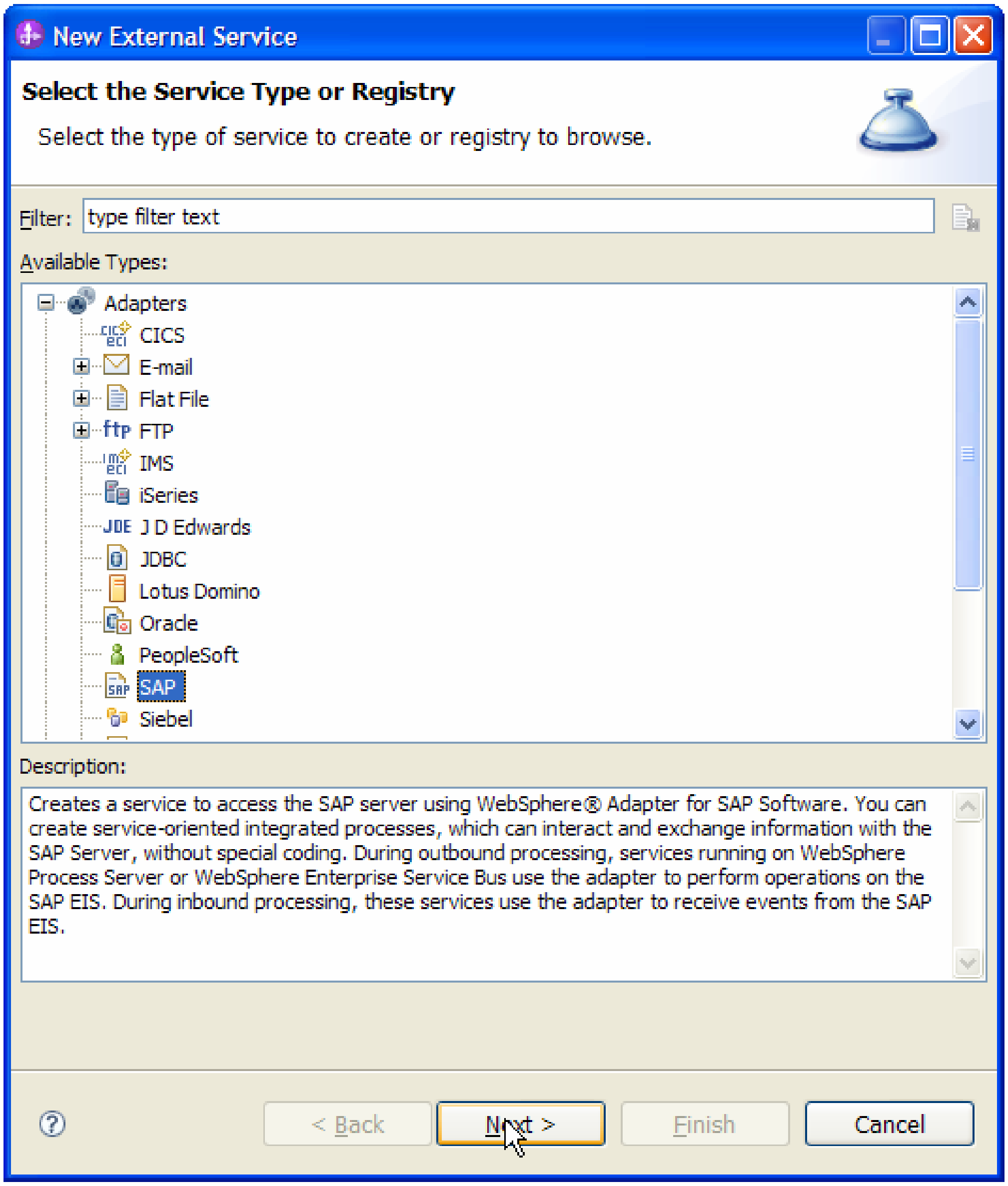
the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service.**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next**.



Select the Service Type or Registry

Select the type of service to create or registry to browse.

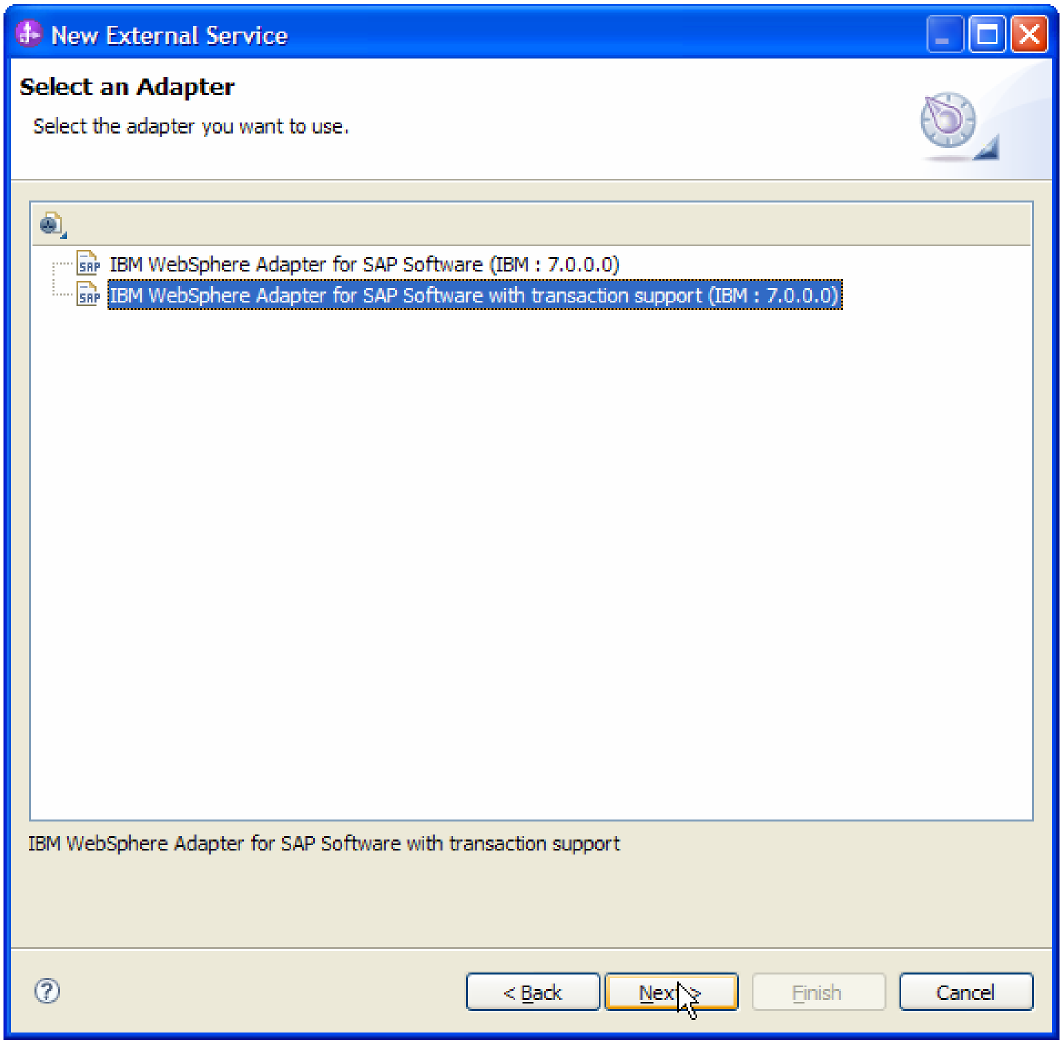
Filter: type filter text

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

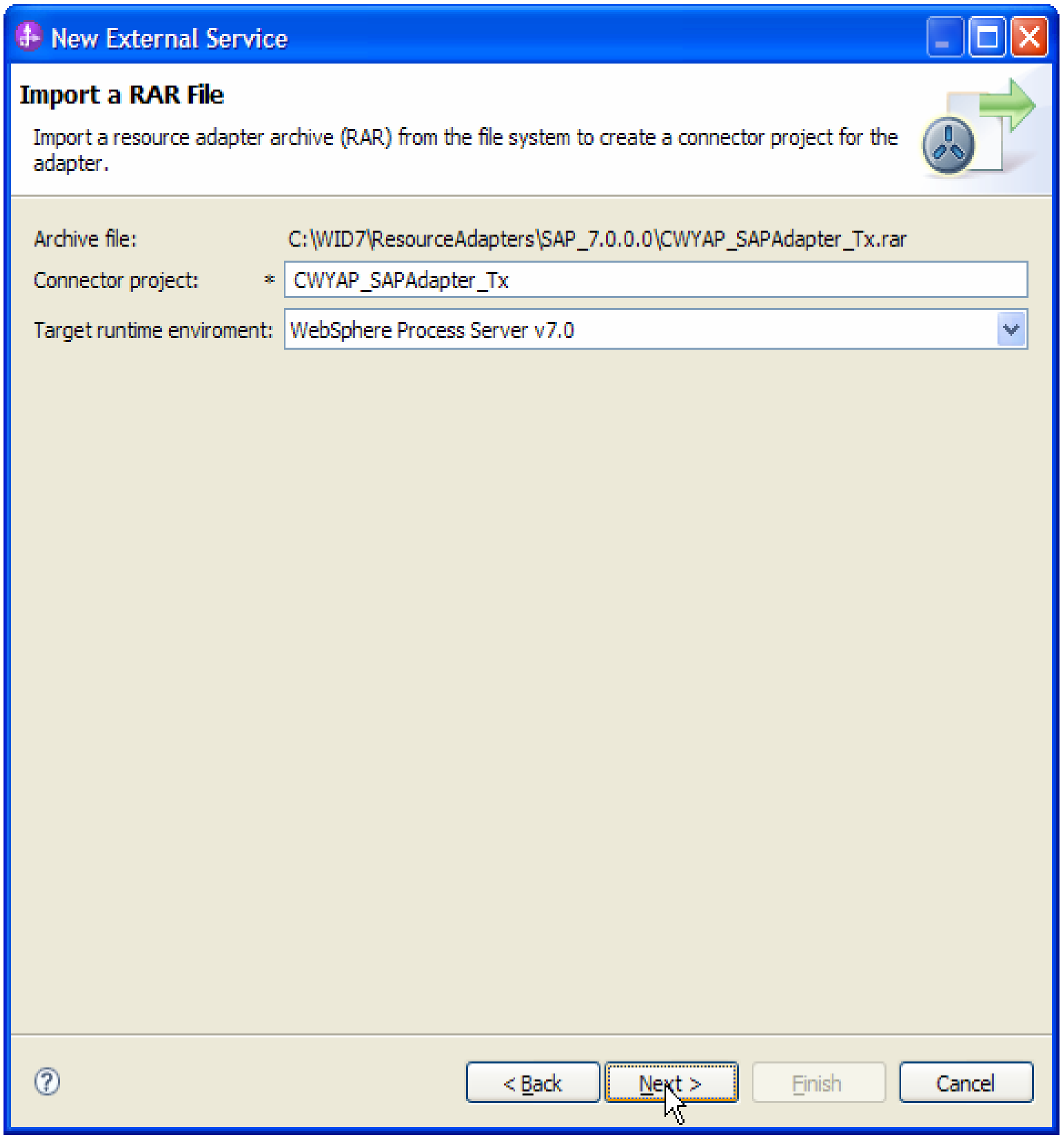
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next.**



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

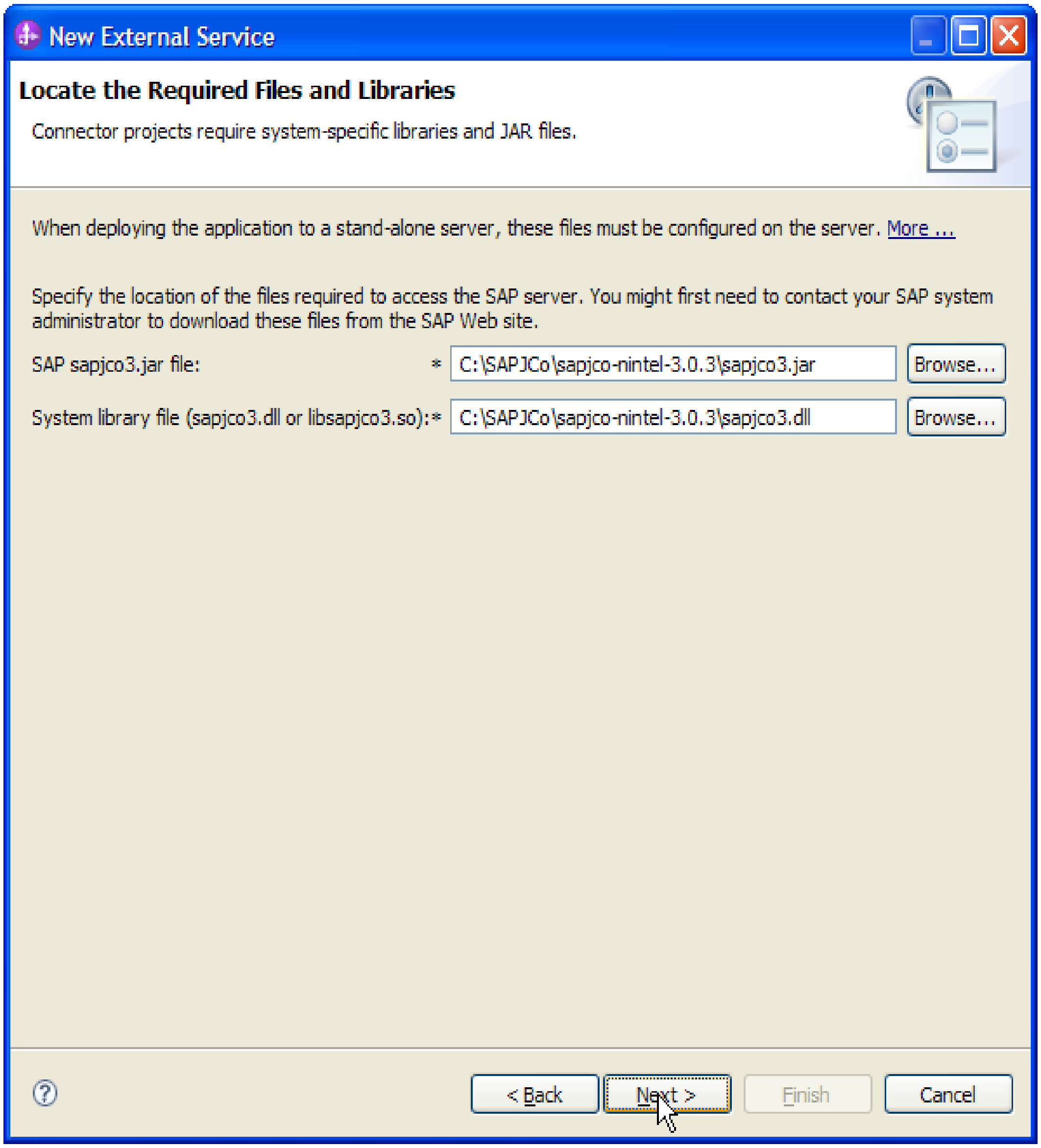
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files**.**



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

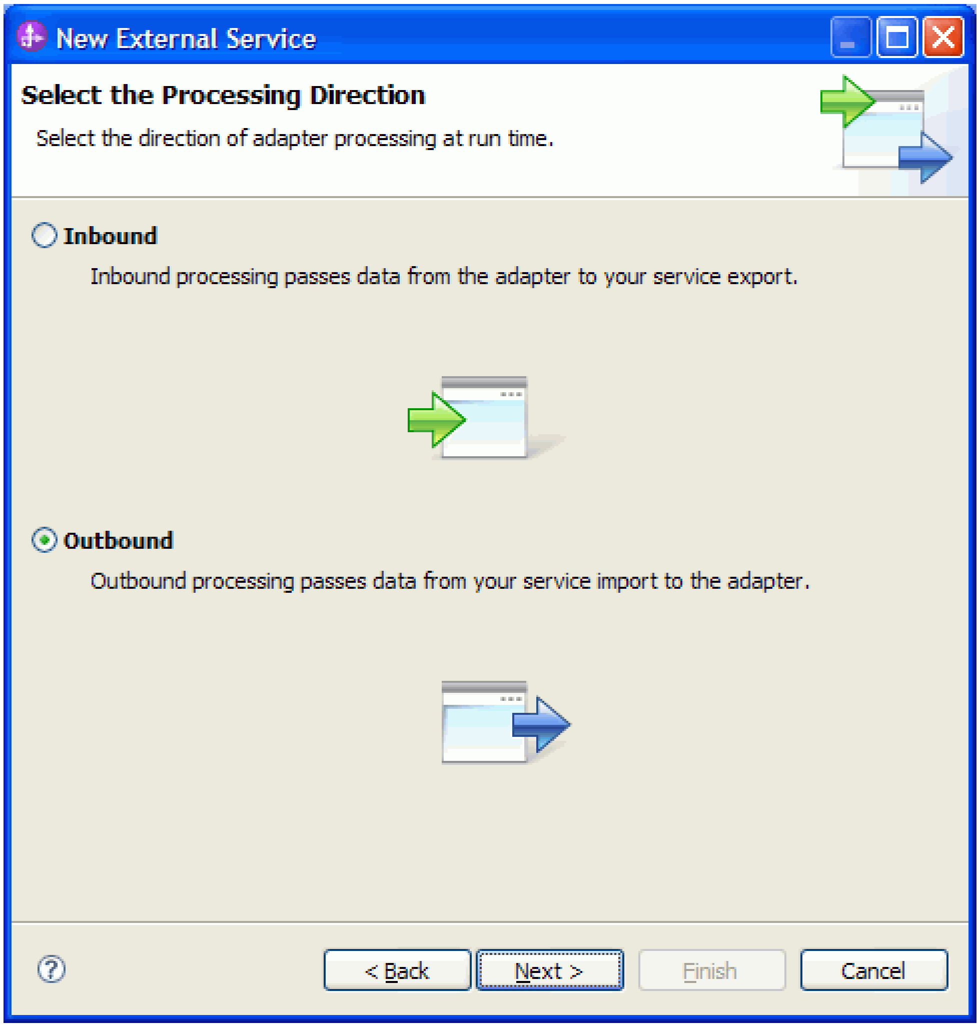
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next**

6. In **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

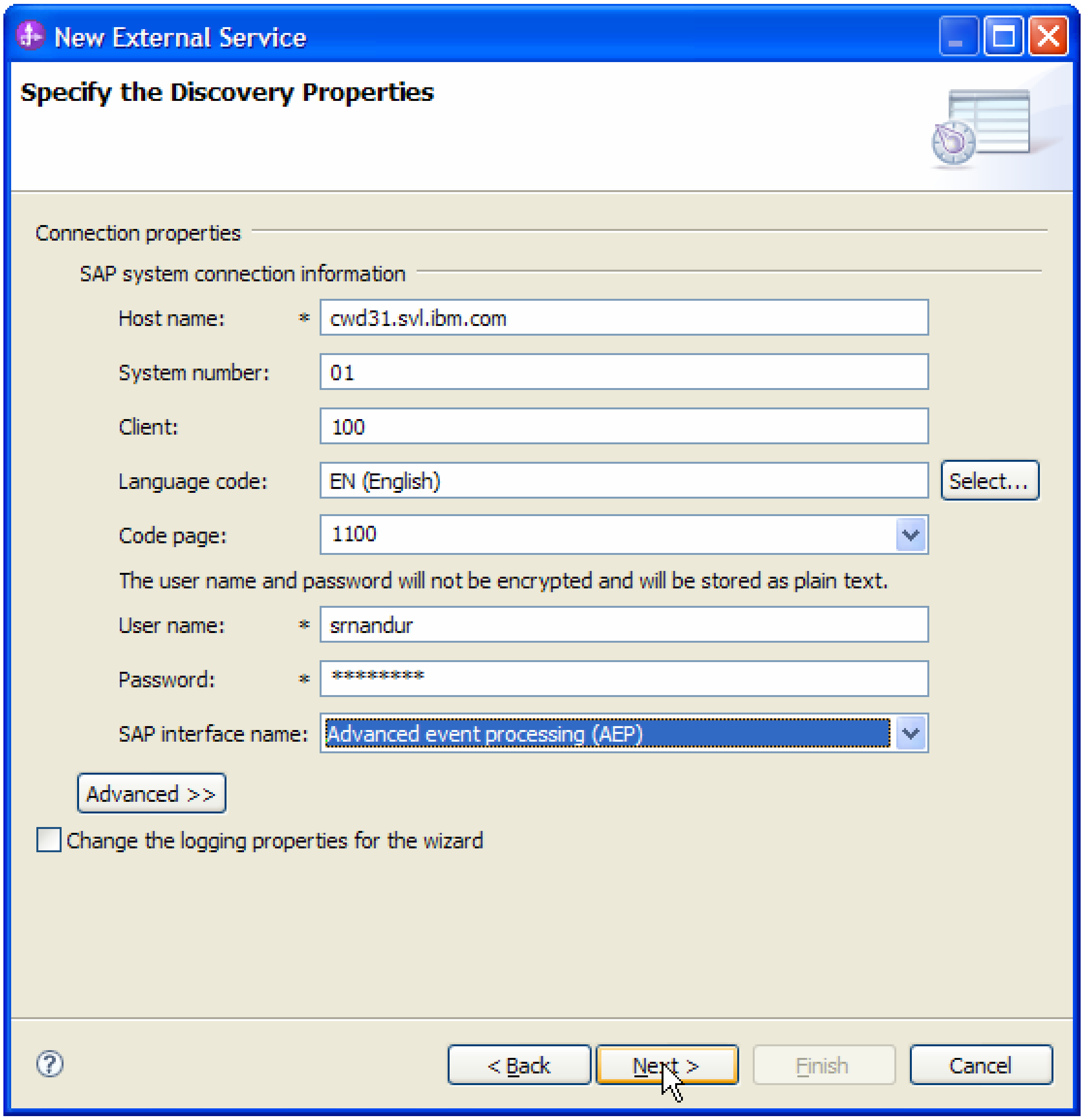
Setting connection properties for the External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

- User name
- Password
- Host name
- System number
- SAP Client connection
- Click Select to change the default Language code from English

- Use the drop down option to change the default Code page from 1100.
- Select **Advanced event processing (AEP)**. as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: *	cwd31.svl.ibm.com
System number:	01
Client:	100
Language code:	EN (English)
Code page:	1100

The user name and password will not be encrypted and will be stored as plain text.

User name: *	srnandur
Password: *	*********
SAP interface name:	Advanced event processing (AEP)

Figure: Select AEP as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find Objects in the Enterprise System** screen, expand **AEP** node under **Discovered objects**, select **Discover IDoc From System**, then click the button.

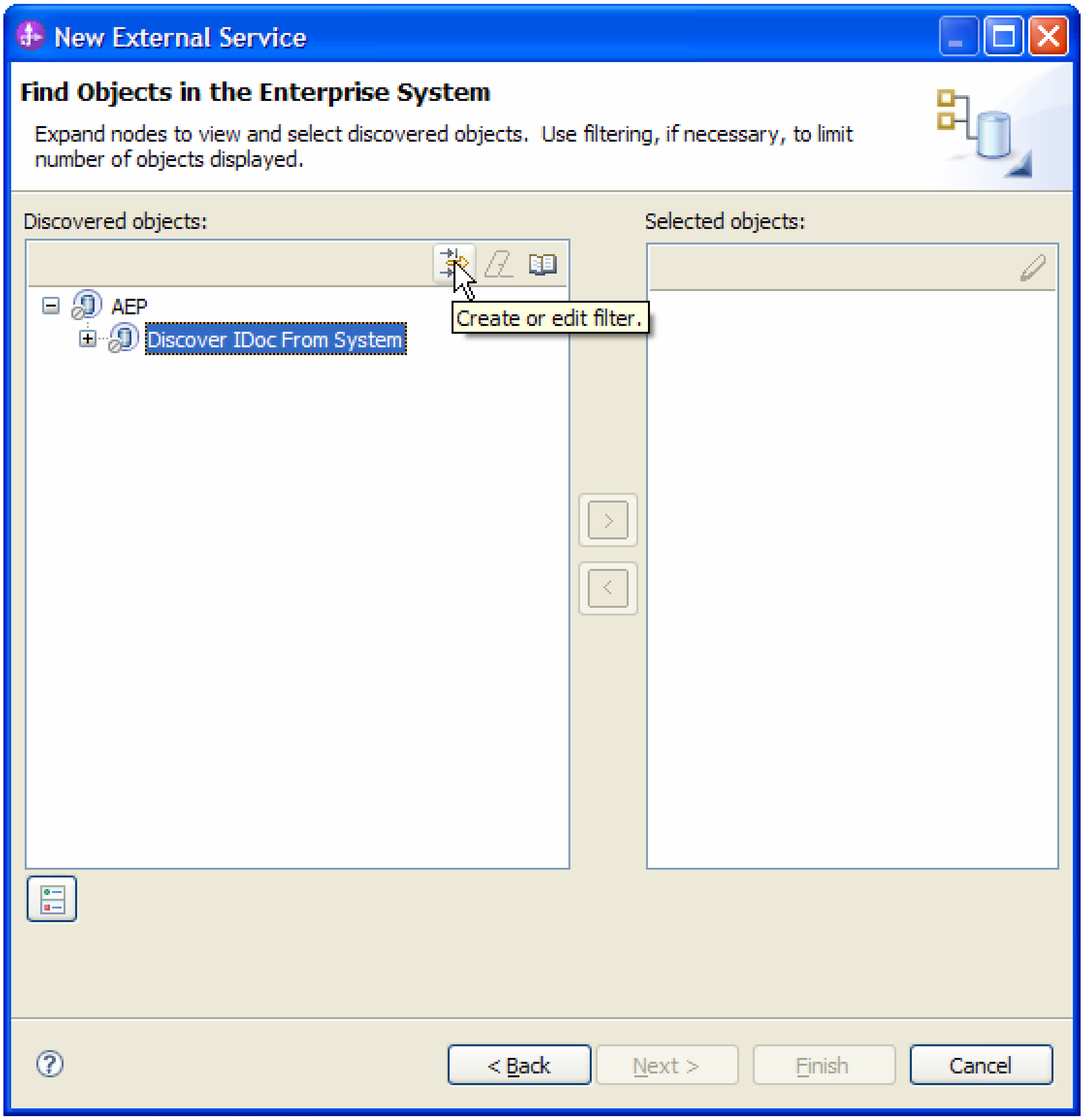
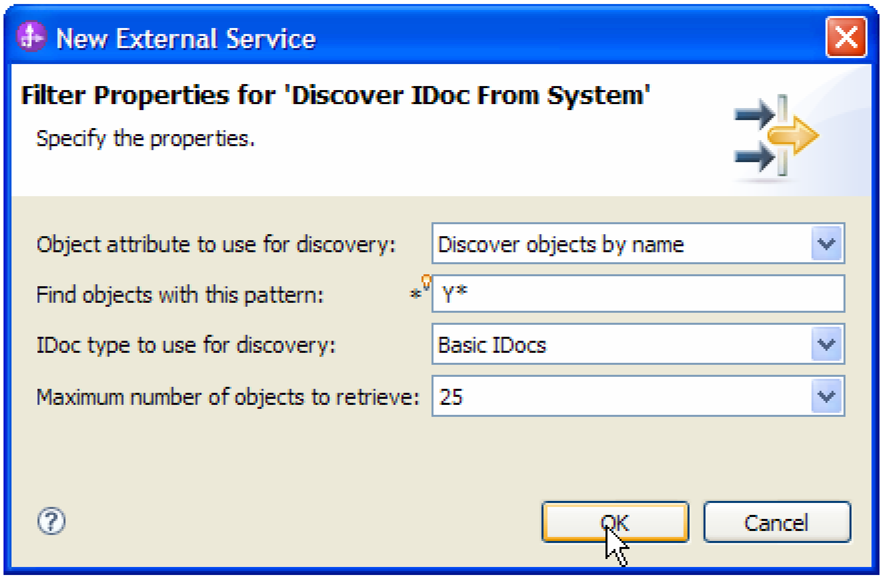

New External Service
Find Objects in the Enterprise System
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.
Discovered objects:
Selected objects:
AEP
Discover IDoc From System
Create or edit filter.
< Back
Next >
Finish
Cancel

Figure: Find Objects in the Enterprise System

Enter Y* in the Filter Properties for **Discover IDoc From System** screen.



New External Service

Filter Properties for 'Discover IDoc From System'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: Y*

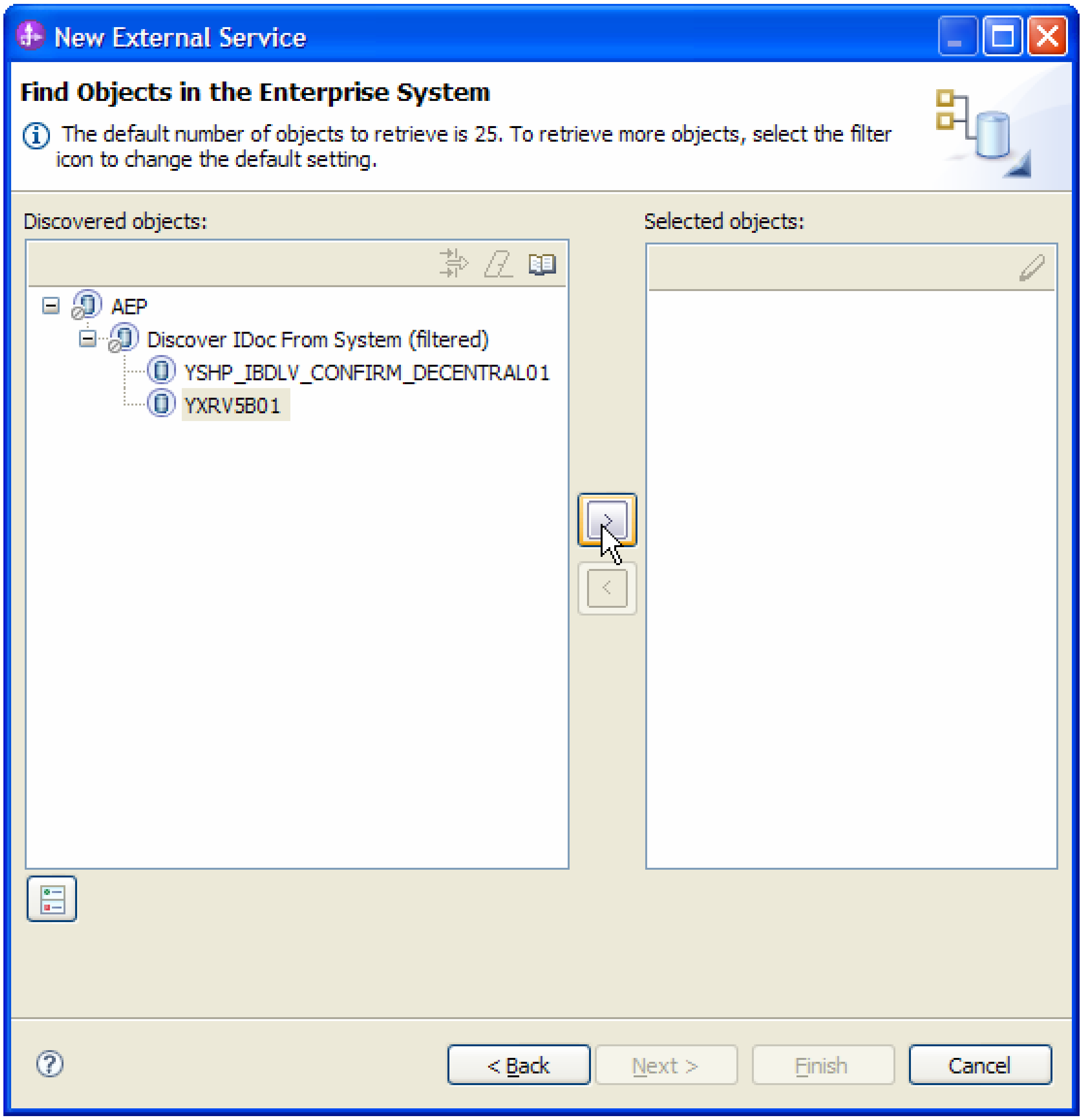
IDoc type to use for discovery: Basic IDocs

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **Discover IDoc From System** node, select **YXRV5B01** and click > button.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

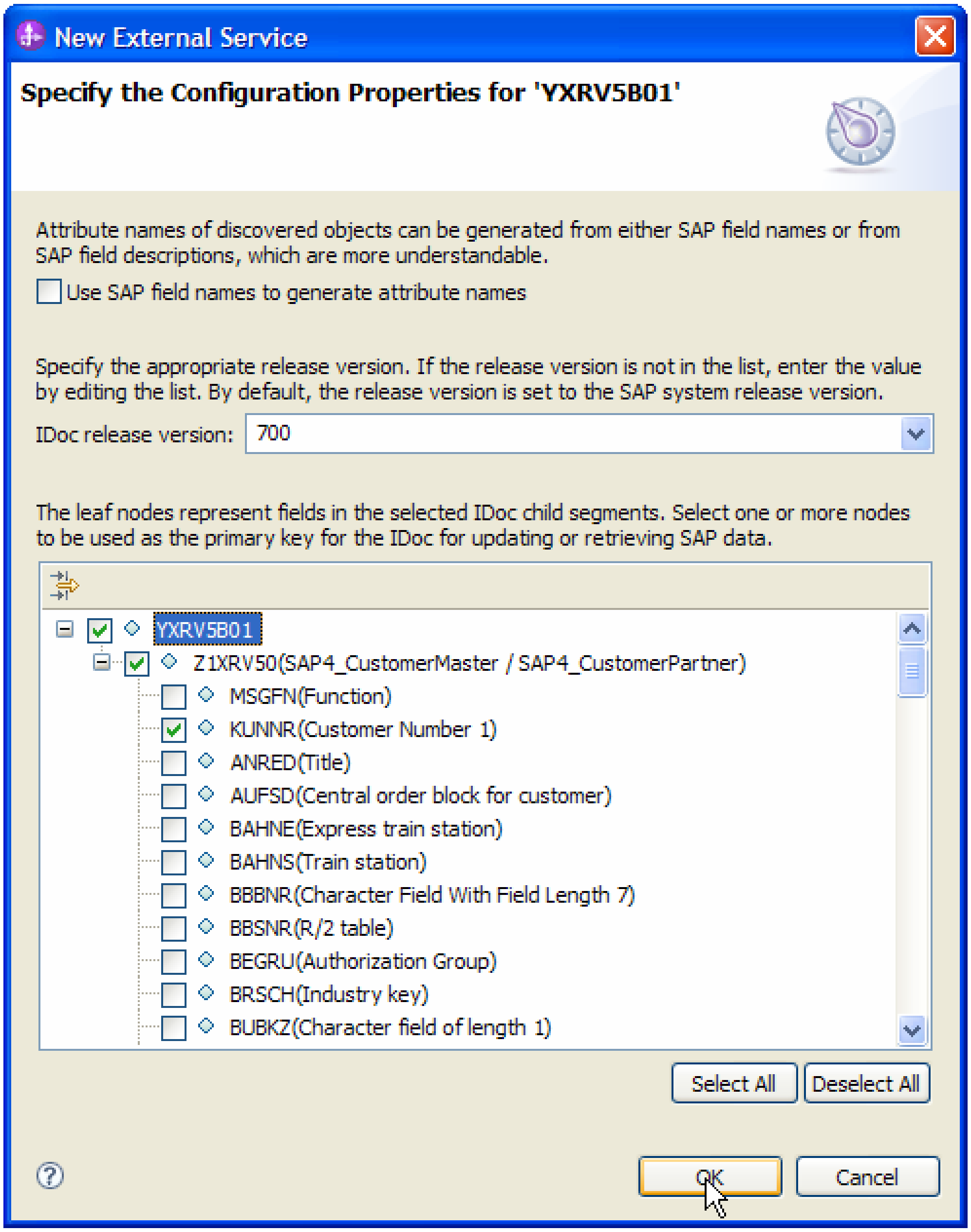
Discovered objects:

- AEP
  - Discover IDoc From System (filtered)
    - YSHP_IBDLV_CONFIRM_DECENTRAL01
    - YXRV5B01

Selected objects:

Figure: Retrieved IDocs' based on search criteria

In **Specify the Configuration Parameters for 'YXRV5B01'**, click **Deselect All** button and then select only KUNNR (Customer Number 1) field. The **Customer Number 1** is the Primary Key field. Click OK.



Specify the Configuration Properties for 'YXRV5B01'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

Specify the appropriate release version. If the release version is not in the list, enter the value by editing the list. By default, the release version is set to the SAP system release version.

IDoc release version: 700

The leaf nodes represent fields in the selected IDoc child segments. Select one or more nodes to be used as the primary key for the IDoc for updating or retrieving SAP data.

- ☑ YXRV5B01
  - ☑ Z1XRV50(SAP4_CustomerMaster / SAP4_CustomerPartner)
    - □ MSGFN(Function)
    - ☑ KUNNR(Customer Number 1)
    - □ ANRED(Title)
    - □ AUFSD(Central order block for customer)
    - □ BAHNE(Express train station)
    - □ BAHNS(Train station)
    - □ BBBNR(Character Field With Field Length 7)
    - □ BBSNR(R/2 table)
    - □ BEGRU(Authorization Group)
    - □ BRSCH(Industry key)
    - □ BUBKZ(Character field of length 1)

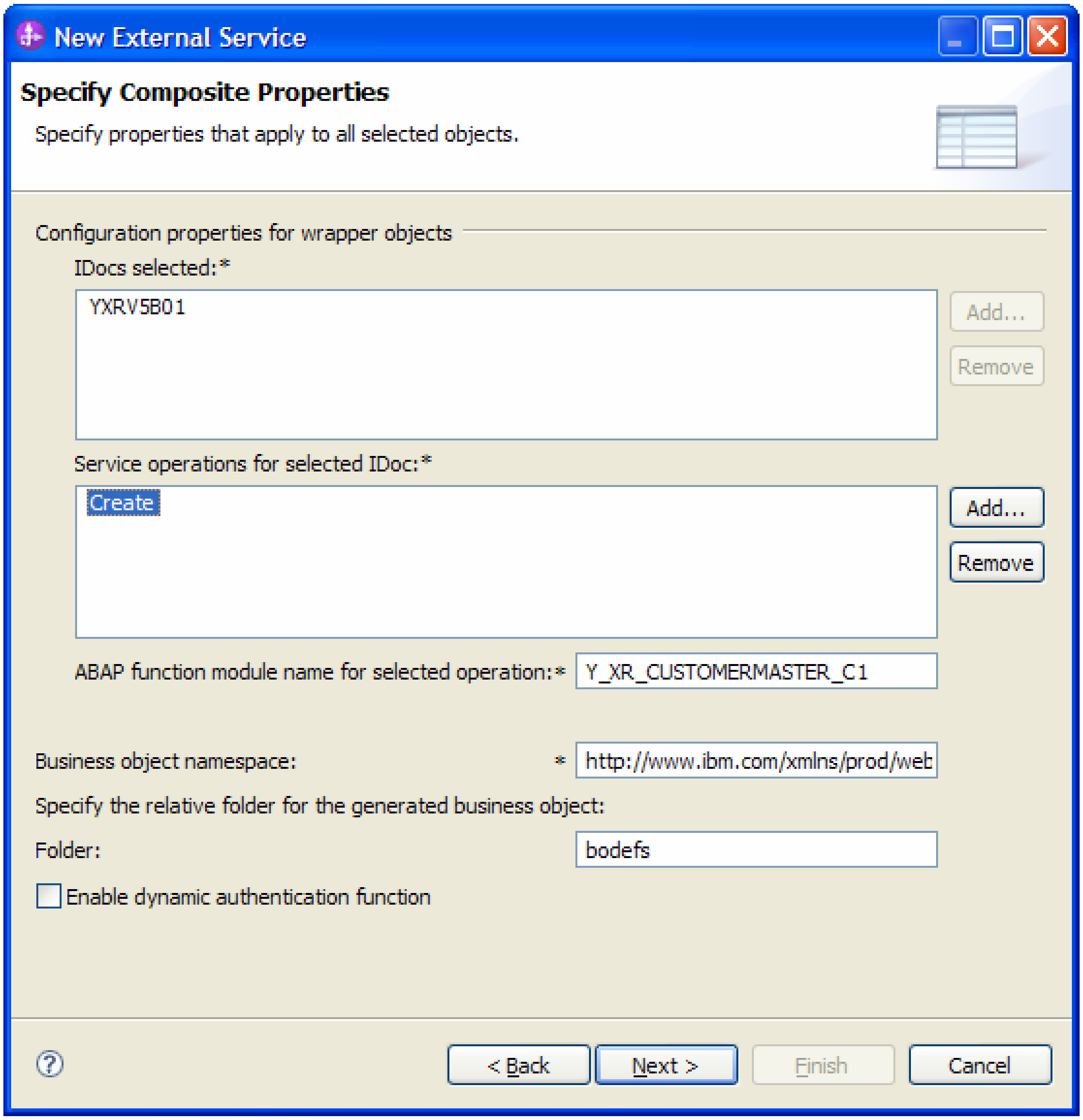
Figure: Setting configuration parameters for the IDoc YXRV5B01 selected

Click **Next** on the Find objects in the Enterprise System screen.

Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen, click the Add button and select Create from the Add Value pop up.

Enter the ABAP function module name and the relative folder for the generated Business Object as shown below.



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Configuration properties for wrapper objects

IDocs selected:* YXRV5B01

Service operations for selected IDoc:* Create

ABAP function module name for selected operation:* Y_XR_CUSTOMERMASTER_C1

Business object namespace: * http://www.ibm.com/xmlns/prod/web

Specify the relative folder for the generated business object:

Folder: bodefs

□ Enable dynamic authentication function

Repeat the steps (a) and (b) above for Update, Delete and Retrieve operations. Give the ABAP function module name as mentioned below.

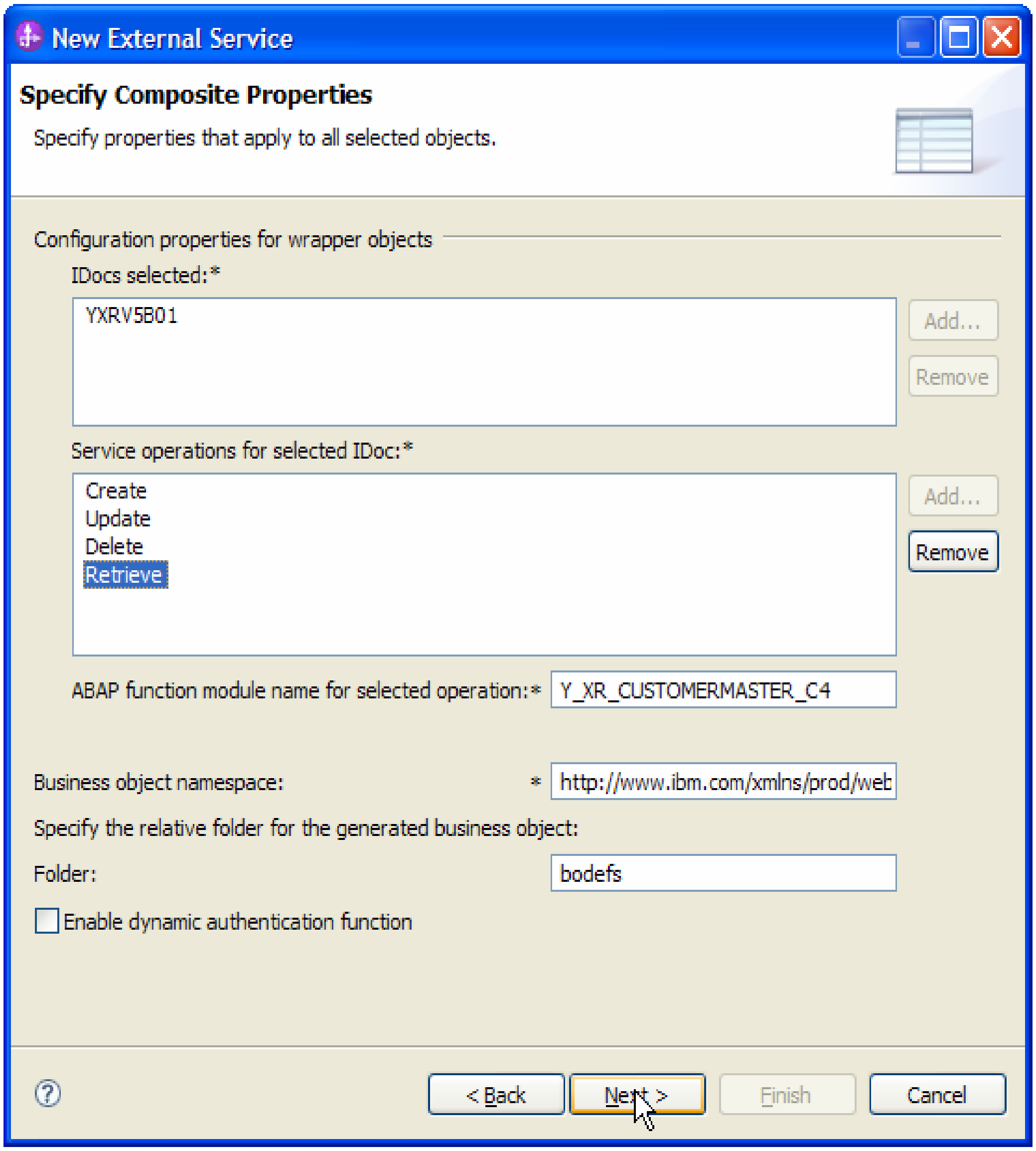
Update - Y_XR_CUSTOMERMASTER_C2

Delete - Y_XR_CUSTOMERMASTER_C3

Retrieve - Y_XR_CUSTOMERMASTER_C4

These are custom Function Modules in SAP system provided as samples by the adapter installer, which were called based on the operation.

Click **Next**.



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Configuration properties for wrapper objects

IDocs selected:*

YXRV5B01

Service operations for selected IDoc:*

Create
Update
Delete
Retrieve

ABAP function module name for selected operation:* Y_XR_CUSTOMERMASTER_C4

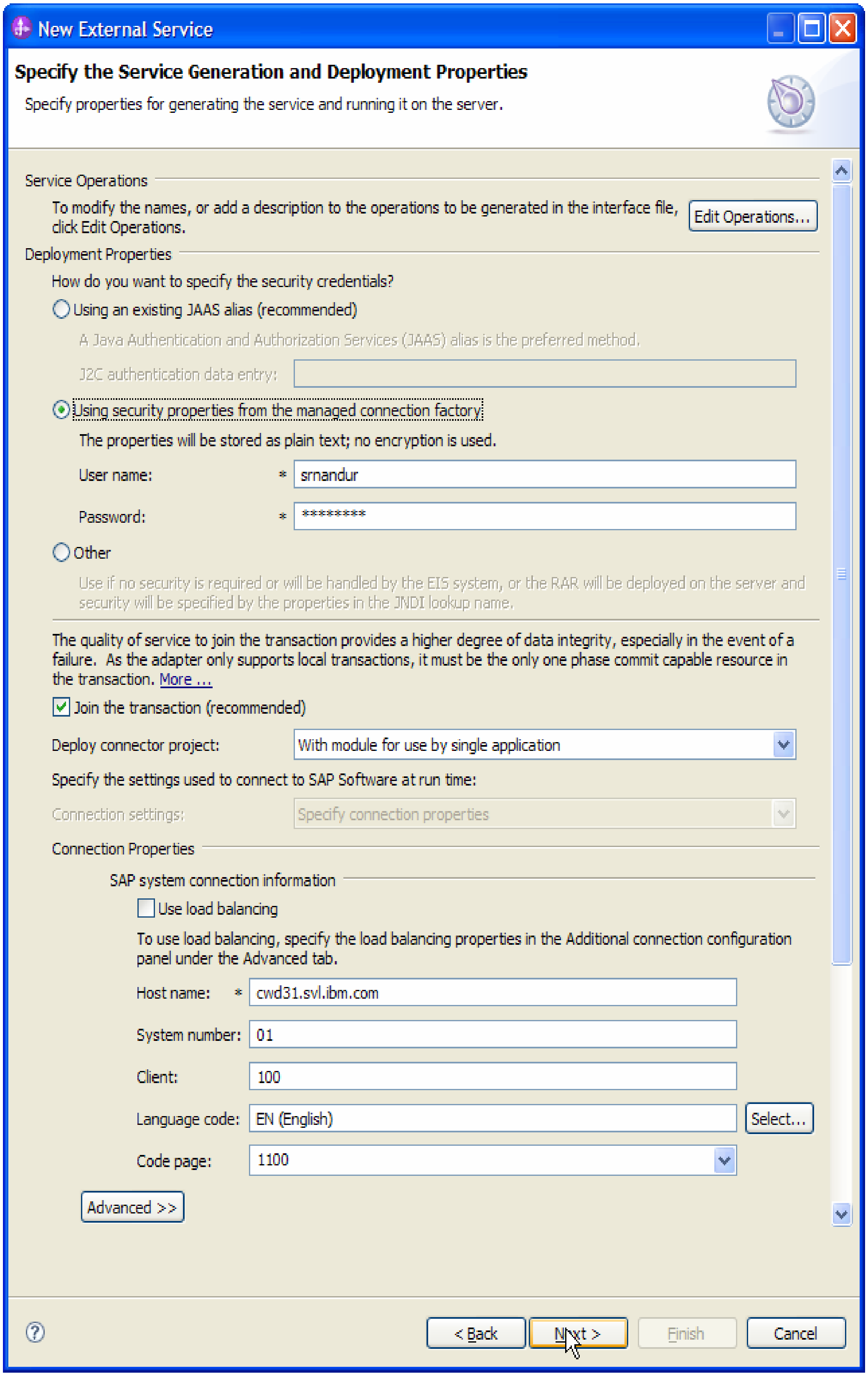
Business object namespace: * http://www.ibm.com/xmlns/prod/web

Specify the relative folder for the generated business object:

Folder: bodefs

□ Enable dynamic authentication function

On the **Service Generation and Deployment Configuration** screen, enter the connection and deployment information.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

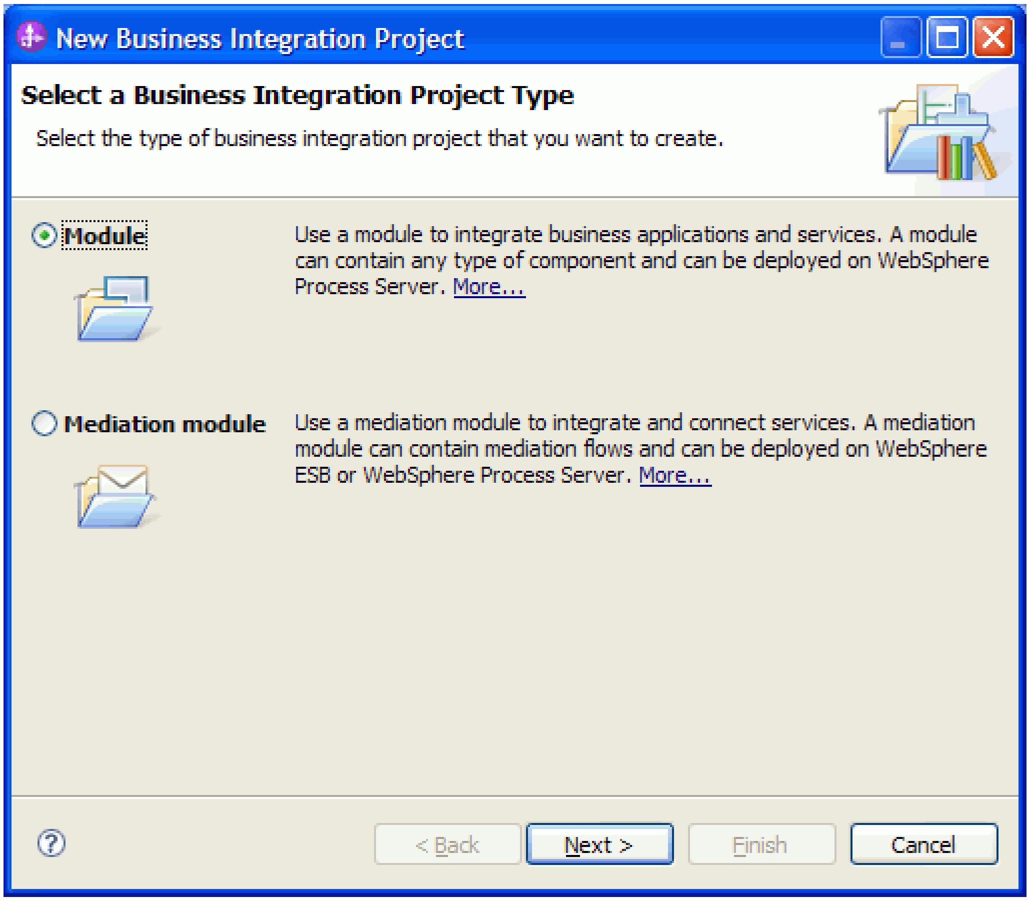
Figure: Service Generation and Deployment Configuration

Note: You can either enter an Authentication Alias previously created using the Administrative Console of the WebSphere Process Server or simply enter the username and password used to login in to the SAP.

Click **Next.**

In the Specify the Location Properties screen, click the **New** button next to the Module field to create a new module.

When the New Business Integration Project screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

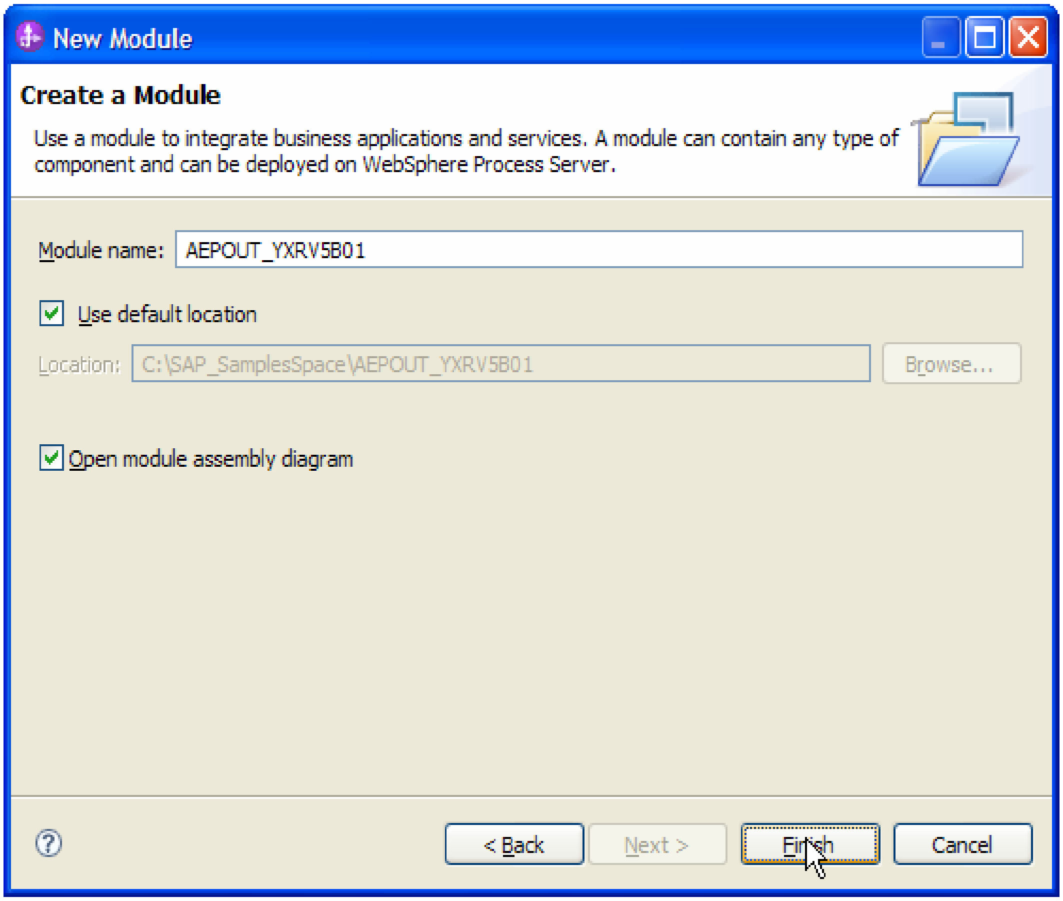
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **AEPOUT_YXRV5B01** in the Module Name field, and then click **Finish**.



New Module

Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

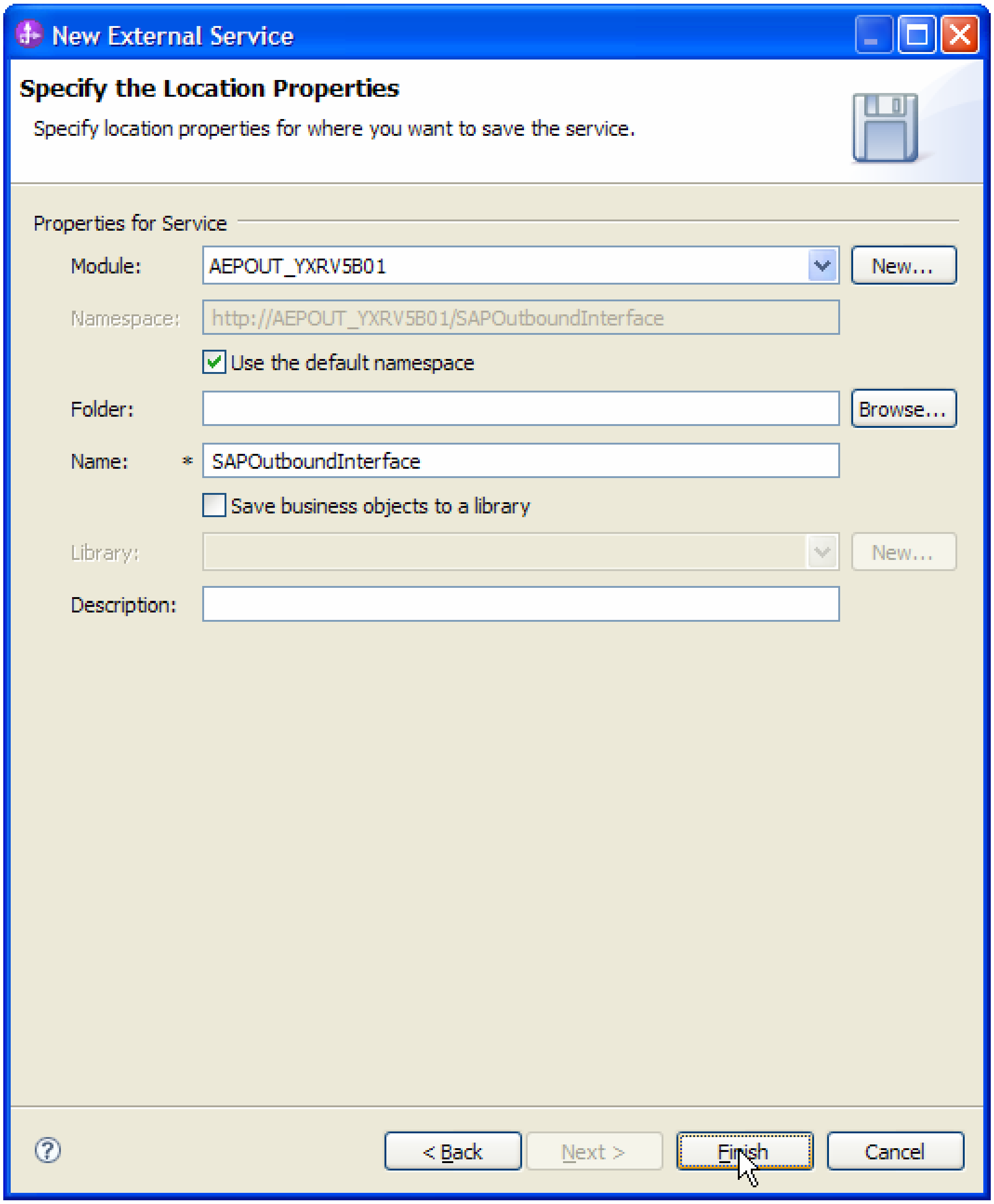
Module name: AEPOUT_YXRV5B01

☑ Use default location

Location: C:\SAP_SamplesSpace\AEPOUT_YXRV5B01

☑ Open module assembly diagram

Click **Finish** on Specify the Location Properties screen**.**



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: AEPOUT_YXRV5B01

Namespace: http://AEPOUT_YXRV5B01/SAPOutboundInterface

☑ Use the default namespace

Folder:

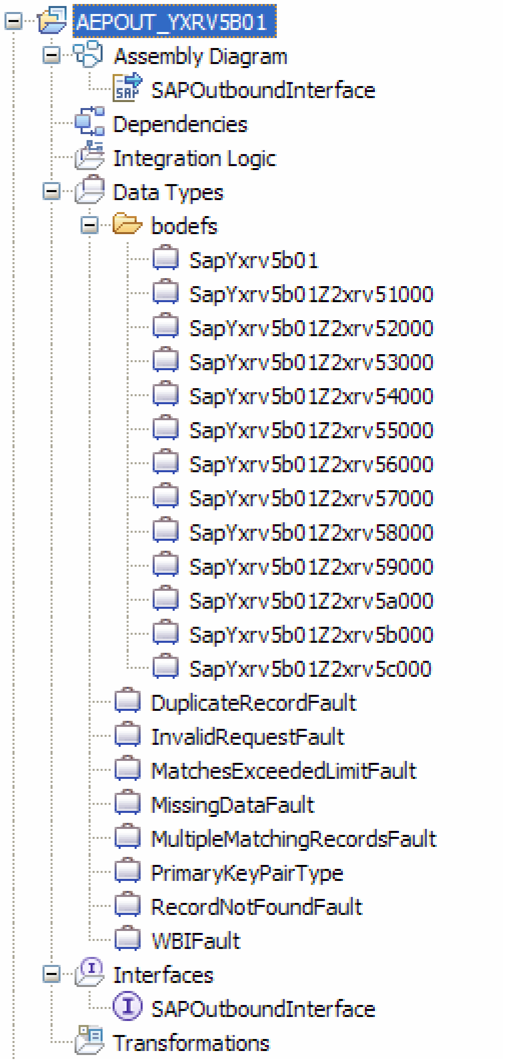
Name: * SAPOutboundInterface

☐ Save business objects to a library

Library:

Description:

Verify the results.



- AEPOUT_YXRV5B01
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapYxrv5b01
      - SapYxrv5b01Z2xrv51000
      - SapYxrv5b01Z2xrv52000
      - SapYxrv5b01Z2xrv53000
      - SapYxrv5b01Z2xrv54000
      - SapYxrv5b01Z2xrv55000
      - SapYxrv5b01Z2xrv56000
      - SapYxrv5b01Z2xrv57000
      - SapYxrv5b01Z2xrv58000
      - SapYxrv5b01Z2xrv59000
      - SapYxrv5b01Z2xrv5a000
      - SapYxrv5b01Z2xrv5b000
      - SapYxrv5b01Z2xrv5c000
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

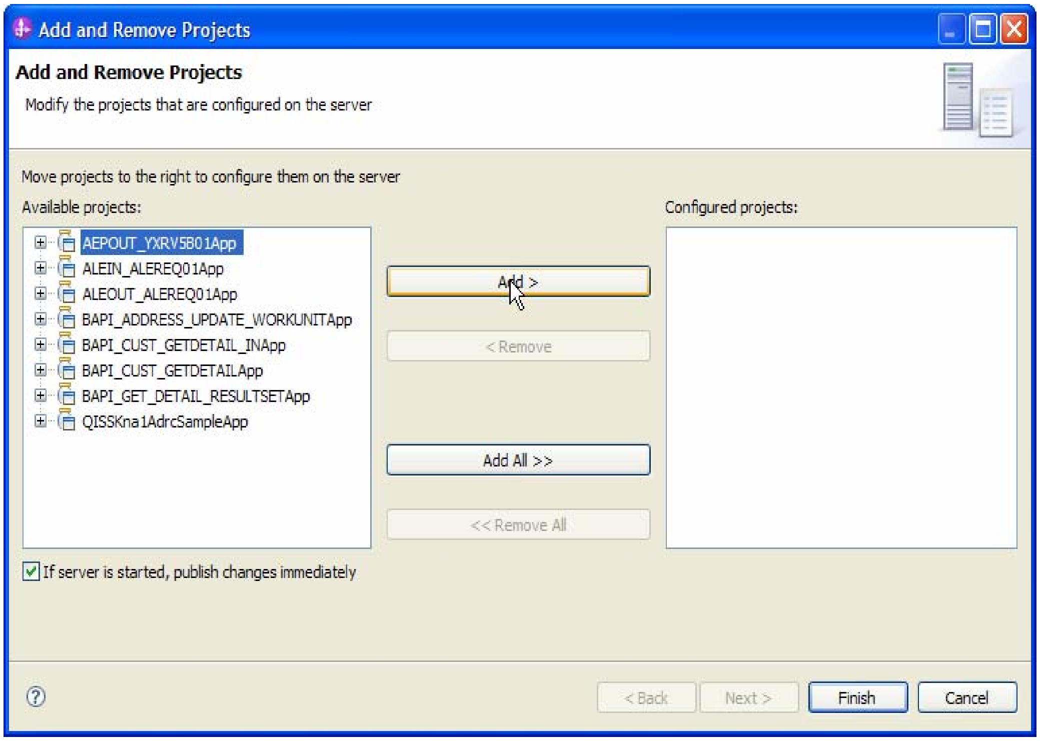
Figure: Artifacts created after the EMD run for the AEP outbound Module

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer’s Test Client.

Right click on your server node in the Server tab and add the module AEPOUT_YXRV5B01 by selecting **Add and Remove Projects**.

The project AEPOUT_YXRV5B01App will be listed under **Available projects**.


Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

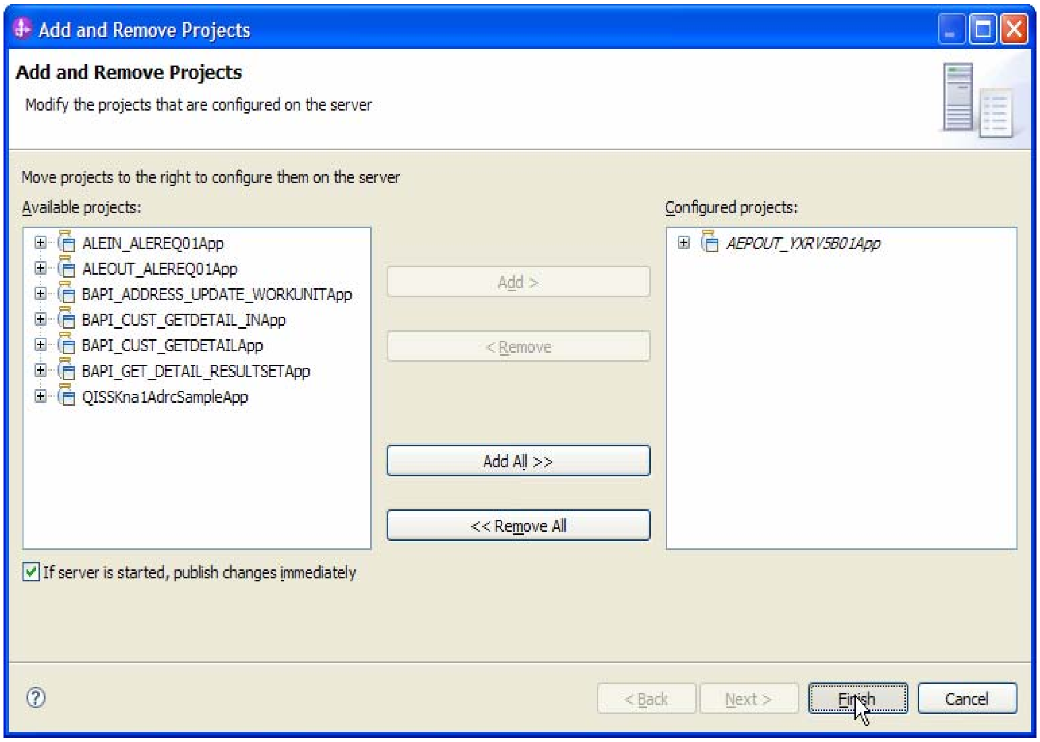
Available projects:

- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

☑ If server is started, publish changes immediately

After adding the project, the added project should appear under the Configured projects. Add the SCA module to the server by clicking **Finish.**


Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- ALEIN_ALEREQ01App
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

- *AEPOUT_YXRV5B01App*

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Test the assembled adapter application using the WebSphere Integration Developer's Test Client.

1. Once the module is deployed to the Server, right click on the module BAPI_CUST_GETDETAIL from the **Projects** view and select **Test > Test Module** from the pop-up menu.

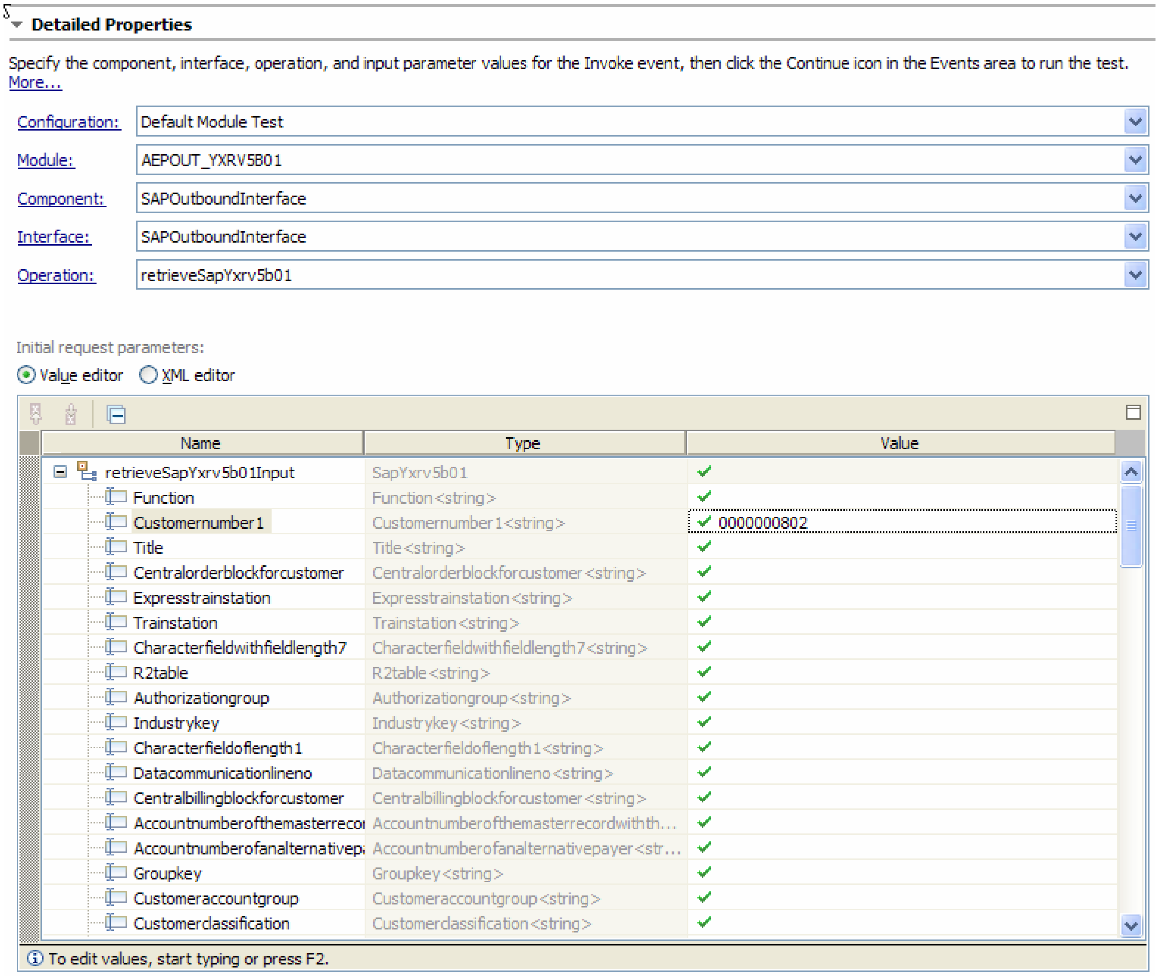
2. Enter values in the **Test Client** as shown in the figure below

For Retrieve operation

Operation: Retrieve (retrieveSapYxrv5b01)

Customernumber1: 0000000802 (of BO SapYxrv5b01)

Verb: Create or Update or Delete



Detailed Properties

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

Configuration: Default Module Test

Module: AEPOUT_YXRV5B01

Component: SAPOutboundInterface

Interface: SAPOutboundInterface

Operation: retrieveSapYxrv5b01

Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
retrieveSapYxrv5b01Input	SapYxrv5b01	✓
Function	Function<string>	✓
Customernumber1	Customernumber1<string>	✓ 0000000802
Title	Title<string>	✓
Centralorderblockforcustomer	Centralorderblockforcustomer<string>	✓
Expresstrainstation	Expresstrainstation<string>	✓
Trainstation	Trainstation<string>	✓
Characterfieldwithfieldlength7	Characterfieldwithfieldlength7<string>	✓
R2table	R2table<string>	✓
Authorizationgroup	Authorizationgroup<string>	✓
Industrykey	Industrykey<string>	✓
Characterfieldoflength1	Characterfieldoflength1<string>	✓
Datacommunicationlineno	Datacommunicationlineno<string>	✓
Centralbillingblockforcustomer	Centralbillingblockforcustomer<string>	✓
Accountnumberofthemasterrecoı	Accountnumberofthemasterrecordwithth...	✓
Accountnumberofanalternativepa	Accountnumberofanalternativepayer<str...	✓
Groupkey	Groupkey<string>	✓
Customeraccountgroup	Customeraccountgroup<string>	✓
Customerclassification	Customerclassification<string>	✓

ⓘ To edit values, start typing or press F2.

For the Create operation

Title: Mr

Name1: Sample Test

City: Burlingame

Sortfield: IB

Customeraccountgroup: 0001

Characterfieldoflength11: EN

Transportationzonetoorfromwhichthegoodsaredelivered: 0000000001

Countrykey: US

ii. Add an element to SapYxrv5b01Z2xrv51000, and populate the following

Salesorganization: 0001

Distributionchannel: 01

Division: 01

Shippingconditions: 01

iii. Add an element to SapYxrv5b01Z2xrv54000, and populate the following

Nameofglobalcompanycode: 0001

Reconciliationaccountingeneralledger: 120000

c) For Update operation

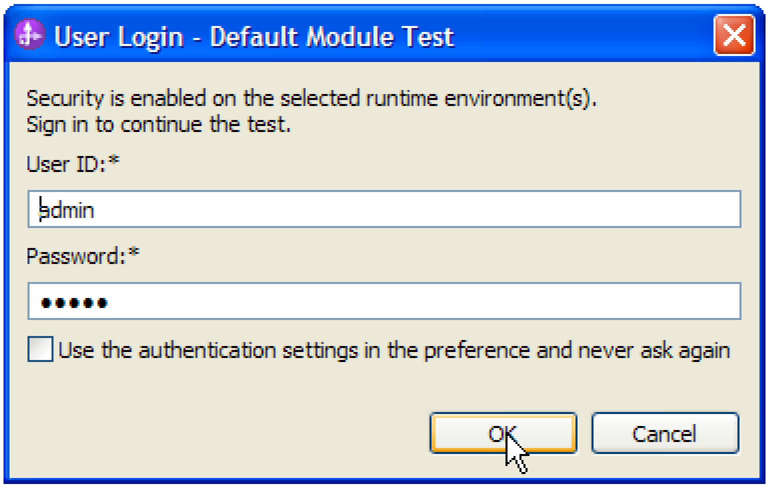
Customernumber1: 0000000815

Title: Mrs

3. Click the **Continue** button▷.

When the **Select Deployment** screen appears, select the WebSphere Process Server instance to which you added the project and click the **Finish** button.

4. If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK**.



User Login - Default Module Test

Security is enabled on the selected runtime environment(s).
Sign in to continue the test.

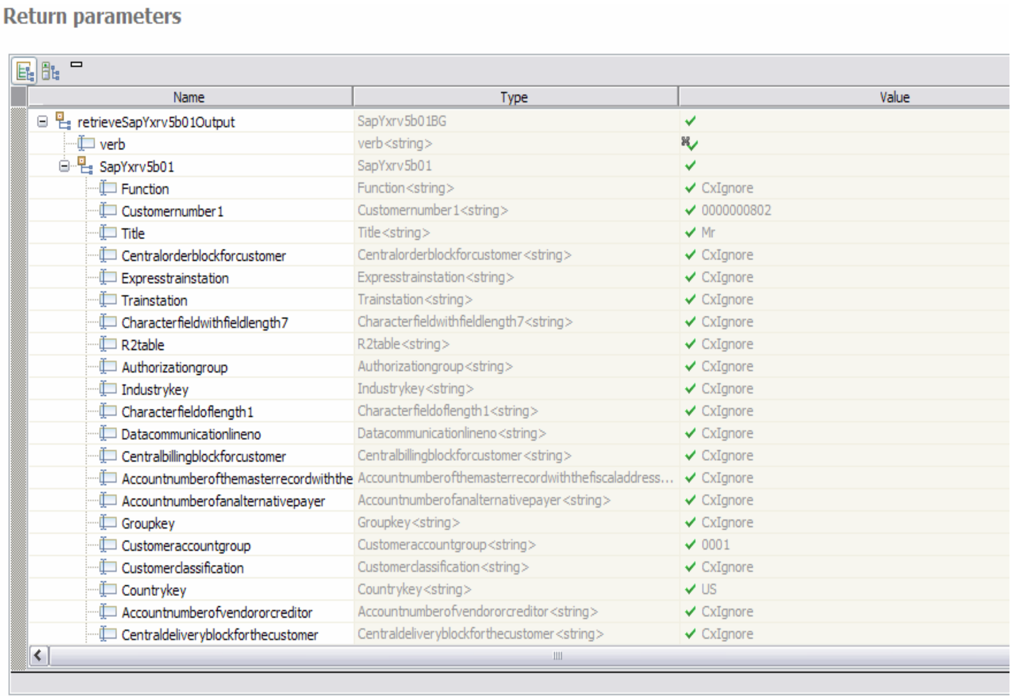
User ID:* admin

Password:* ●●●●●

□ Use the authentication settings in the preference and never ask again

5. Check the output of the service in the test client

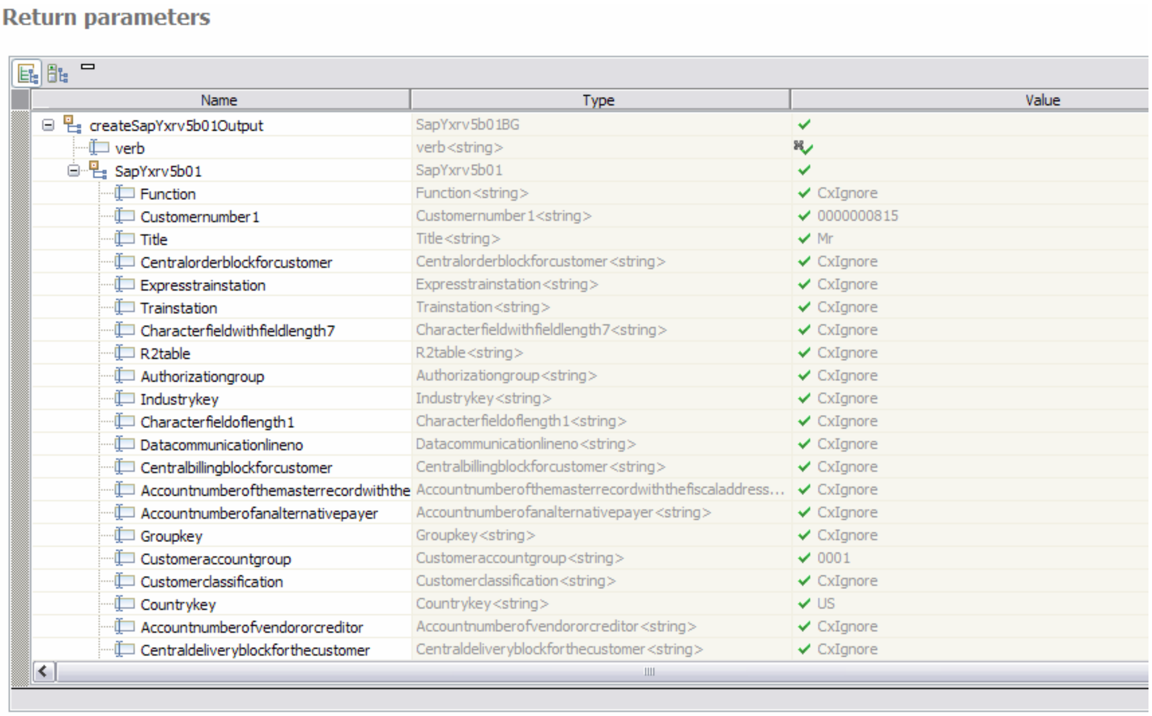
a. Retrieve



Return parameters

Name	Type	Value
retrieveSapYxrv5b01Output	SapYxrv5b01BG	✓
verb	verb<string>	✓
SapYxrv5b01	SapYxrv5b01	✓
Function	Function<string>	✓ CxIgnore
Customernumber1	Customernumber1<string>	✓ 0000000802
Title	Title<string>	✓ Mr
Centralorderblockforcustomer	Centralorderblockforcustomer<string>	✓ CxIgnore
Expresstrainstation	Expresstrainstation<string>	✓ CxIgnore
Trainstation	Trainstation<string>	✓ CxIgnore
Characterfieldwithfieldlength7	Characterfieldwithfieldlength7<string>	✓ CxIgnore
R2table	R2table<string>	✓ CxIgnore
Authorizationgroup	Authorizationgroup<string>	✓ CxIgnore
Industrykey	Industrykey<string>	✓ CxIgnore
Characterfieldoflength1	Characterfieldoflength1<string>	✓ CxIgnore
Datacommunicationlineno	Datacommunicationlineno<string>	✓ CxIgnore
Centralbillingblockforcustomer	Centralbillingblockforcustomer<string>	✓ CxIgnore
Accountnumberofthemasterrecordwiththe	Accountnumberofthemasterrecordwiththefiscaladdress...	✓ CxIgnore
Accountnumberofanalternativepayer	Accountnumberofanalternativepayer<string>	✓ CxIgnore
Groupkey	Groupkey<string>	✓ CxIgnore
Customeraccountgroup	Customeraccountgroup<string>	✓ 0001
Customerclassification	Customerclassification<string>	✓ CxIgnore
Countrykey	Countrykey<string>	✓ US
Accountnumberofvendororcreditor	Accountnumberofvendororcreditor<string>	✓ CxIgnore
Centraldeliveryblockforthecustomer	Centraldeliveryblockforthecustomer<string>	✓ CxIgnore

b. Create



Return parameters

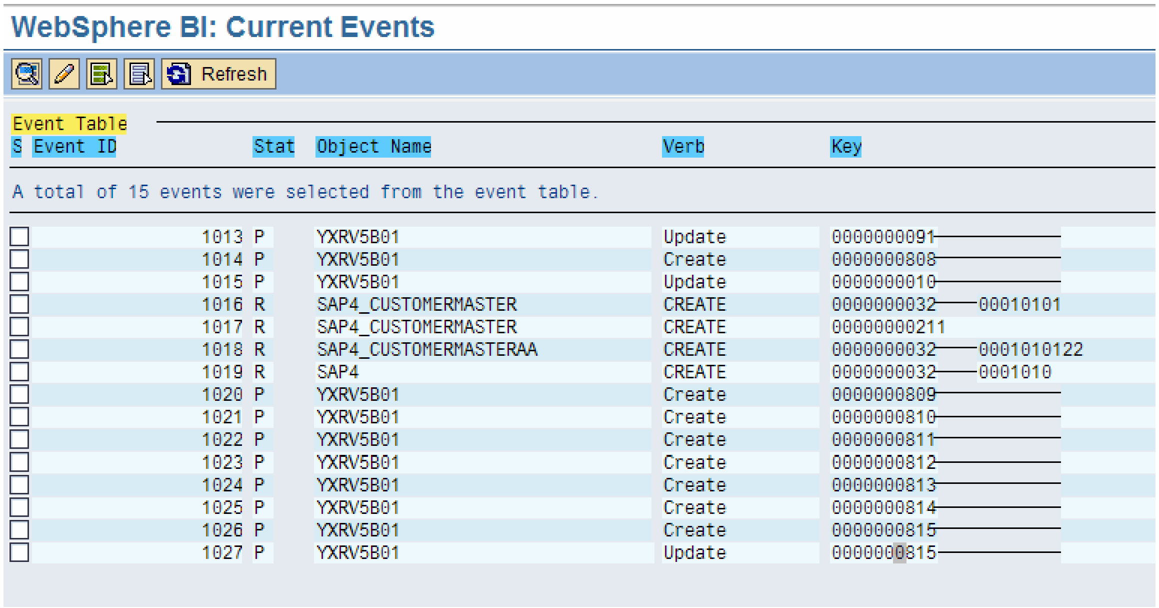
Name	Type	Value
createSapYxrv5b01Output	SapYxrv5b01BG	✓
verb	verb<string>	✓
SapYxrv5b01	SapYxrv5b01	✓
Function	Function<string>	✓ CxIgnore
Customernumber1	Customernumber1<string>	✓ 0000000815
Title	Title<string>	✓ Mr
Centralorderblockforcustomer	Centralorderblockforcustomer<string>	✓ CxIgnore
Expresstrainstation	Expresstrainstation<string>	✓ CxIgnore
Trainstation	Trainstation<string>	✓ CxIgnore
Characterfieldwithfieldlength7	Characterfieldwithfieldlength7<string>	✓ CxIgnore
R2table	R2table<string>	✓ CxIgnore
Authorizationgroup	Authorizationgroup<string>	✓ CxIgnore
Industrykey	Industrykey<string>	✓ CxIgnore
Characterfieldoflength1	Characterfieldoflength1<string>	✓ CxIgnore
Datacommunicationlineno	Datacommunicationlineno<string>	✓ CxIgnore
Centralbillingblockforcustomer	Centralbillingblockforcustomer<string>	✓ CxIgnore
Accountnumberofthemasterrecordwiththe	Accountnumberofthemasterrecordwiththefiscaladdress...	✓ CxIgnore
Accountnumberofanalternativepayer	Accountnumberofanalternativepayer<string>	✓ CxIgnore
Groupkey	Groupkey<string>	✓ CxIgnore
Customeraccountgroup	Customeraccountgroup<string>	✓ 0001
Customerclassification	Customerclassification<string>	✓ CxIgnore
Countrykey	Countrykey<string>	✓ US
Accountnumberofvendororcreditor	Accountnumberofvendororcreditor<string>	✓ CxIgnore
Centraldeliveryblockforthecustomer	Centraldeliveryblockforthecustomer<string>	✓ CxIgnore

c. Update – check the EIS.

6. Check that the data in the EIS matches the above output -

Login to the SAP GUI using the credentials for the given SAP server

Execute /o/cwld/home_aep, Click Management tab, Click Current Events button, enter Date of Event, click Execute



Event Table

S	Event ID	Stat	Object Name	Verb	Key
A total of 15 events were selected from the event table.					
□	1013	P	YXRV5B01	Update	0000000091
□	1014	P	YXRV5B01	Create	0000000808
□	1015	P	YXRV5B01	Update	0000000010
□	1016	R	SAP4_CUSTOMERMASTER	CREATE	0000000032 00010101
□	1017	R	SAP4_CUSTOMERMASTER	CREATE	00000000211
□	1018	R	SAP4_CUSTOMERMASTERAA	CREATE	0000000032 0001010122
□	1019	R	SAP4	CREATE	0000000032 0001010
□	1020	P	YXRV5B01	Create	0000000809
□	1021	P	YXRV5B01	Create	0000000810
□	1022	P	YXRV5B01	Create	0000000811
□	1023	P	YXRV5B01	Create	0000000812
□	1024	P	YXRV5B01	Create	0000000813
□	1025	P	YXRV5B01	Create	0000000814
□	1026	P	YXRV5B01	Create	0000000815
□	1027	P	YXRV5B01	Update	0000000815

Clearing the sample content

If you have added a test record to the Customer Master table, clean up after this tutorial.

Chapter 13. Tutorial 9: AEP Interface Inbound processing

This tutorial demonstrates how the WebSphere Adapter for SAP 7.0.0.0 uses the AEP interface polling mechanism to retrieve events from the event table with P or Q status in the SAP system. These events will be processed by the adapter and sent to the configured end-points. After the events are retrieved and processed, they will be archived in the SAP system.

This tutorial explains how you can configure the adapter for inbound processing; deploy; and test the module for processing.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <*WPS_INSTALL*>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <*WPS_INSTALL*>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the *<WPS_INSTALL>*/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

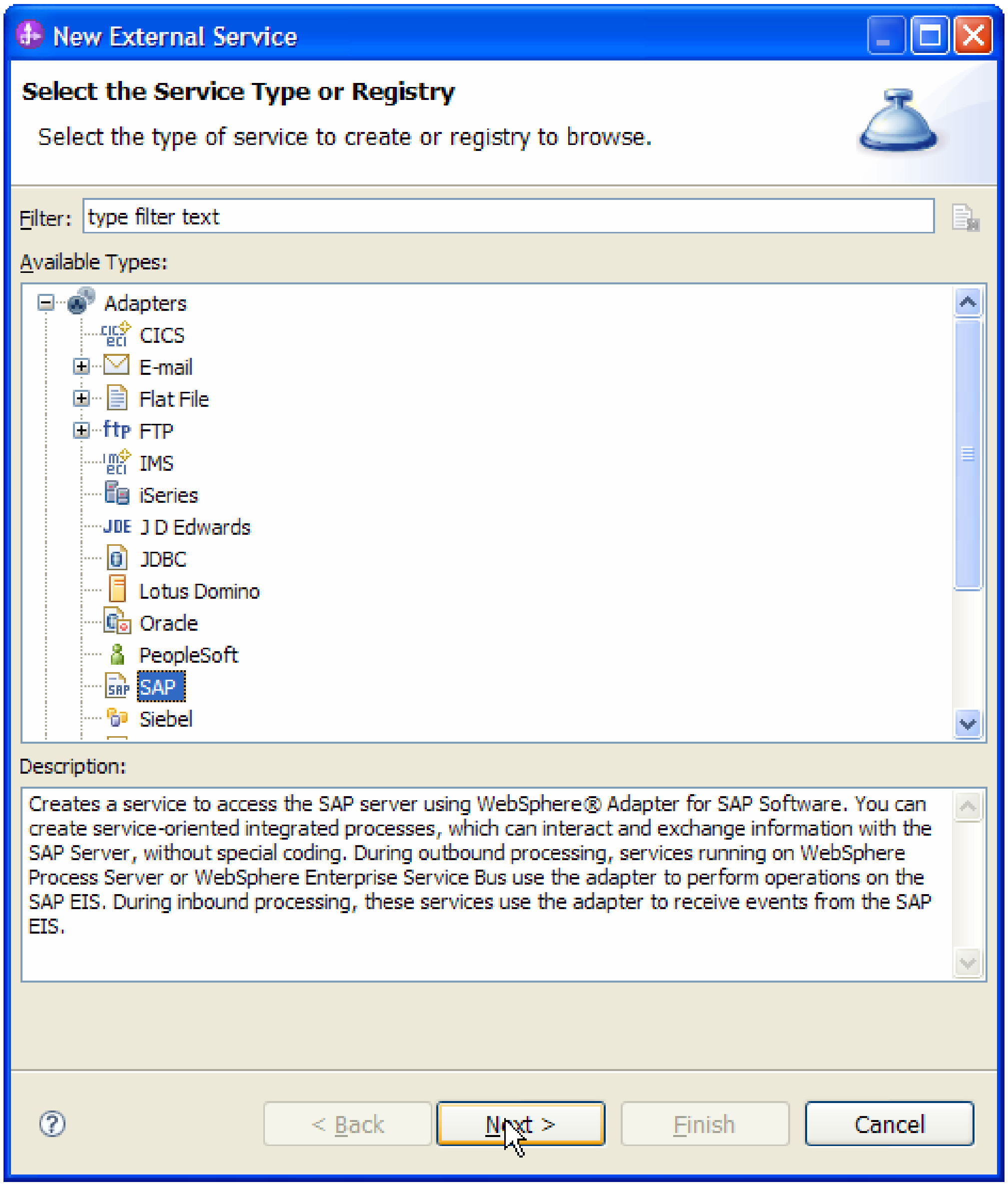
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

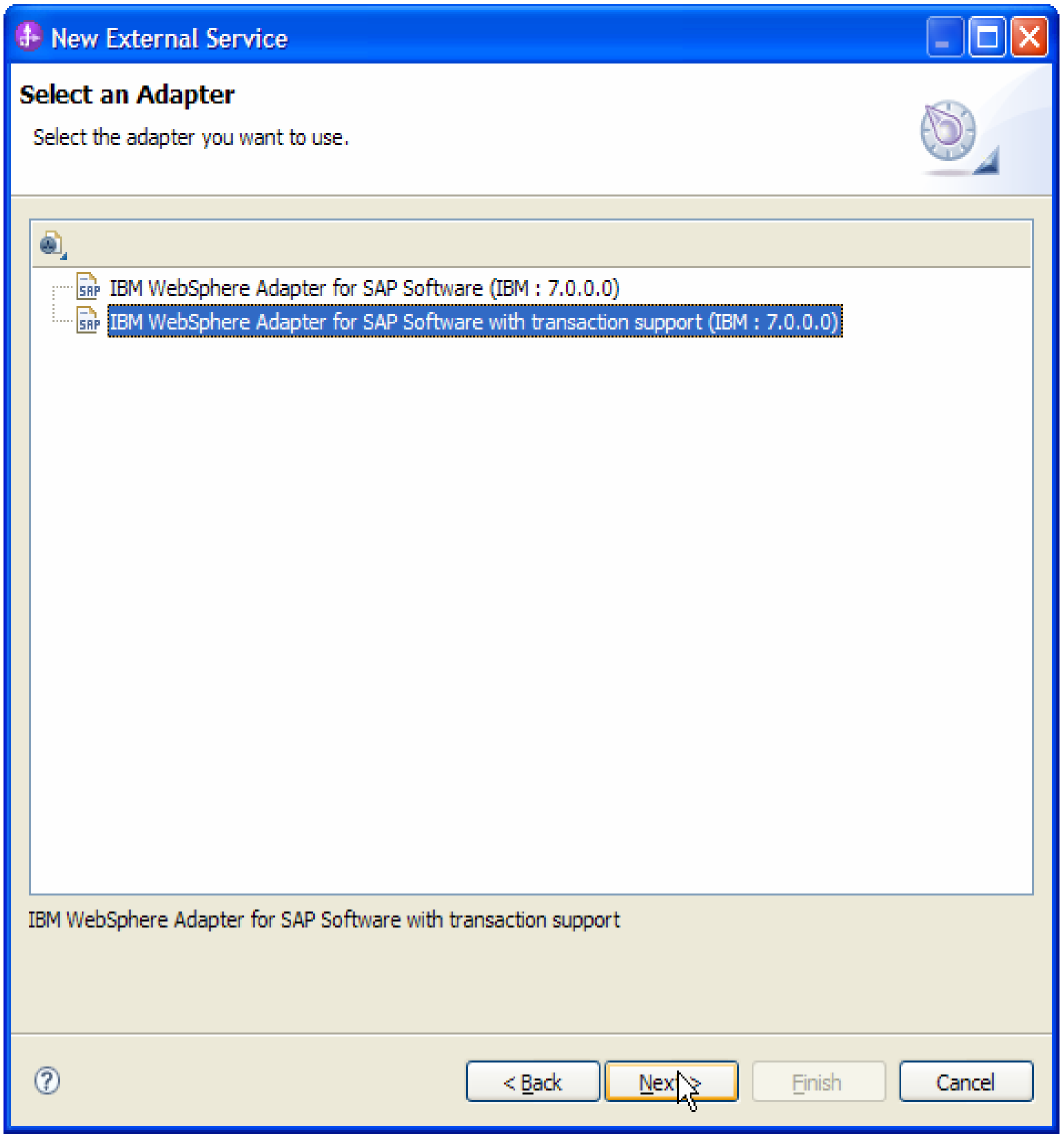
Available Types:

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

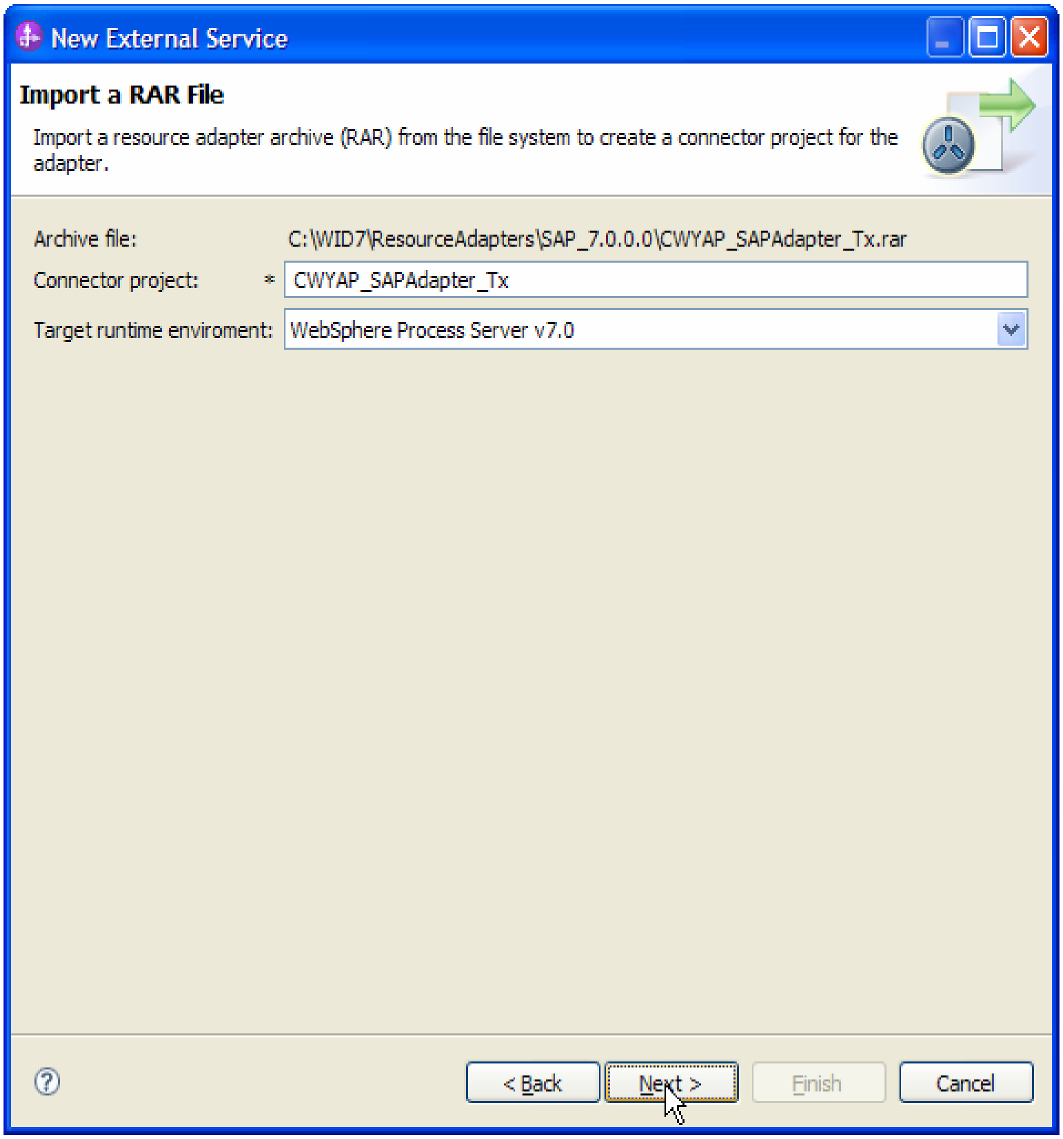
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next**.



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

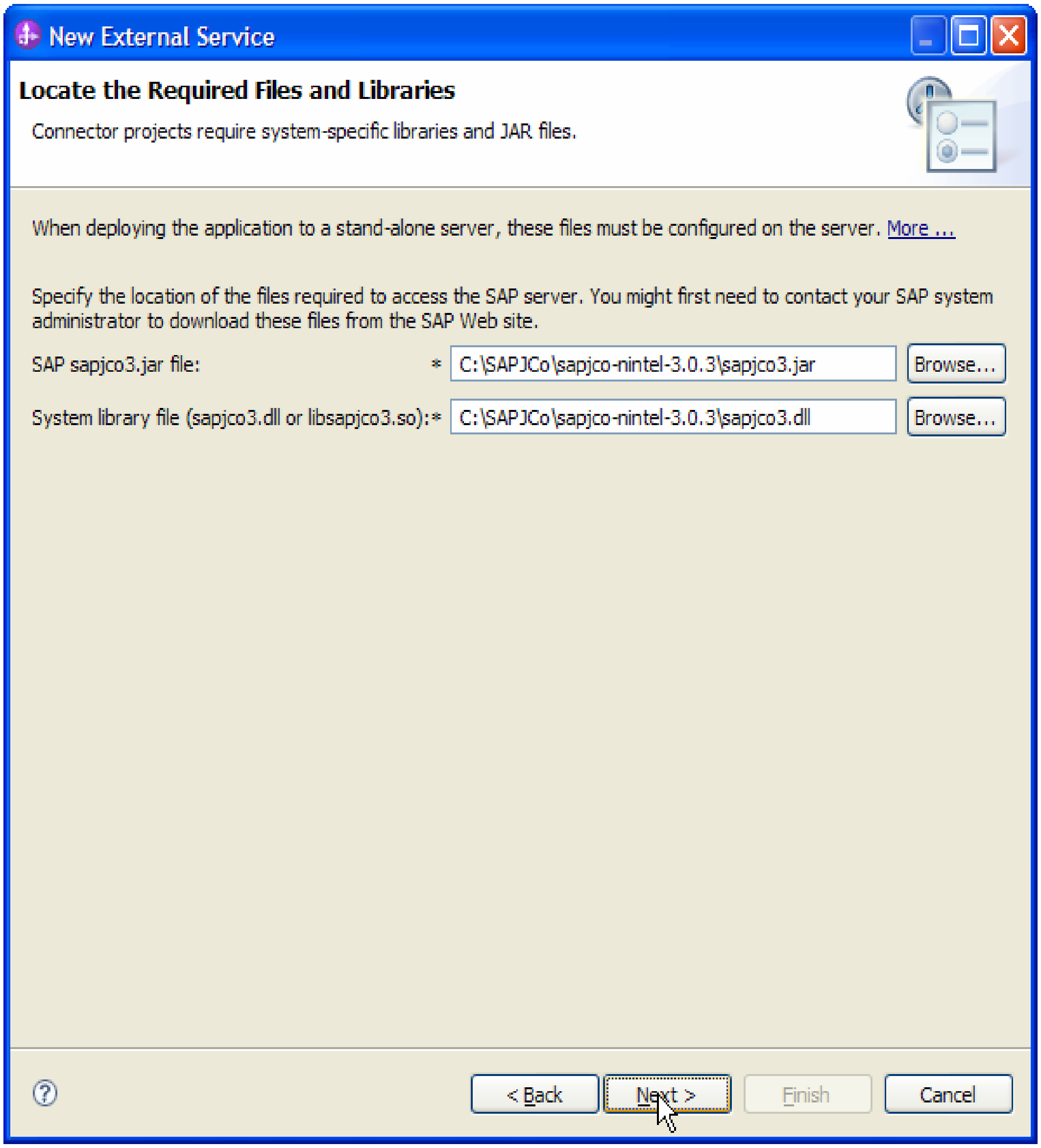
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

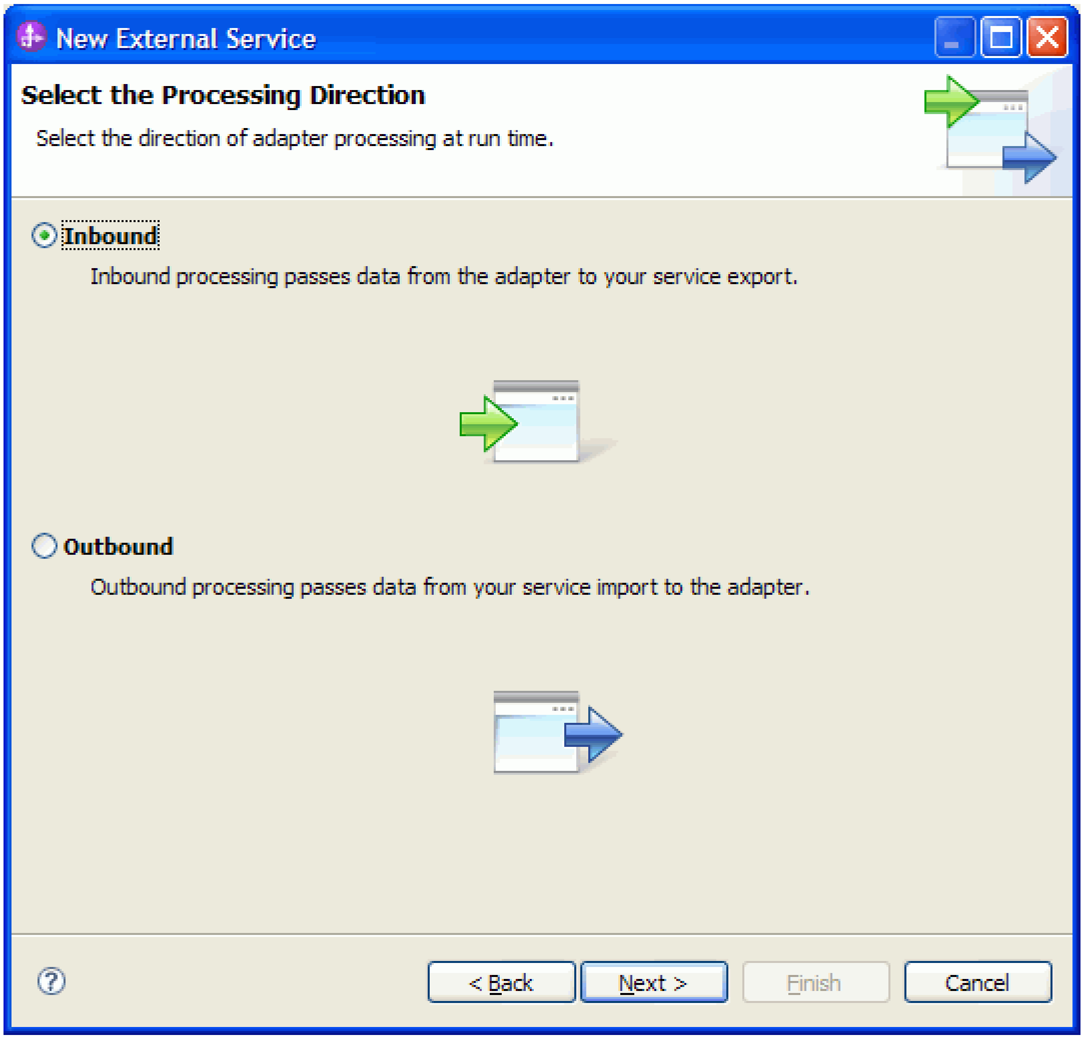
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select the **Inbound** radio button and click **Next**.



Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

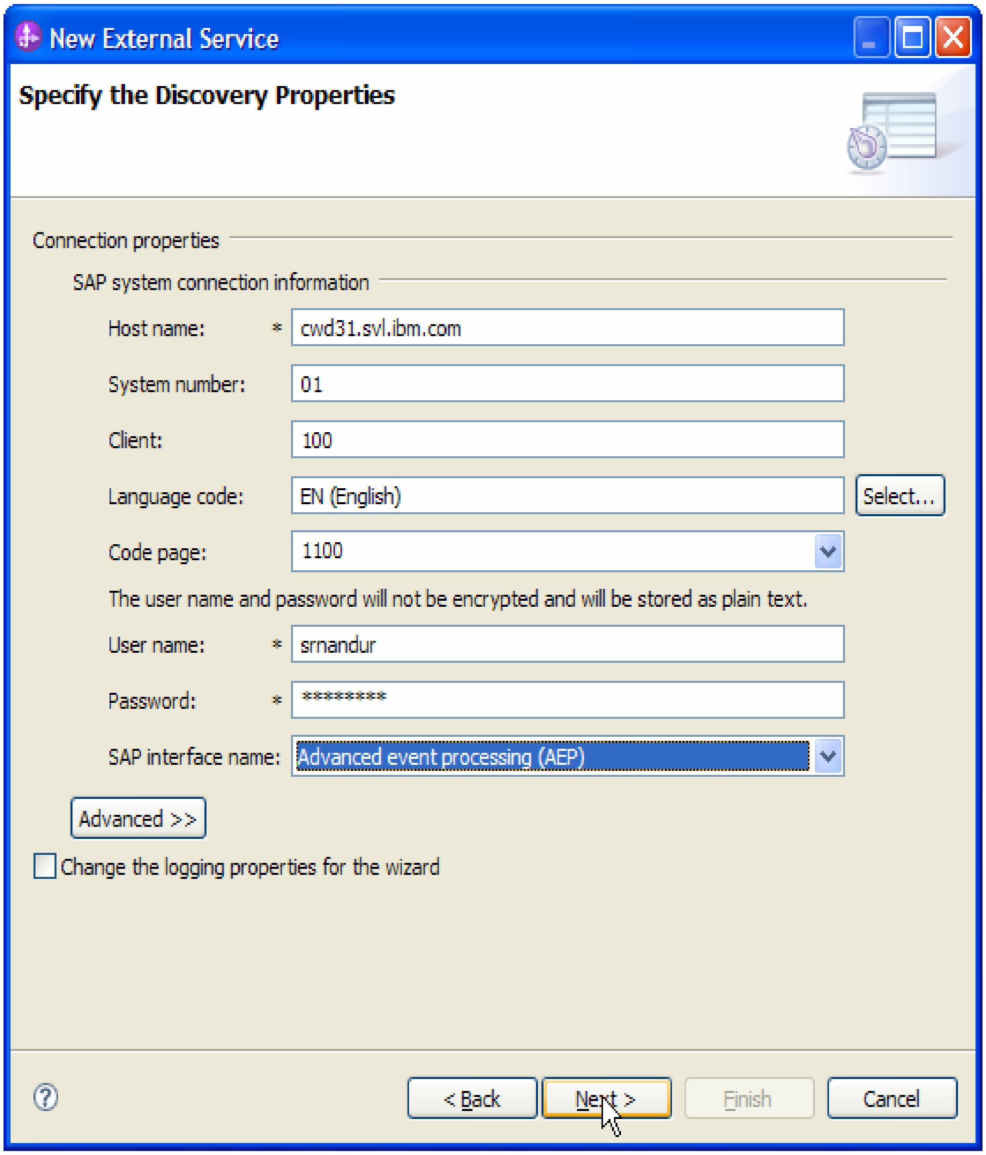
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select **Advanced Event Processing (AEP)** as the SAP Interface name.

Click **Next**.



Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English) Select...

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

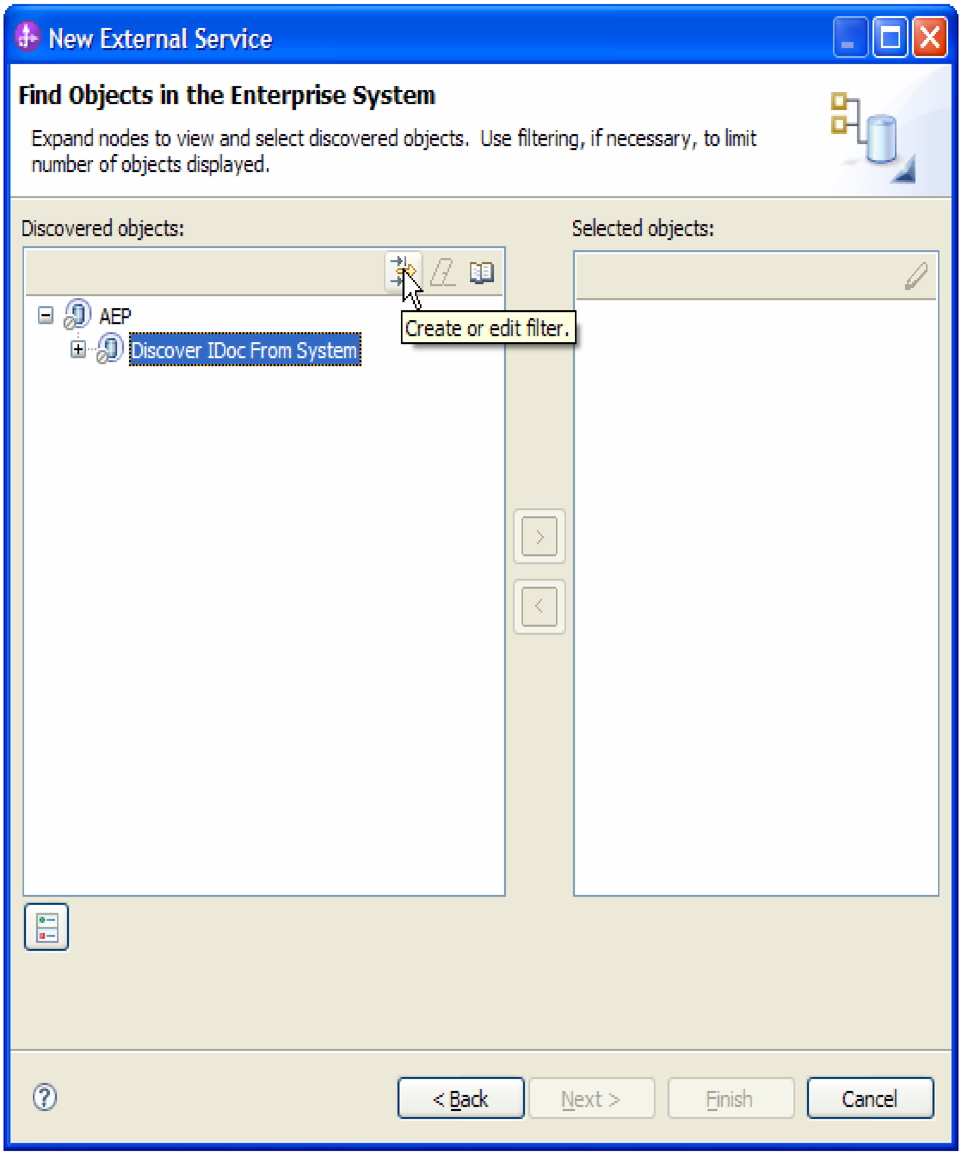
Password: * *********

SAP interface name: Advanced event processing (AEP)

Figure: Select AEP as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find Objects in the Enterprise System** screen, expand **AEP** node under **Discovered objects**, select **Discover IDoc From System**, then click the ⇥ button.



New External Service

Find Objects in the Enterprise System

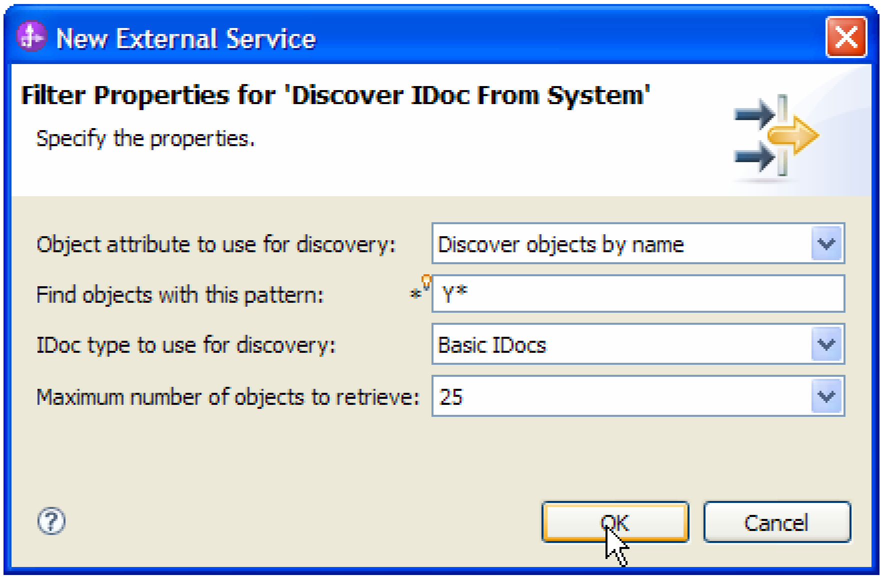
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

Selected objects:

Figure: Find Objects in the Enterprise System

Enter Y* in the Filter Properties for **Discover IDoc From System** screen.



New External Service

Filter Properties for 'Discover IDoc From System'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: Y*

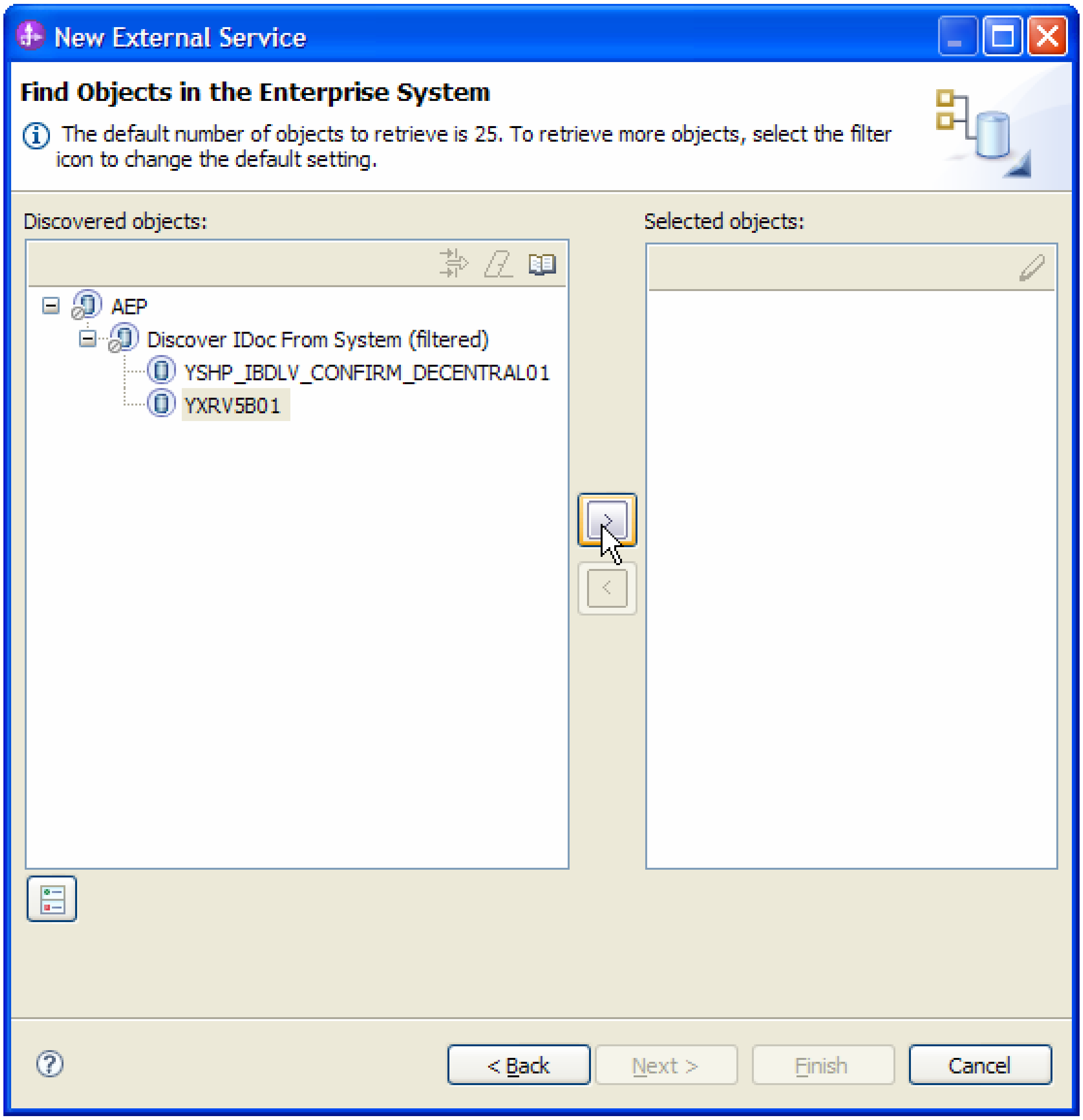
IDoc type to use for discovery: Basic IDocs

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **Discover IDoc From System** node, select **YXRV5B01** and click the > button.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- AEP
  - Discover IDoc From System (filtered)
    - YSHP_IBDLV_CONFIRM_DECENTRAL01
    - YXRV5B01

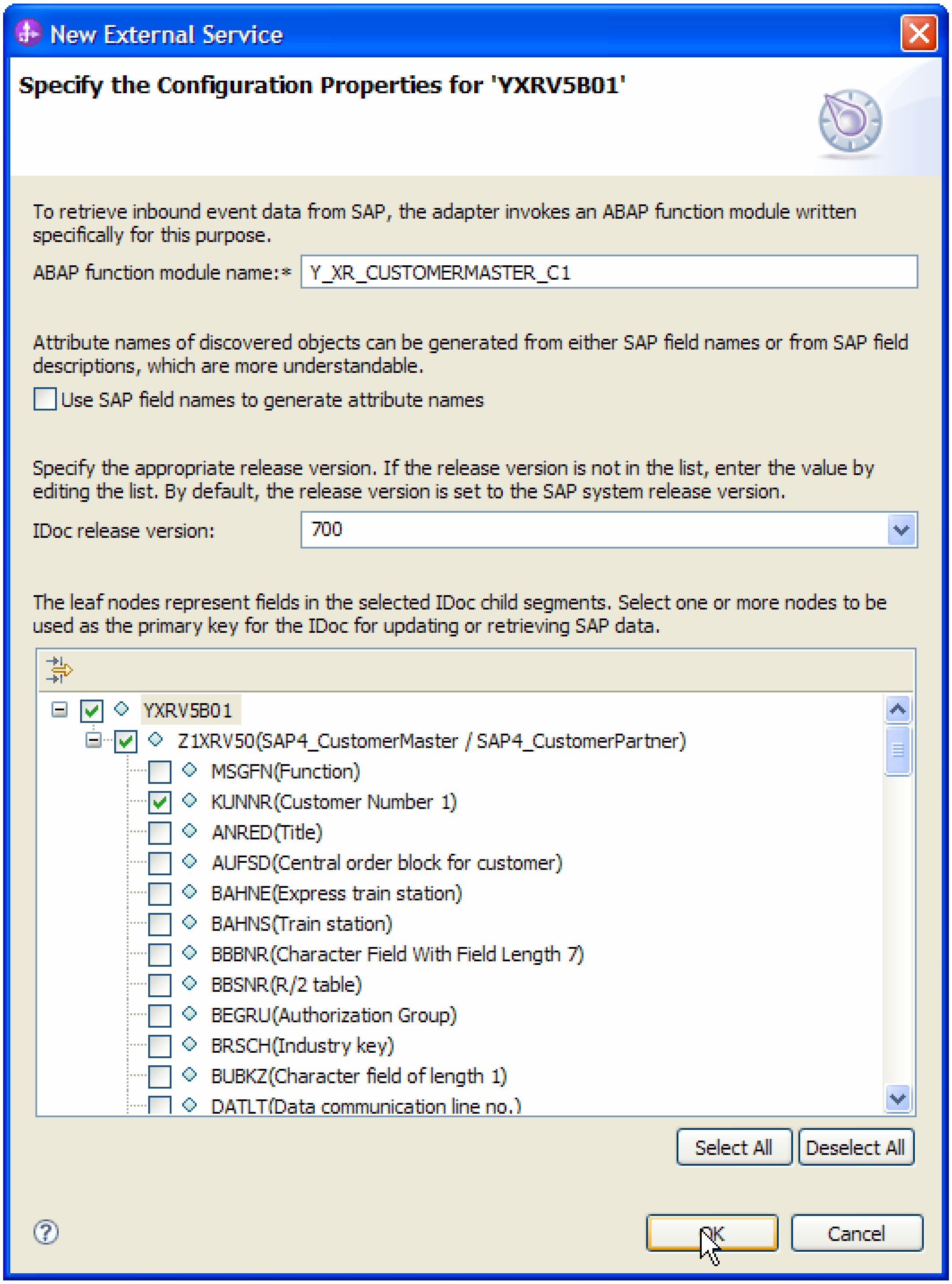
Selected objects:

Figure: Retrieved IDocs' based on search criteria

In **Specify the Configuration Parameters for 'YXRV5B01'**, click **Deselect All** button and then select only KUNNR (Customer Number 1) field.

The **Customer Number 1** is the Primary Key field. Enter the ABAP function module name as Y_XR_CUSTOMERMASTER_C1.

Click **OK**.



New External Service

Specify the Configuration Properties for 'YXRV5B01'

To retrieve inbound event data from SAP, the adapter invokes an ABAP function module written specifically for this purpose.

ABAP function module name:* Y_XR_CUSTOMERMASTER_C1

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

Specify the appropriate release version. If the release version is not in the list, enter the value by editing the list. By default, the release version is set to the SAP system release version.

IDoc release version: 700

The leaf nodes represent fields in the selected IDoc child segments. Select one or more nodes to be used as the primary key for the IDoc for updating or retrieving SAP data.

- ☑ YXRV5B01
  - ☑ Z1XRV50(SAP4_CustomerMaster / SAP4_CustomerPartner)
    - □ MSGFN(Function)
    - ☑ KUNNR(Customer Number 1)
    - □ ANRED(Title)
    - □ AUFSD(Central order block for customer)
    - □ BAHNE(Express train station)
    - □ BAHNS(Train station)
    - □ BBBNR(Character Field With Field Length 7)
    - □ BBSNR(R/2 table)
    - □ BEGRU(Authorization Group)
    - □ BRSCH(Industry key)
    - □ BUBKZ(Character field of length 1)
    - □ DATLT(Data communication line no.)

Figure: Setting configuration parameters for the IDoc YXRV5B01 selected

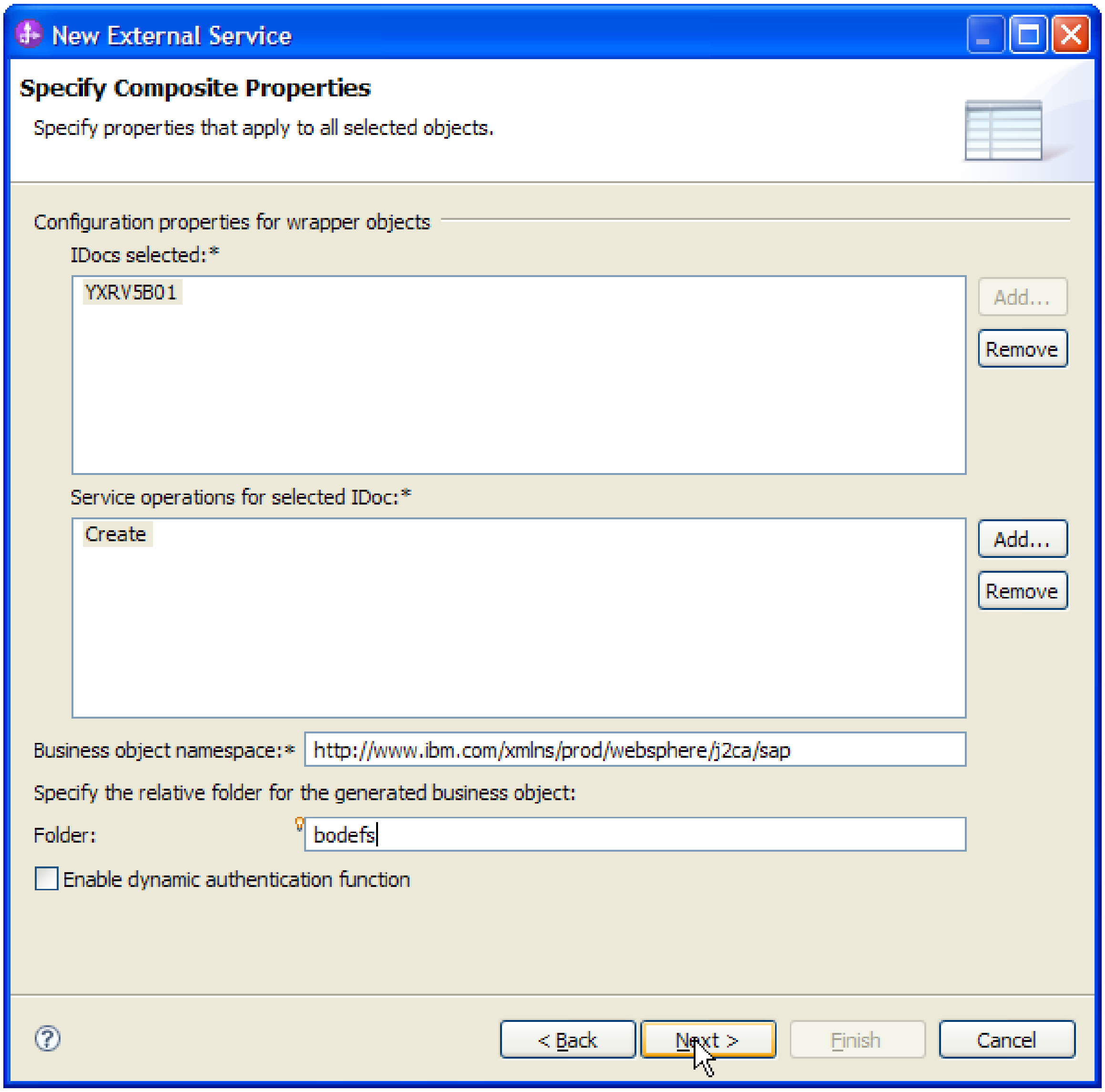
Click **Next** on the Find objects in the Enterprise System screen.

Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen,

a) Select the IDoc **YXRV5B01**, click **Add** button under **Service operations for selected IDoc** and select **Create** from the **Add Value** pop up.

b) Enter the relative folder for the generated Business Object as **bodefs**.



Specify Composite Properties

Specify properties that apply to all selected objects.

Configuration properties for wrapper objects

IDocs selected:* YXRV5B01

Service operations for selected IDoc:* Create

Business object namespace:* http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

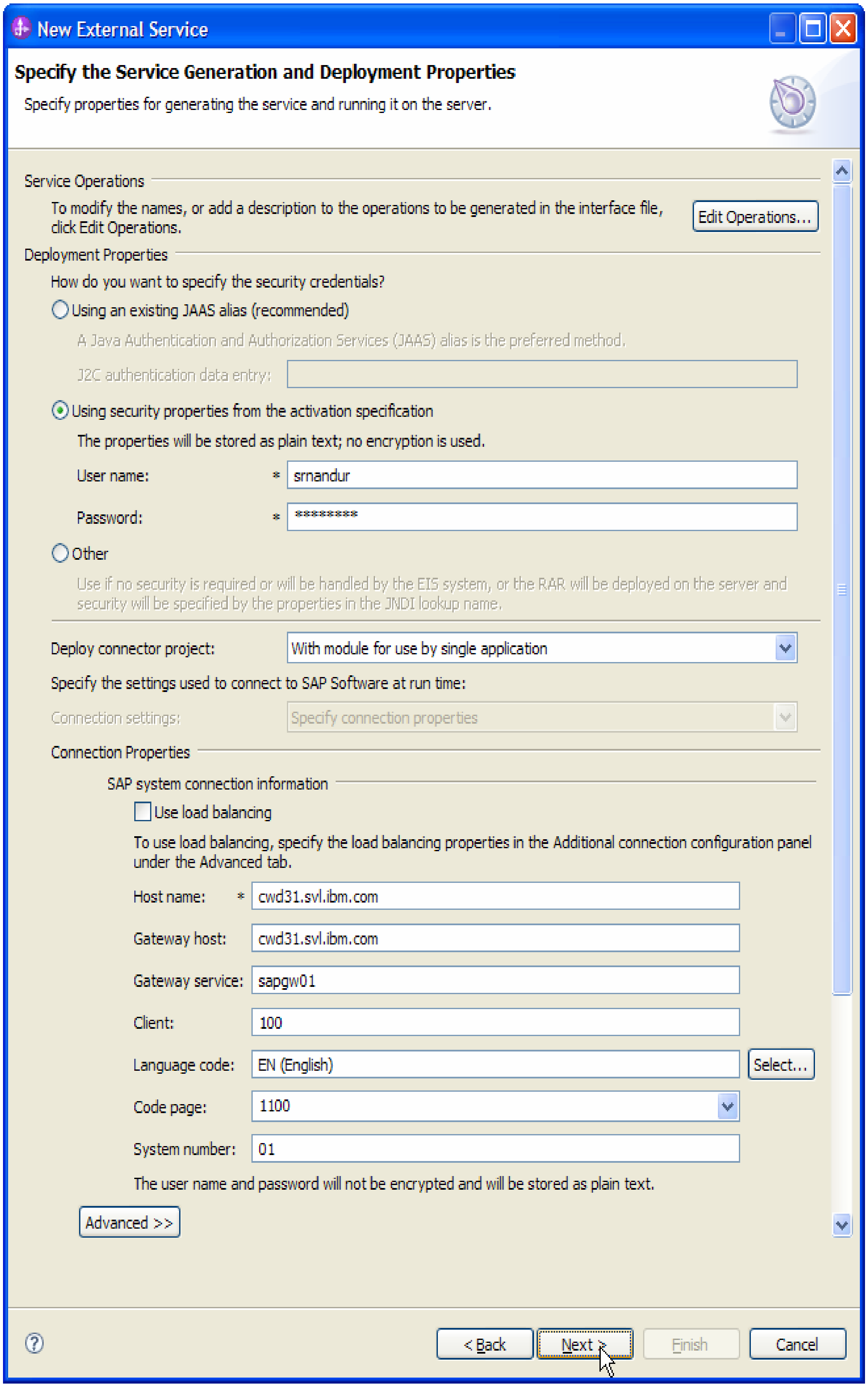
Folder: bodefs

□ Enable dynamic authentication function

Figure: Configuration properties for 'YXRV5B01'

Click **Next.**

In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the activation specification

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English)

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

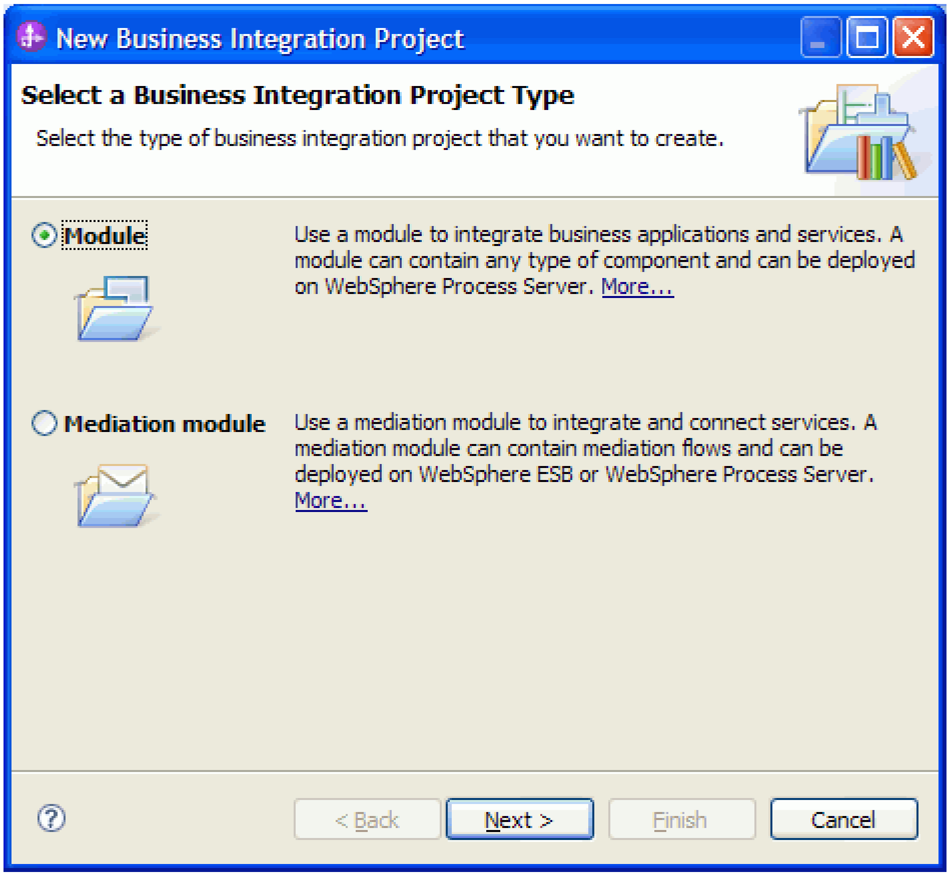
Figure: Service Generation and Deployment Configuration

Note: You can either enter an Authentication Alias previously created using the Administrative Console of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

Click **Next.**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



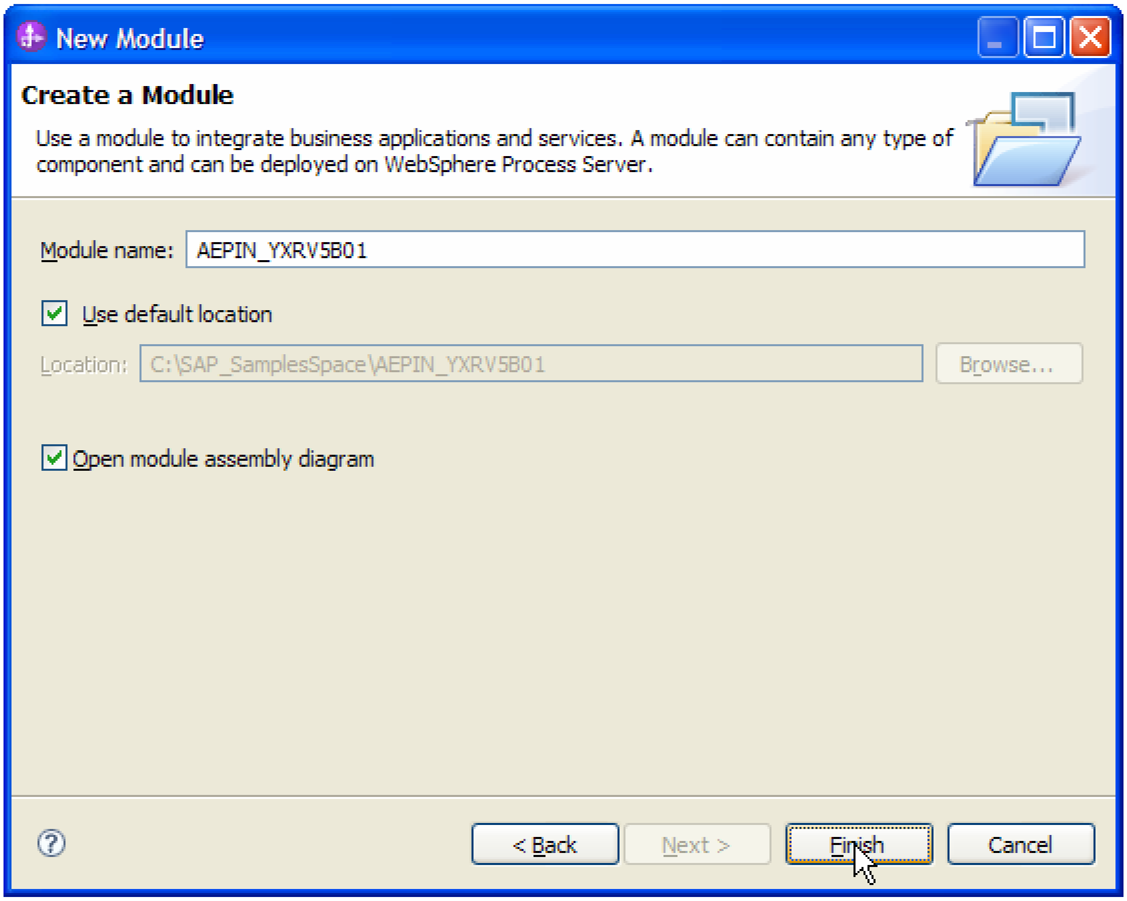
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the **New Module** screen, type **AEPIN_YXRV5B01** in the **Module Name** field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

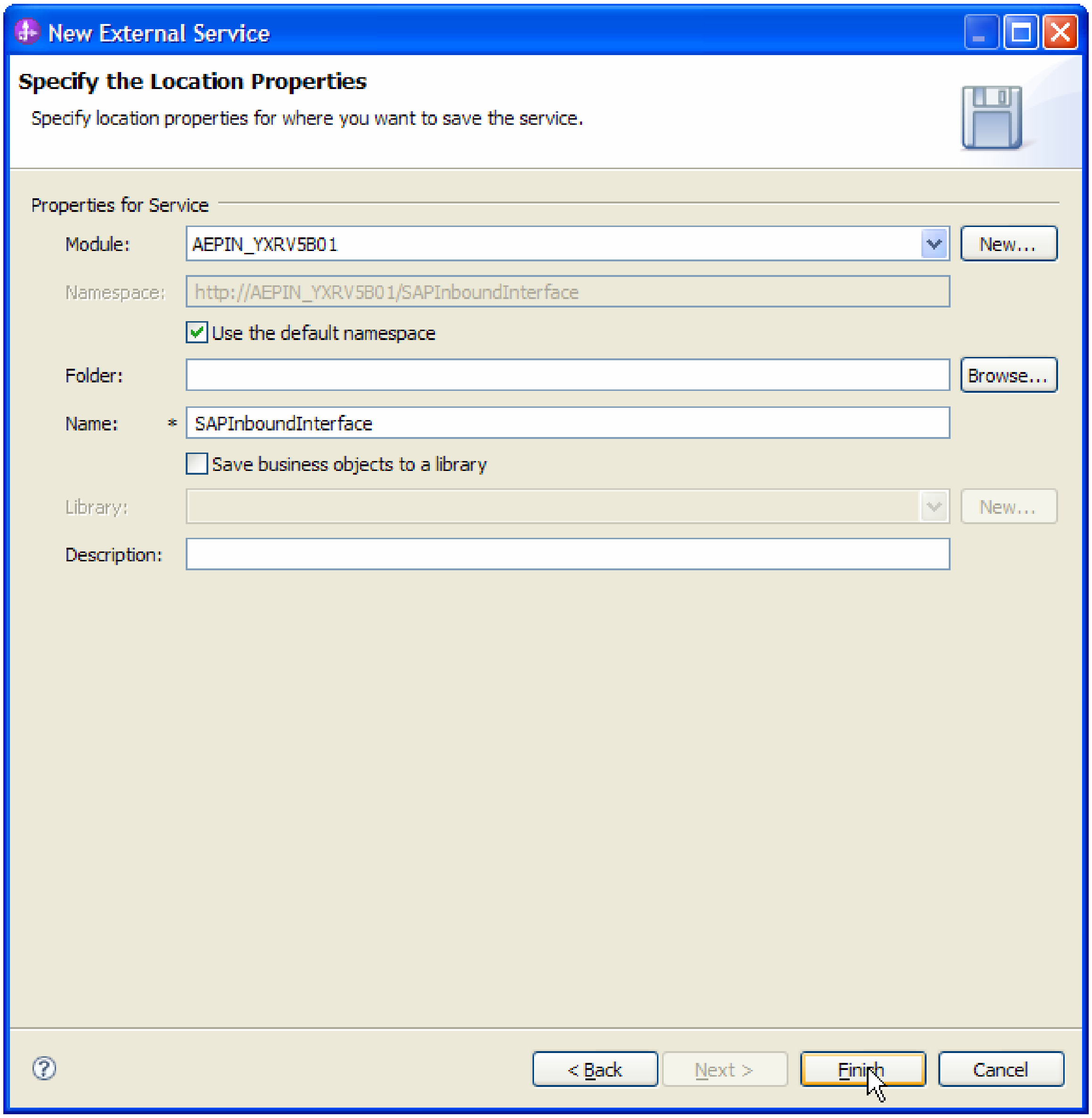
Module name: AEPIN_YXRV5B01

☑ Use default location

Location: C:\SAP_SamplesSpace\AEPIN_YXRV5B01

☑ Open module assembly diagram

Click **Finish** on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: AEPIN_YXRV5B01

Namespace: http://AEPIN_YXRV5B01/SAPInboundInterface

☑ Use the default namespace

Folder:

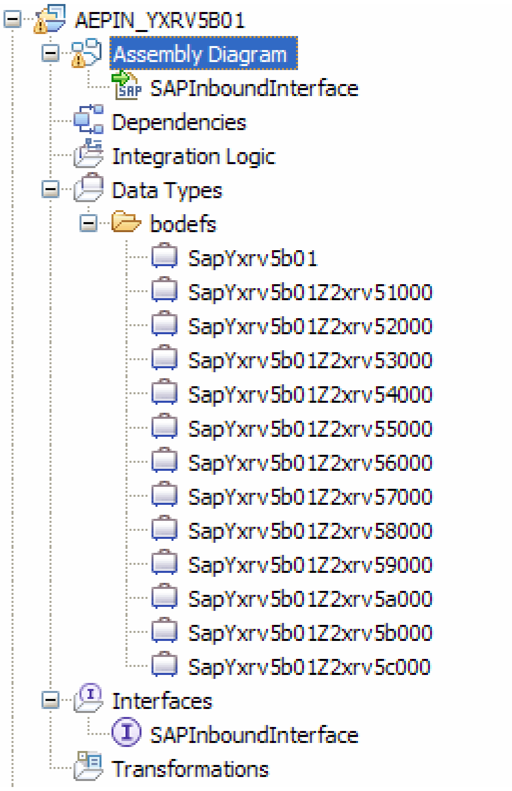
Name: * SAPInboundInterface

☐ Save business objects to a library

Library:

Description:

Verify the results.



- AEPIN_YXRV5B01
  - Assembly Diagram
    - SAPInboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapYxrv5b01
      - SapYxrv5b01Z2xrv51000
      - SapYxrv5b01Z2xrv52000
      - SapYxrv5b01Z2xrv53000
      - SapYxrv5b01Z2xrv54000
      - SapYxrv5b01Z2xrv55000
      - SapYxrv5b01Z2xrv56000
      - SapYxrv5b01Z2xrv57000
      - SapYxrv5b01Z2xrv58000
      - SapYxrv5b01Z2xrv59000
      - SapYxrv5b01Z2xrv5a000
      - SapYxrv5b01Z2xrv5b000
      - SapYxrv5b01Z2xrv5c000
  - Interfaces
    - SAPInboundInterface
  - Transformations

Figure: Artifacts created after the EMD run fore AEP Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **AEPIN_YXRV5B01** SCA module, and double click the **Assembly Diagram**.

The Assembly Diagram screen appears with the module‘s Export component in view.

1. To create a new component, click the button of Java component from the **Palette**.

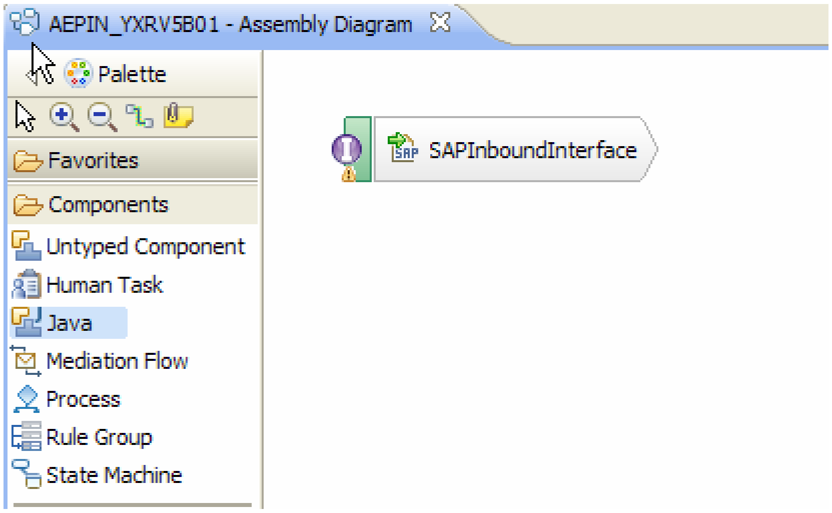


Figure: AEP Inbound interface in the Assembly editor

2. Click and drag the Java component to add the new component to the Assembly Diagram screen.

3. Add a Wire between the **SAPInboundInterface** and the Java component.

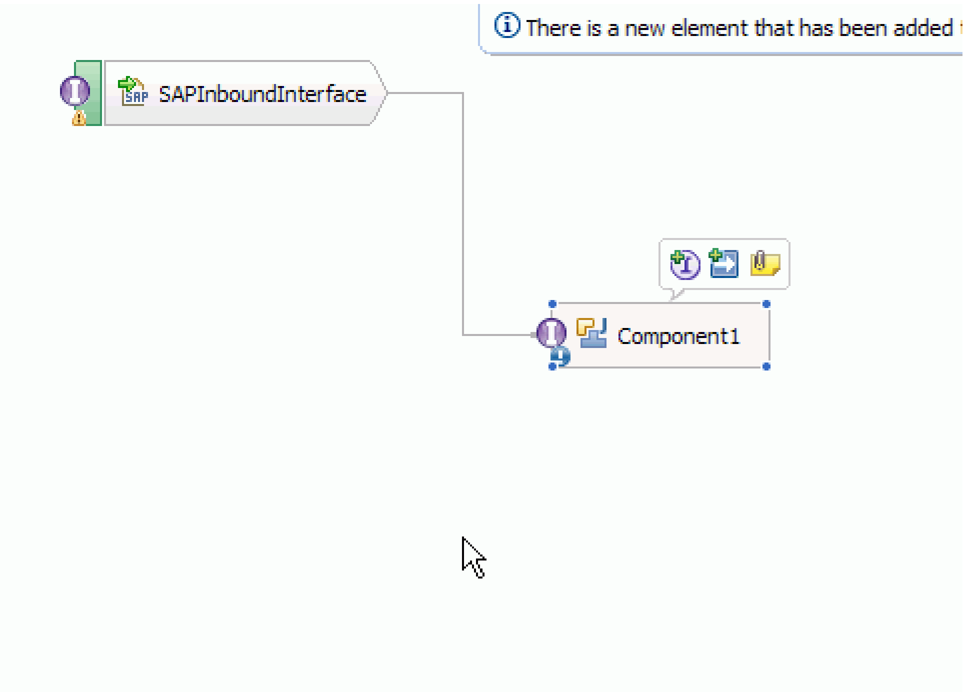
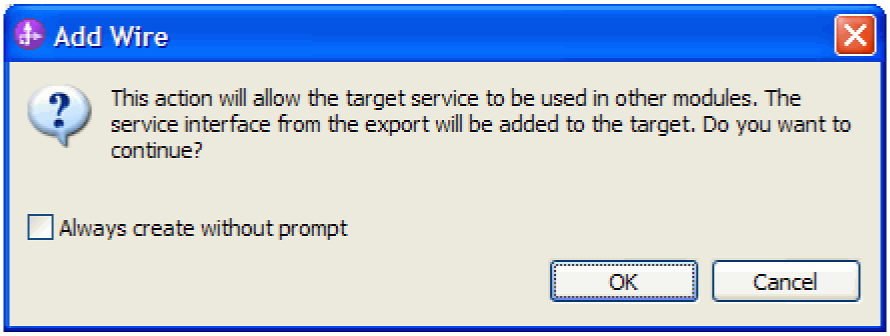


Figure: AEP Inbound interface being wired to a target Component(end-point)

4. In the Add Wire screen, click OK.


Add Wire

This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Confirmation Dialog

5. Right-click the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

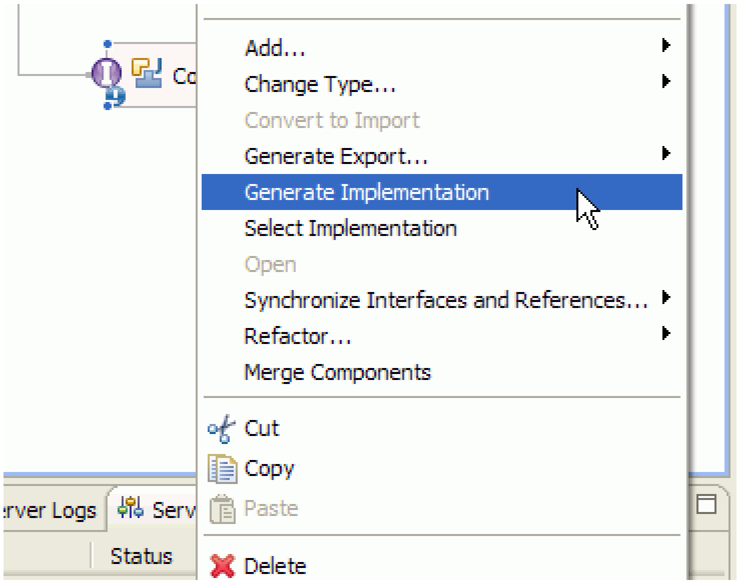
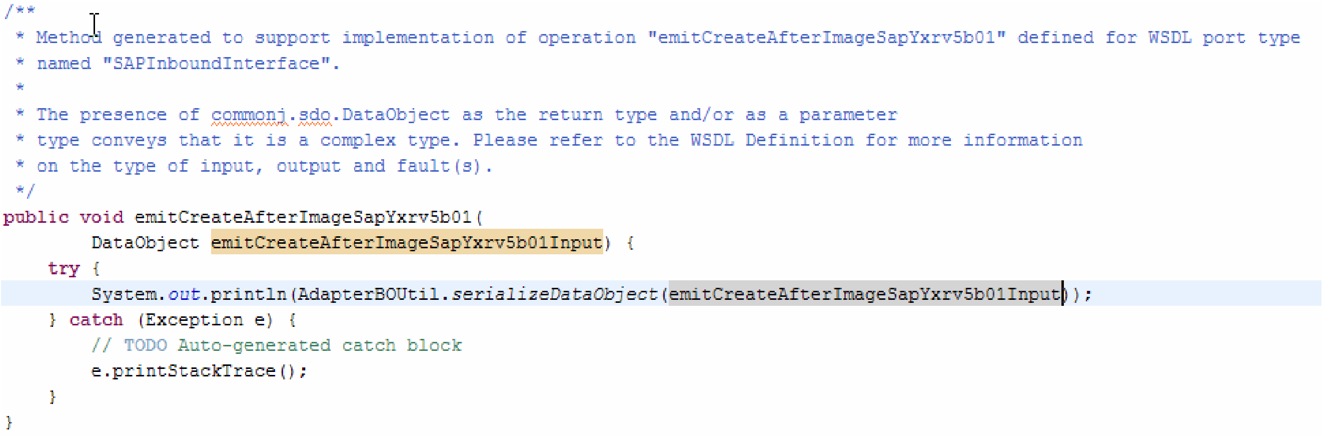


Figure: Creating Java implementation for the target Component.

6. In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen is presented.

Edit the Java file if you want to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapYxrv5b01" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void emitCreateAfterImageSapYxrv5b01(
        DataObject emitCreateAfterImageSapYxrv5b01Input) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapYxrv5b01Input));
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
}
```

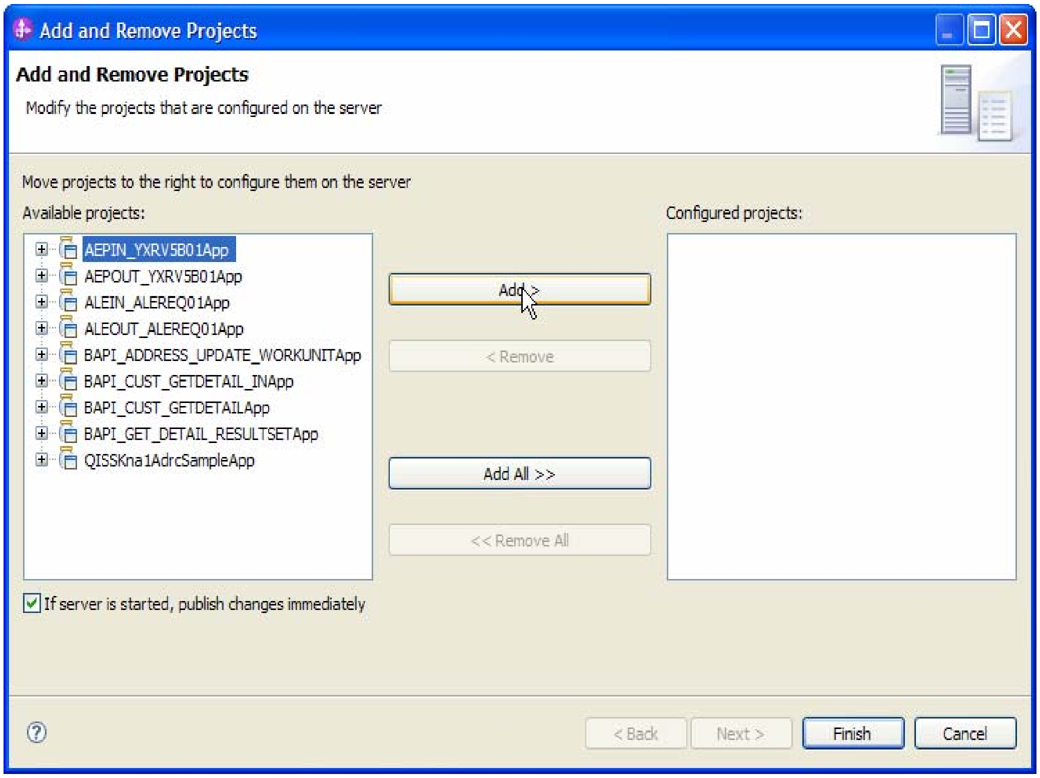
Save the Java file and assembly diagram.

Deploying the module in the test environment

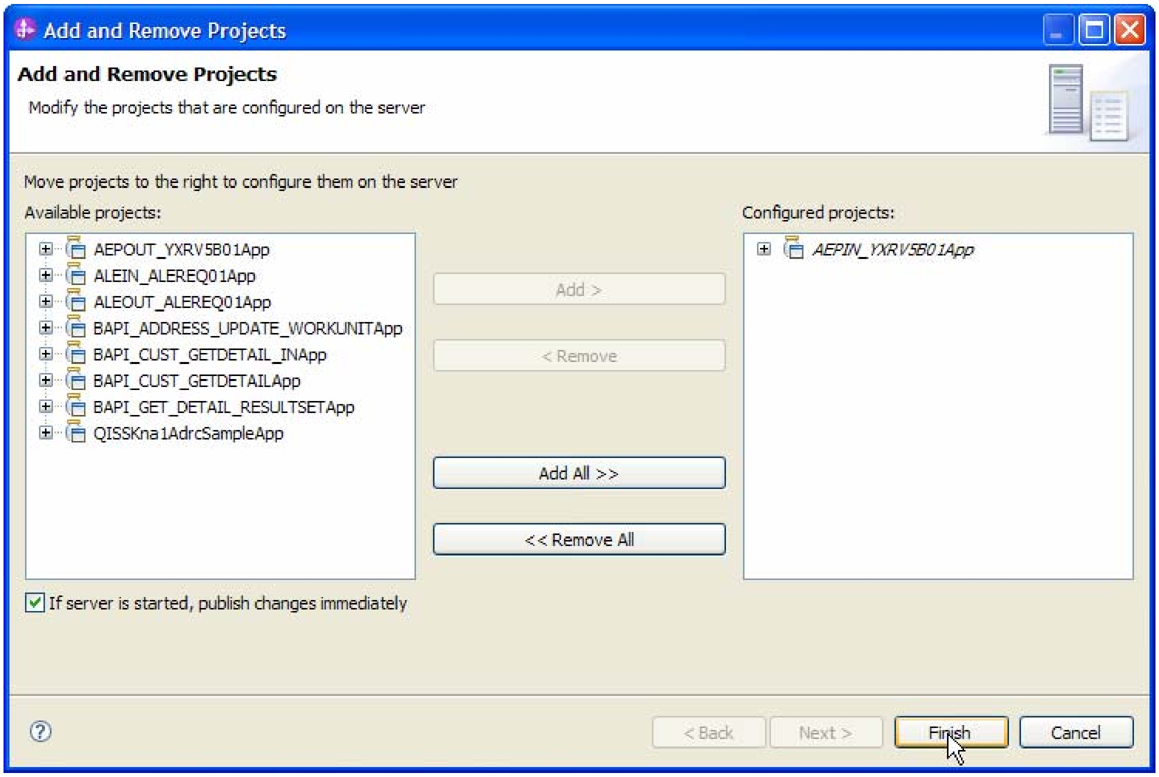
After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module AEPIN_YXRV5B01 by selecting **Add and Remove Projects**.

The project AEPIN_YXRV5B01App will be listed under **Available projects**.



After adding the project, the added project should appear under the **Configured projects**. Add the SCA module to the server by clicking on **Finish**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

- *AEPIN_YXRV5B01App*

☑ If server is started, publish changes immediately

After the module is successfully deployed, you should see the below message on the Console

```
[10/6/09 22:39:01:562 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:03:906 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:06:375 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:08:765 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:11:187 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:13:640 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:19:171 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:21:453 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:23:796 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:26:093 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:28:703 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
[10/6/09 22:39:31:359 IST] 0000000c SAPRA001      I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>> Polling for Events
```

Testing the assembled adapter application

Test the assembled adapter application by posting the events to Event Table. Adapter continuously polls for the events in this table.

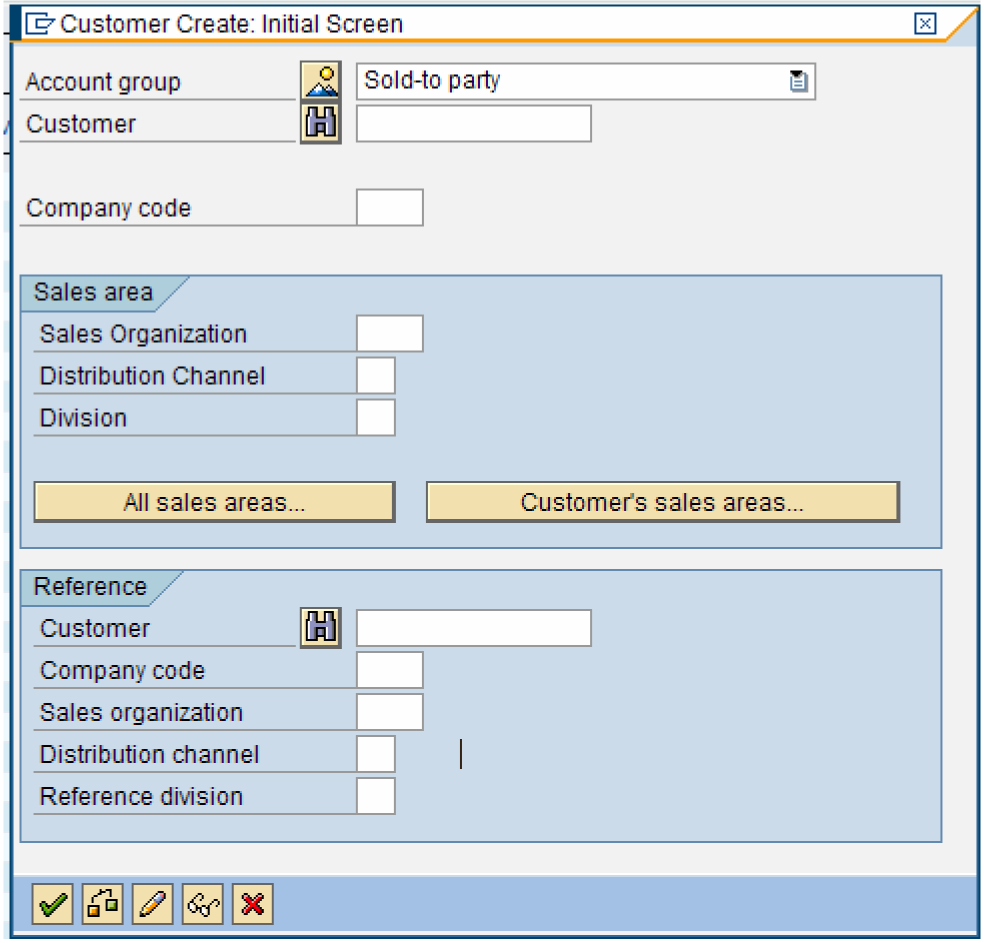
Logon to the SAP system.

Events can be posted to event table by using one of the options.

a) Execute tcode **/o/cwld/home_aep**, **Management** tab, **Archived Events**, click **Execute**, select an event, change the Event Status to **P**, save it, click **continue**, select the event, click

Resubmit button. Event will be posted to event table and gets processed by the adapter. **This option is for testing purposes only.**

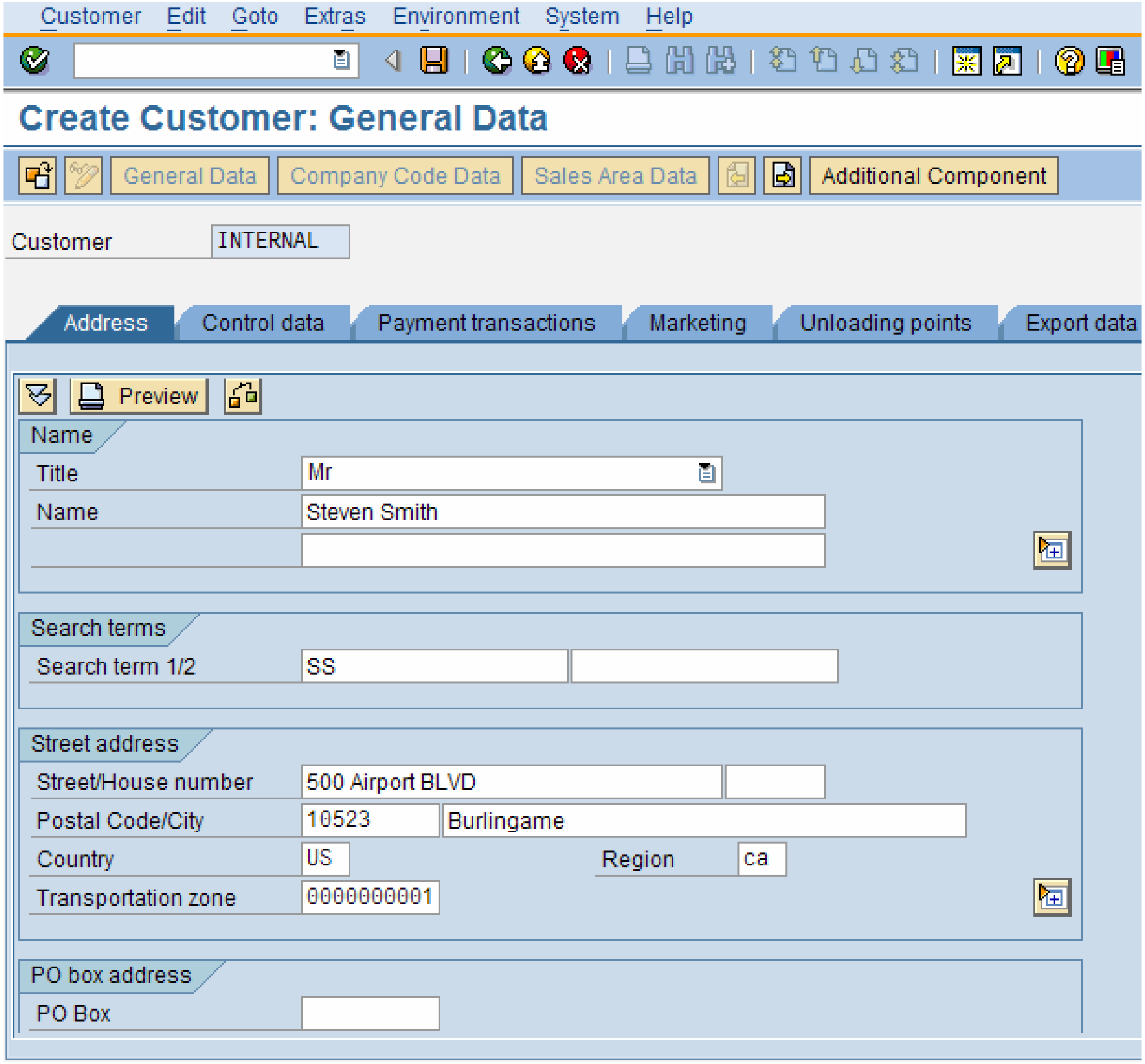
b) Execute tcode XD01 and follow the below screen shots to create a customer record. After the customer is created, an event will be queued in the event table.



Customer Create: Initial Screen

Account group: Sold-to party

Click Continue.



Create Customer: General Data

Customer INTERNAL

Name

Title Mr

Name Steven Smith

Search terms

Search term 1/2 SS

Street address

Street/House number 500 Airport BLVD

Postal Code/City 10523 Burlingame

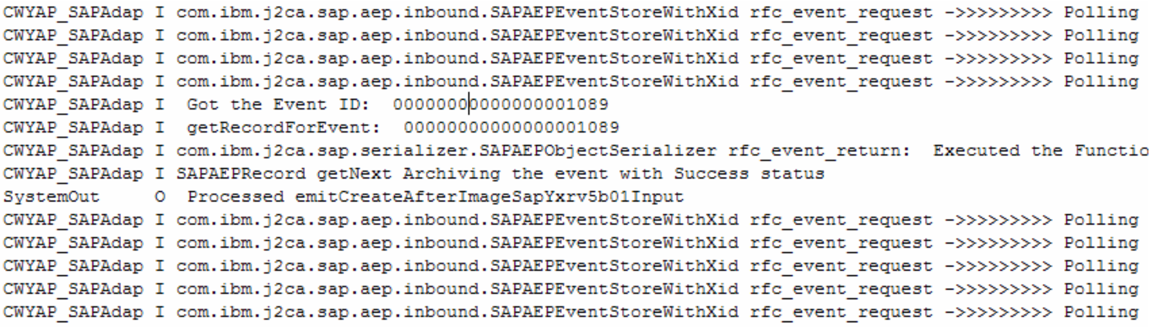
Country US Region ca

Transportation zone 0000000001

PO box address

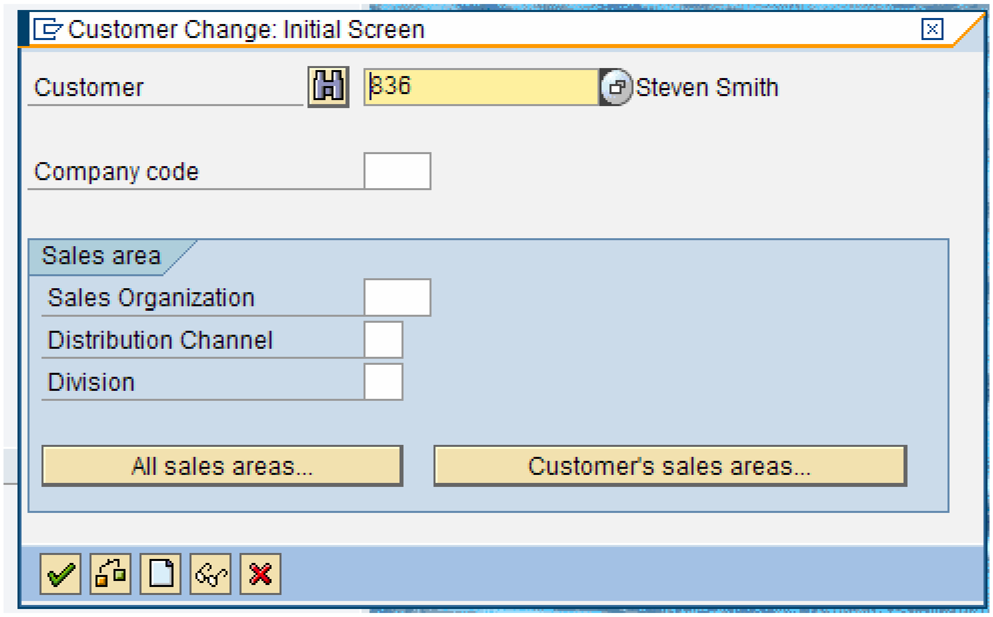
PO Box

ii. Save the customer record. See in the WebSphere Integration Developer that this event is picked up by the adapter and processed successfully.



```
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I  Got the Event ID:  00000000000000001089
CWYAP_SAPAdap I  getRecordForEvent:  00000000000000001089
CWYAP_SAPAdap I com.ibm.j2ca.sap.serializer.SAPAEPObjectSerializer rfc_event_return:  Executed the Functio
CWYAP_SAPAdap I SAPAEPRecord getNext Archiving the event with Success status
SystemOut     O  Processed emitCreateAfterImageSapYxrv5b01Input
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
```

iii. Execute tcode XD02 and follow the below screen shots to update a customer record. After the customer is updated, an event will be queued in the event table.



Customer Change: Initial Screen

Customer 836 Steven Smith

Company code

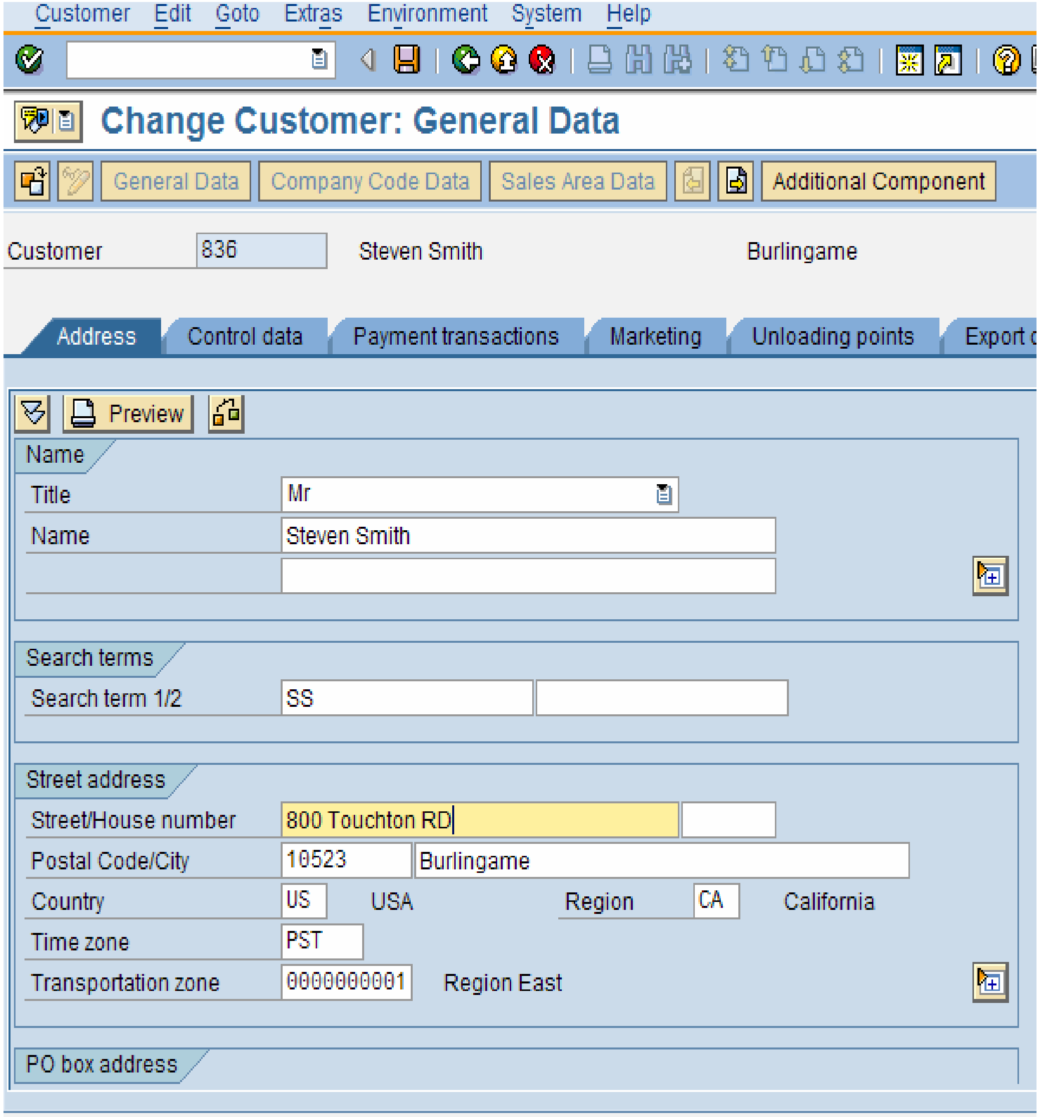
Sales area

Sales Organization

Distribution Channel

Division

iv. Click Continue



Change Customer: General Data

Customer 836 Steven Smith Burlingame

Name

Title	Mr
Name	Steven Smith

Search terms

Search term 1/2	SS	

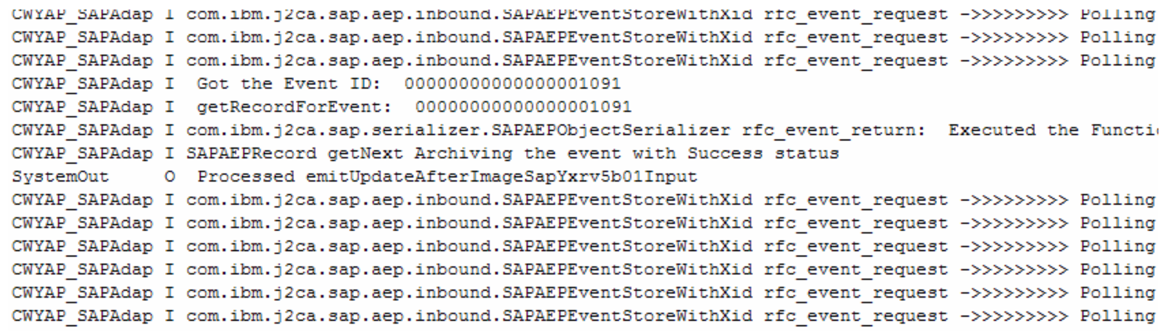
Street address

Street/House number	800 Touchton RD			
Postal Code/City	10523	Burlingame		
Country	US	USA	Region	CA California
Time zone	PST			
Transportation zone	0000000001	Region East		

PO box address

v. Save the customer record.

vi. See in the WebSphere Integration Developer that this event is picked up by the adapter and processed successfully.



```
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I  Got the Event ID:  00000000000000001091
CWYAP_SAPAdap I  getRecordForEvent:  00000000000000001091
CWYAP_SAPAdap I com.ibm.j2ca.sap.serializer.SAPAEPObjectSerializer rfc_event_return:  Executed the Functi
CWYAP_SAPAdap I SAPAEPRecord getNext Archiving the event with Success status
SystemOut     O  Processed emitUpdateAfterImageSapYxrv5b01Input
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
CWYAP_SAPAdap I com.ibm.j2ca.sap.aep.inbound.SAPAEPEventStoreWithXid rfc_event_request ->>>>>>>>> Polling
```

Clearing the sample content

If you have added a test record to the **Customer Master** table, clean up after this tutorial.

Chapter 14. **Troubleshooting AEP**

1. **Symptom**: A ServiceRuntimeException exception is thrown at runtime:

```
Caused by: com.ibm.websphere.sca.ServiceRuntimeException: Did not find method for native method 'emitCreateAfterImageSapYXRV5B01'
    ... 20 more
javax.resource.ResourceException: Caught unexpected unchecked exception while delivering event to endpoint: $Proxy6@354e354e
    at com.ibm.j2ca.extension.eventmanagement.internal.EventSender.deliverEvent(EventSender.java:241)
    at com.ibm.j2ca.extension.eventmanagement.internal.EventSender.doSendEvent(EventSender.java:276)
    at com.ibm.j2ca.extension.eventmanagement.internal.EventSender.sendEvent(EventSender.java:191)
    at com.ibm.j2ca.extension.eventmanagement.internal.EventListSender.sendEvents(EventListSender.java:129)
    at com.ibm.j2ca.extension.eventmanagement.internal.EventListSender.run(EventListSender.java:99)
    at com.ibm.ejs.j2c.work.WorkProxy.run(WorkProxy.java:419)
    at com.ibm.ejs.j2c.work.AsyncWorkProxy.run(AsyncWorkProxy.java:136)
    at com.ibm.ws.asynchbeans.J2EEContext.run(J2EEContext.java:761)
    at com.ibm.ws.asynchbeans.ExecutionContextImpl.go(ExecutionContextImpl.java:85)
    at com.ibm.ejs.j2c.work.AsyncWorkProxy.run(AsyncWorkProxy.java:90)
    at com.ibm.ws.util.ThreadPool$Worker.run(ThreadPool.java:1469)
```

Cause: This is usually caused by wrong BO name or Componenet1Impl which is not generated successfully.

Resolution:

Verify that the BO name is correct in the event table.

Verify that the component1 is added in the Assembly Diagram and java class Componenet1Impl was generated.

Run Menu Project, Clean.., clean all projects.

Symptom: Error received attempting to connect to SAP System with EMD

Resolution:

Verify that the connection parameters have been entered correctly

Chapter 15. Tutorial 10: Sending data from the SAP system(inbound processing) and processing it using the ALE-passthrough interface with a Generic IDoc

Sending IDoc data From SAP – ALE Inbound Processing

This tutorial demonstrates how to use New External Service to create a Generic Object for all IDocs, create an SCA module that uses the WebSphere Adapter (7.0) for SAP Software, deploy the module to the test environment of WebSphere Integration Developer (7.0).

In this tutorial, we use two IDoc types to test the Generic IDoc type – ALEREQ01 and MATMAS03.

Scenario

The scenario explains how ALE inbound processing can be used in real business integration case.

An integration developer wants to integrate a legacy system with a SAP ERP system.

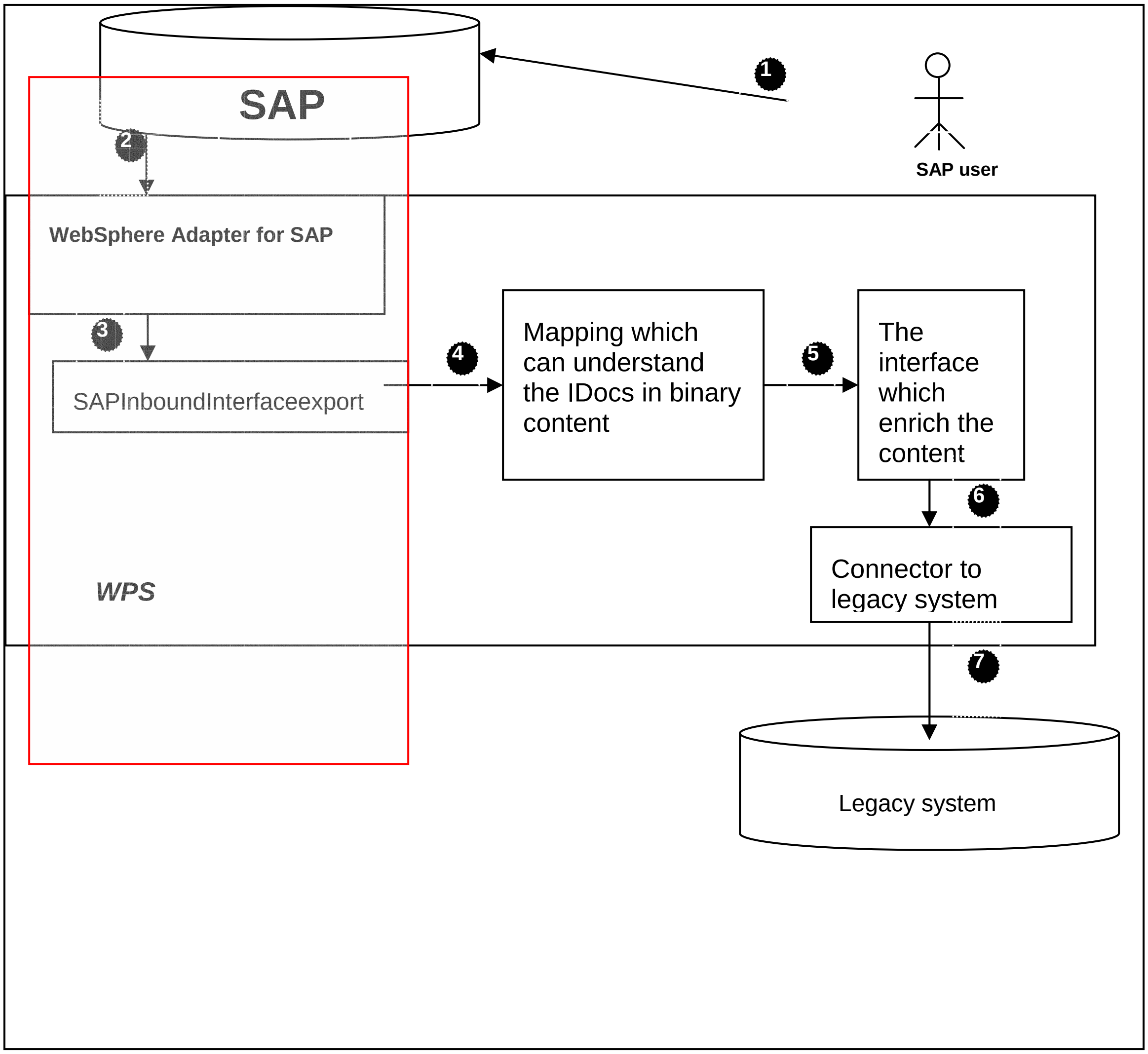
Any changes in SAP system should be updated in the legacy system as well.

For example, a new customer record created in SAP should result in a new record legacy system.

The integration with the SAP system is handled by the WebSphere Adapter for SAP Software whereas the legacy system integration is handled by a proprietary connector.

In this case, the Integration developer has to use the ALE passthrough interface of the adapter in order to achieve the result.

The ALE passthrough interface can return the changes of SAP in the form of binary content which helps to configure SAP integration independent of a particular business item like customer or material, etc.


SAP
1
SAP user
2
WebSphere Adapter for SAP
3
SAPInboundInterfaceexport
4
Mapping which can understand the IDocs in binary content
5
The interface which enrich the content
6
Connector to legacy system
WPS
7
Legacy system

The user creates material information in SAP. The SAP user exit function triggers a matmas01 IDoc to the configured Receiving partner. In this case, the receiving partner is configured to SAP adapter.

The tutorial only cover the part of the scenario marked in red colored rectangular in the above picture.

1. The user creates Material information in the SAP system.

2. The user exit function in SAP triggers a Matmas01 IDoc to the adapter. The delivery is transactional; SAP creates a transaction ID which is used for Assured-event once delivery.

3. The adapter receives a request from the SAP system in the form of an IDoc object. The adapter converts the IDoc into a Generic Business Object. The Generic Business Object holds the IDoc content in a binary format.

4. The business process in WebSphere Process Server routes the Generic Business Object to subsequent components. In this case, the component is the one which can understand the Idoc in binary format for example, a WTX mapping.

5. Further in the business process you may want add more components which actual enrich the data received from adapter. This involves connecting other EIS or having static information. The enrichment component may or may not be useful depending on the legacy system requirements.

6. The enrichment component, delivers the enriched data to the legacy system.

The whole scenario is configured in asynchronous fashion. Any exception in the subsequent components should intimate the adapter component in a synchronous fashion so that the IDoc can be resubmitted from the SAP system.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

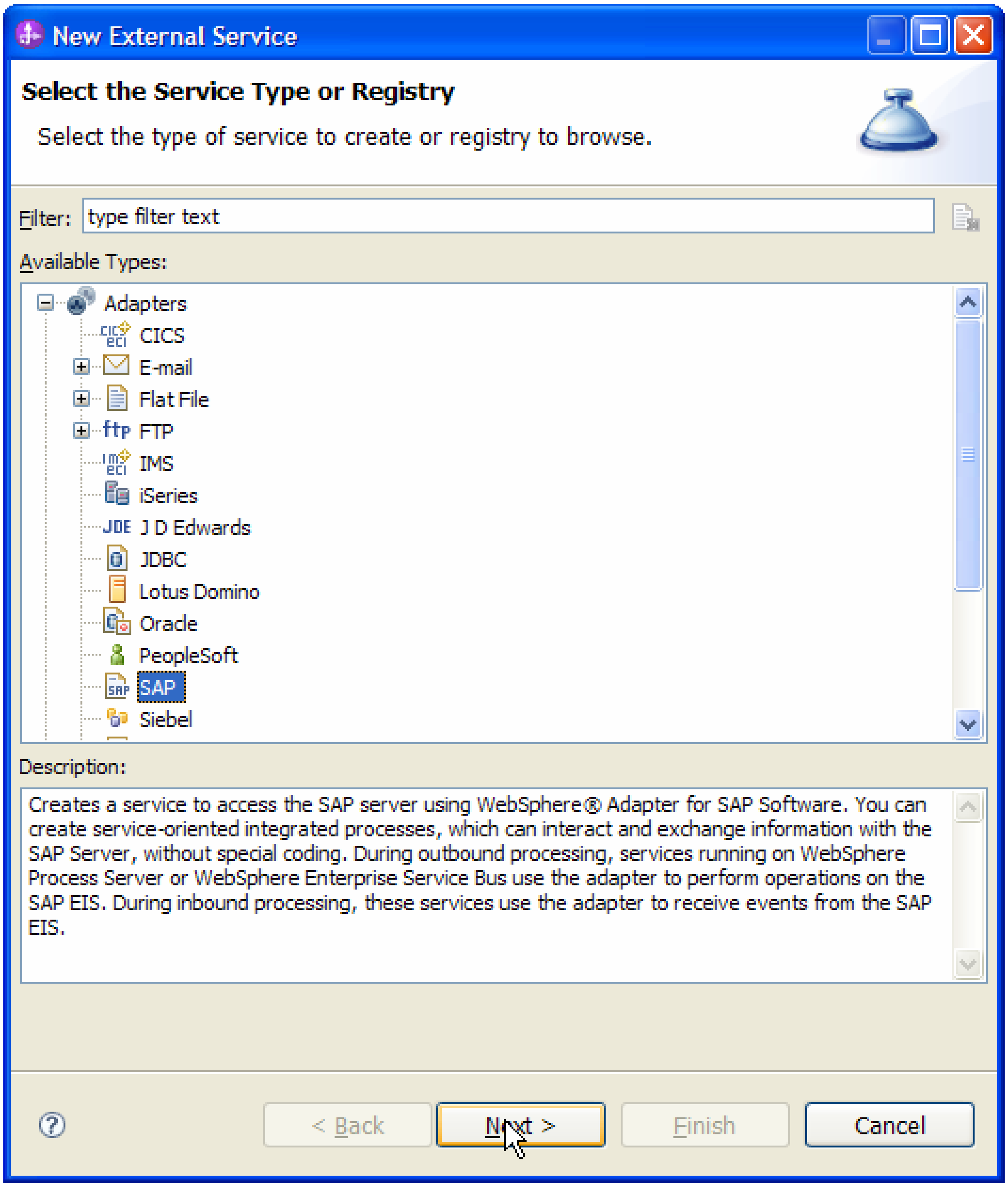
<*WPS_INSTALL*> represents the WebSphere Process Server installation directoryConfiguring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

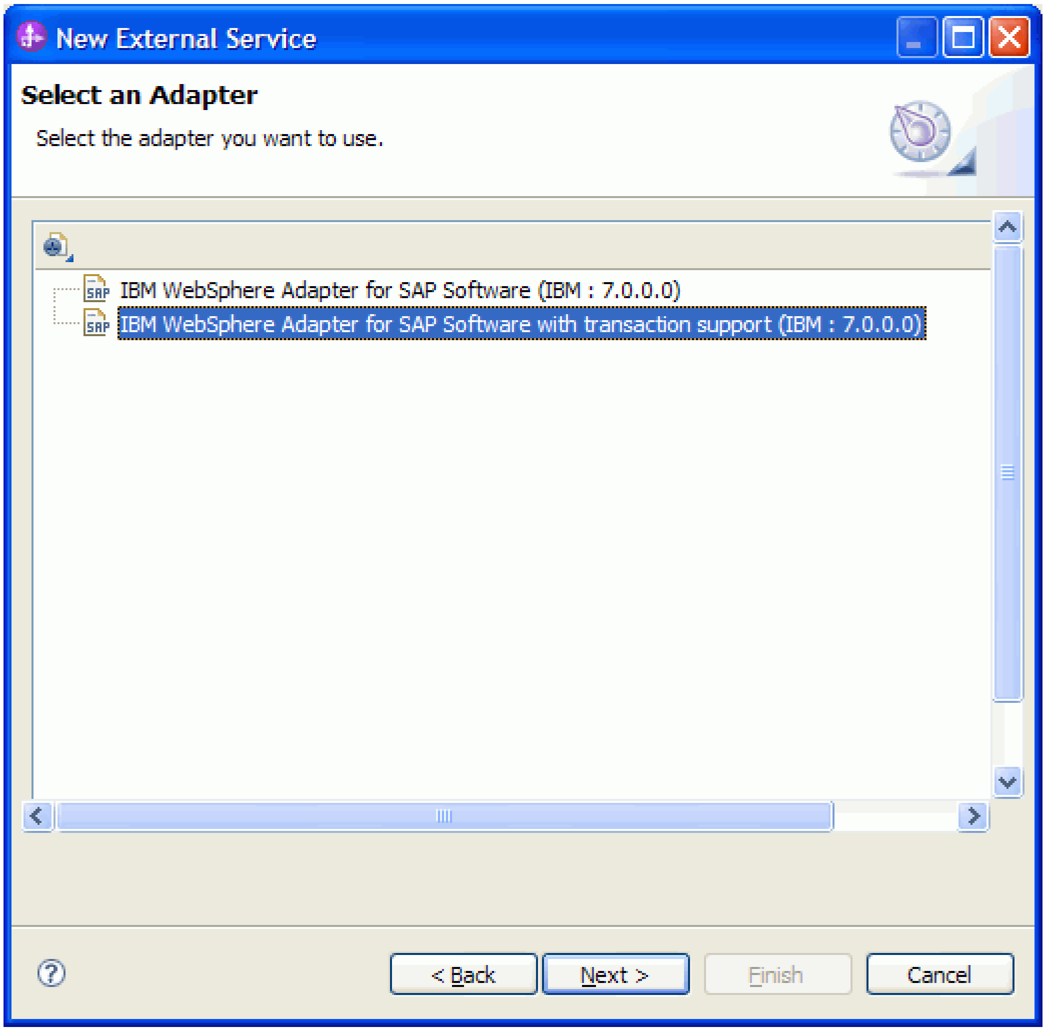
1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next**.



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

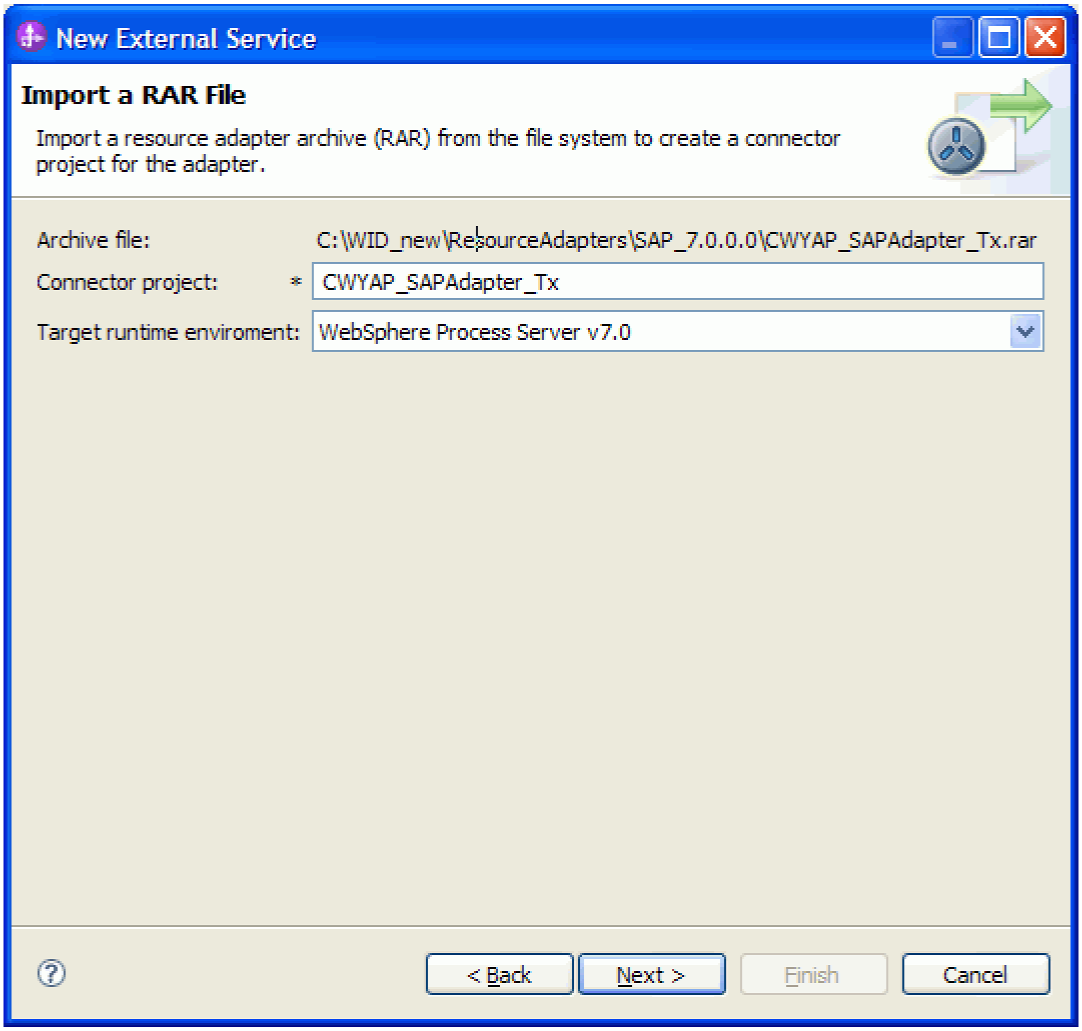
- IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
- IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** and click **Next.**



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

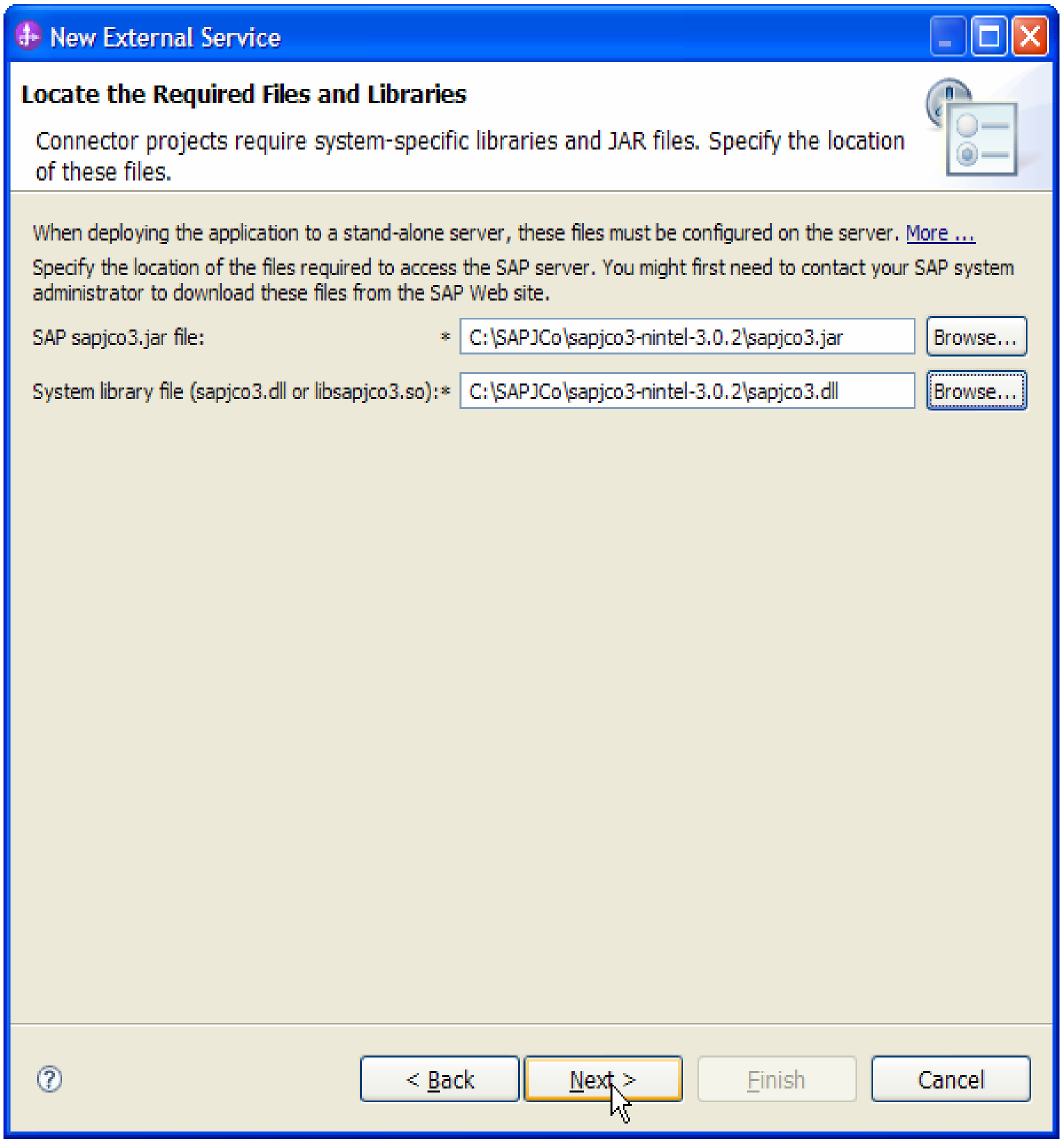
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

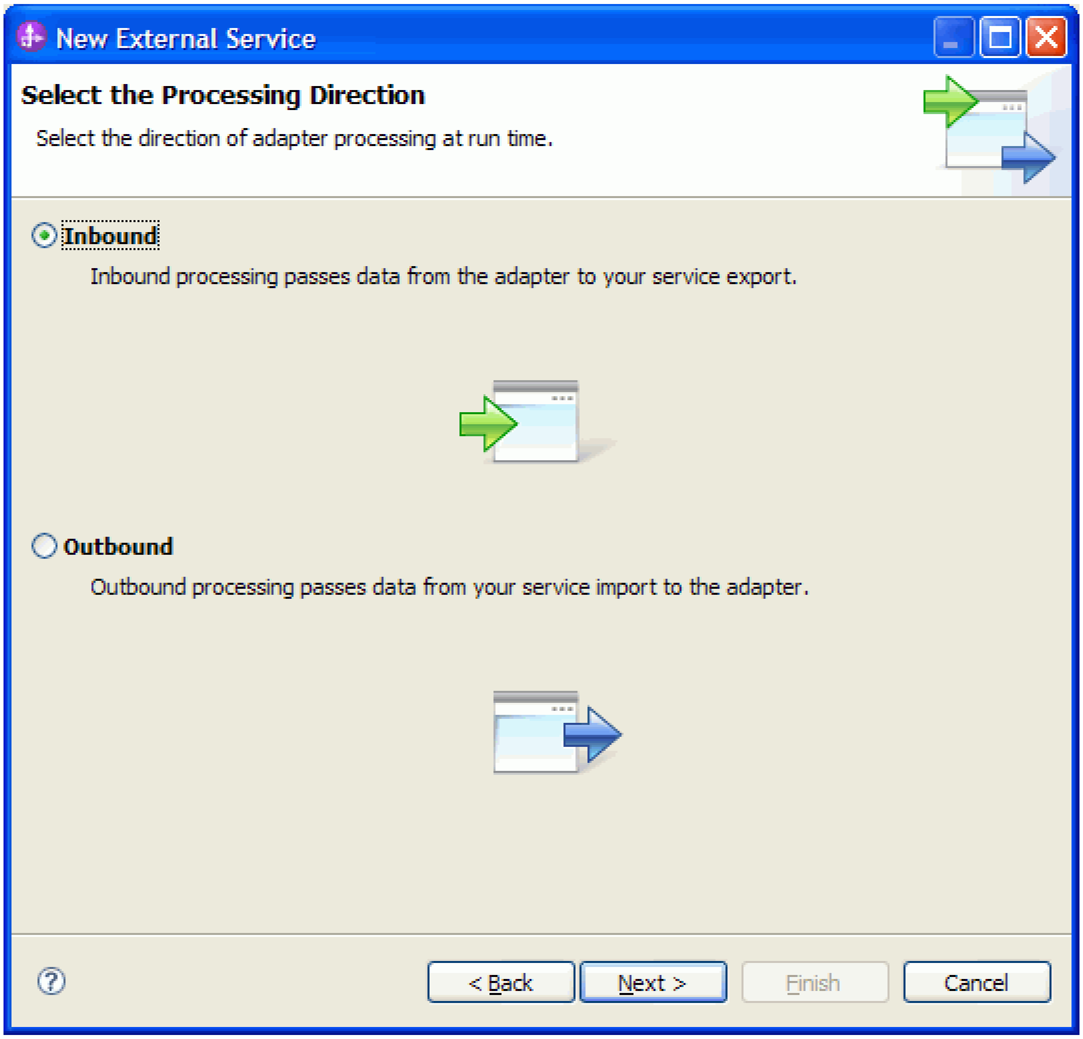
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

5. Click **Next**.

6. In the **Select the Processing Direction**, select **Inbound** radio button, then click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Figure: Select the processing direction

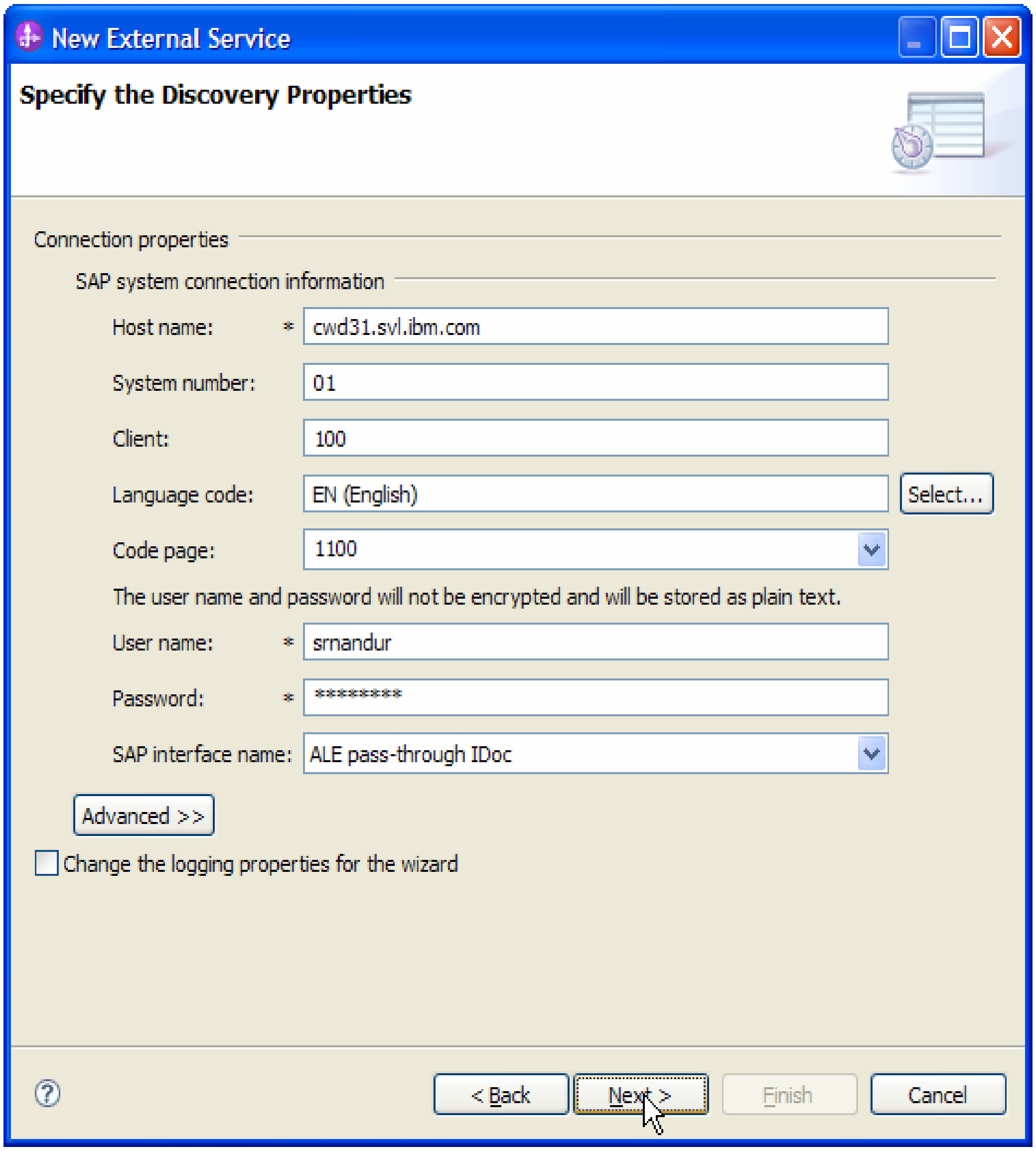
Setting connection properties for the New External Service wizard

You must prove the following information in the **Discovery Configuration** screen:

- User name
- Password
- Host name
- System number
- SAP Client connection
- Click Select to change the default Language code from English

- Use the drop down option to change the default Code page from 1100.
- Select **ALE pass-through IDoc** as the SAP Interface name.

Click **Next**.


New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

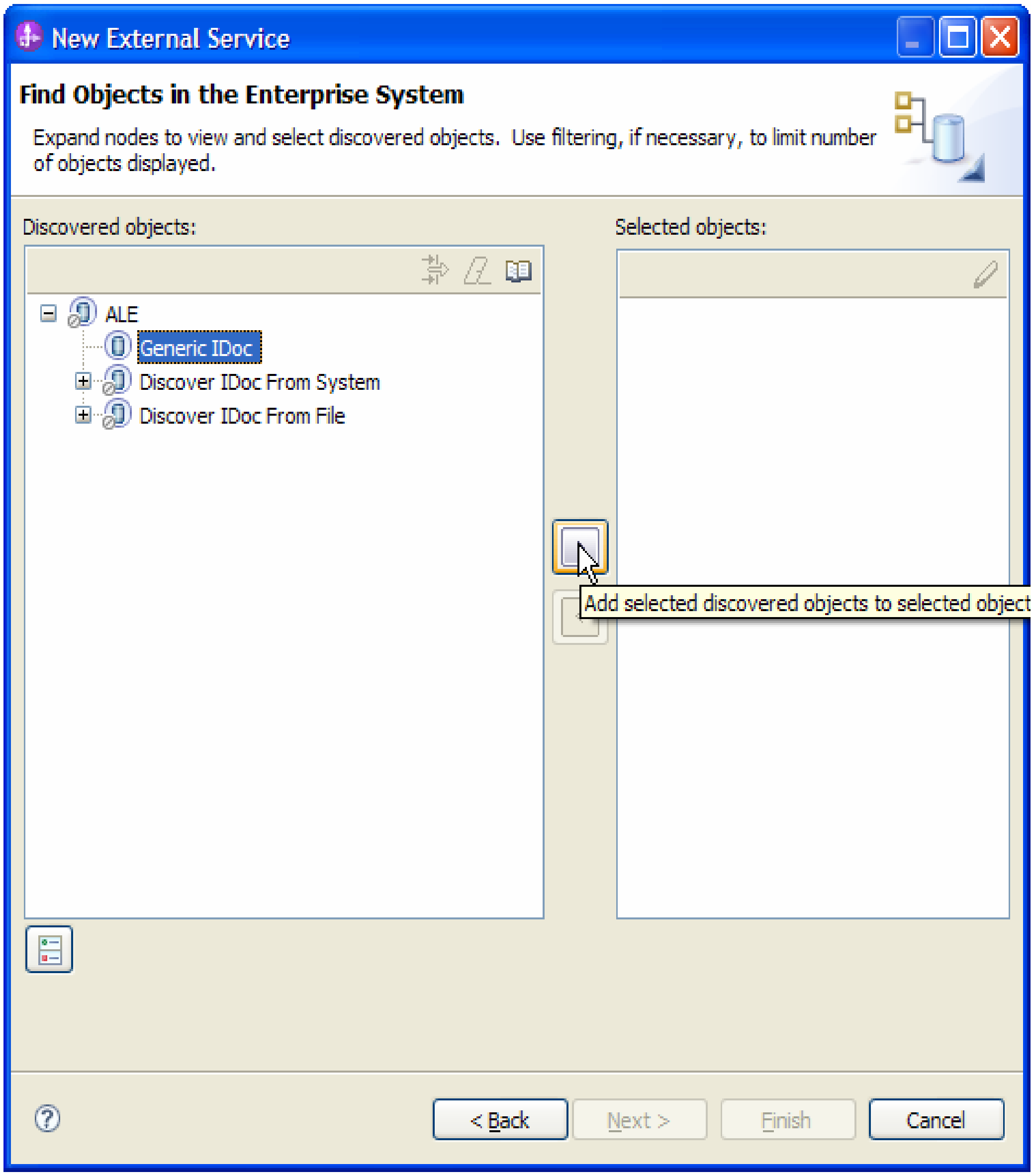
SAP interface name: ALE pass-through IDoc

□ Change the logging properties for the wizard

Figure: Select ALE pass-through IDoc as the interface

Selecting the Business Objects and services to be used with the adapter

Under **Find Objects in the Enterprise System**, expand the **ALE** node, select **Generic IDoc** and click the > button to add to the selected objects.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

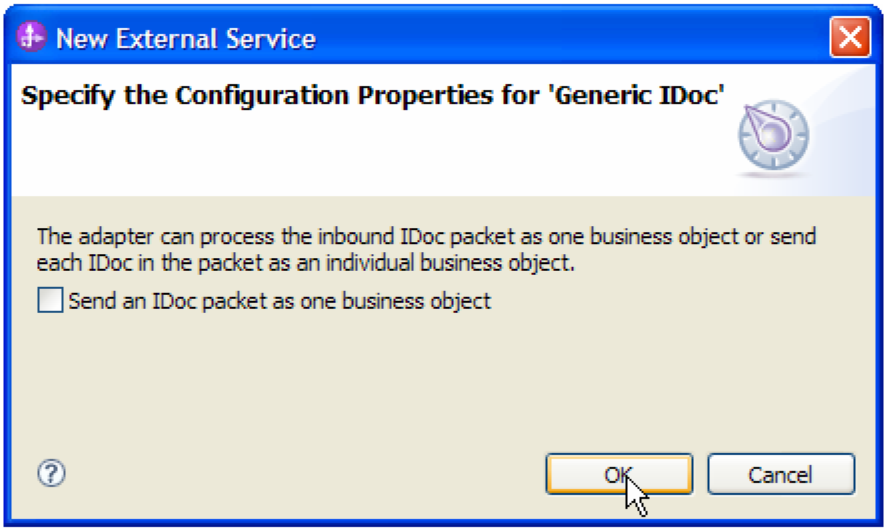
- ALE
  - Generic IDoc
  - Discover IDoc From System
  - Discover IDoc From File

Selected objects:

Add selected discovered objects to selected object

Figure: Object Discovery and Selection

In the **Configuration Parameters** screen, choose the default values and Click **OK**.



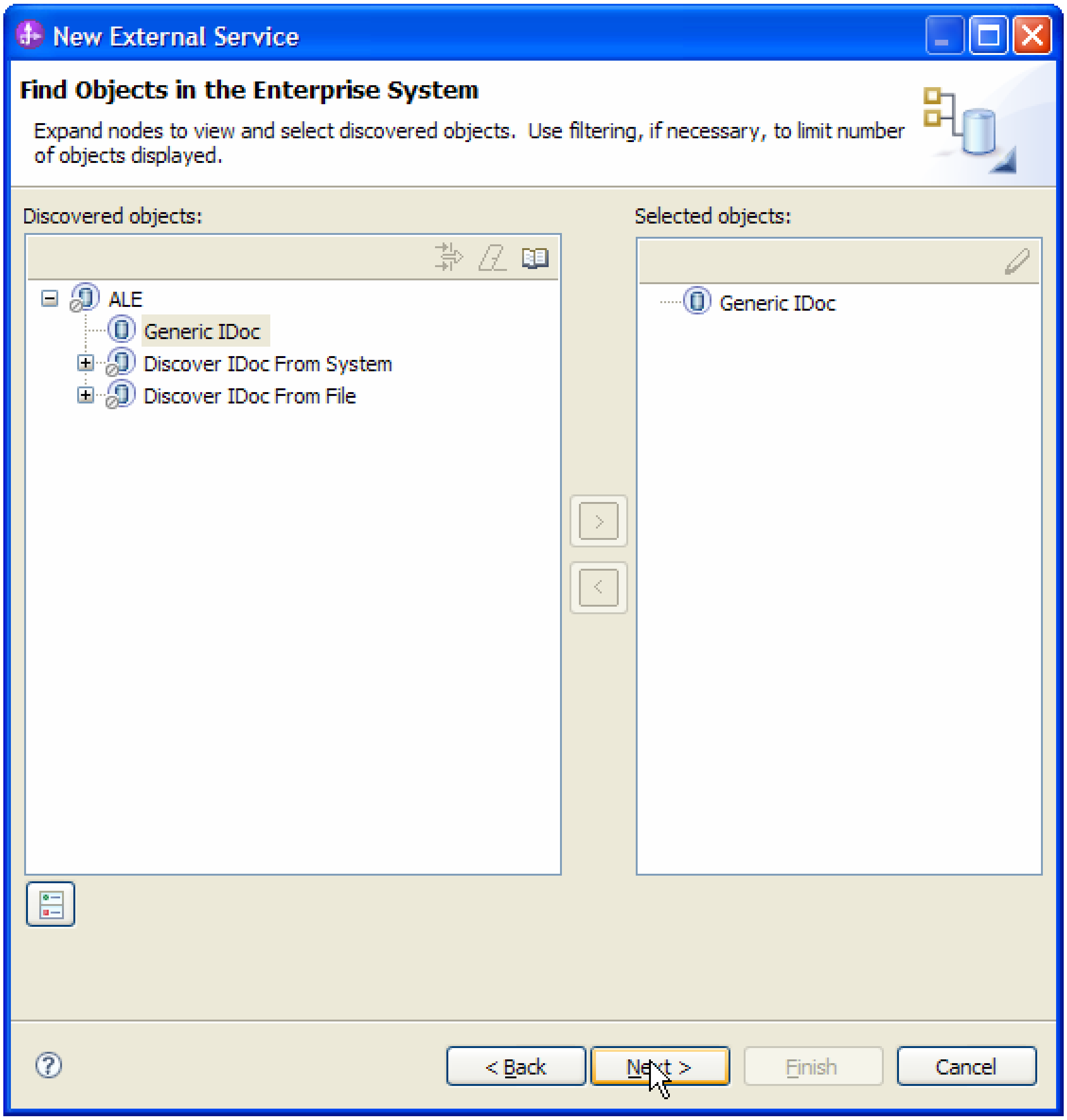
Specify the Configuration Properties for 'Generic IDoc'

The adapter can process the inbound IDoc packet as one business object or send each IDoc in the packet as an individual business object.

□ Send an IDoc packet as one business object

Figure: Configuration properties for 'Generic IDoc'

Generic IDoc has now been added to the list of Business Objects to be imported.


New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

- ALE
  - Generic IDoc
  - Discover IDoc From System
  - Discover IDoc From File

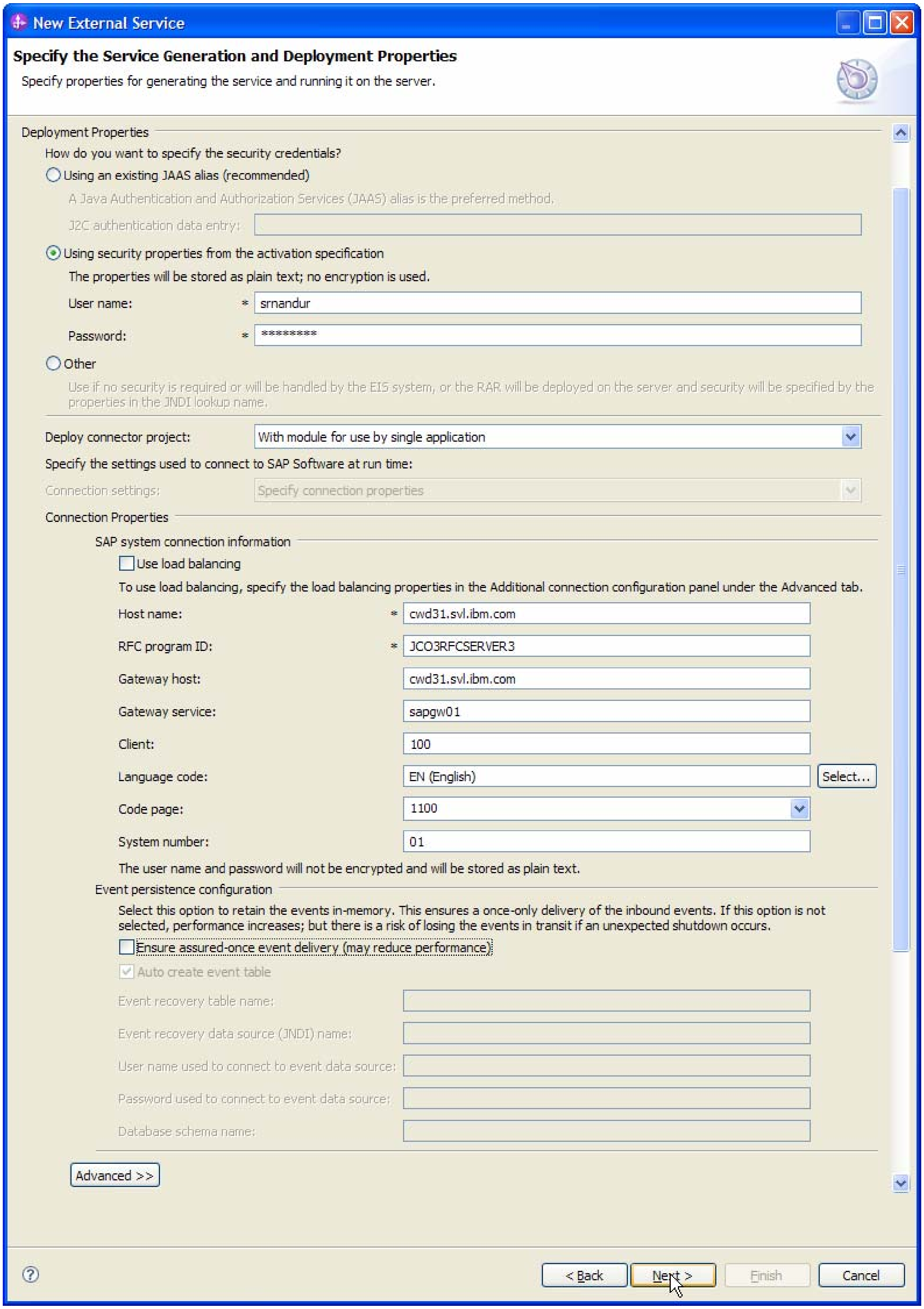
Selected objects:

- Generic IDoc

Figure: Selected Generic IDoc added to the Objects to be imported

Click **Next**

On the **Service Generation and Deployment Configuration** screen, enter the connection information. Click **Next**.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the activation specification

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: *	cwd31.svl.ibm.com
RFC program ID: *	JCO3RFCSERVER3
Gateway host:	cwd31.svl.ibm.com
Gateway service:	sapgw01
Client:	100
Language code:	EN (English)
Code page:	1100
System number:	01

The user name and password will not be encrypted and will be stored as plain text.

Event persistence configuration

Select this option to retain the events in-memory. This ensures a once-only delivery of the inbound events. If this option is not selected, performance increases; but there is a risk of losing the events in transit if an unexpected shutdown occurs.

□ Ensure assured-once event delivery (may reduce performance)

☑ Auto create event table

Event recovery table name:

Event recovery data source (JNDI) name:

User name used to connect to event data source:

Password used to connect to event data source:

Database schema name:

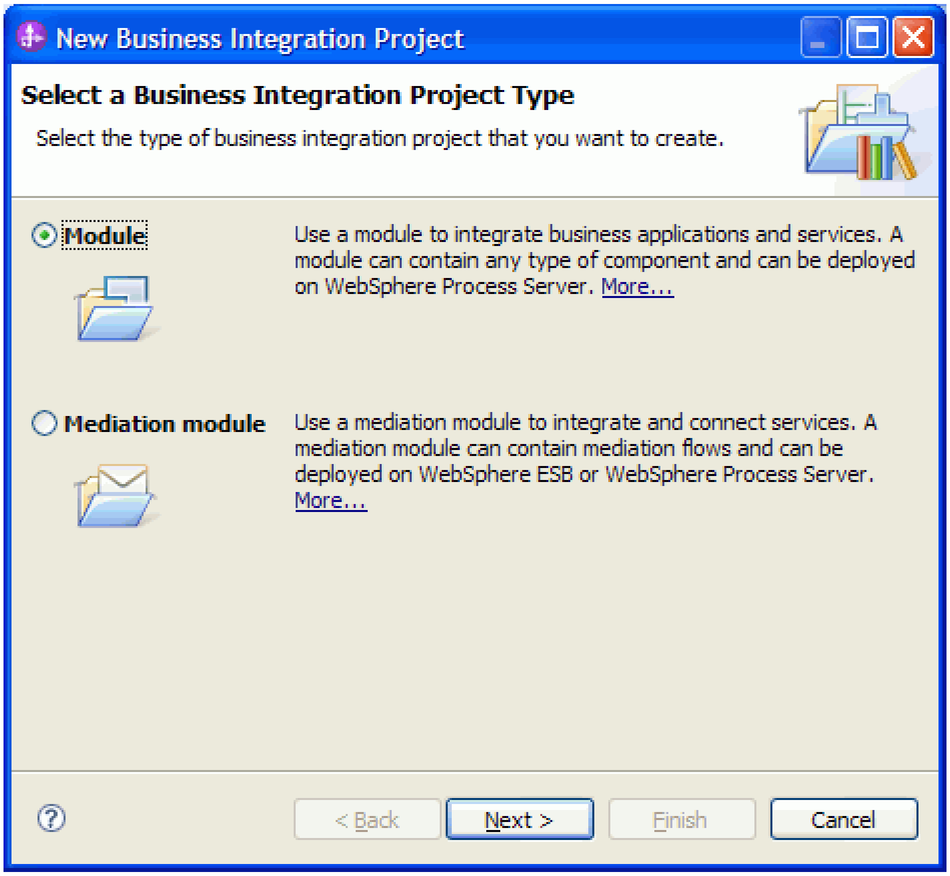
Figure: Service Generation and Deployment Configuration

Note: You can either enter the Authentication Alias previously created using the Administrative Console of the WebSphere Process Server or enter the username and password used to login in to the SAP system.

Click Next.

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the New Business Integration Project screen appears, select **Module** radio button and click **Next.**



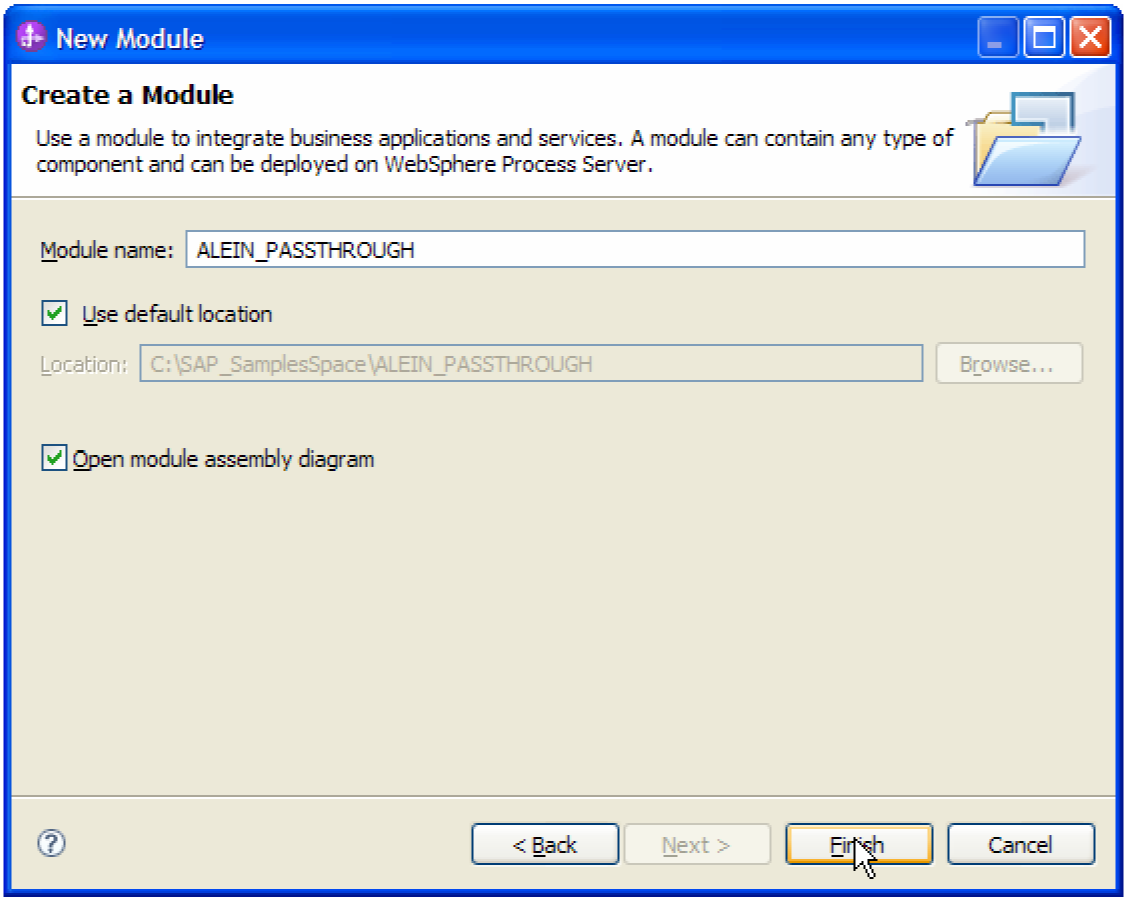
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **ALEIN_PASSTHROUGH** in the **Module Name** field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

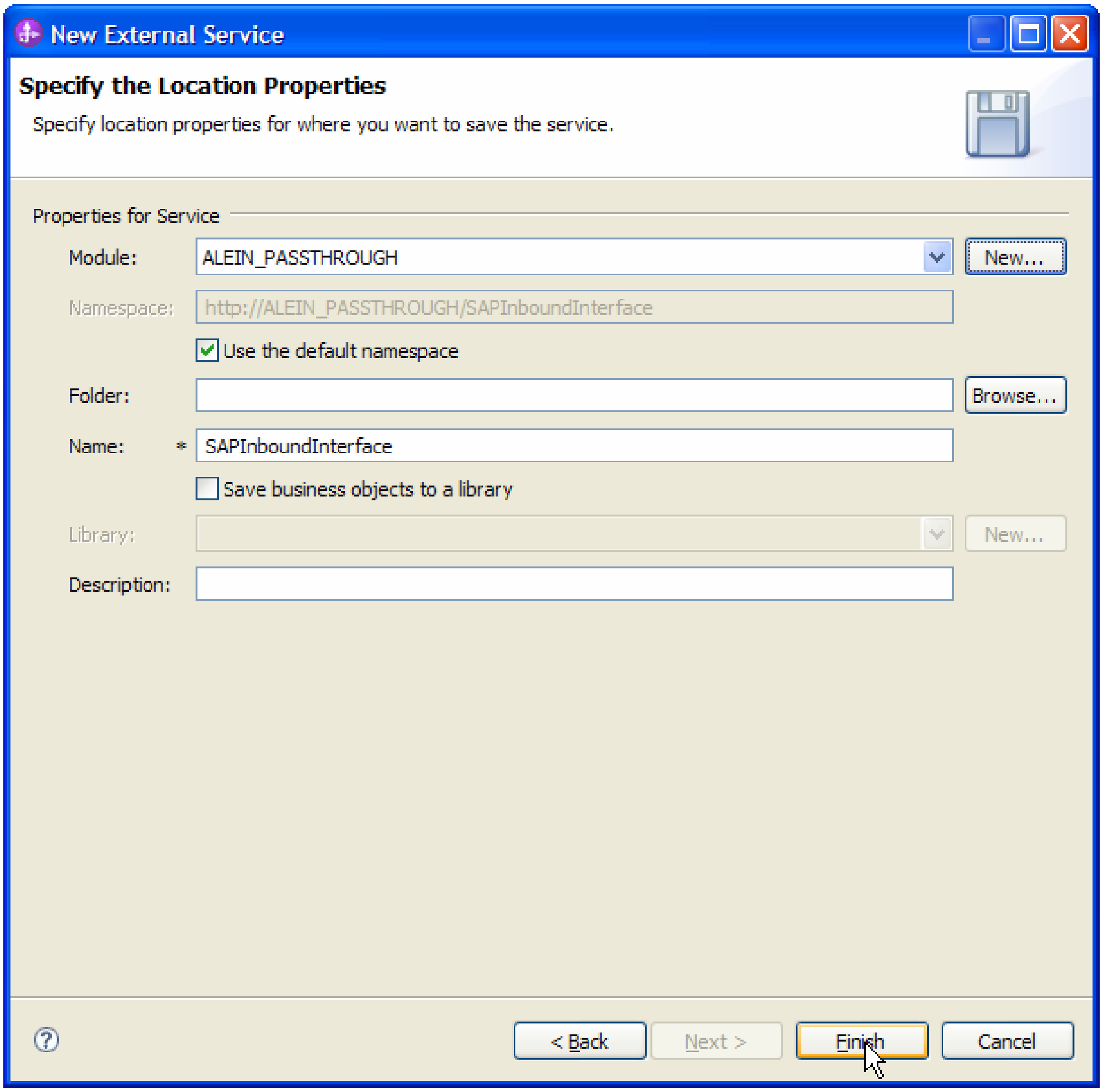
Module name: ALEIN_PASSTHROUGH

☑ Use default location

Location: C:\SAP_SamplesSpace\ALEIN_PASSTHROUGH

☑ Open module assembly diagram

Click Finish on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: ALEIN_PASSTHROUGH

Namespace: http://ALEIN_PASSTHROUGH/SAPInboundInterface

☑ Use the default namespace

Folder:

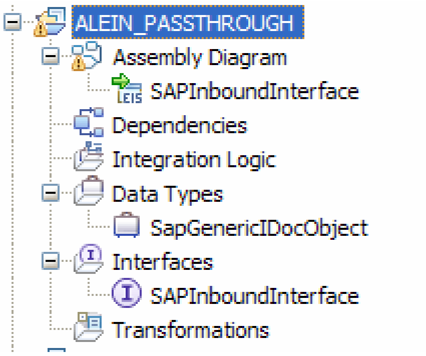
Name: * SAPInboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



ALEIN_PASSTHROUGH
- Assembly Diagram
  - SAPInboundInterface
- Dependencies
- Integration Logic
- Data Types
  - SapGenericIDocObject
- Interfaces
  - SAPInboundInterface
- Transformations

Figure: Artifacts created after the EMD run fore ALE pass-through Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **ALEIN_PASSTHROUGH** SCA module, and double click the **Assembly Diagram**. The Assembly Diagram screen appears with the module's Export component in view.

1. To create a new component, click the button of Java component from the **Palette.**

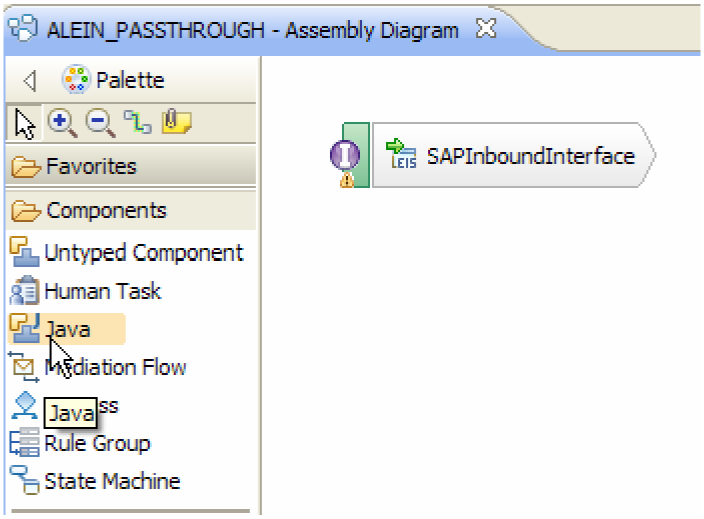


Figure: ALE pass-through Inbound interface in the Assembly editor

Click and drag the Java component to add the new component to the **Assembly Diagram** screen.

Add a Wire between the **SAPInboundInterface** and the Java component.

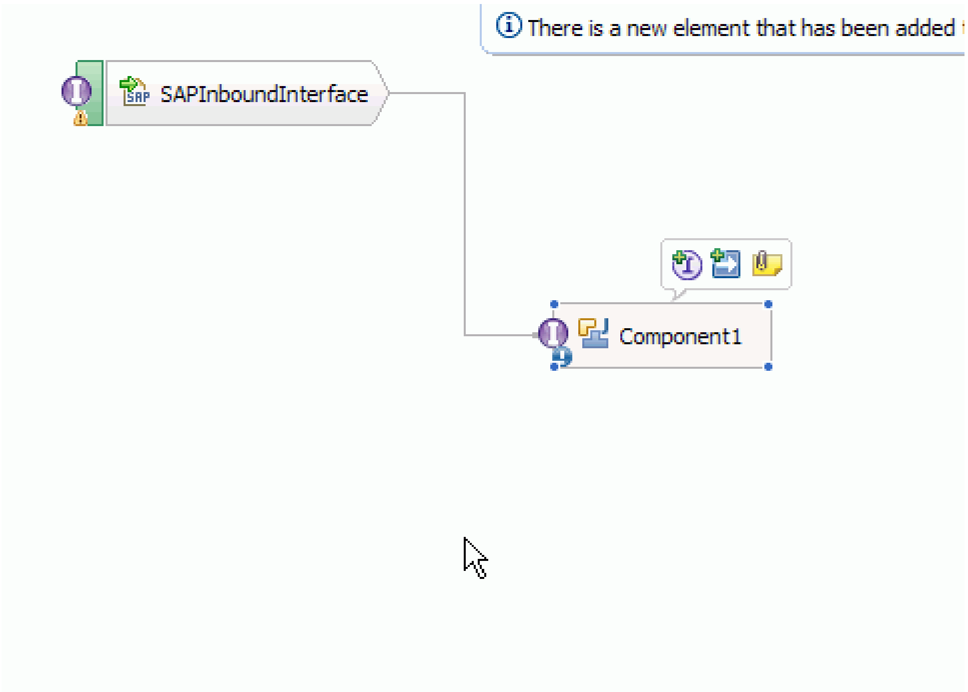
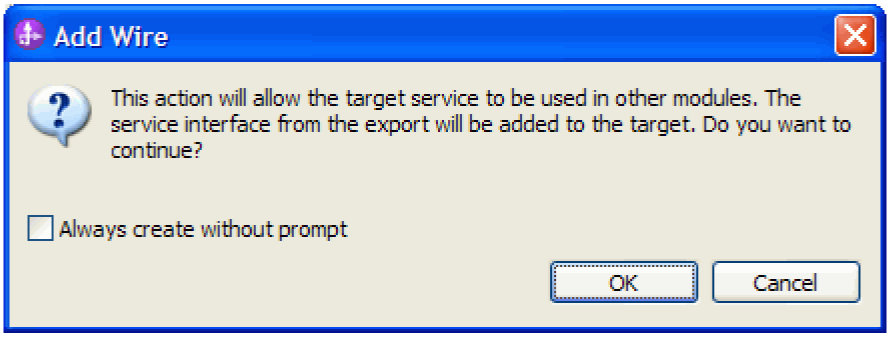


Figure: ALE pass-through Inbound interface being wired to a target Component(end-point)

In the **Add Wire** screen, click **OK**.



Add Wire

This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Confirmation Dialog

Right-click the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

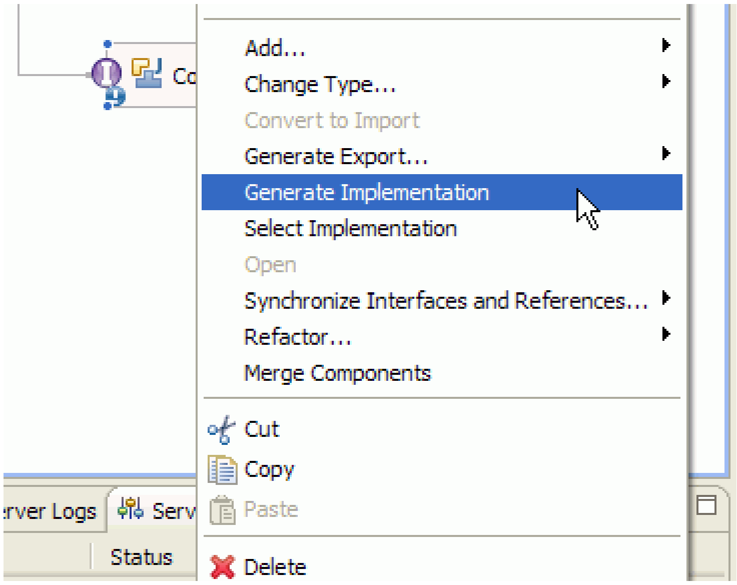
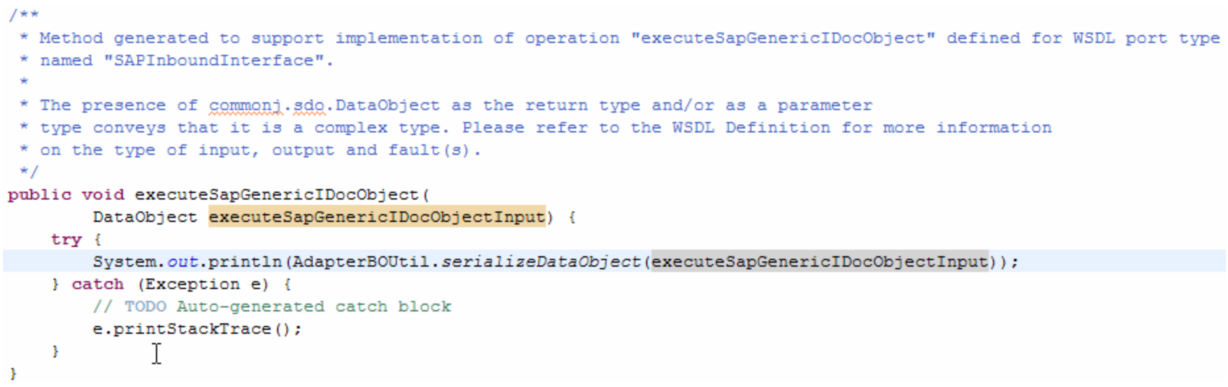


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "executeSapGenericIDocObject" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void executeSapGenericIDocObject(
        DataObject executeSapGenericIDocObjectInput) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(executeSapGenericIDocObjectInput));
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
}
```

Save the Java file

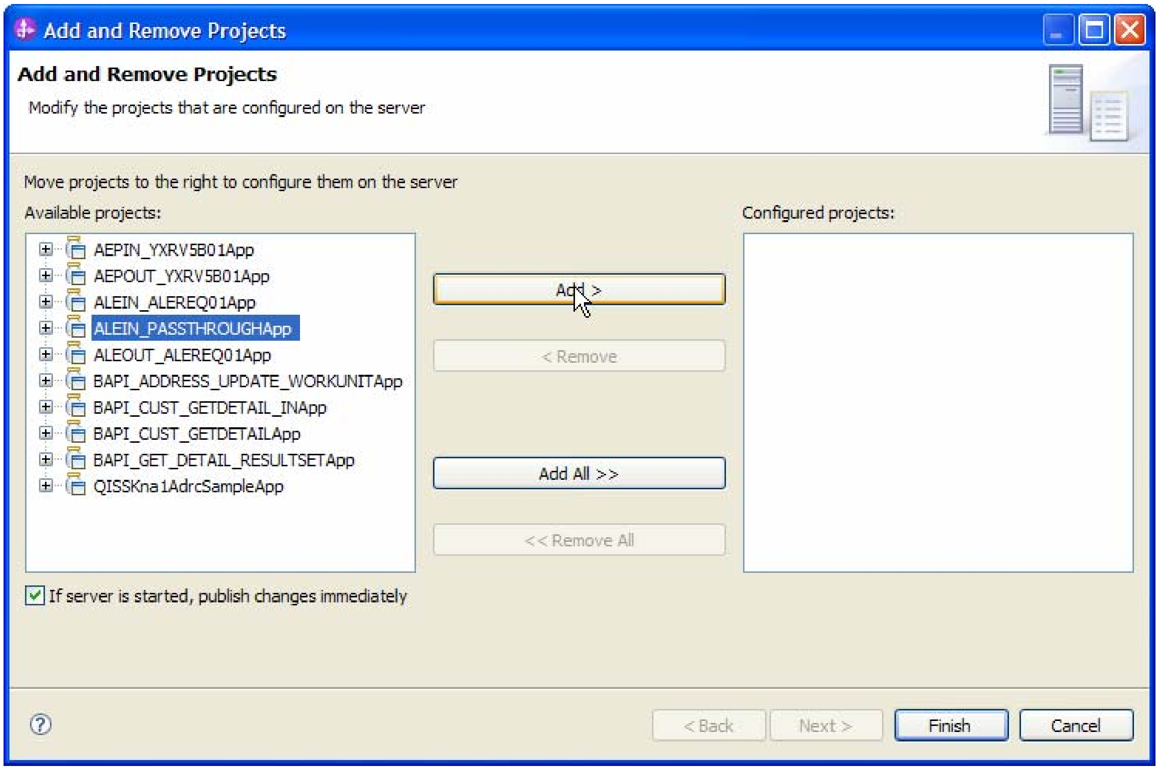
Save assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module ALEIN_PASSTHROUGHby selecting **Add and Remove Projects**.

The project ALEIN_PASSTHROUGHApp will be listed under **Available projects**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

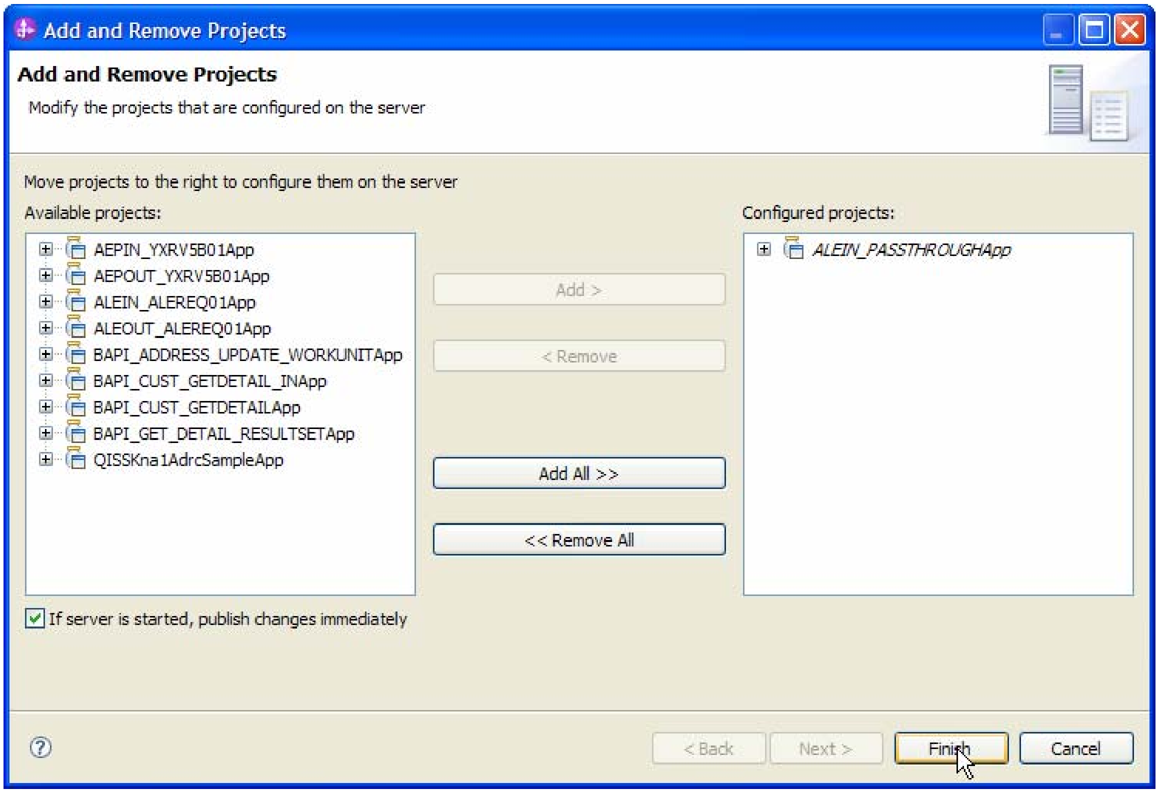
Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEIN_PASSTHROUGHApp
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

☑ If server is started, publish changes immediately

After adding the project, the added project should appear under the **Configured projects**. Add the SCA module to the server by clicking on **Finish.**



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

- *ALEIN_PASSTHROUGHApp*

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

Start the Transaction **WE19**.

Choose the radio button **Existing IDoc.**

Select an existing IDoc **MATMAS01** that you want to send

Set appropriate values in IDoc.

Select Standard Outbound Processing button

Select **Continue** in the pop-up box

This creates an ALE inbound event for the ALE inbound application deployed earlier.

The event should reach the Java end point, indicated by the output of MATMAS01 Business Object on the console of WebSphere Integration Developer.

Chapter 16. Tutorial 11: Sending data to SAP (outbound processing) using the Queued RFC(qRFC) BAPI Interface

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses this interface to make calls to the SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector interface to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If WebSphere Integration Developer is installed generally the WebSphere Process Server instance is installed under <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy sapjco3.jar to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath.

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

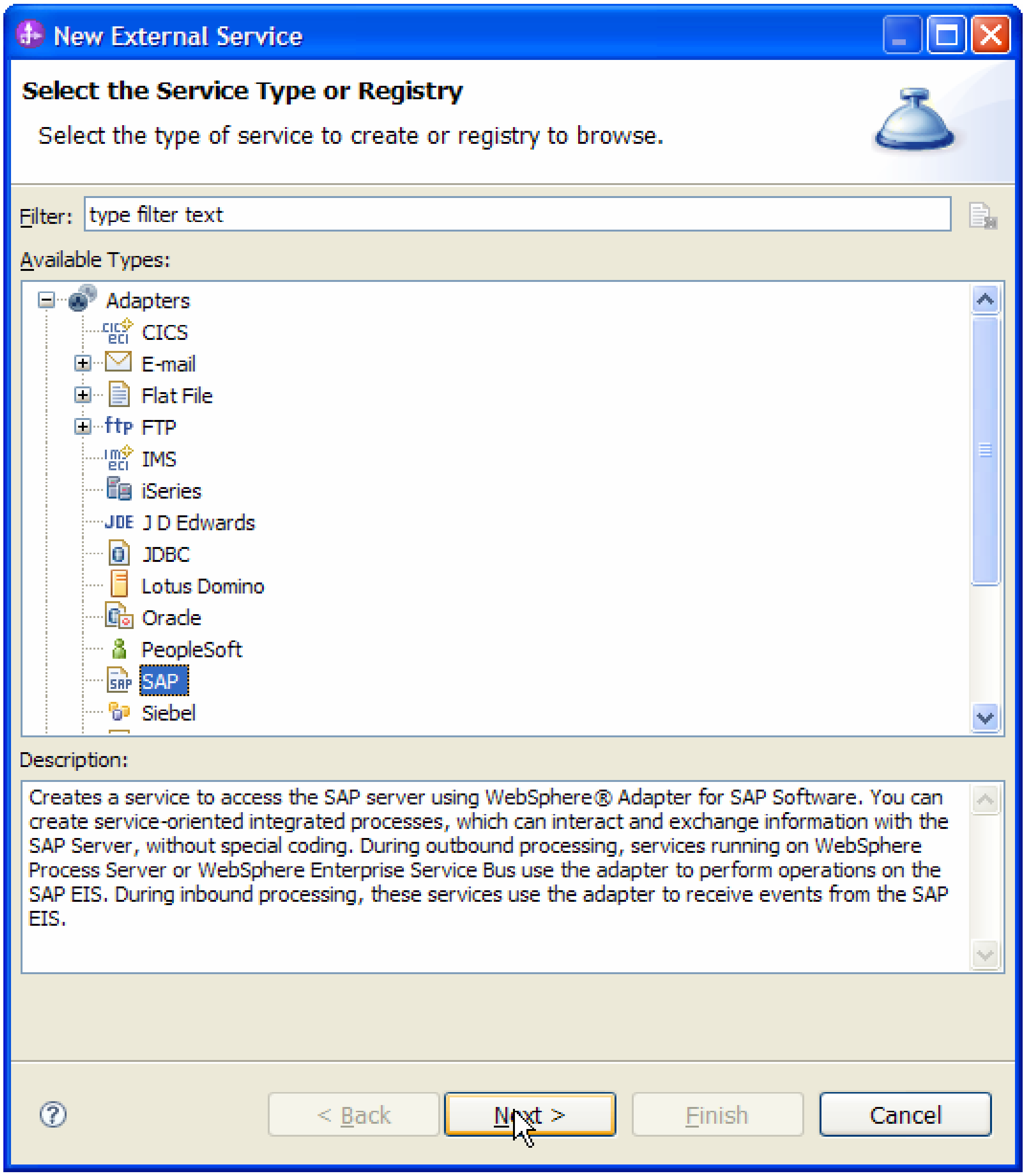
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



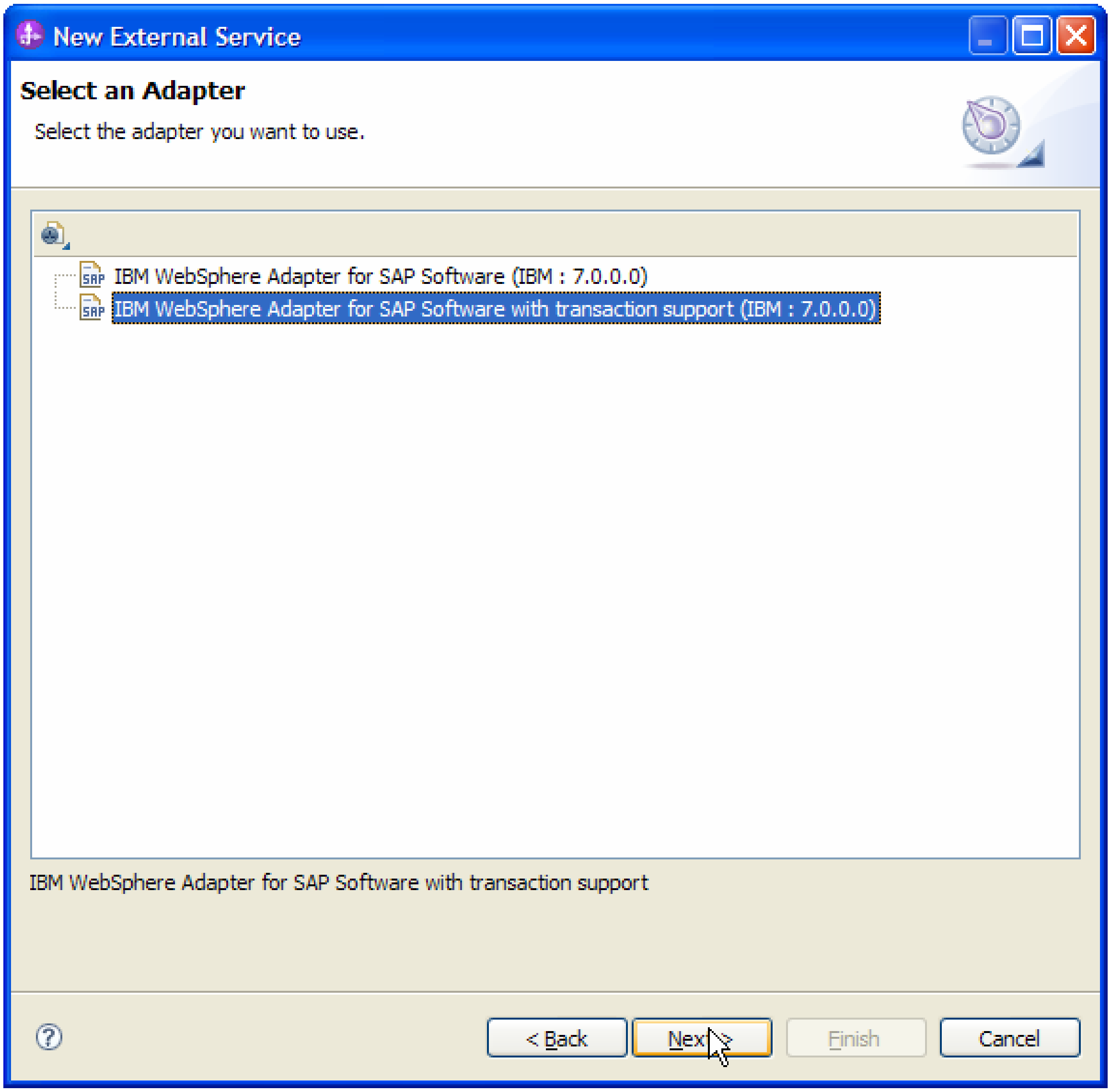
Select the Service Type or Registry

Select the type of service to create or registry to browse.

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

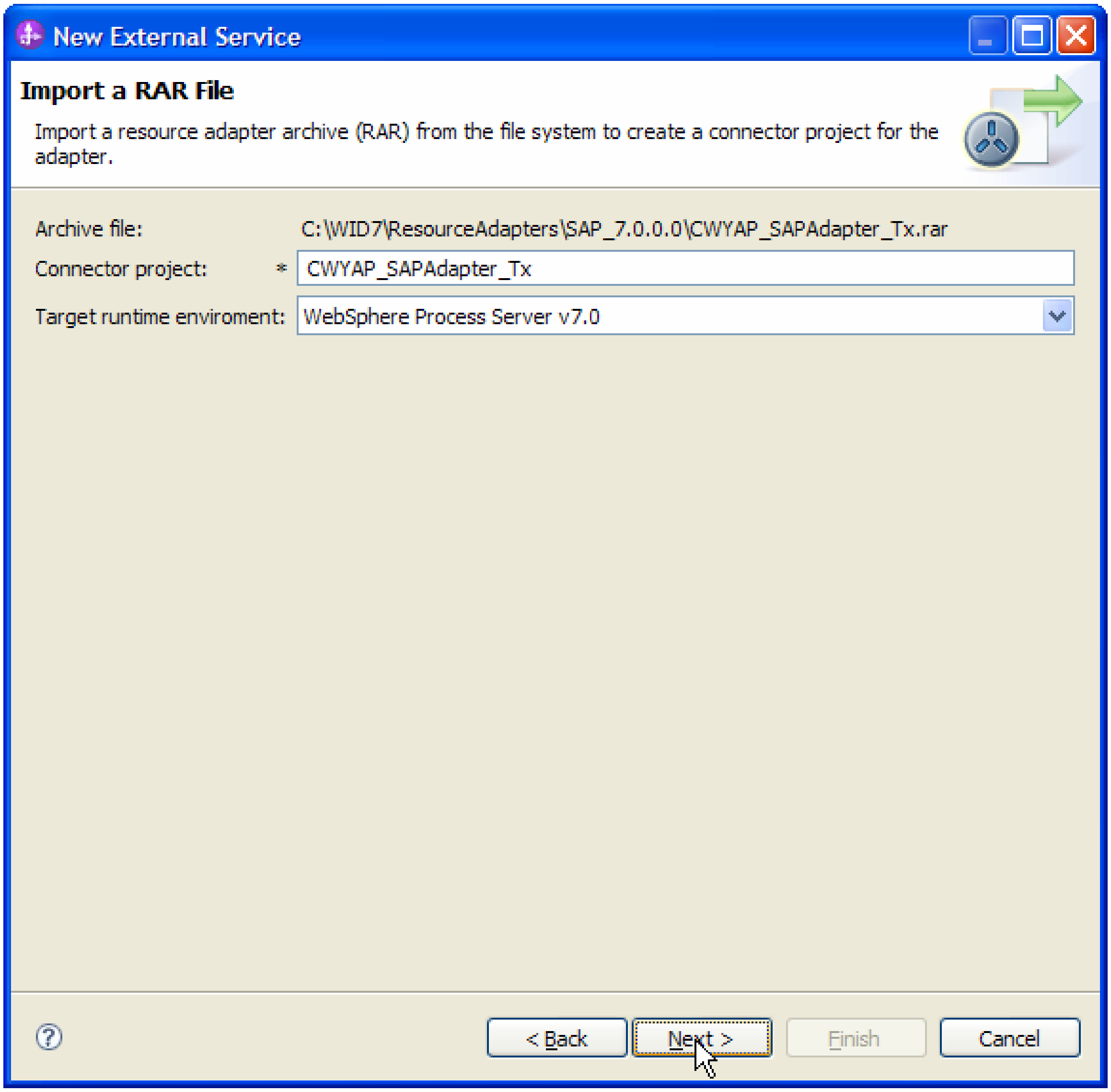
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify the Connector Project name in the **Import a RAR File** screen and click **Next.**



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

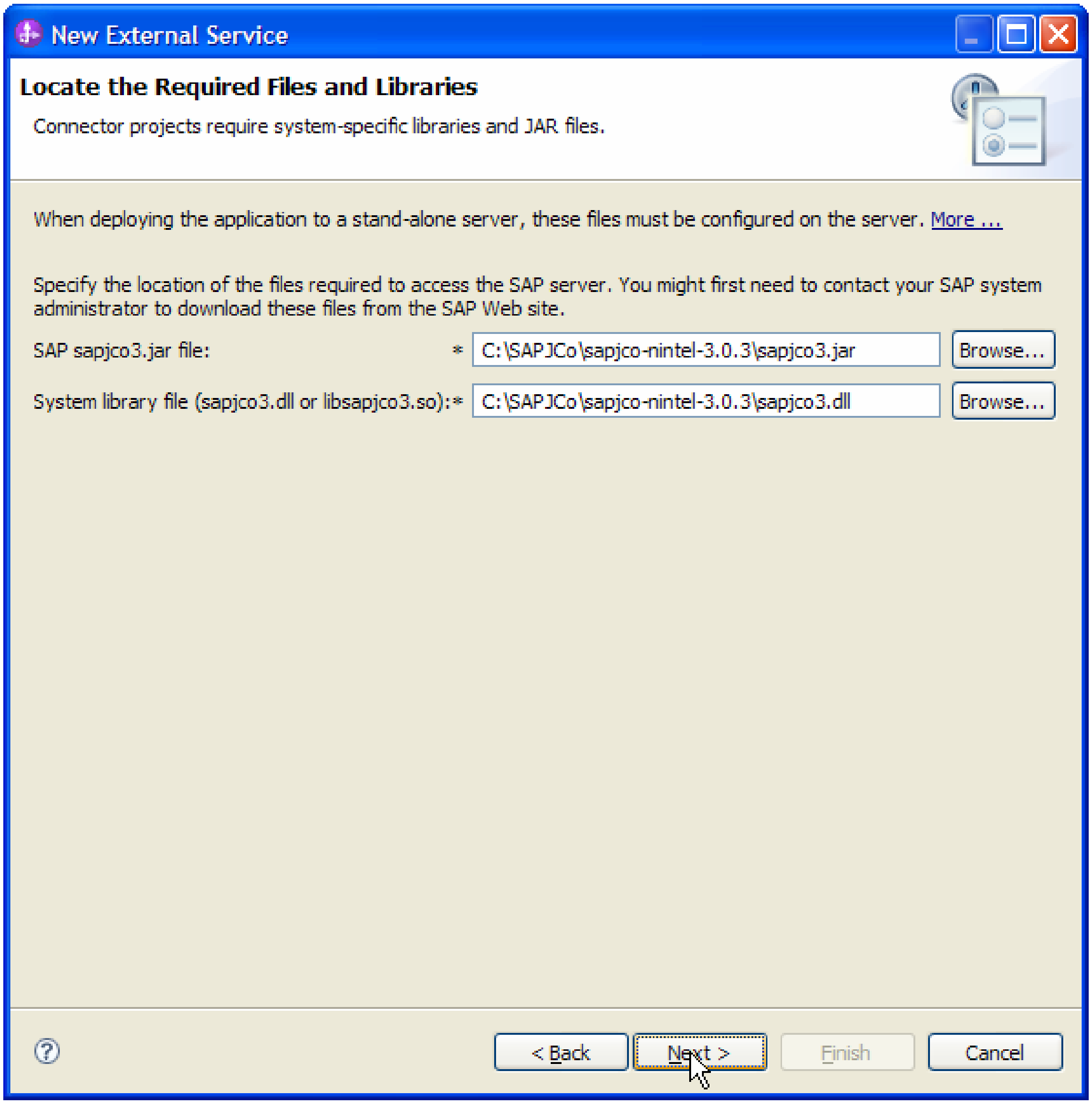
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

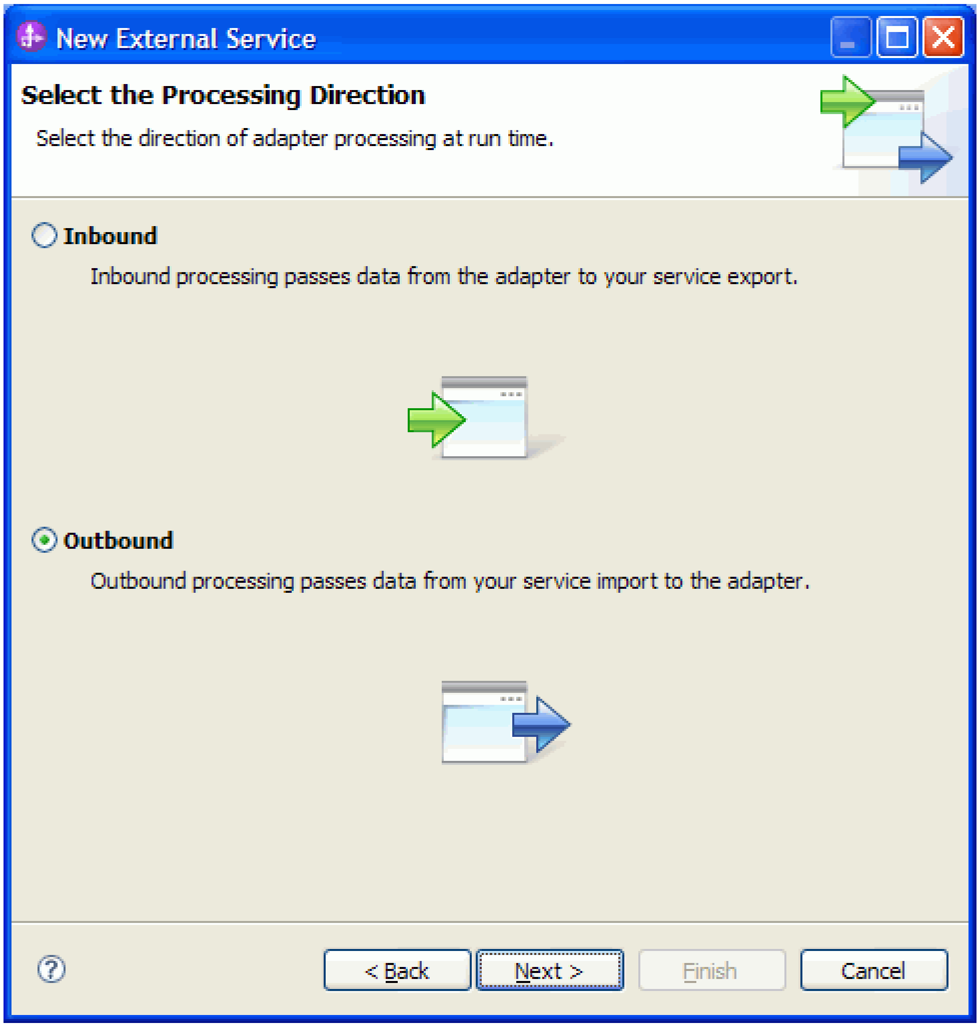
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll

5. Click **Next**.

6. In **Select the Processing Direction** screen, select the **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ **Inbound**

Inbound processing passes data from the adapter to your service export.

● **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

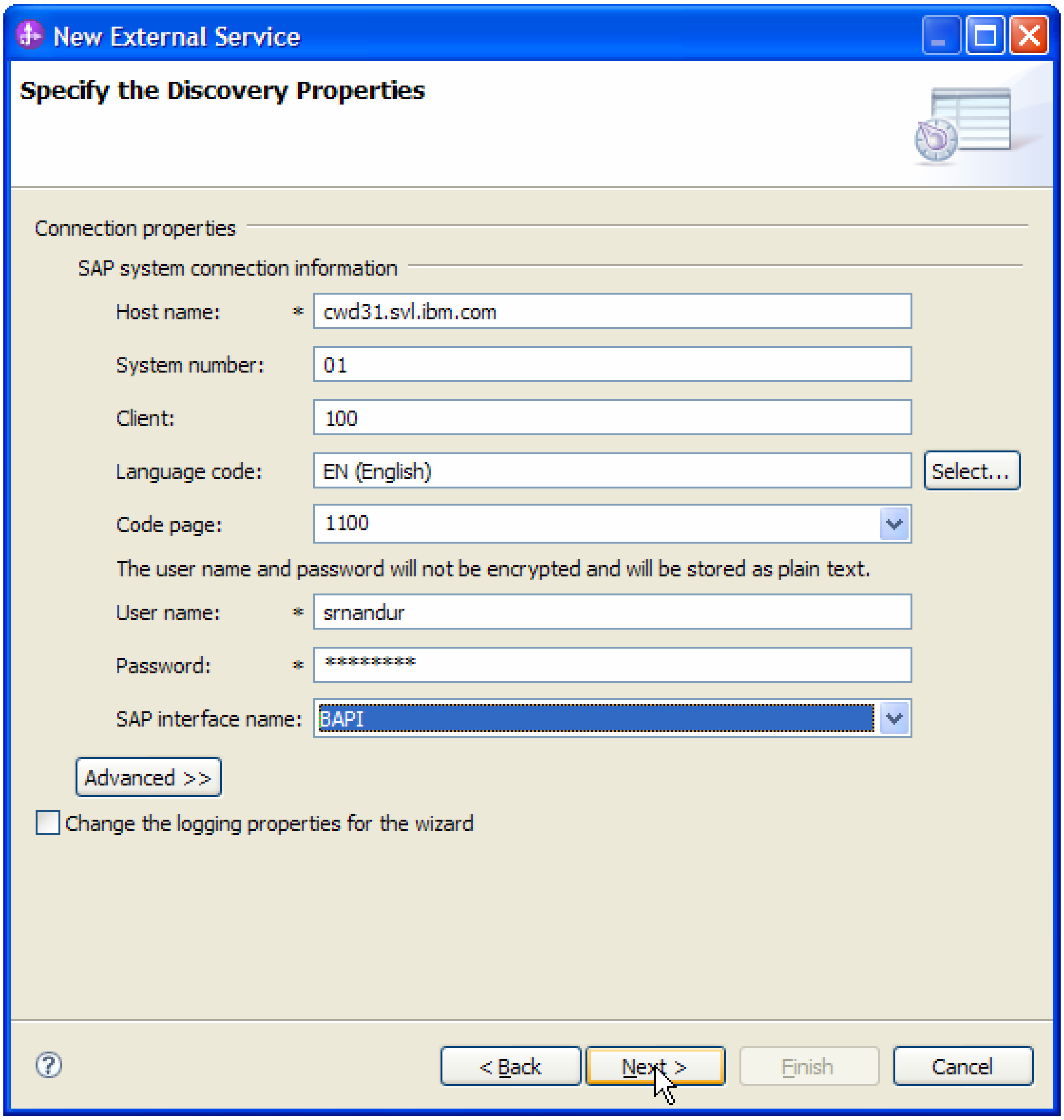
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

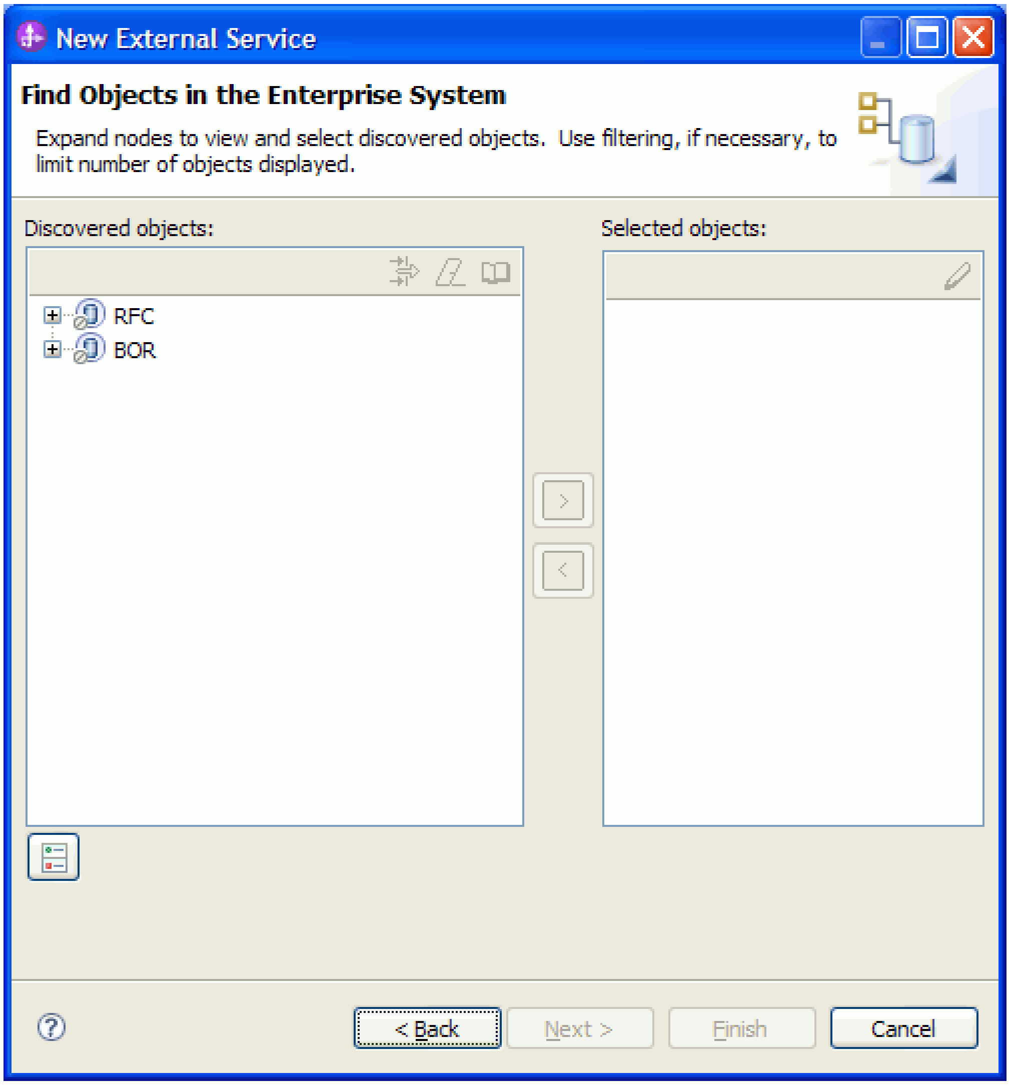
SAP interface name: BAPI

□ Change the logging properties for the wizard

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find objects in the Enterprise System** screen, click the RFC node. Then click the ⇥ button.



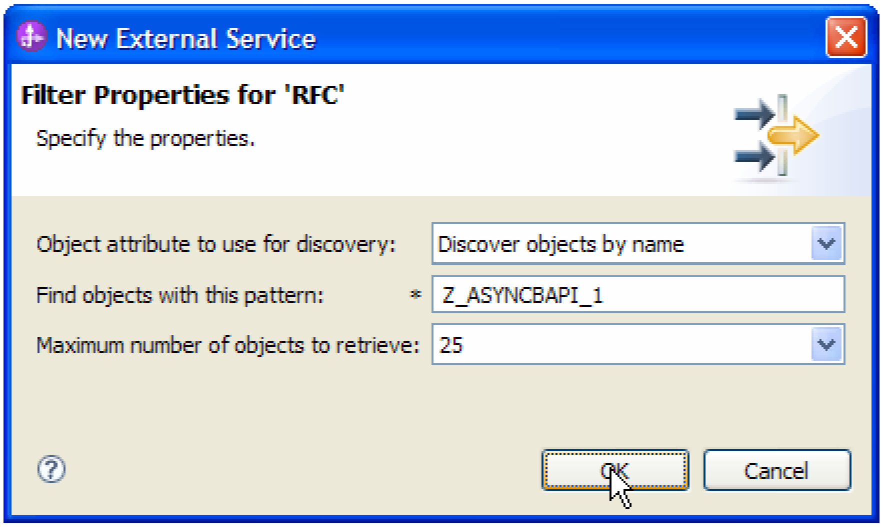
New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Figure: Object Discovery and Selection

Enter **Z_ASYNCBAPI_1** (the name of the BAPI in SAP) in the **Filter Properties for 'RFC'** screen.



Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

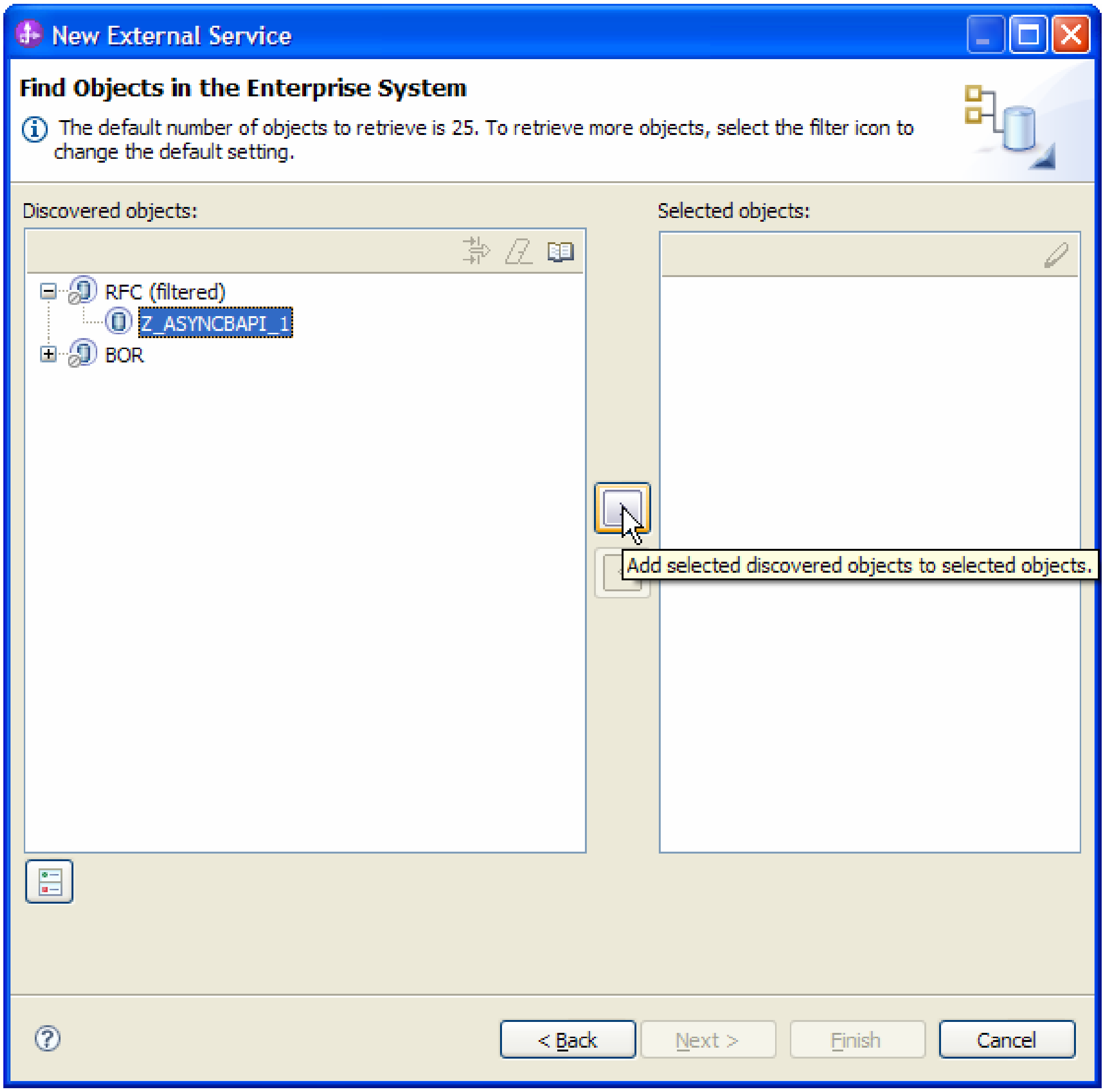
Find objects with this pattern: * Z_ASYNCBAPI_1

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **RFC** node.

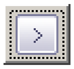

New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Figure: Retrieved BAPIs' based on search criteria

Select the **Z_ASYNCBAPI_1** from the metadata tree.

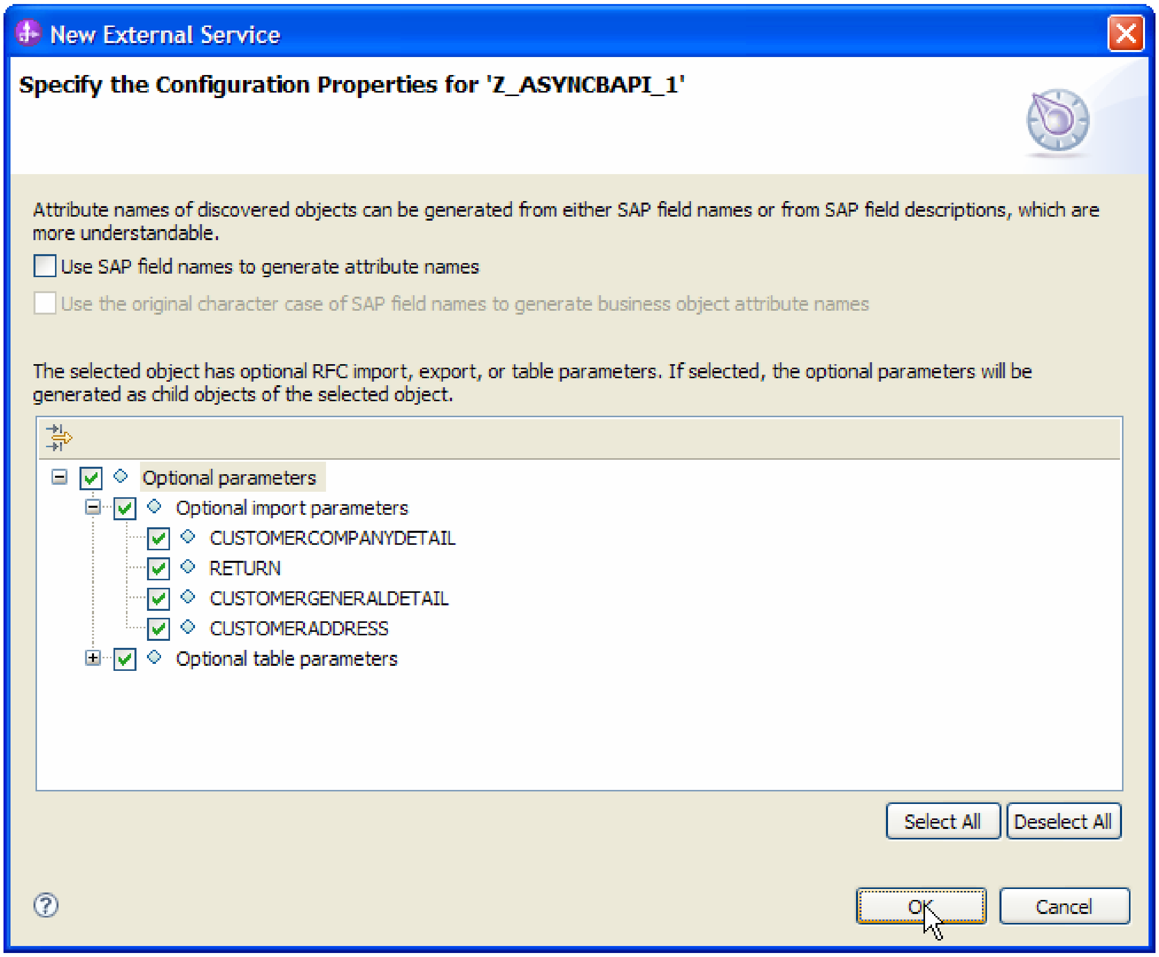
Click the  button.

A popup will appear containing the Configuration properties for the **Z_ASYNCBAPI_1** object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click **OK**.



New External Service

Specify the Configuration Properties for 'Z_ASYNCBAPI_1'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

- ☑ Optional parameters
  - ☑ Optional import parameters
    - ☑ CUSTOMERCOMPANYDETAIL
    - ☑ RETURN
    - ☑ CUSTOMERGENERALDETAIL
    - ☑ CUSTOMERADDRESS
  - ☑ Optional table parameters

Figure: Setting configuration parameters for the BAPI Z_ASYNCBAPI_1

Click **Next**

Generating Business Object definitions and related artifacts

In the Specify Composite Properties screen, check the Generate BAPI Business Objects within a wrapper checkbox.

Optionally, the Business Object folder name could be entered in which the Business Objects are created. Enter **bodefs** as the folder name.

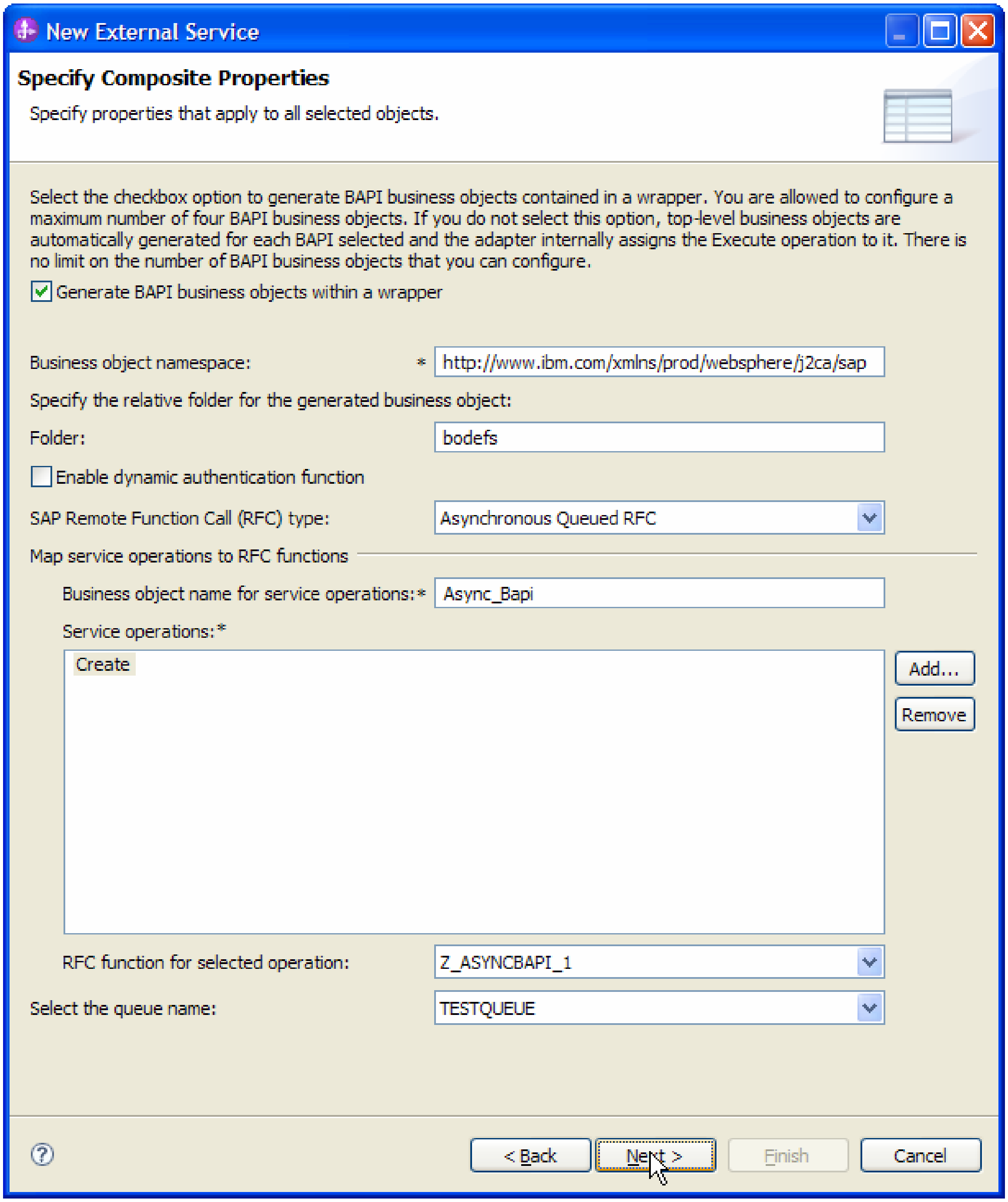
Choose **Asynchronous Queued RFC** for SAP Remote Function Call (RFC) type.

Enter **Async_Bapi** for the Business object for **Service operations** field

Associate a Service Operation to the RFC Function **Z_ASYNCBAPI_1**.

To do this, Click the **Add** button under **Service Operations** and select **Create** and select the **RFC Function** for selection operation as **Z_ASYNCBAPI_1**.

Choose the configured Queue name on the SAP Server for **Select the queue name**. **TESTQUEUE** is chosen here.



Specify Composite Properties

Specify properties that apply to all selected objects.

Select the checkbox option to generate BAPI business objects contained in a wrapper. You are allowed to configure a maximum number of four BAPI business objects. If you do not select this option, top-level business objects are automatically generated for each BAPI selected and the adapter internally assigns the Execute operation to it. There is no limit on the number of BAPI business objects that you can configure.

☑ Generate BAPI business objects within a wrapper

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Asynchronous Queued RFC

Map service operations to RFC functions

Business object name for service operations:* Async_Bapi

Service operations:*

Create

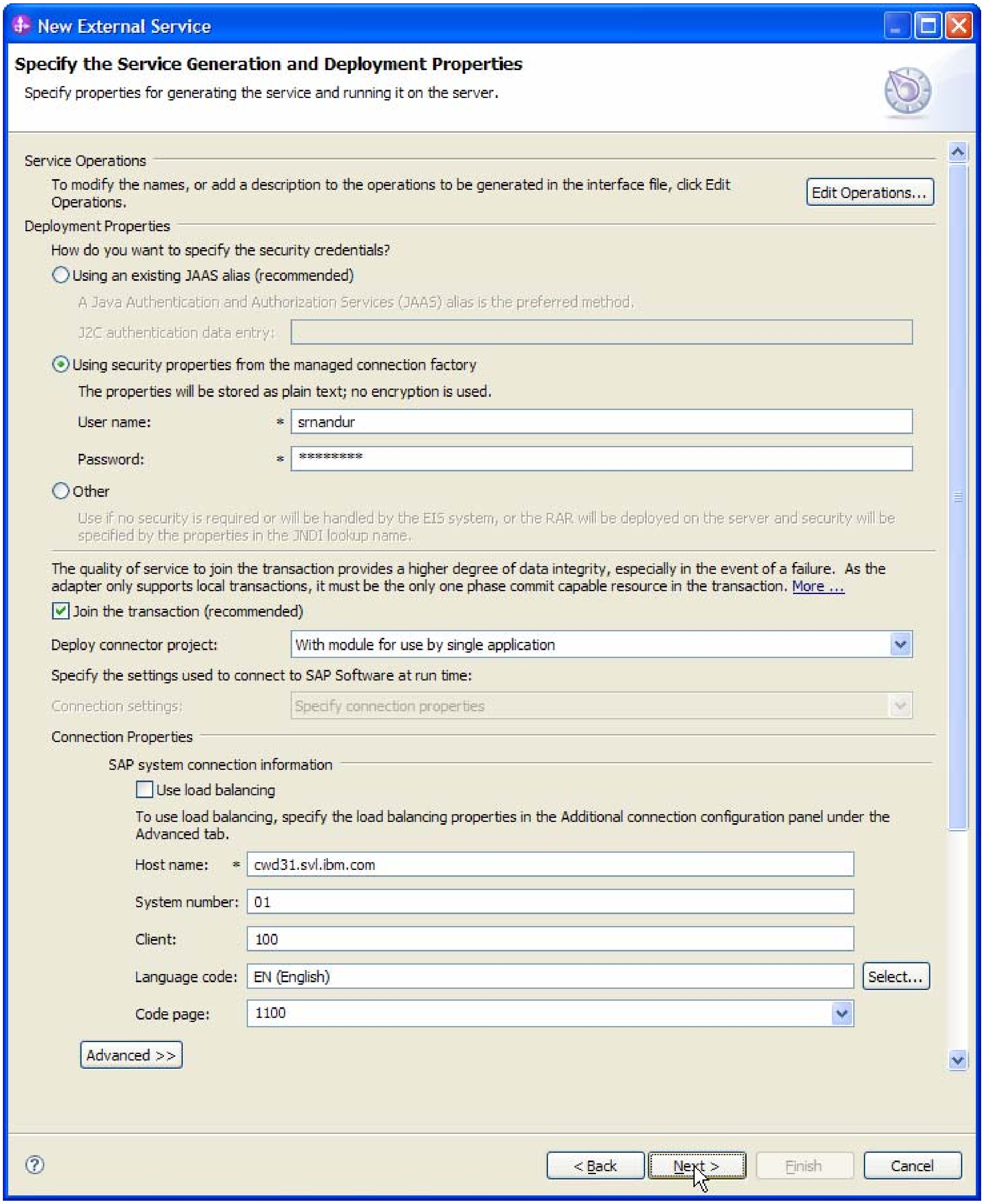
RFC function for selected operation: Z_ASYNCBAPI_1

Select the queue name: TESTQUEUE

Figure: Specify Composite Properties

Click **Next**.

In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

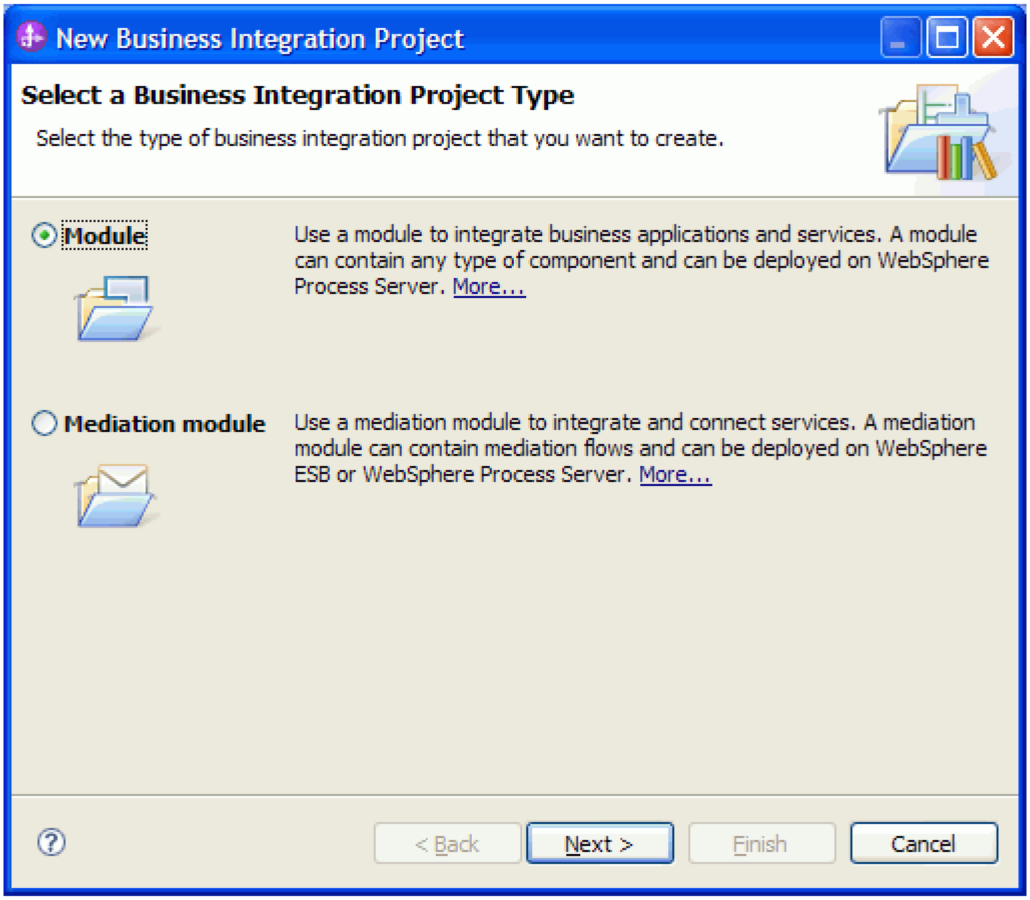
Figure: Service Generation and Deployment Configuration

Note: You can either use the Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP.

Click **Next.**

In the **Specify the Location Properties** screen, click the **New** button next to the **Module** field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

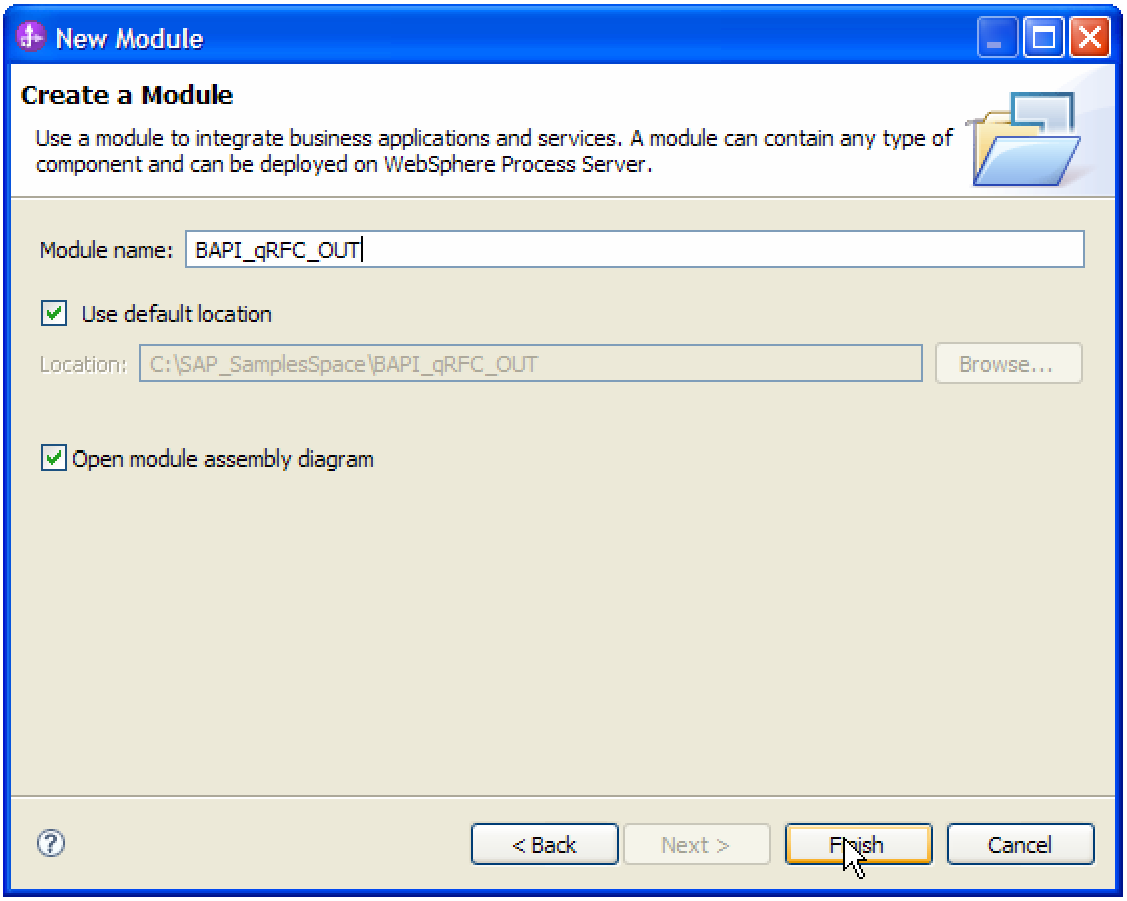
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_qRFC_OUT** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

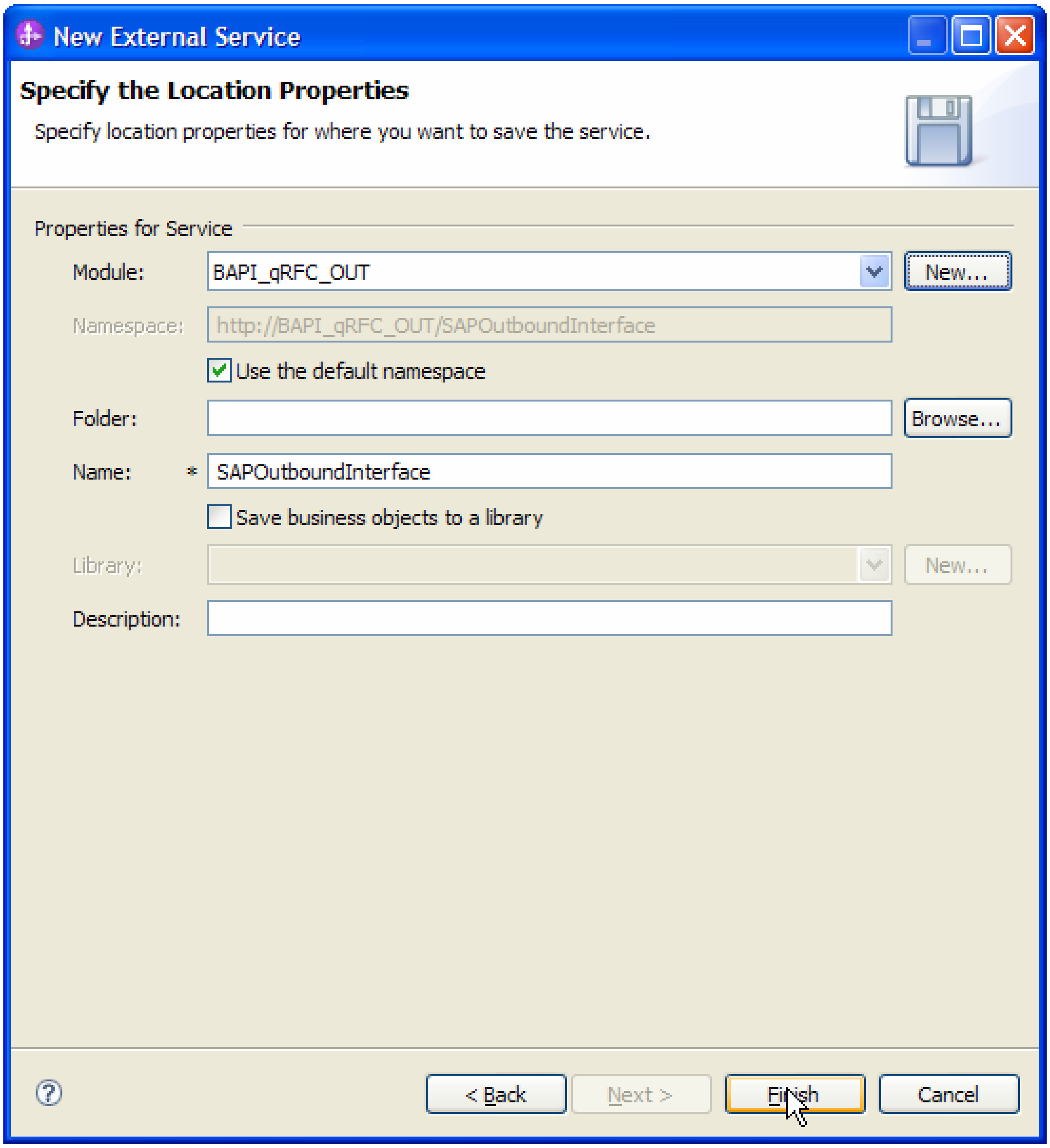
Module name: BAPI_qRFC_OUT

☑ Use default location

Location: C:\SAP_SamplesSpace\BAPI_qRFC_OUT

☑ Open module assembly diagram

Click Finish on the Specify the Location Properties screen.



Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: BAPI_qRFC_OUT

Namespace: http://BAPI_qRFC_OUT/SAPOutboundInterface

☑ Use the default namespace

Folder:

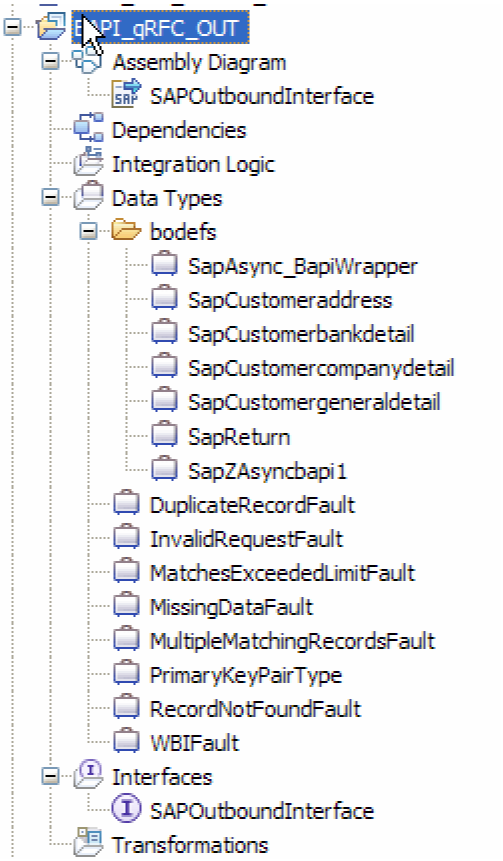
Name: * SAPOutboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.



- BAPI_qRFC_OUT
  - Assembly Diagram
    - SAPOutboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - bodefs
      - SapAsync_BapiWrapper
      - SapCustomeraddress
      - SapCustomerbankdetail
      - SapCustomercompanydetail
      - SapCustomergeneraldetail
      - SapReturn
      - SapZAsyncbapi1
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - WBIFault
  - Interfaces
    - SAPOutboundInterface
  - Transformations

Figure: Artifacts created after the EMD run for the BAPI qRFC Module

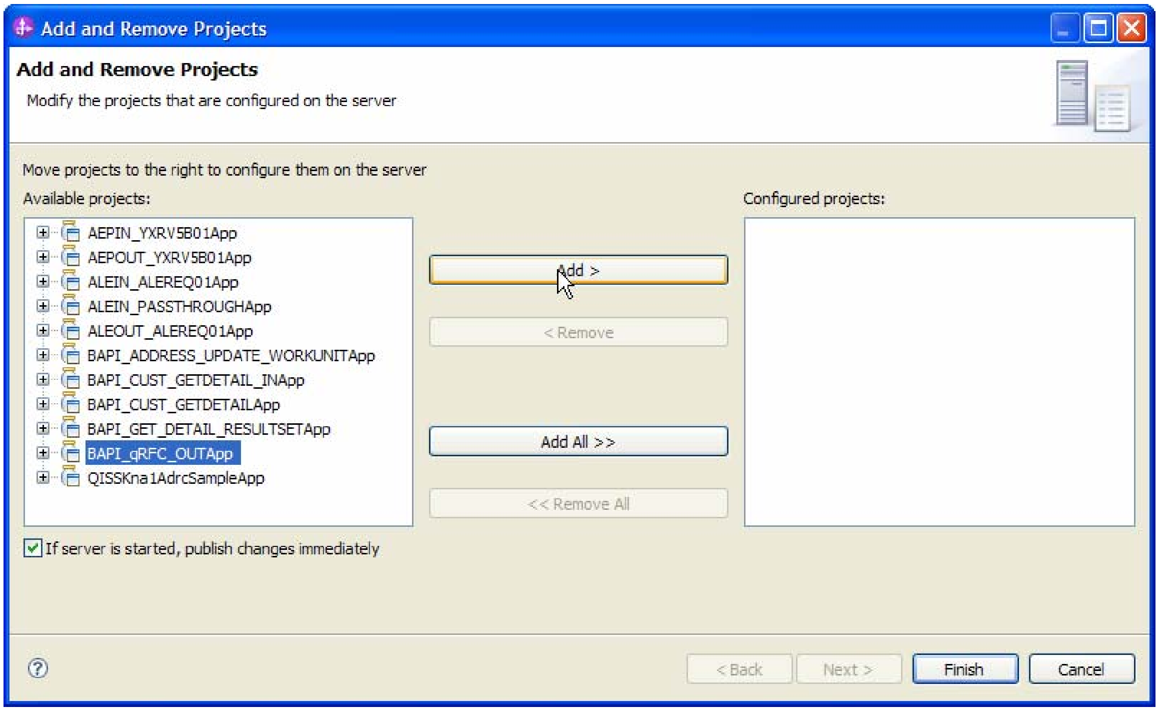
---

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module **BAPI_qRFC_OUT** by selecting **Add and Remove Projects**.

The project **BAPI_qRFC_OUTApp** will be listed under **Available projects**.



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

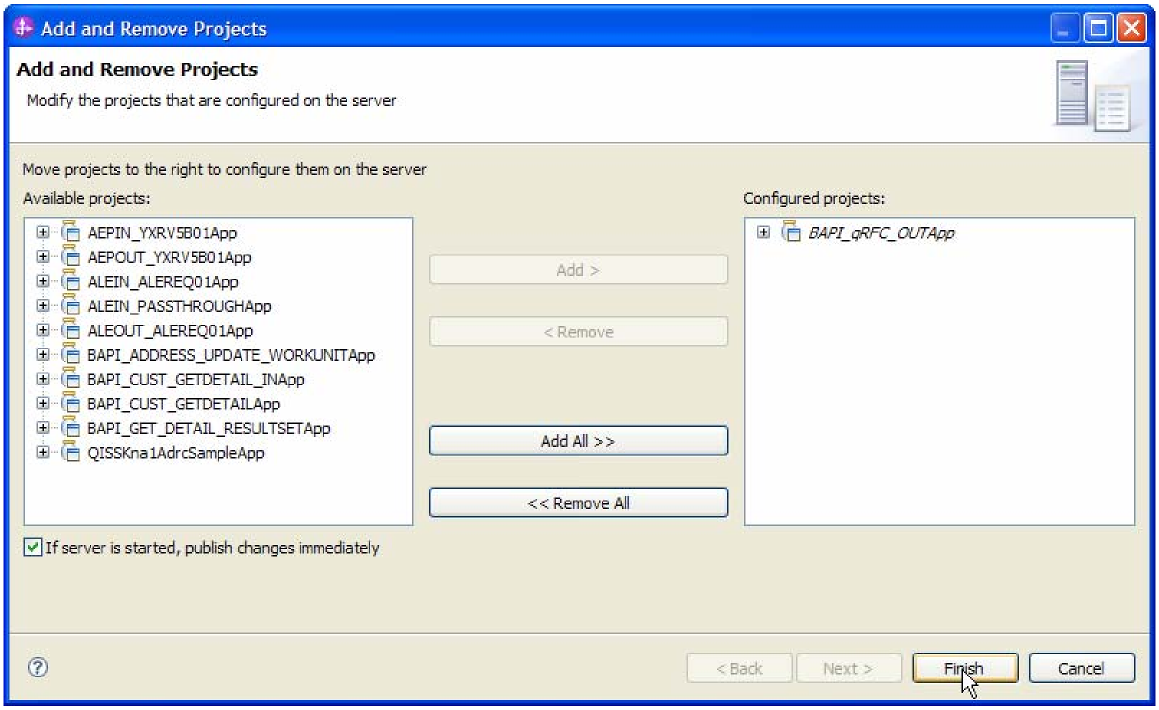
Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEIN_PASSTHROUGHApp
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- BAPI_qRFC_OUTApp
- QISSKna1AdrcSampleApp

Configured projects:

☑ If server is started, publish changes immediately

3. After adding the project. The added project should appear under the **Configured projects**. Add the SCA module to the server by clicking on **Finish.**



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEIN_PASSTHROUGHApp
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- QISSKna1AdrcSampleApp

Configured projects:

- *BAPI_qRFC_OUTApp*

☑ If server is started, publish changes immediately

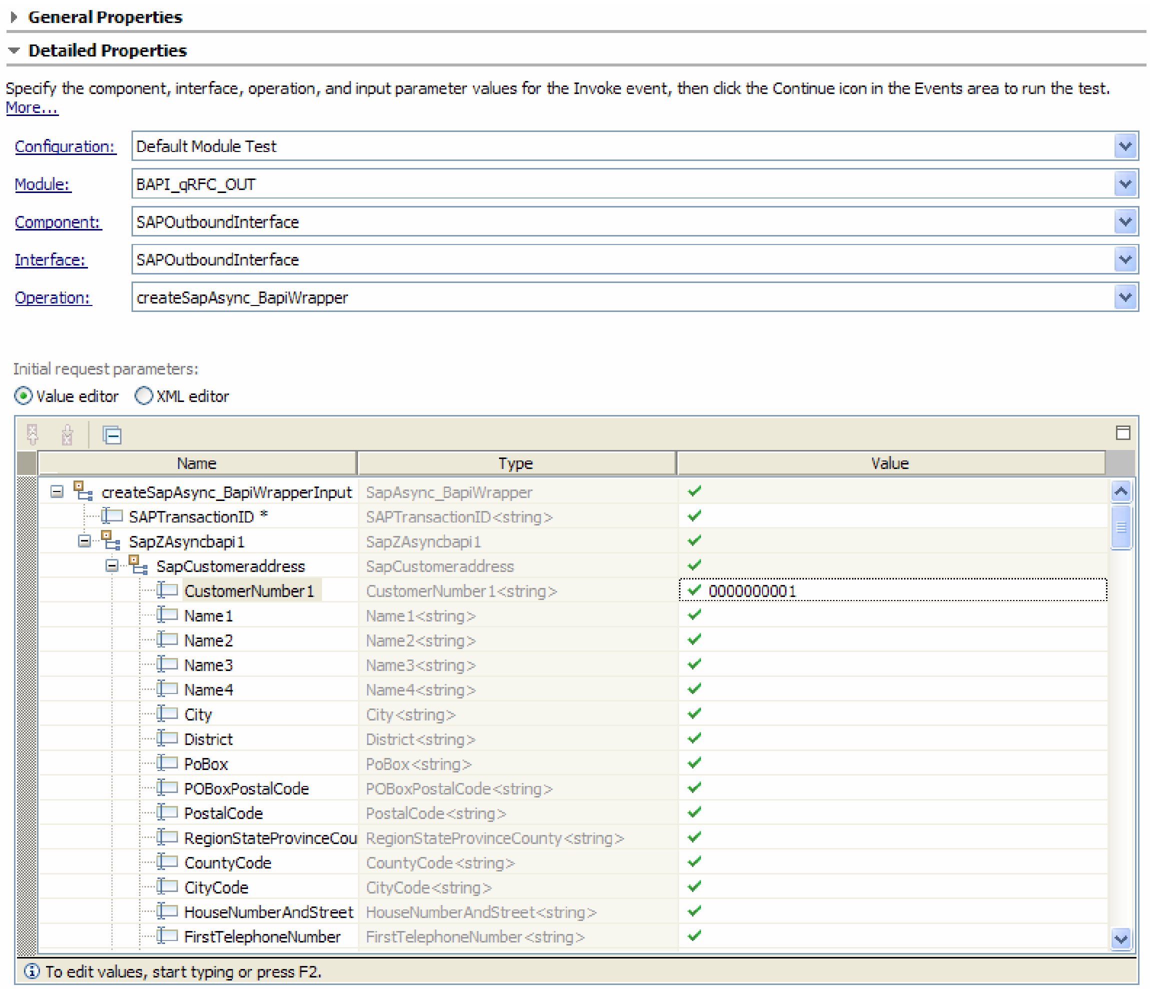
Testing the assembled adapter application

Test the assembled adapter application using the WebSphere Integration Developer test client.

Once the module is deployed to the Server, right click the module **BAPI_qRFC_OUT** from the Projects view and select **Test > Test Module** from the pop-up menu.

Enter values as shown in the following figure.

CustomerNumber1 0000000001



▸ **General Properties**

▾ **Detailed Properties**

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

Configuration: Default Module Test

Module: BAPI_qRFC_OUT

Component: SAPOutboundInterface

Interface: SAPOutboundInterface

Operation: createSapAsync_BapiWrapper

Initial request parameters:

● Value editor ○ XML editor

Name	Type	Value
createSapAsync_BapiWrapperInput	SapAsync_BapiWrapper	✓
SAPTransactionID *	SAPTransactionID<string>	✓
SapZAsyncbapi1	SapZAsyncbapi1	✓
SapCustomeraddress	SapCustomeraddress	✓
CustomerNumber1	CustomerNumber1<string>	✓ 0000000001
Name1	Name1<string>	✓
Name2	Name2<string>	✓
Name3	Name3<string>	✓
Name4	Name4<string>	✓
City	City<string>	✓
District	District<string>	✓
PoBox	PoBox<string>	✓
POBoxPostalCode	POBoxPostalCode<string>	✓
PostalCode	PostalCode<string>	✓
RegionStateProvinceCou	RegionStateProvinceCounty<string>	✓
CountyCode	CountyCode<string>	✓
CityCode	CityCode<string>	✓
HouseNumberAndStreet	HouseNumberAndStreet<string>	✓
FirstTelephoneNumber	FirstTelephoneNumber<string>	✓

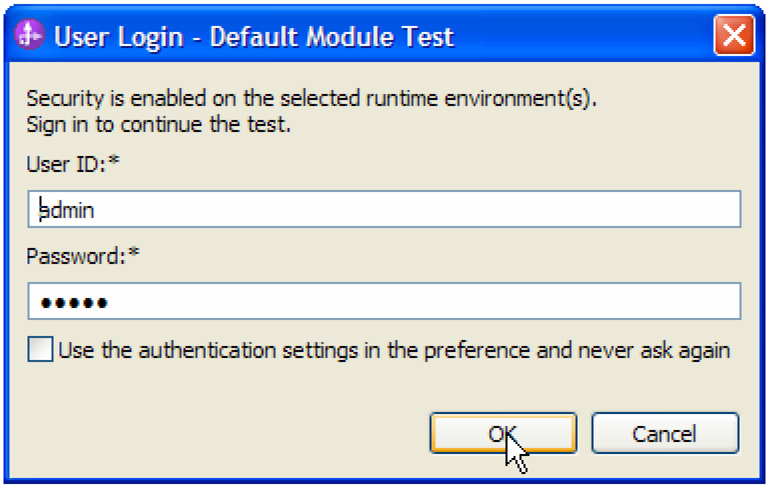
ⓘ To edit values, start typing or press F2.

Figure: Test Client Screen

3. Click the Continue button ▶.

When the **Select Deployment** screen appears, select the WebSphere Process Server to which you added the project and click the **Finish** button.

4. If security is enabled, type in the username and password in the popup **User Login** screen that appears and click **OK.**



User Login - Default Module Test

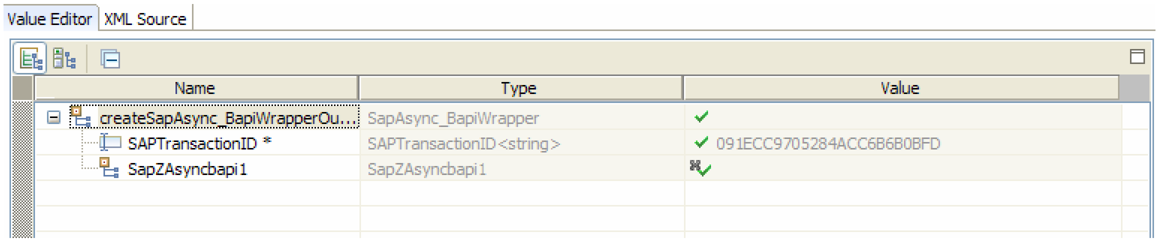
Security is enabled on the selected runtime environment(s).
Sign in to continue the test.

User ID:* admin

Password:* •••••

□ Use the authentication settings in the preference and never ask again

5. Check the output of the service in the test client



Name	Type	Value
createSapAsync_BapiWrapperOu...	SapAsync_BapiWrapper	✓
SAPTransactionID *	SAPTransactionID<string>	✓ 091ECC9705284ACC6B6B0BFD
SapZAsyncbapi1	SapZAsyncbapi1	✓

6. Check the data in the EIS to ensure it matches expected values

Clearing the sample content

Nothing is required to clean up after this tutorial.

Chapter 17. Tutorial 12: Sending data from SAP system (INBOUND processing) using qRFC BAPI

Following sections explain inbound scenarios for the BAPI interface.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add
${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to
WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

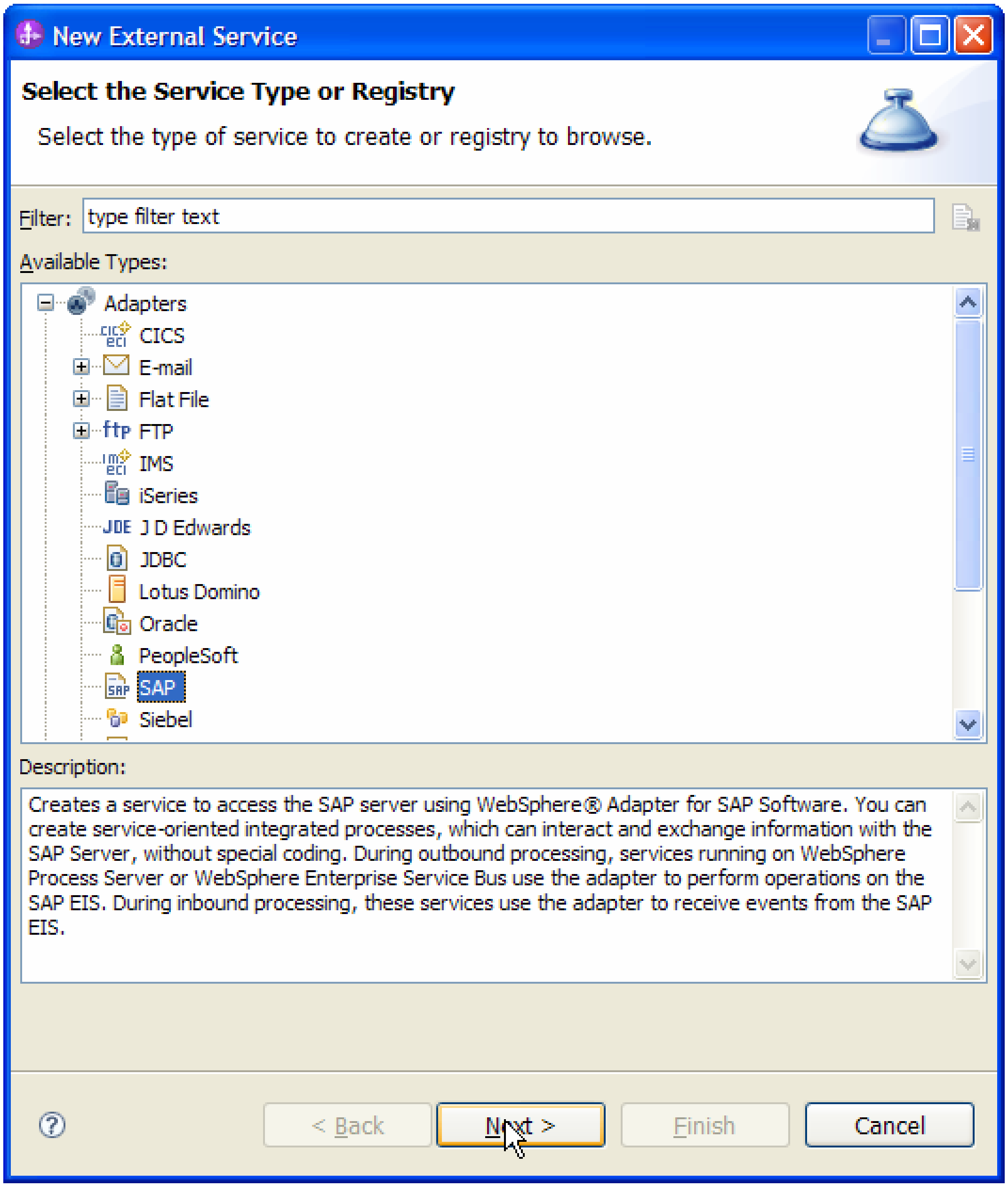
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate business objects, services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**.

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

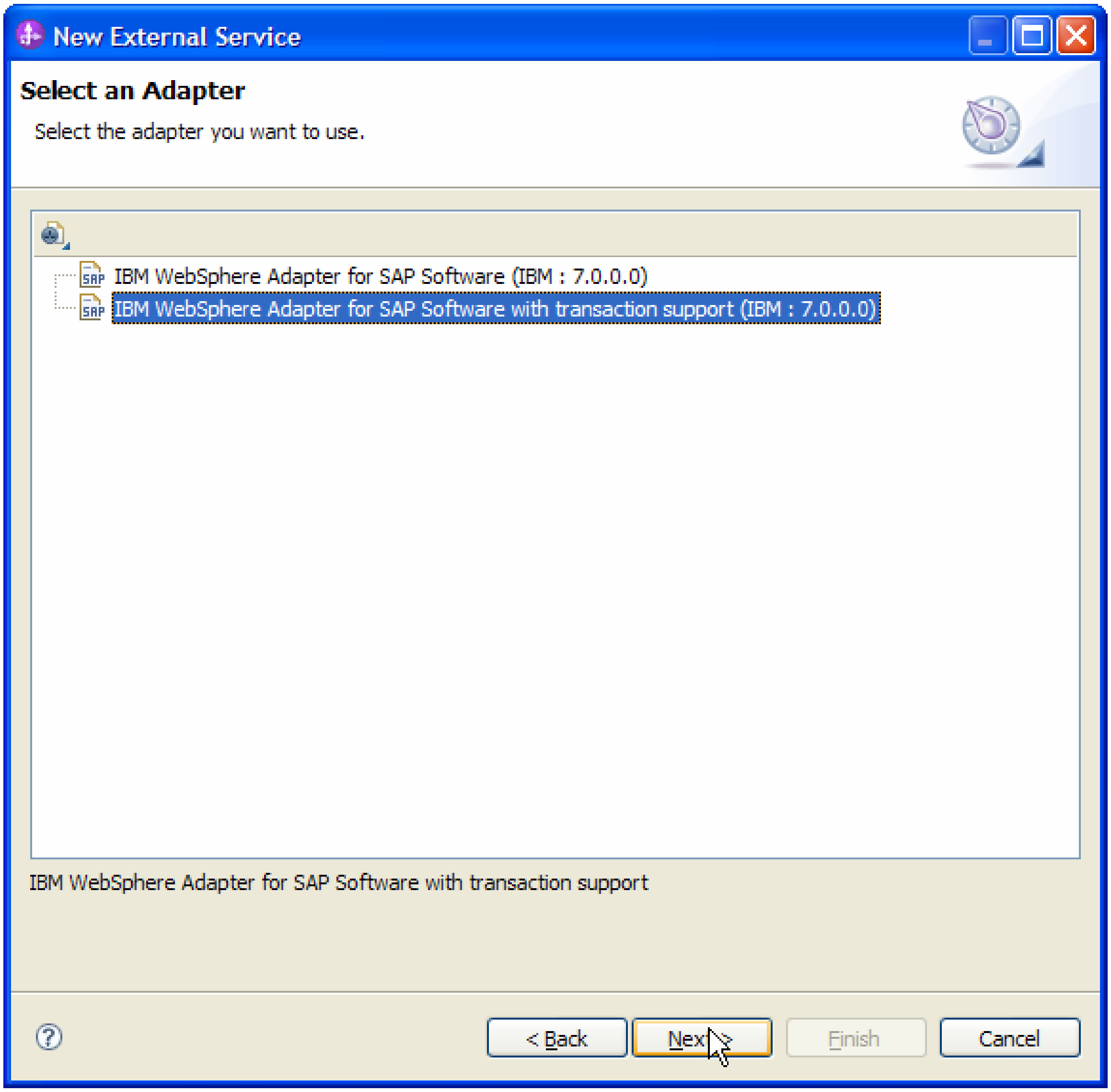
1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

- IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
- IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

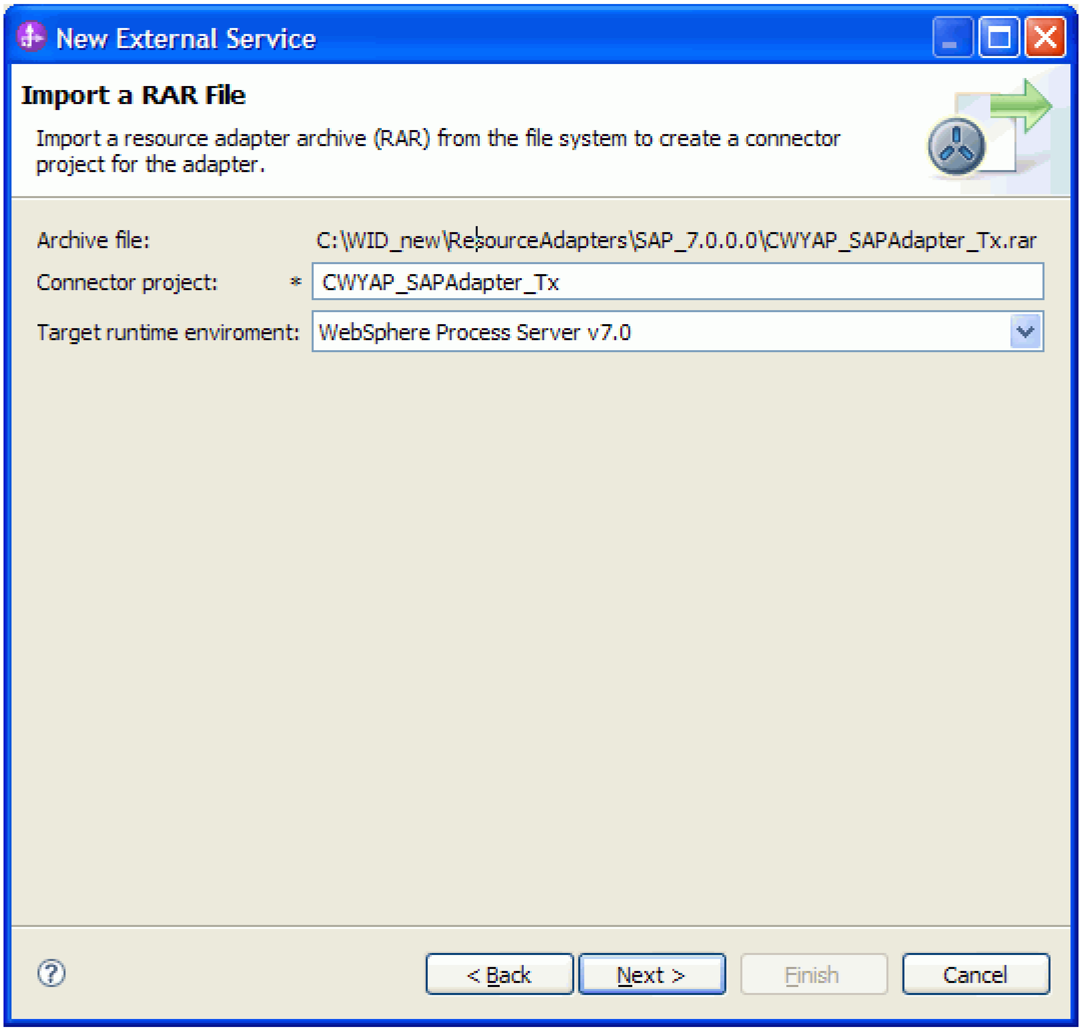
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify the Connector Project name in the **Import a RAR File** screen and click **Next.**


New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

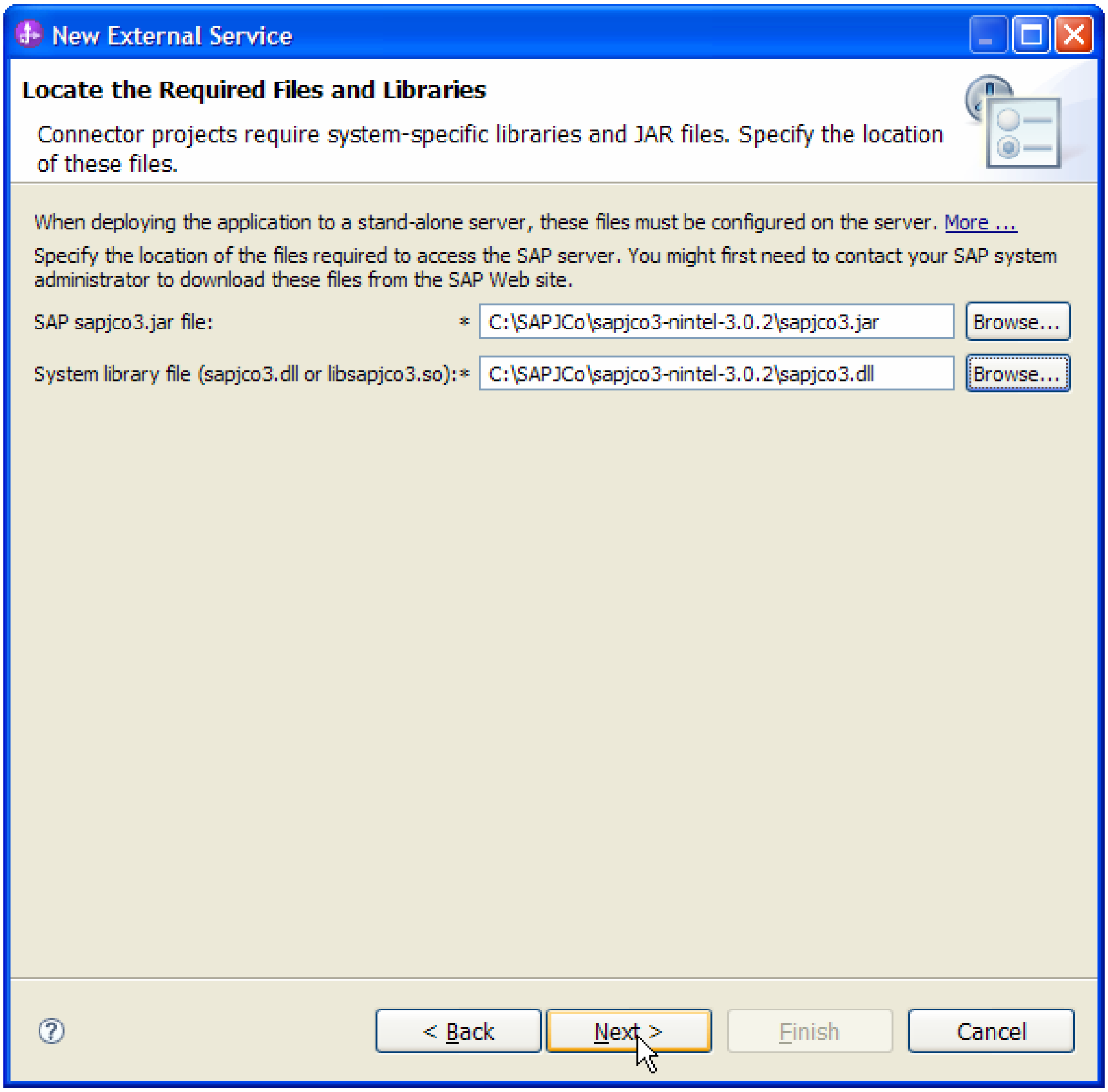
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

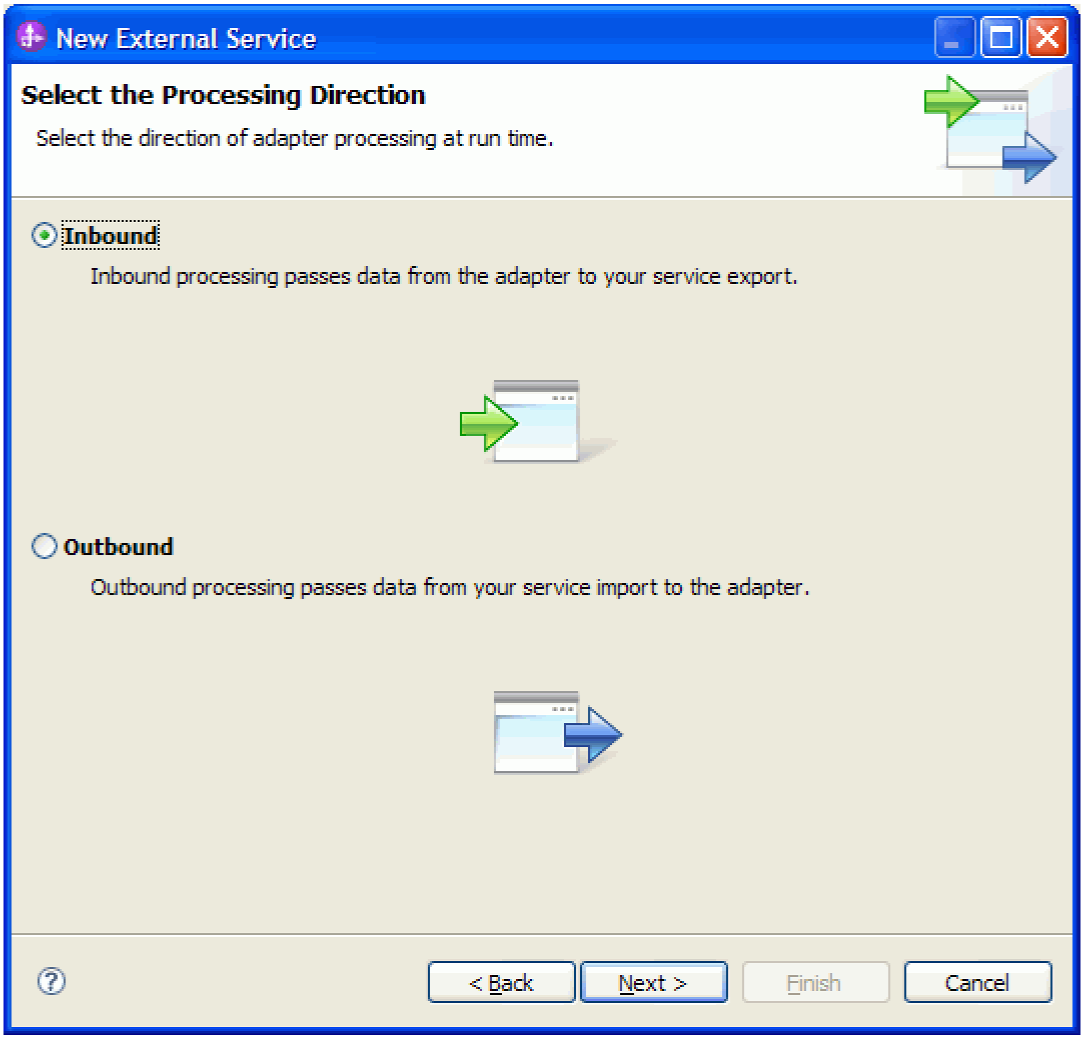
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar Browse...

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll Browse...

Figure: Locate the required files and Libraries screen

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select **Inbound** radio button, then click **Next.**



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

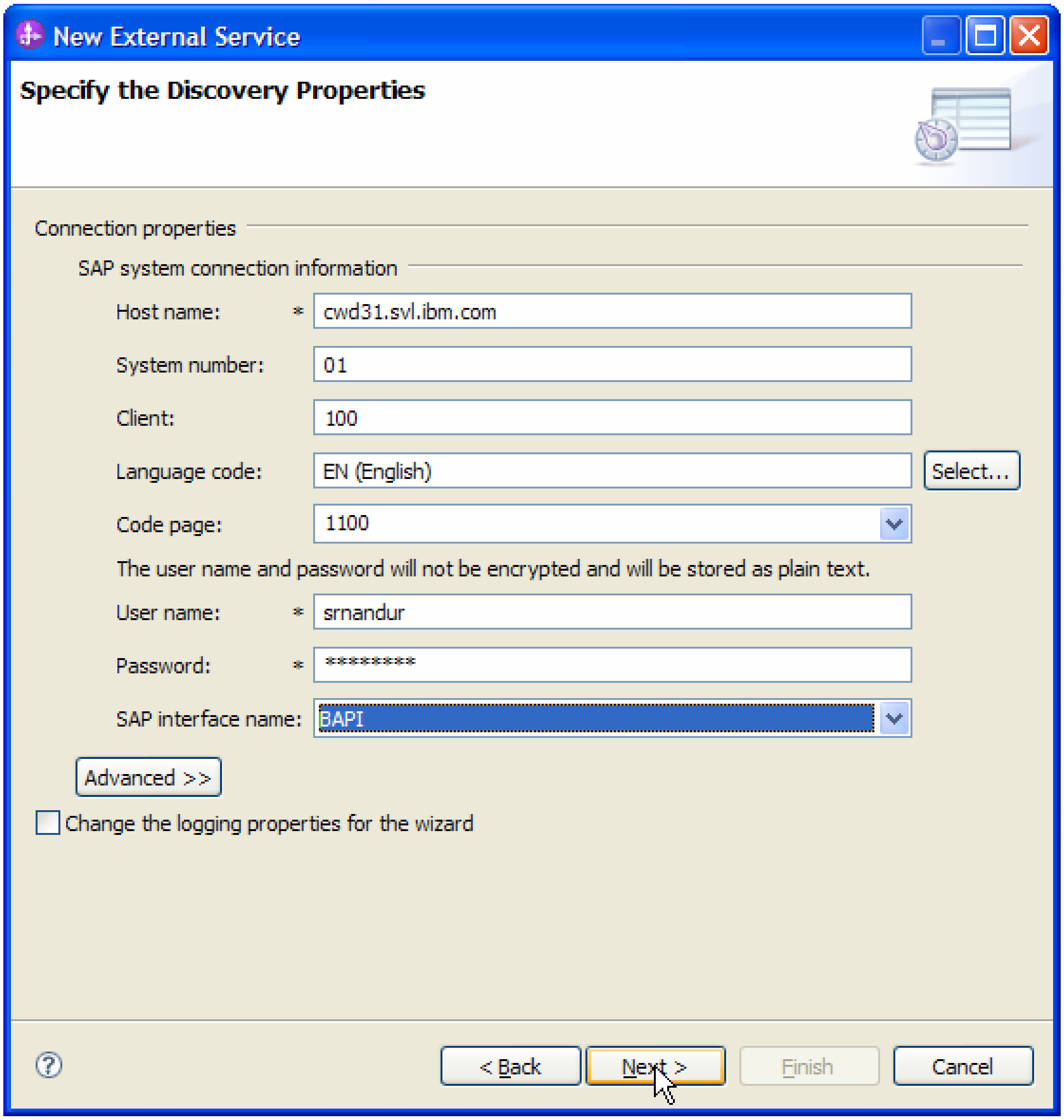
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Click **Next**.



Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English) Select...

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

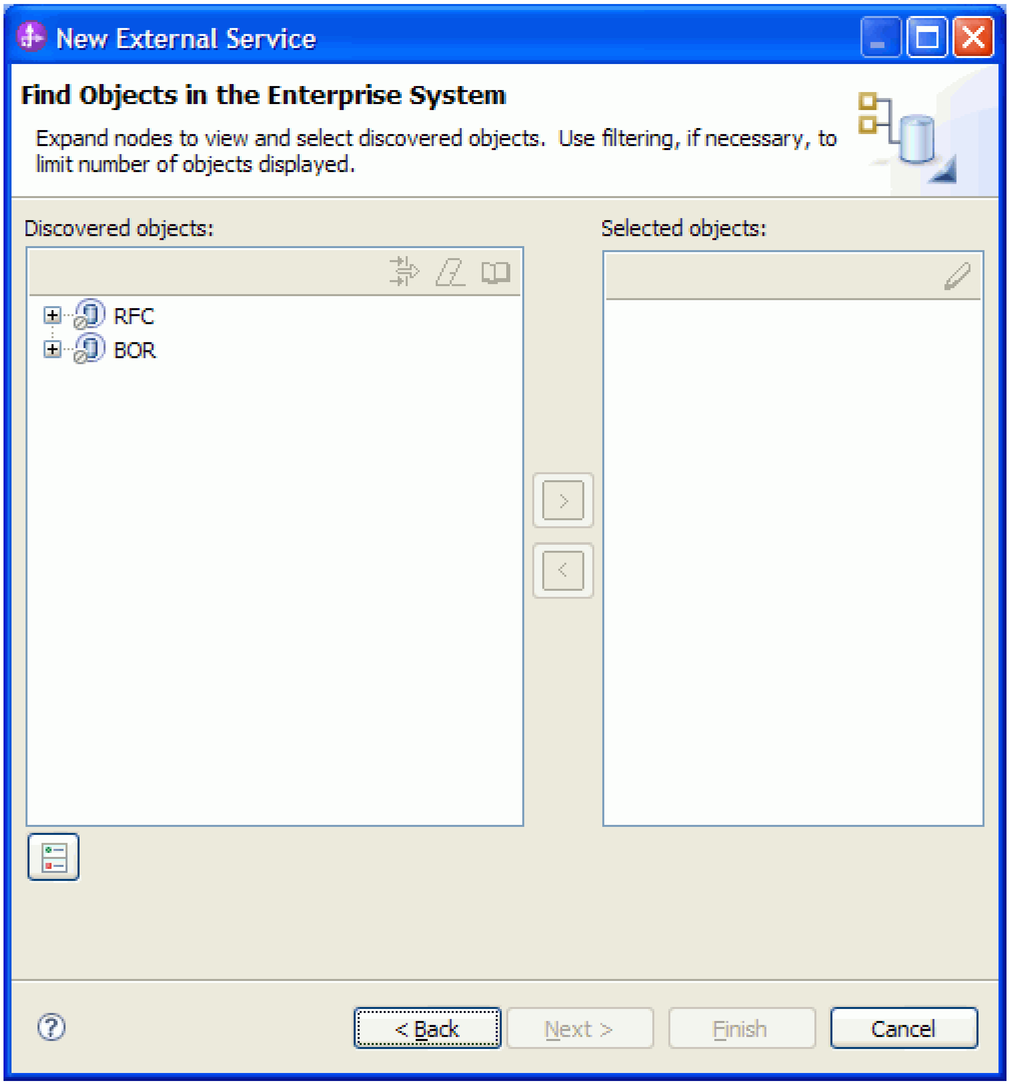
Password: * *********

SAP interface name: BAPI

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

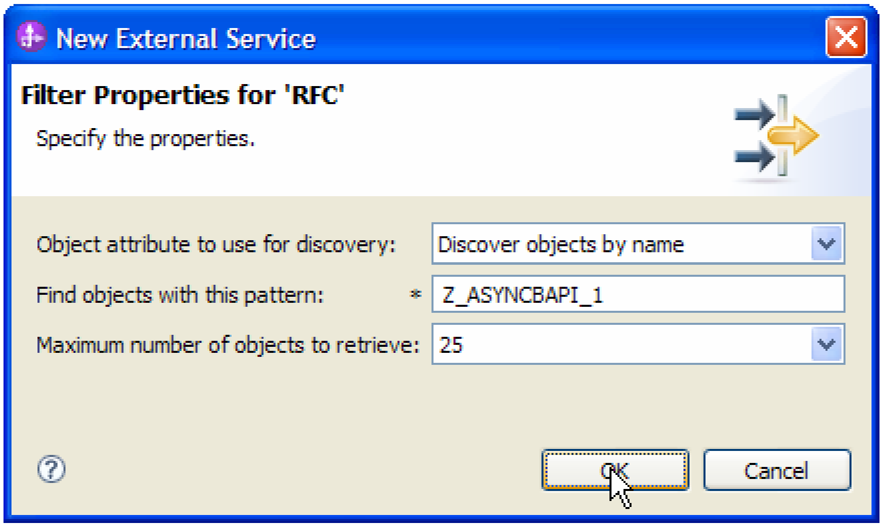
Under **Find Objects in the Enterprise System**, click **RFC** node. Then click the button.



New External Service
Find Objects in the Enterprise System
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.
Discovered objects:
Selected objects:
RFC
BOR
< Back
Next >
Finish
Cancel

Figure: Object Discovery and Selection

Enter Z_ASYNCBAPI_1 (the name of the BAPI in SAP) in the Filter Properties for 'RFC' screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

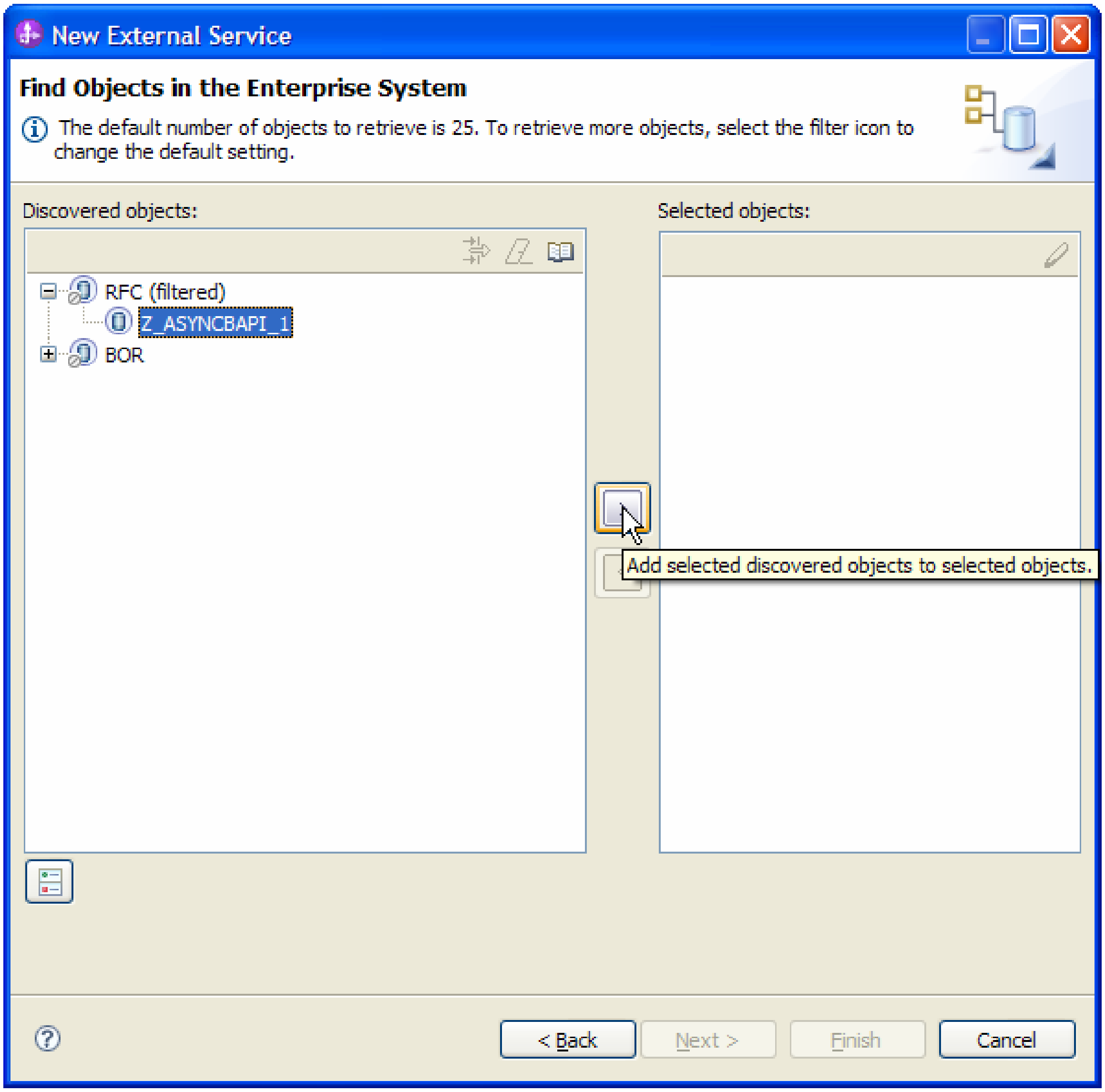
Find objects with this pattern: * Z_ASYNCBAPI_1

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **RFC** node.



Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Add selected discovered objects to selected objects.

Figure: Retrieved BAPIs' based on search criteria

Select the Z_ASYNCBAPI_1 from the metadata tree.

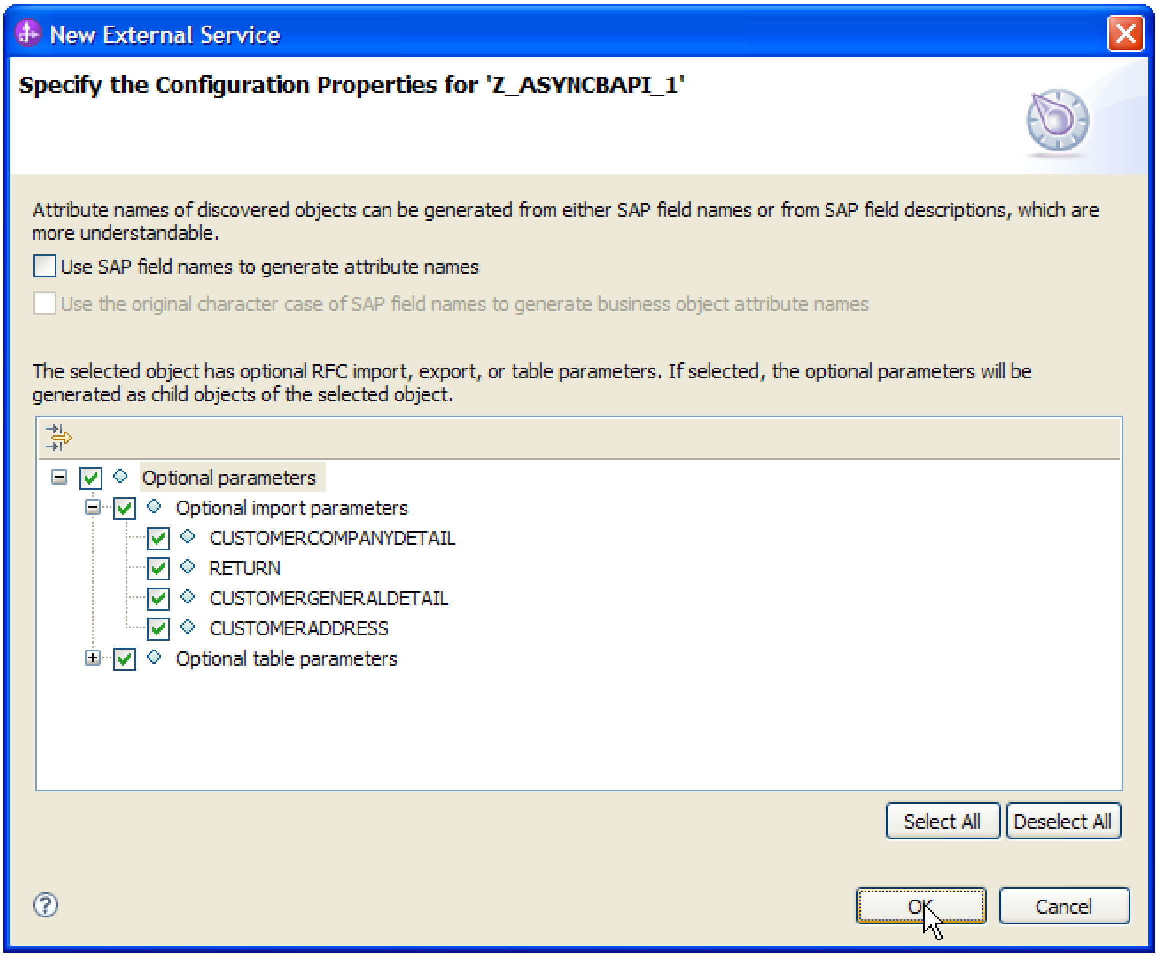
Click the > button.

A popup will appear containing the Configuration properties for the **Z_ASYNCBAPI_1** object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click **OK**.



New External Service

Specify the Configuration Properties for 'Z_ASYNCBAPI_1'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

☐ Use SAP field names to generate attribute names

☐ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

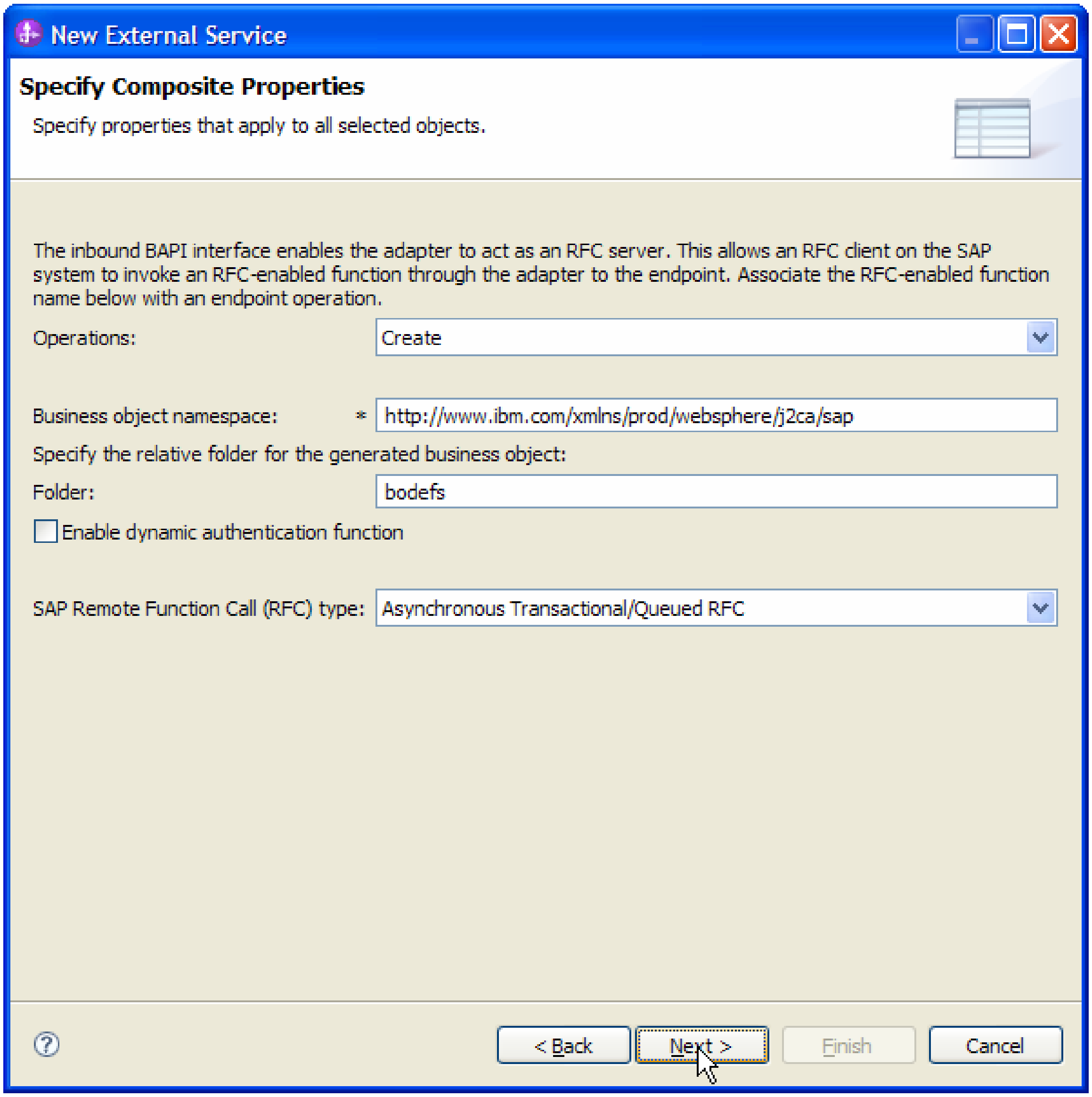
- ☑ Optional parameters
  - ☑ Optional import parameters
    - ☑ CUSTOMERCOMPANYDETAIL
    - ☑ RETURN
    - ☑ CUSTOMERGENERALDETAIL
    - ☑ CUSTOMERADDRESS
  - ☑ Optional table parameters

Figure: Setting configuration parameters for the BAPI Z_ASYNCBAPI_1

Click **Next.**

Generating Business Object definitions and related artifacts

1. In the **Specify Composite Properties** screen, select **Create** as the operation, **bodefs** as the folder name for the Business Objects generated and choose the RFC Function Call Type as **Asynchronous Transactional/Queued RFC**.



Specify Composite Properties

Specify properties that apply to all selected objects.

The inbound BAPI interface enables the adapter to act as an RFC server. This allows an RFC client on the SAP system to invoke an RFC-enabled function through the adapter to the endpoint. Associate the RFC-enabled function name below with an endpoint operation.

Operations: Create

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

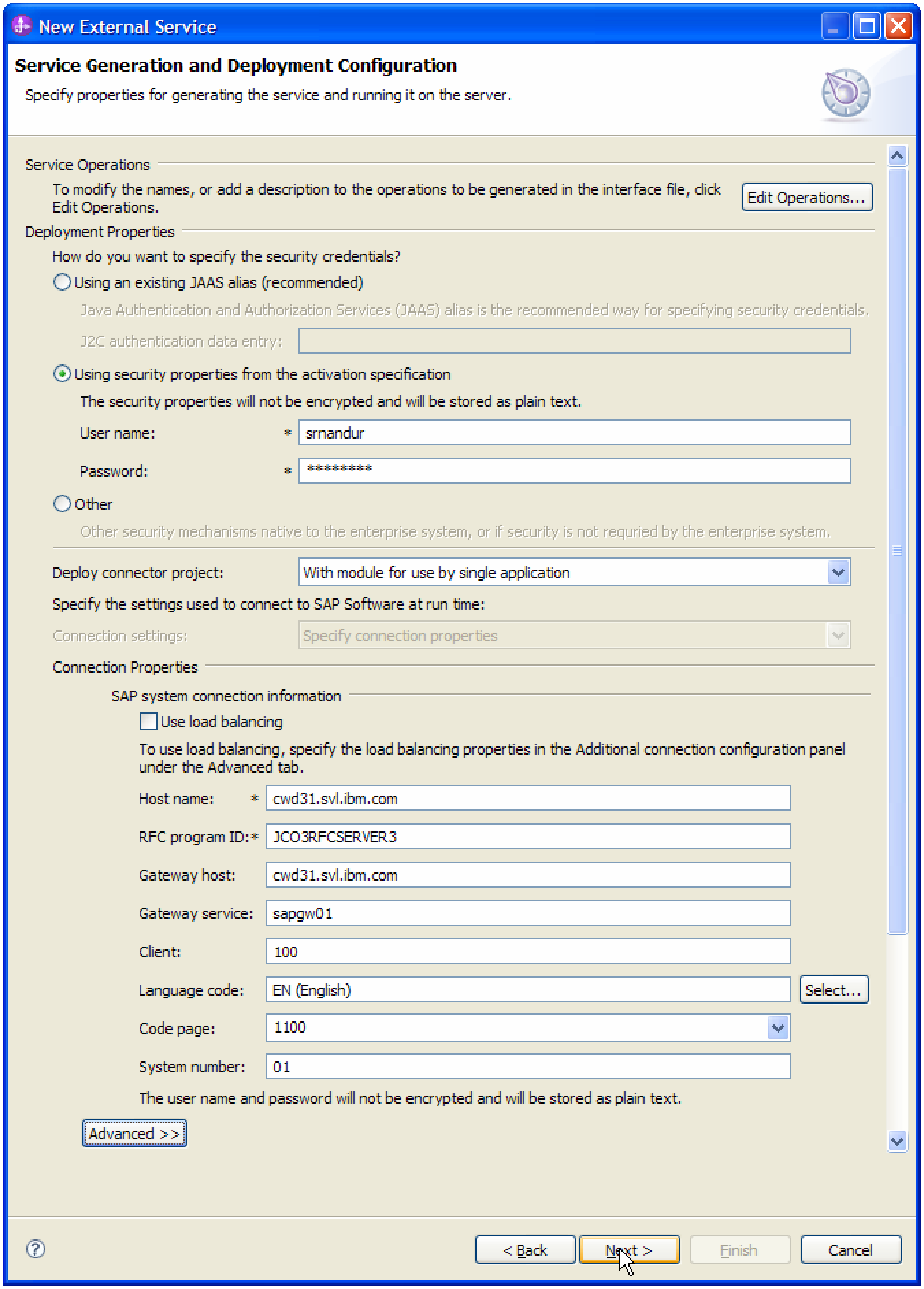
□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Asynchronous Transactional/Queued RFC

Figure: Specify Composite Properties

2. Click **Next**.

3. In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Service Generation and Deployment Configuration

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

Java Authentication and Authorization Services (JAAS) alias is the recommended way for specifying security credentials.

J2C authentication data entry:

● Using security properties from the activation specification

The security properties will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

○ Other

Other security mechanisms native to the enterprise system, or if security is not requried by the enterprise system.

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID:* JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English)

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

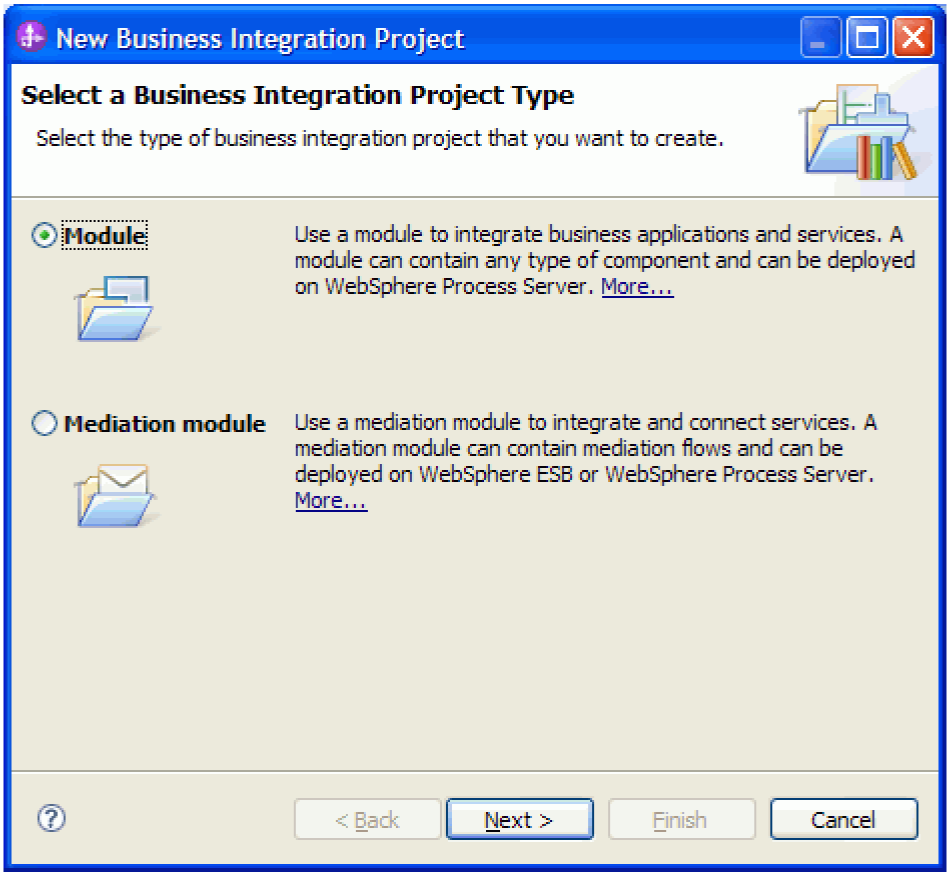
Figure: Service Generation and Deployment Configuration

Note: You can either enter Authentication Alias already previously using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system.

4. Click **Next.**

5. In the Specify the Location Properties screen, click the **New** button next to the Module field to create a new module.

6. When the **New Business Integration Project** screen appears, select the **Module** radio button and click **Next.**



New Business Integration Project

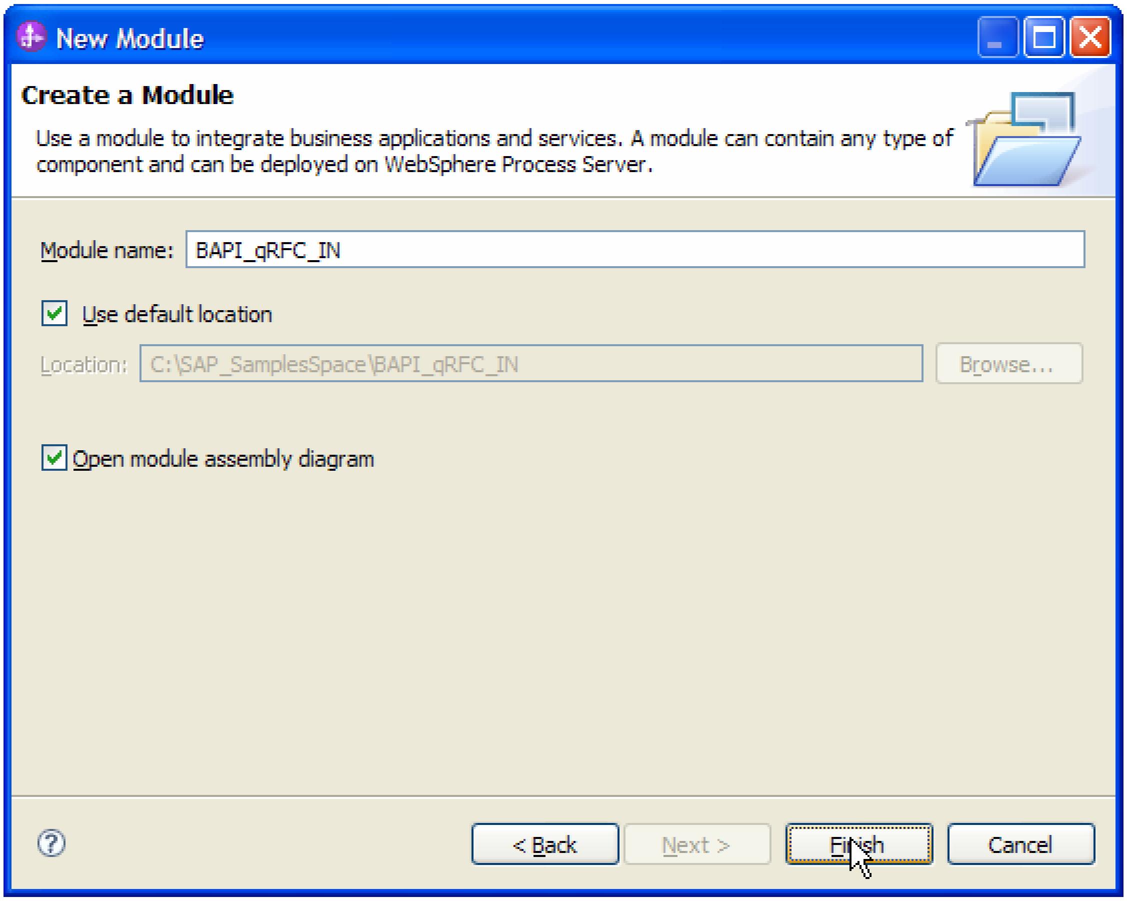
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

7. In the **New Module** screen, type **BAPI_qRFC_IN** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

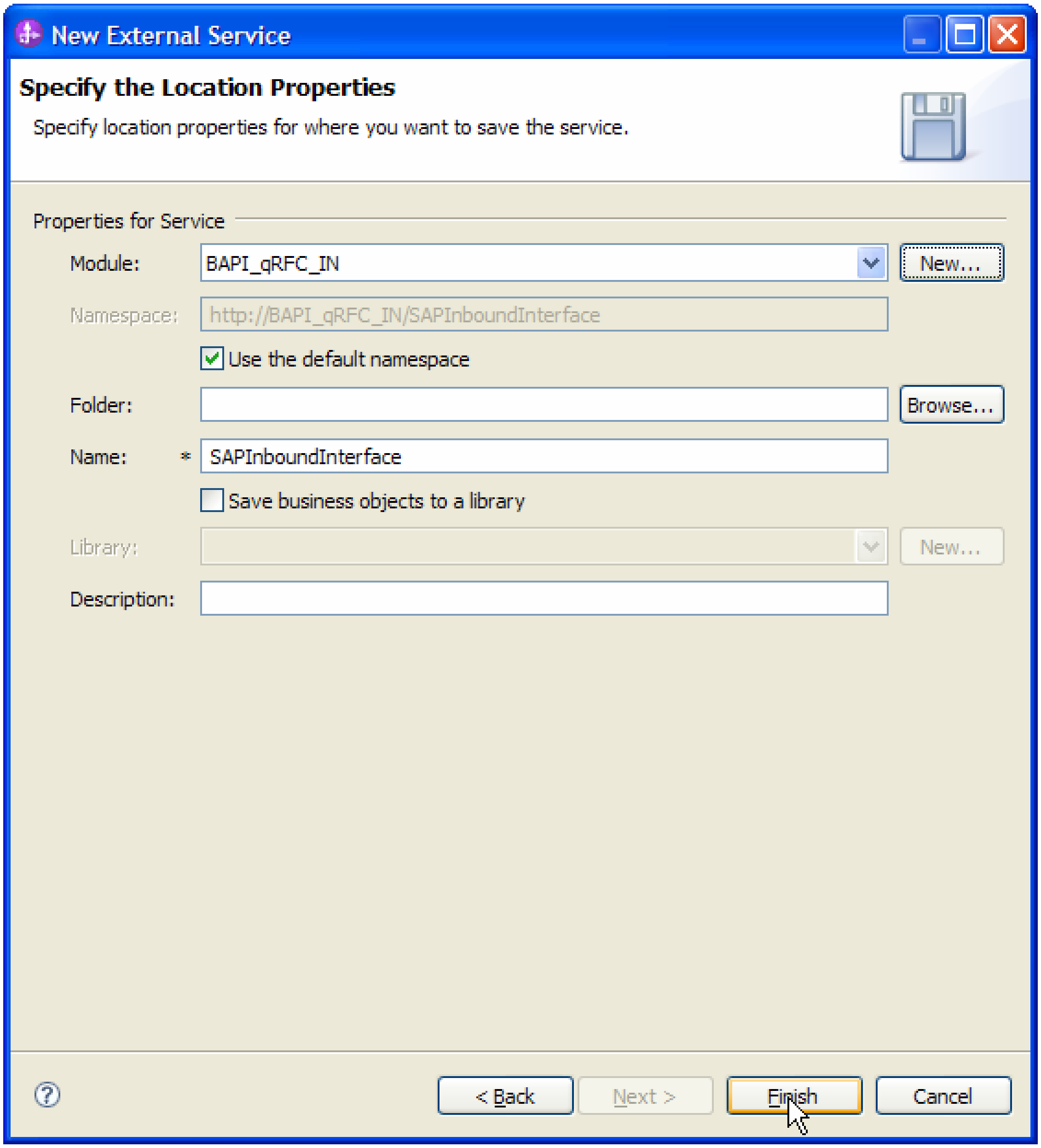
Module name: BAPI_qRFC_IN

☑ Use default location

Location: C:\SAP_SamplesSpace\BAPI_qRFC_IN

☑ Open module assembly diagram

8. Click Finish on the Specify the Location Properties screen.



Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for Service

Module: BAPI_qRFC_IN

Namespace: http://BAPI_qRFC_IN/SAPInboundInterface

☑ Use the default namespace

Folder:

Name: * SAPInboundInterface

☐ Save business objects to a library

Library:

Description:

9. Verify the results.

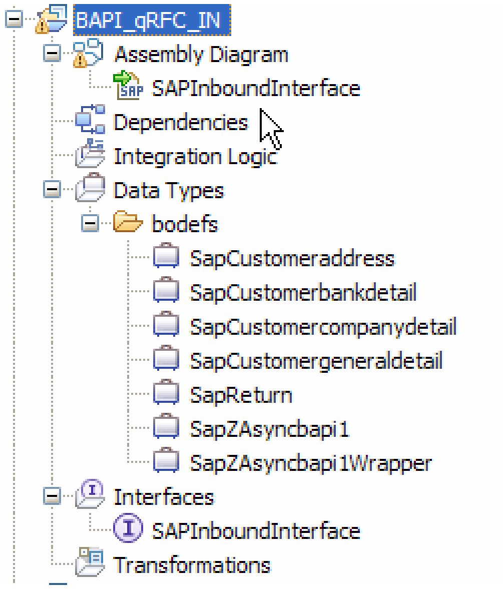


Figure: Artifacts created after the EMD run fore BAPI qRFC Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **BAPI_qRFC_IN** SCA module, and double click the Assembly Diagram. The Assembly Diagram screen appears with the module's Export component in view.

1. To create a new component, click the button of Java component from the **Palette**.

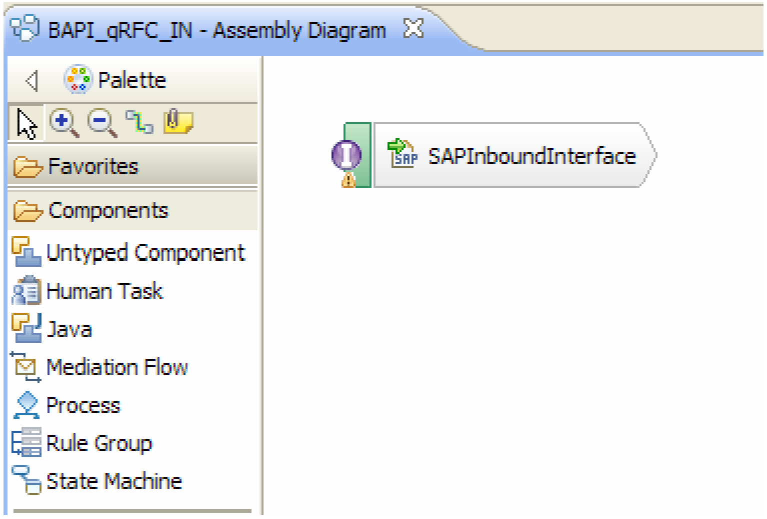


Figure: BAPI qRFC Inbound interface in the Assembly editor

Click and drag the Java component to add the new component to the **Assembly Diagram** screen.

Add a Wire between the **SAPInboundInterface** and the Java component.

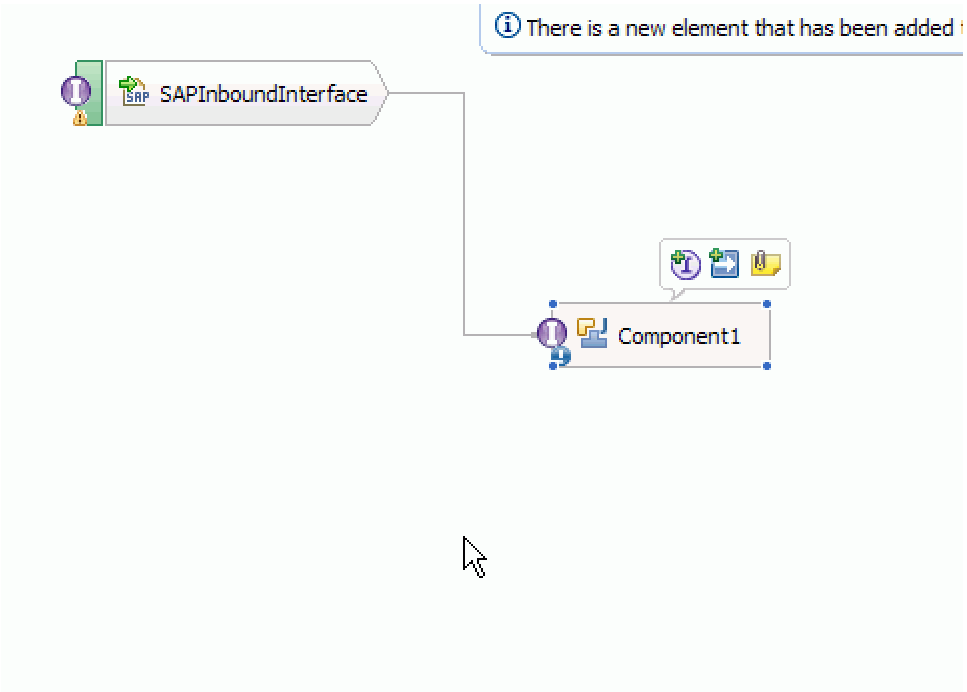
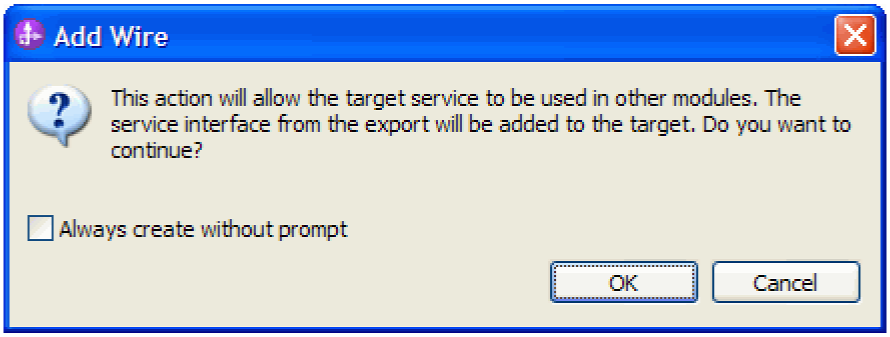


Figure: BAPI Inbound interface being wired to a target Component(end-point)

In the Add Wire screen, click OK.



This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Screen

2. Right-click the new component and select Generate Implementation. This creates a Java component that will act as an endpoint.

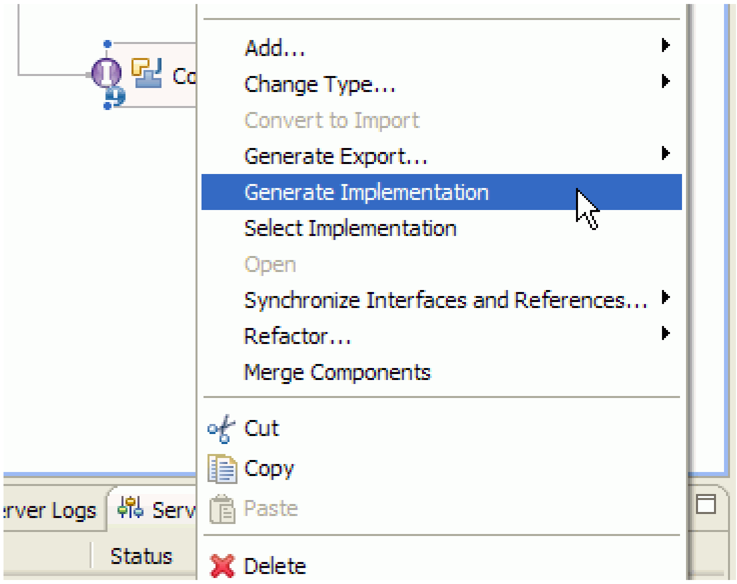
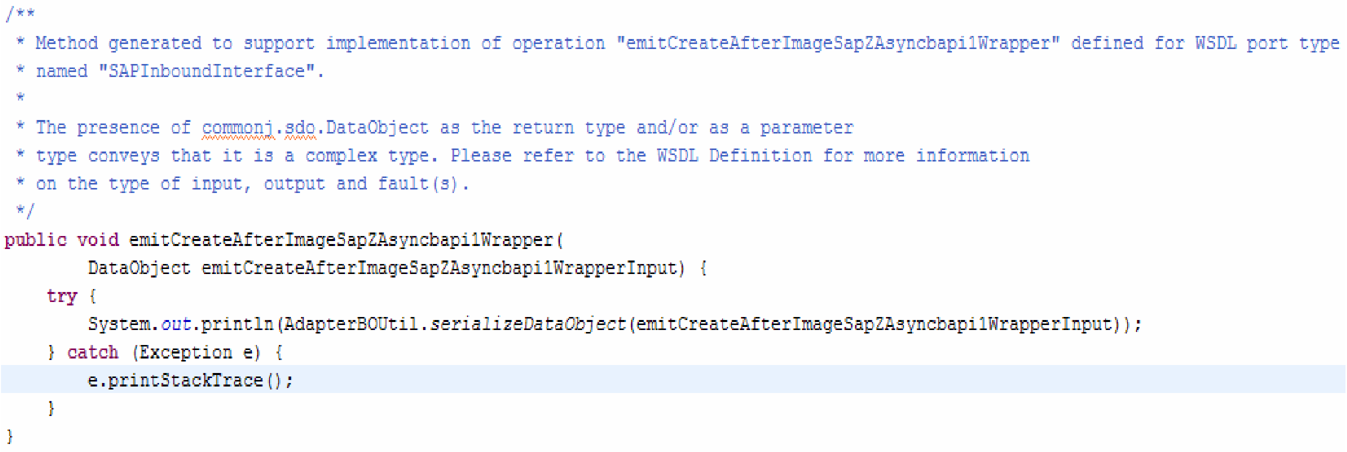


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapZAsyncbapi1Wrapper" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void emitCreateAfterImageSapZAsyncbapi1Wrapper(
        DataObject emitCreateAfterImageSapZAsyncbapi1WrapperInput) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapZAsyncbapi1WrapperInput));
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```

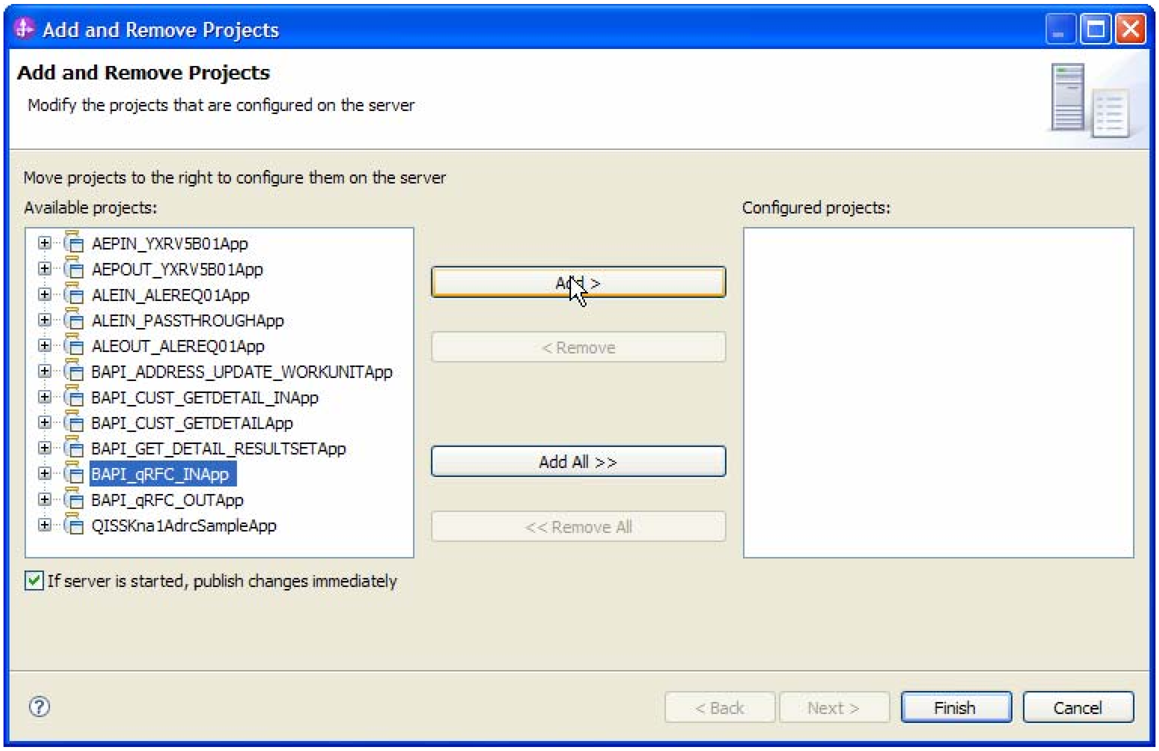
Save the Java file

Save assembly diagram.

Deploying the module in the test environment

Test the assembled adapter application using the WebSphere Integration Developer's Test Client.

Right click on the server and add the module **BAPI_qRFC_IN** by selecting Add and remove projects in WebSphere Integration Developer. You will see the project **BAPI_qRFC_INApp** listed under Available projects.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

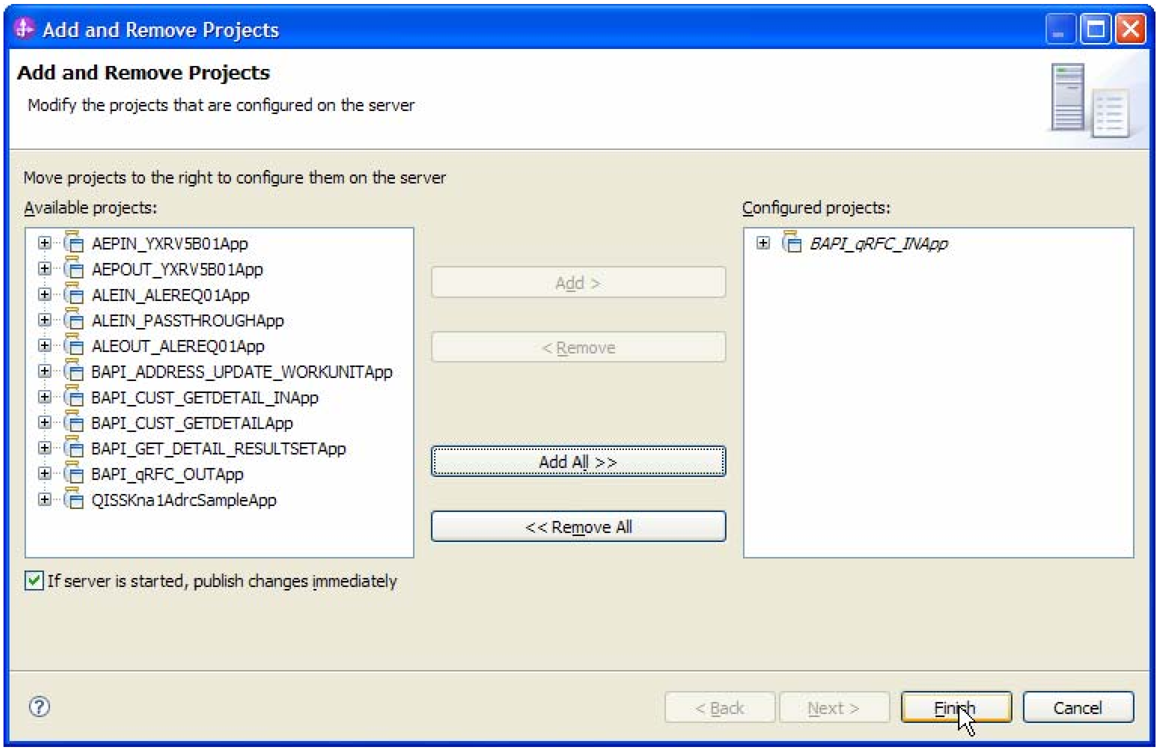
Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEIN_PASSTHROUGHApp
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- BAPI_qRFC_INApp
- BAPI_qRFC_OUTApp
- QISSKna1AdrcSampleApp

Configured projects:

☑ If server is started, publish changes immediately

After adding the project, the added project should appear under the Configured projects. Add the SCA module to the server by clicking on **Finish.**



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- AEPIN_YXRV5B01App
- AEPOUT_YXRV5B01App
- ALEIN_ALEREQ01App
- ALEIN_PASSTHROUGHApp
- ALEOUT_ALEREQ01App
- BAPI_ADDRESS_UPDATE_WORKUNITApp
- BAPI_CUST_GETDETAIL_INApp
- BAPI_CUST_GETDETAILApp
- BAPI_GET_DETAIL_RESULTSETApp
- BAPI_qRFC_OUTApp
- QISSKna1AdrcSampleApp

Configured projects:

- *BAPI_qRFC_INApp*

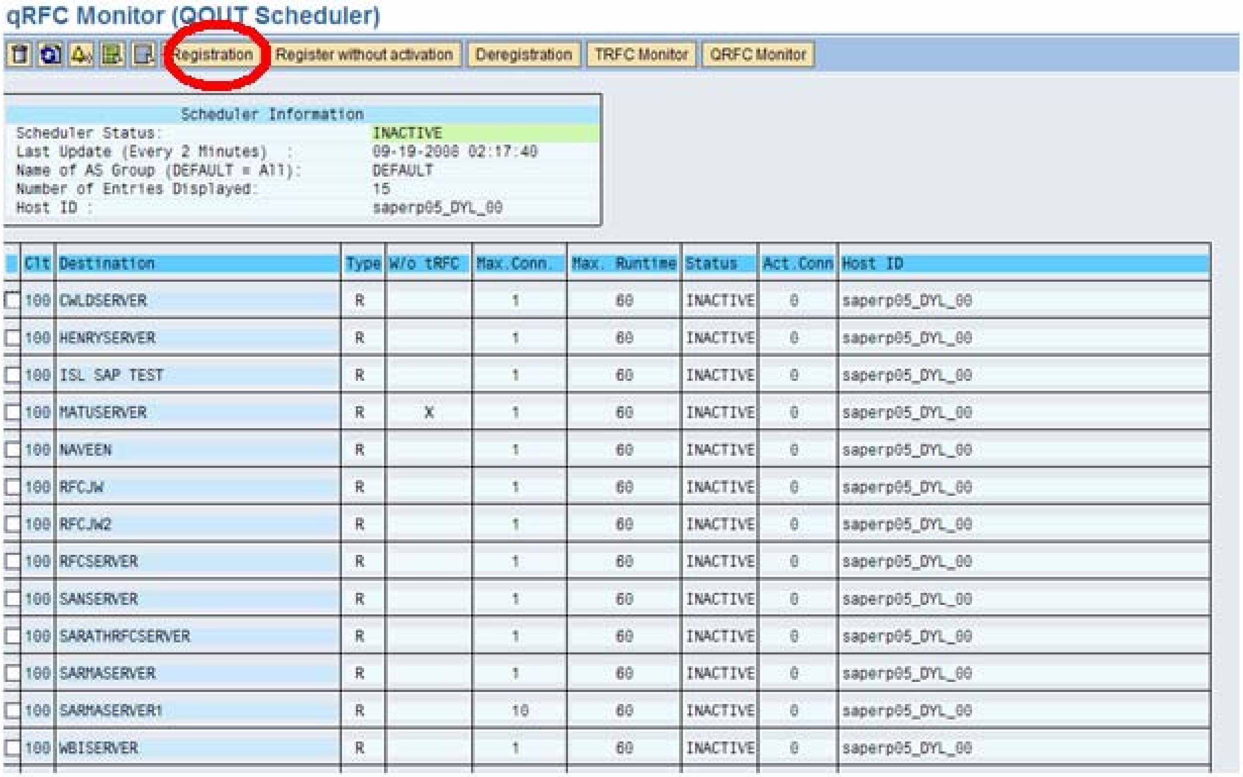
☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

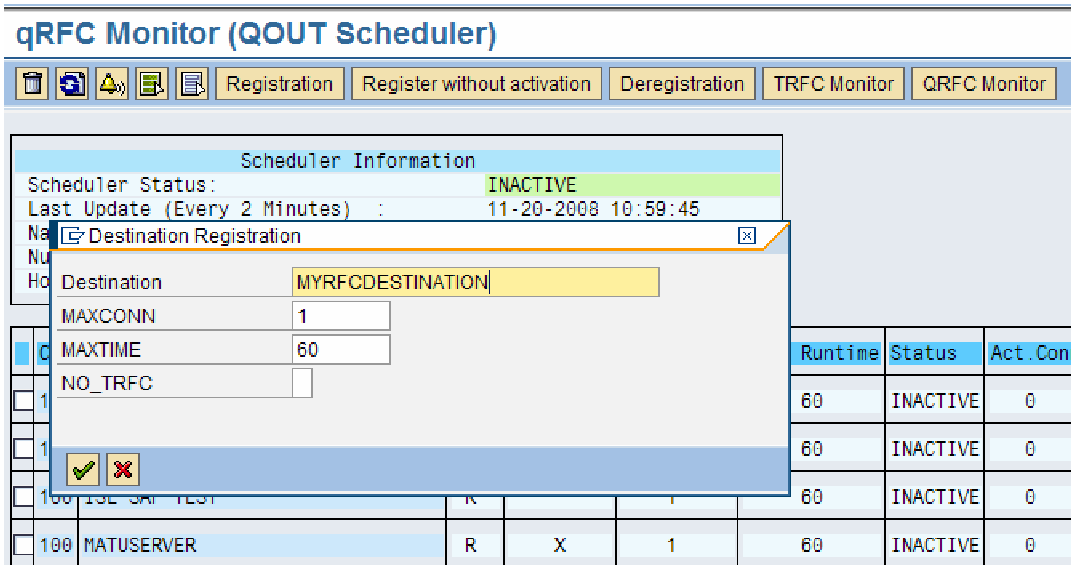
Define the destination in the sending system to enable qRFC communication. Use transaction SM59 to define the destination.

Register a RFC destination for qRFC. Use transaction SMQS. In the first screen, you will see a list of previously registered destinations. To register a new destination, choose REGISTRATION.



```
Scheduler Information
Scheduler Status:                          INACTIVE
Last Update (Every 2 Minutes)  :           09-19-2008 02:17:40
Name of AS Group (DEFAULT = All):          DEFAULT
Number of Entries Displayed:               15
Host ID :                                  saperp05_DYL_00
```

Clt	Destination	Type	W/o tRFC	Max.Conn.	Max. Runtime	Status	Act.Conn	Host ID
100	CWLDSERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	HENRYSERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	ISL SAP TEST	R		1	60	INACTIVE	0	saperp05_DYL_00
100	MATUSERVER	R	X	1	60	INACTIVE	0	saperp05_DYL_00
100	NAVEEN	R		1	60	INACTIVE	0	saperp05_DYL_00
100	RFCJW	R		1	60	INACTIVE	0	saperp05_DYL_00
100	RFCJW2	R		1	60	INACTIVE	0	saperp05_DYL_00
100	RFCSERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	SANSERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	SARATHRFCSERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	SARMASERVER	R		1	60	INACTIVE	0	saperp05_DYL_00
100	SARMASERVER1	R		10	60	INACTIVE	0	saperp05_DYL_00
100	WBISERVER	R		1	60	INACTIVE	0	saperp05_DYL_00



```
Scheduler Information
Scheduler Status:                          INACTIVE
Last Update (Every 2 Minutes)  :           11-20-2008 10:59:45
```

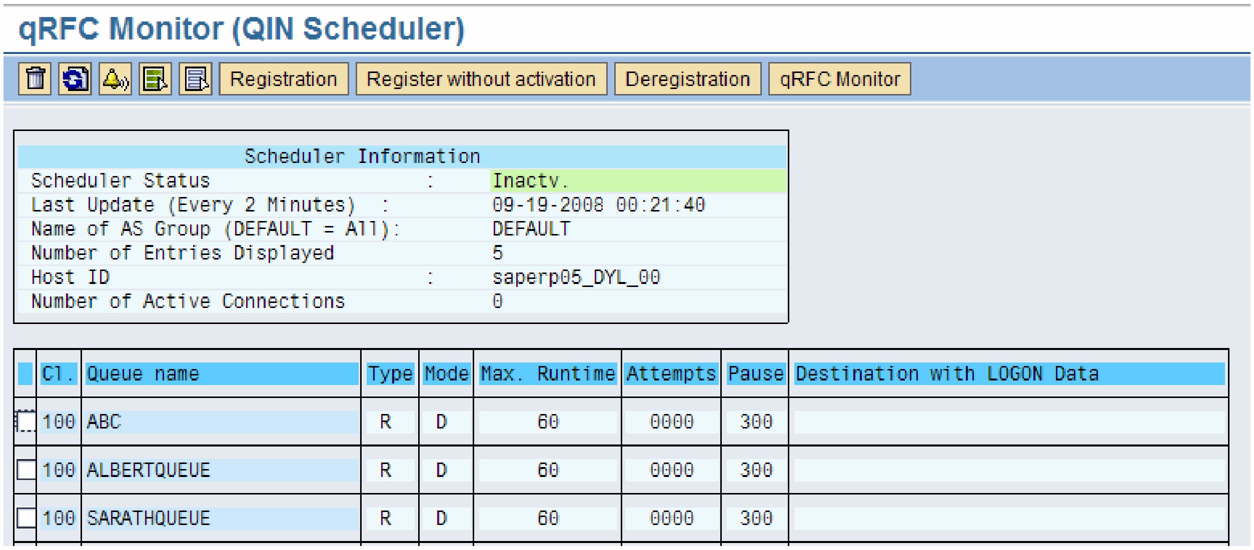
Destination Registration

Destination	MYRFCDESTINATION
MAXCONN	1
MAXTIME	60
NO_TRFC	□

C	Destination				Runtime	Status	Act.Con
1					60	INACTIVE	0
1					60	INACTIVE	0
100	ISL SAP TEST	R		1	60	INACTIVE	0
100	MATUSERVER	R	X	1	60	INACTIVE	0

Enter the value for the RFC destination, MYRFCDESTINATION in the example.

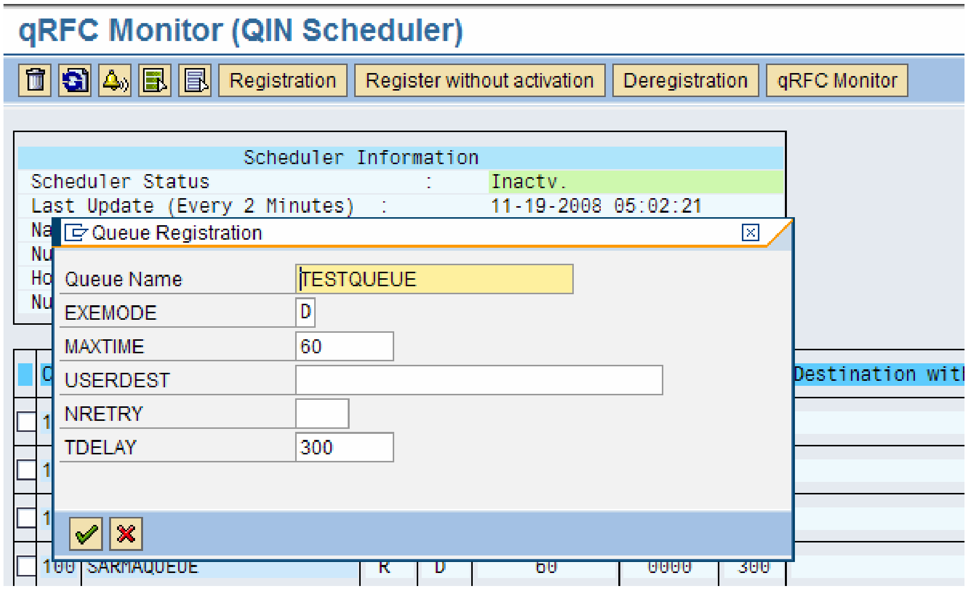
Register a queue name. Invoke transaction SMQR. In the first screen, you will see a list of registered queue names.



```
Scheduler Information
Scheduler Status                     :    Inactv.
Last Update (Every 2 Minutes)   :         09-19-2008 00:21:40
Name of AS Group (DEFAULT = All):         DEFAULT
Number of Entries Displayed               5
Host ID                              :    saperp05_DYL_00
Number of Active Connections              0
```

	Cl.	Queue name	Type	Mode	Max. Runtime	Attempts	Pause	Destination with LOGON Data
□	100	ABC	R	D	60	0000	300	
□	100	ALBERTQUEUE	R	D	60	0000	300	
□	100	SARATHQUEUE	R	D	60	0000	300	

Click Registration to add the new queue name.



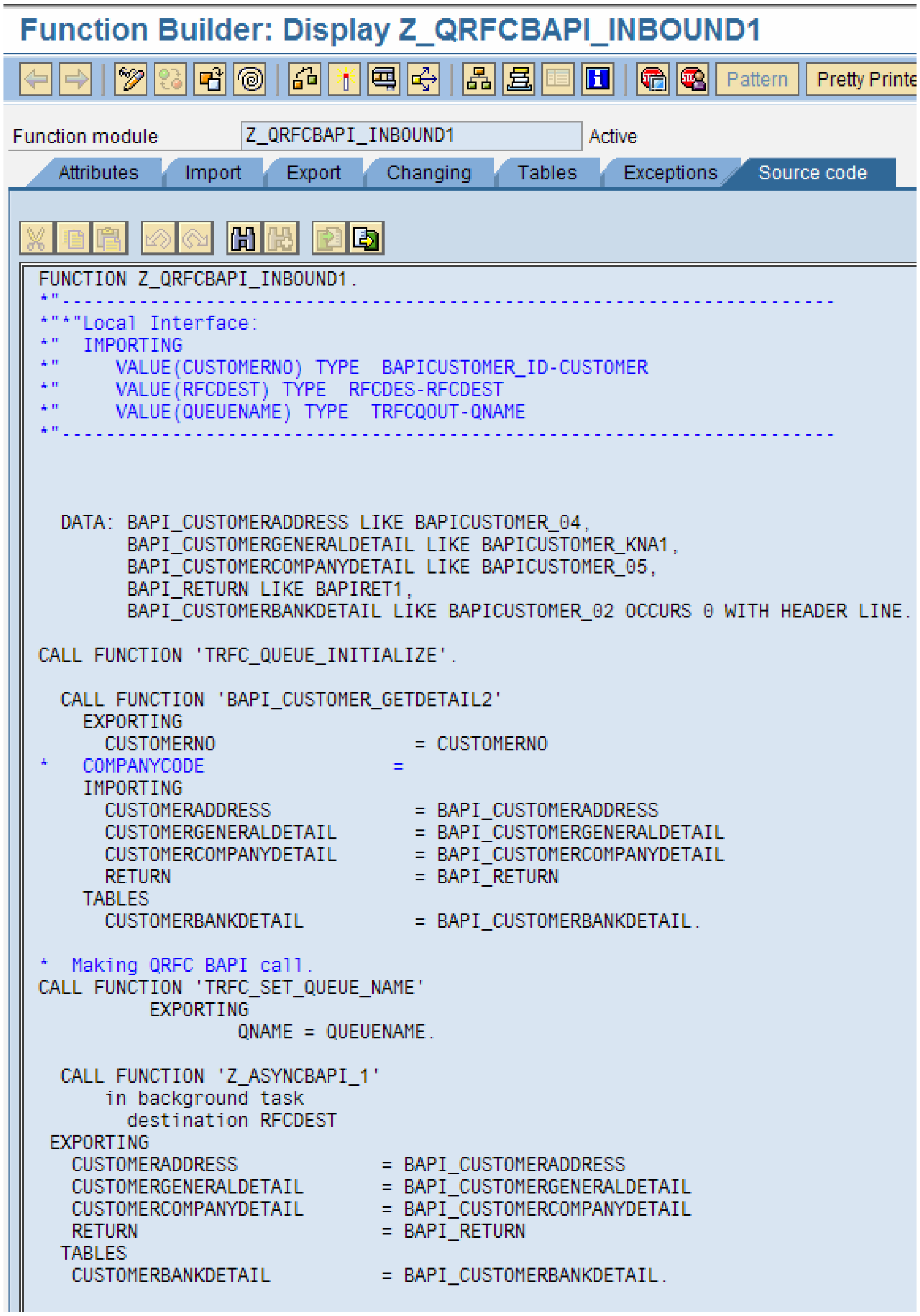
```
Scheduler Information
Scheduler Status                     :    Inactv.
Last Update (Every 2 Minutes)   :         11-19-2008 05:02:21
```

Queue Name	TESTQUEUE
EXEMODE	D
MAXTIME	60
USERDEST	
NRETRY	
TDELAY	300

□	100	SARMAQUEUE	R	D	60	0000	300

At this point, your queue is setup and ready for use.
Invoke transaction SE37.

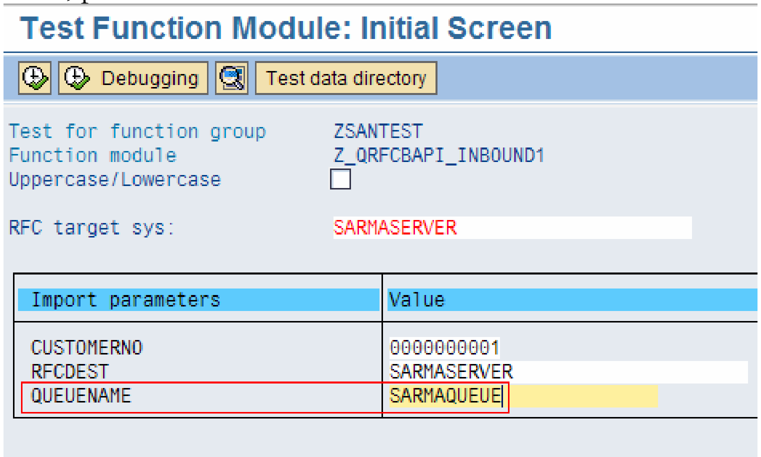
You need to have a new BAPI that initializes the queue and invokes the original BAPI and sends the result to the queue. So in EMD, you discover Z_ASYNCBAPI_1 but execute Z_QRFCBAPI_INBOUND1 from SE37 to send to the queue.



Function module Z_QRFCBAPI_INBOUND1 Active

```
FUNCTION Z_QRFCBAPI_INBOUND1.
*"----------------------------------------------------------------------
*"*"Local Interface:
*"  IMPORTING
*"     VALUE(CUSTOMERNO) TYPE  BAPICUSTOMER_ID-CUSTOMER
*"     VALUE(RFCDEST) TYPE  RFCDES-RFCDEST
*"     VALUE(QUEUENAME) TYPE  TRFCQOUT-QNAME
*"----------------------------------------------------------------------



  DATA: BAPI_CUSTOMERADDRESS LIKE BAPICUSTOMER_04,
        BAPI_CUSTOMERGENERALDETAIL LIKE BAPICUSTOMER_KNA1,
        BAPI_CUSTOMERCOMPANYDETAIL LIKE BAPICUSTOMER_05,
        BAPI_RETURN LIKE BAPIRET1,
        BAPI_CUSTOMERBANKDETAIL LIKE BAPICUSTOMER_02 OCCURS 0 WITH HEADER LINE.

CALL FUNCTION 'TRFC_QUEUE_INITIALIZE'.

  CALL FUNCTION 'BAPI_CUSTOMER_GETDETAIL2'
    EXPORTING
      CUSTOMERNO                    = CUSTOMERNO
*    COMPANYCODE                   =
    IMPORTING
      CUSTOMERADDRESS               = BAPI_CUSTOMERADDRESS
      CUSTOMERGENERALDETAIL         = BAPI_CUSTOMERGENERALDETAIL
      CUSTOMERCOMPANYDETAIL         = BAPI_CUSTOMERCOMPANYDETAIL
      RETURN                        = BAPI_RETURN
    TABLES
      CUSTOMERBANKDETAIL            = BAPI_CUSTOMERBANKDETAIL.

*  Making QRFC BAPI call.
CALL FUNCTION 'TRFC_SET_QUEUE_NAME'
          EXPORTING
                  QNAME = QUEUENAME.

  CALL FUNCTION 'Z_ASYNCBAPI_1'
      in background task
        destination RFCDEST
 EXPORTING
   CUSTOMERADDRESS               = BAPI_CUSTOMERADDRESS
   CUSTOMERGENERALDETAIL         = BAPI_CUSTOMERGENERALDETAIL
   CUSTOMERCOMPANYDETAIL         = BAPI_CUSTOMERCOMPANYDETAIL
   RETURN                        = BAPI_RETURN
  TABLES
   CUSTOMERBANKDETAIL            = BAPI_CUSTOMERBANKDETAIL.
```

Now, press **F8** to execute this BAPI



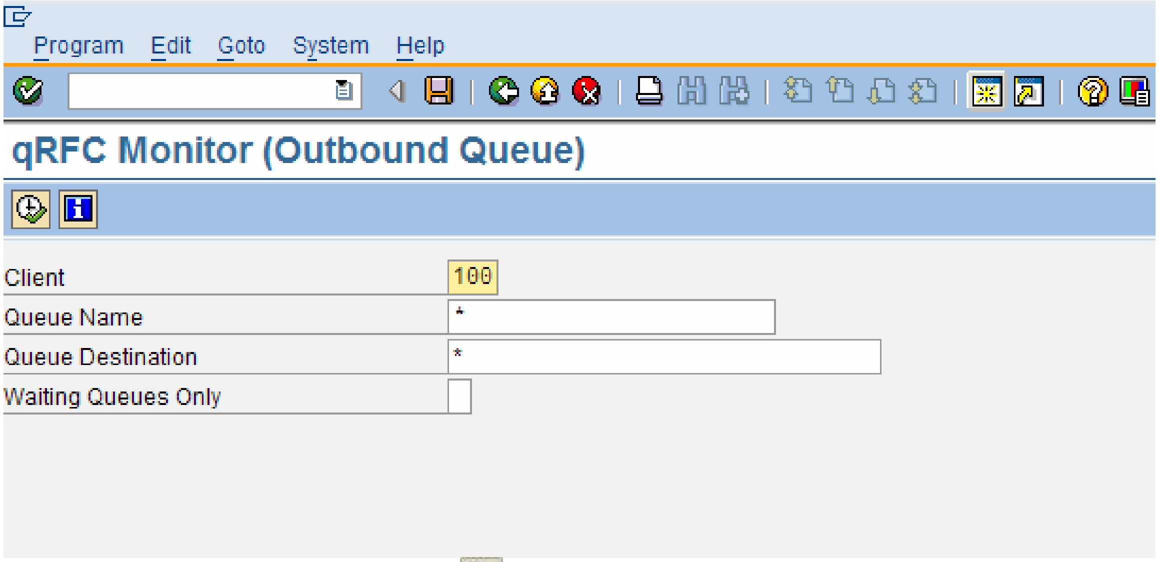
Test Function Module: Initial Screen

Test for function group	ZSANTEST
Function module	Z_QRFCBAPI_INBOUND1
Uppercase/Lowercase	□
RFC target sys:	SARMASERVER

Import parameters	Value
CUSTOMERNO	0000000001
RFCDEST	SARMASERVER
QUEUENAME	SARMAQUEUE

Here, you need to enter the queue name and the RFC destination

Invoke the Outbound queue monitor using transaction SMQ1

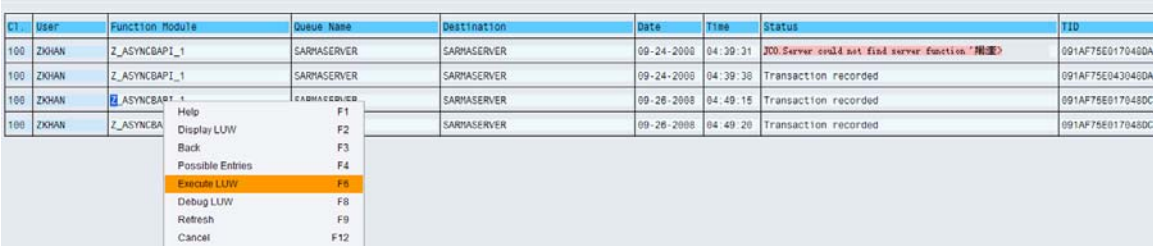


qRFC Monitor (Outbound Queue)

Client	100
Queue Name	*
Queue Destination	*
Waiting Queues Only	□

To view the specified queue, choose **Execute**

Double Click the queue name to see the LUWs.



Cl.	User	Function Module	Queue Name	Destination	Date	Time	Status	TID
100	ZKHAN	Z_ASYNCBAPI_1	SARMASERVER	SARMASERVER	09-24-2008	04:39:31	JCO.Server could not find server function '[illegible]'	091AF75E017048DA
100	ZKHAN	Z_ASYNCBAPI_1	SARMASERVER	SARMASERVER	09-24-2008	04:39:38	Transaction recorded	091AF75E043048DA
100	ZKHAN	Z_ASYNCBAPI_1	SARMASERVER	SARMASERVER	09-26-2008	04:49:15	Transaction recorded	091AF75E017048DC
100	ZKHAN	Z_ASYNCBA		SARMASERVER	09-26-2008	04:49:20	Transaction recorded	091AF75E017048DC

Double click on **Execute LUW(F6)** to execute logical unit of work

The SAP system will send the LUW to the destination once it is alive.

In the console of WebSphere Integration Developer, you could see the BAPI Business Object printed (as we entered a print statement in the Component implementation above).

Clearing the sample content

Nothing is required to clean up after this tutorial.

Chapter 18. Tutorial 13: Generating ALE Audit IDocs per packet (Inbound processing ALE Interface)

Following sections explain inbound scenarios for the ALE interface where the ALE Audit are generated per packet rather than per IDOC.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

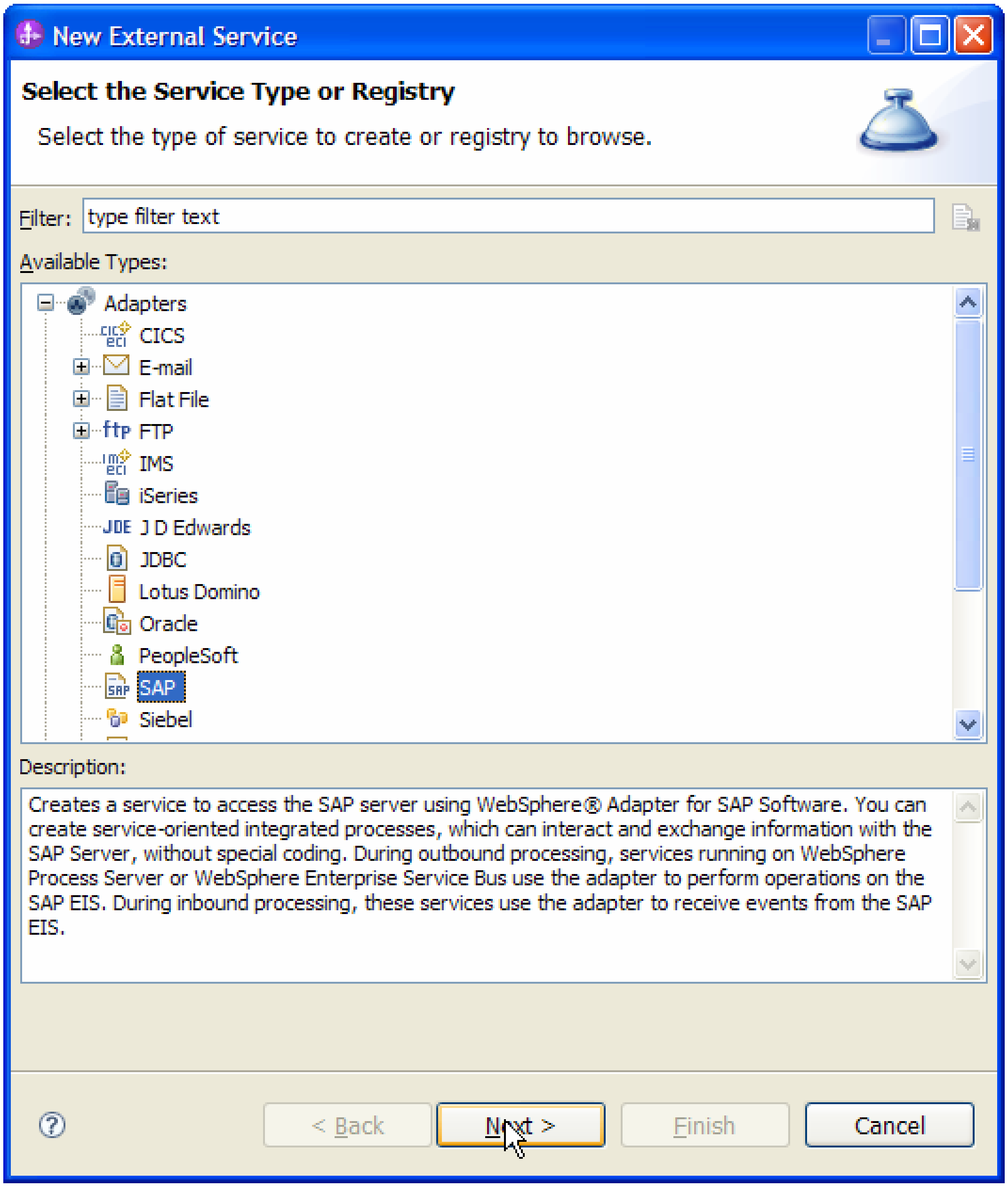
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

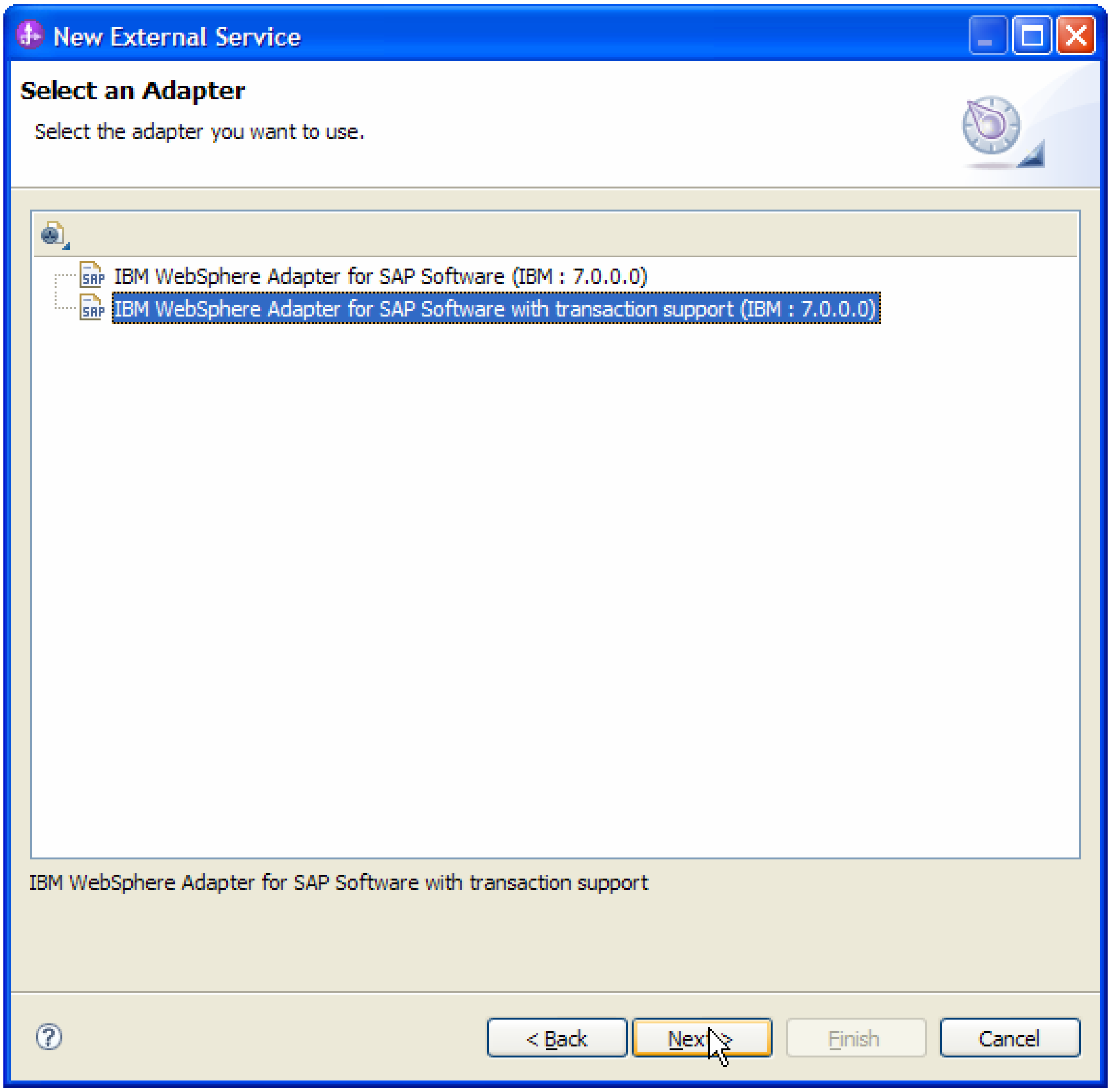
1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

1. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

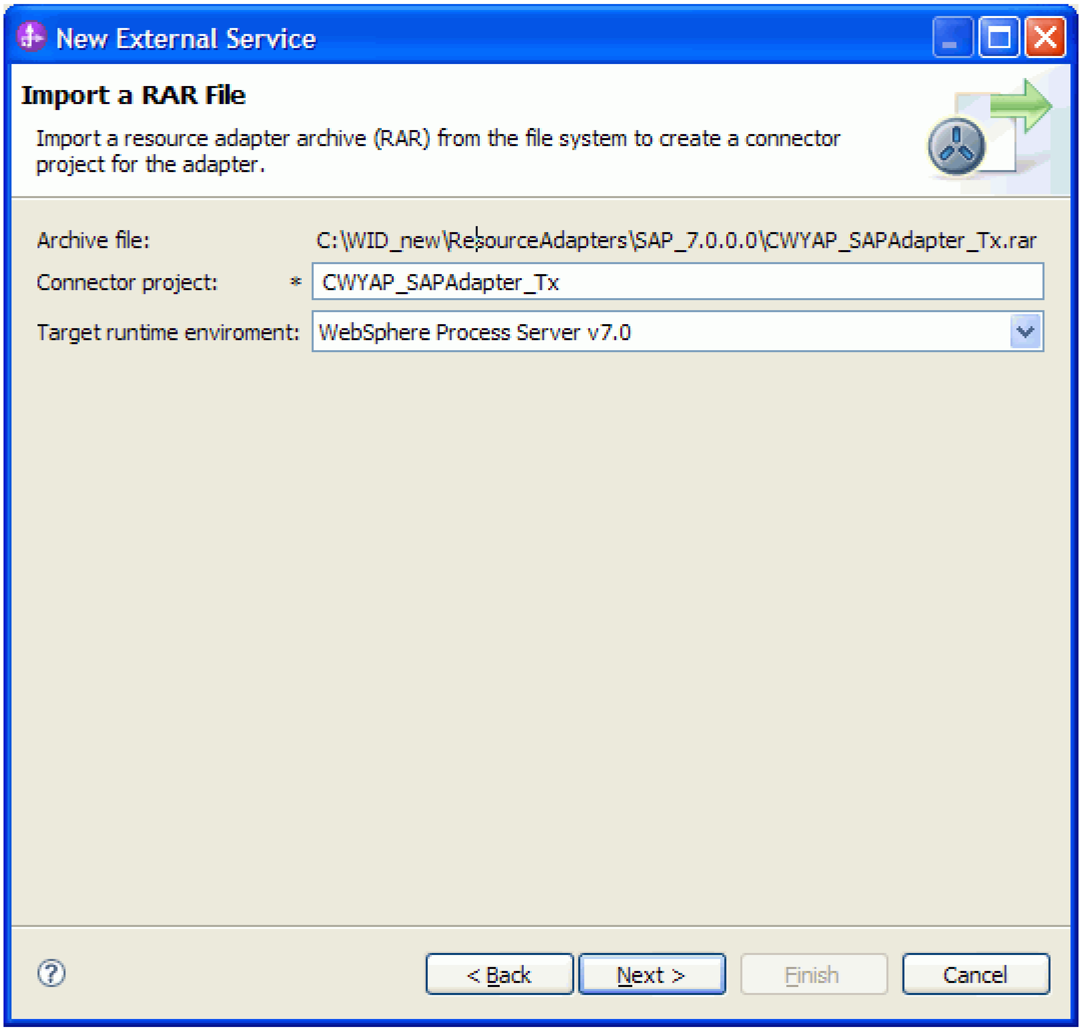
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

2. Specify a Connector Project name in the **Import a RAR File** screen and proceed by clicking on **Next**.



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

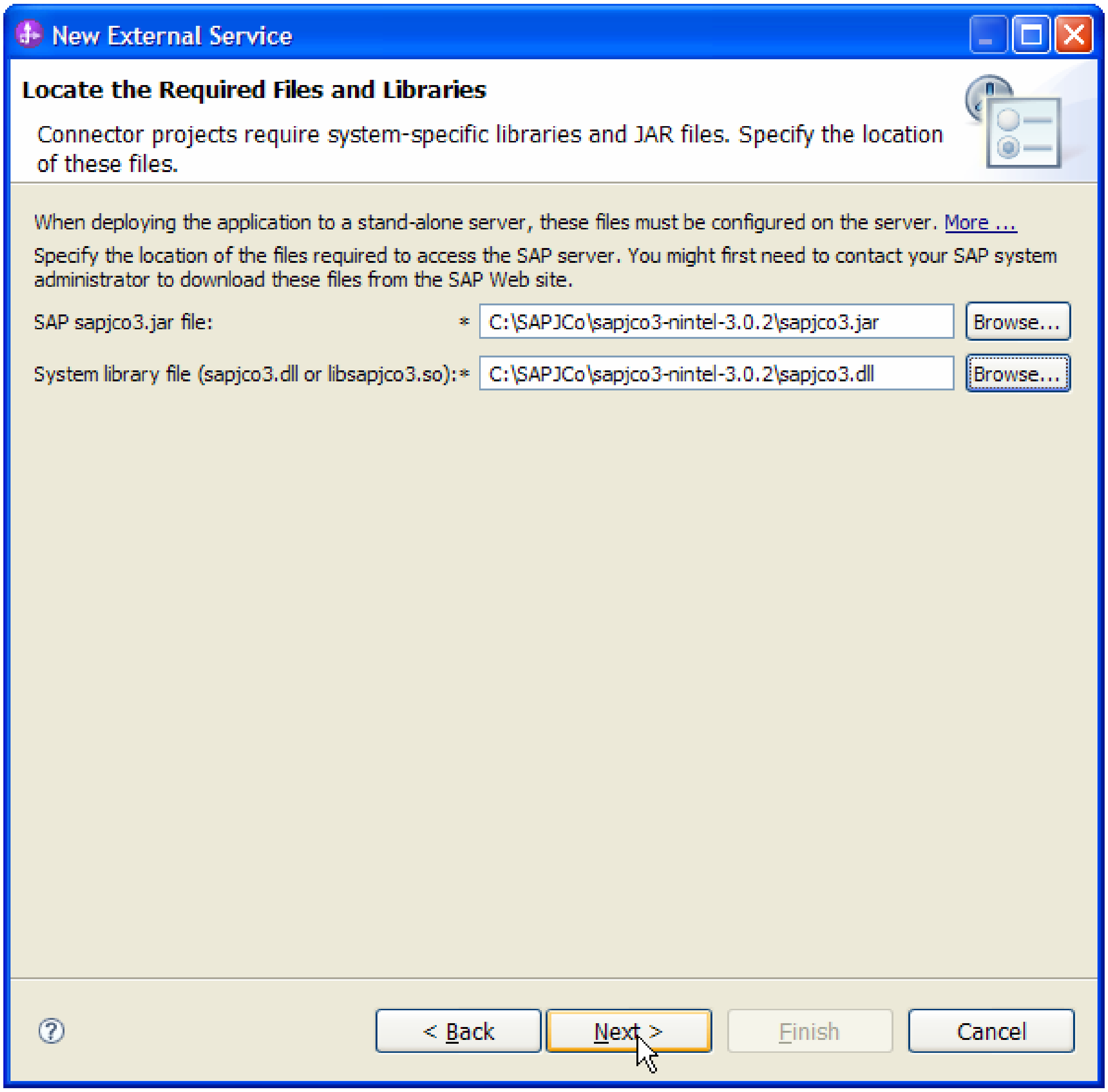
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

3. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

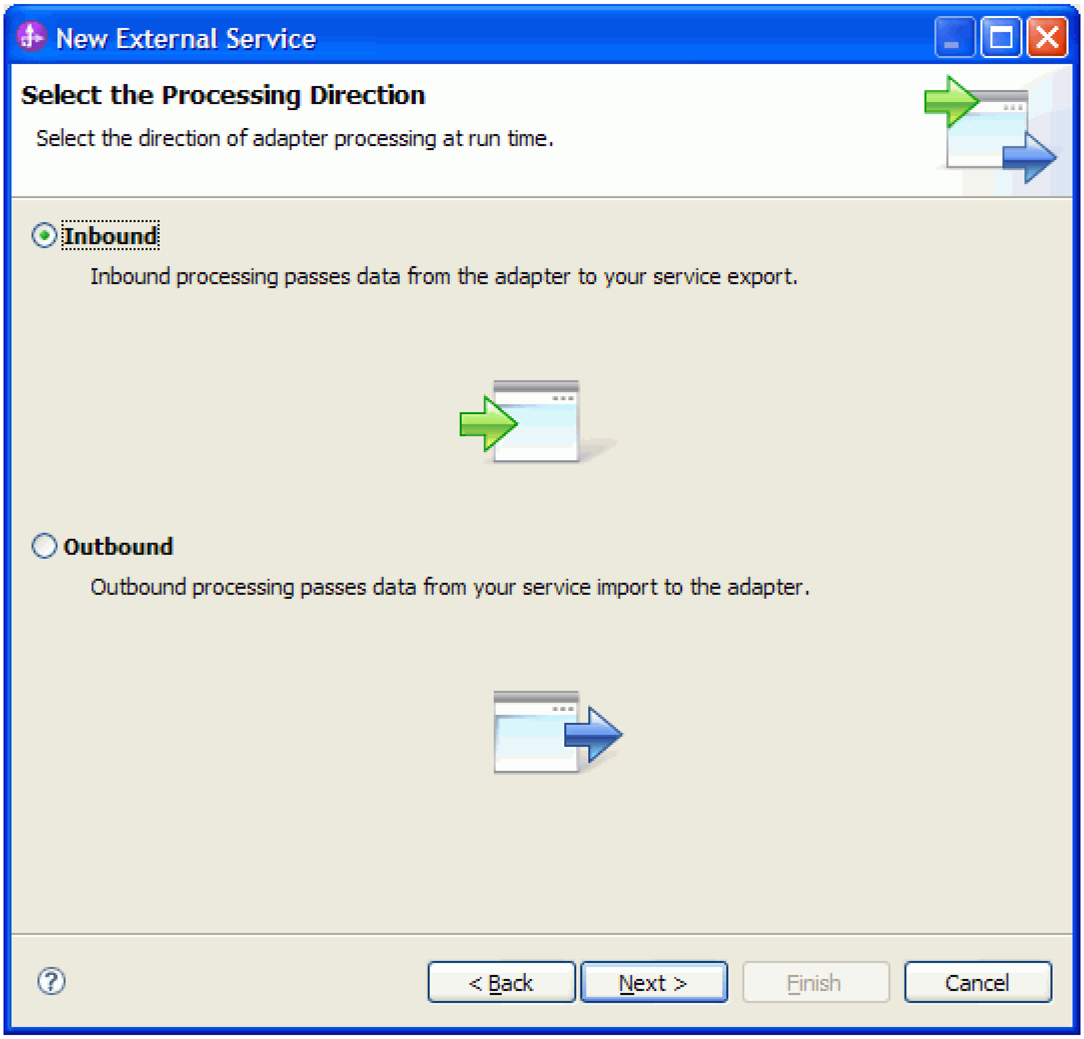
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

4. Click **Next**.

5. In the **Select the Processing Direction** screen, select **Inbound** radio button, then click **Next**.



Select the direction of adapter processing at run time.

● Inbound

Inbound processing passes data from the adapter to your service export.

○ Outbound

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

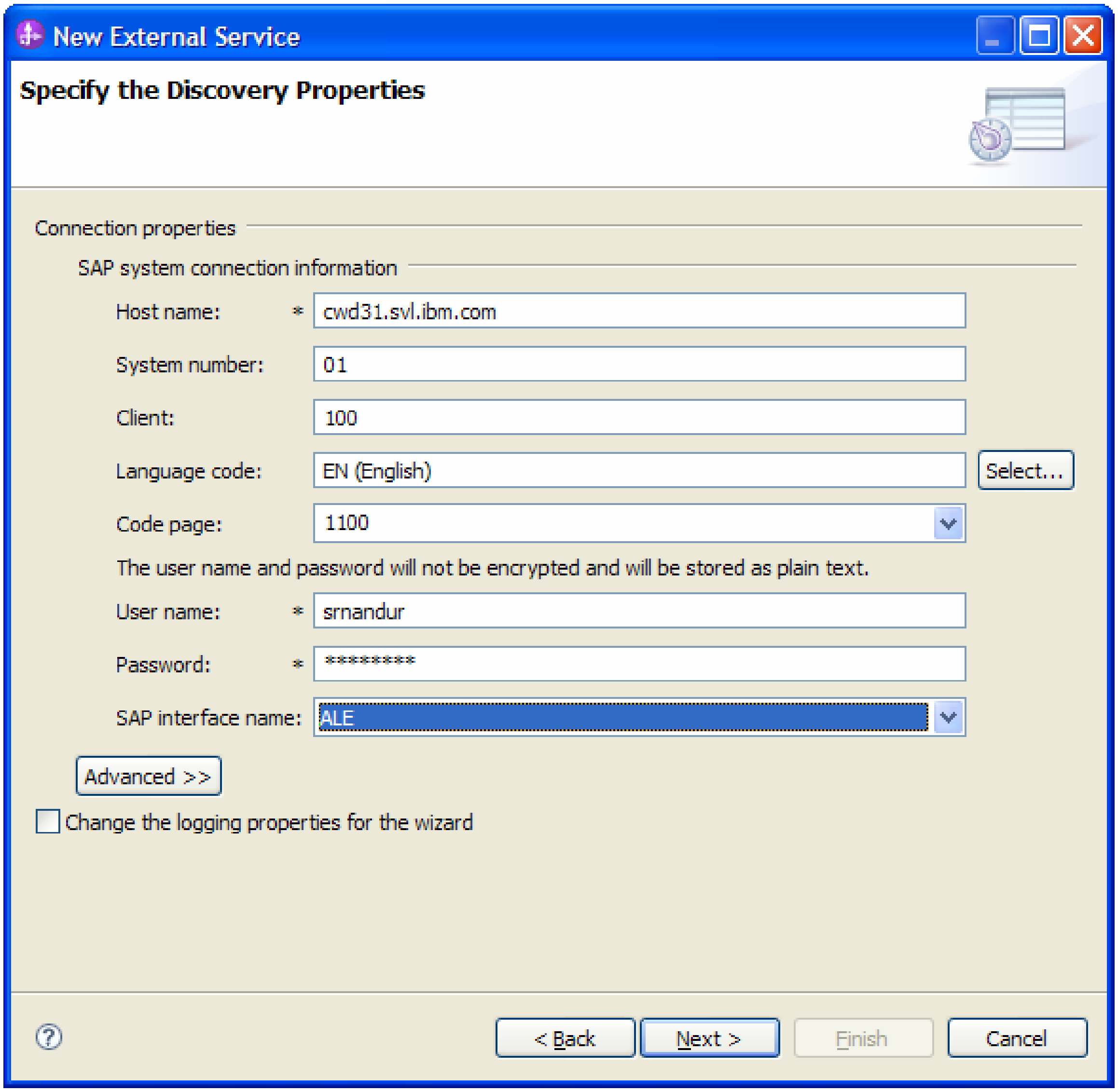
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select **ALE** as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

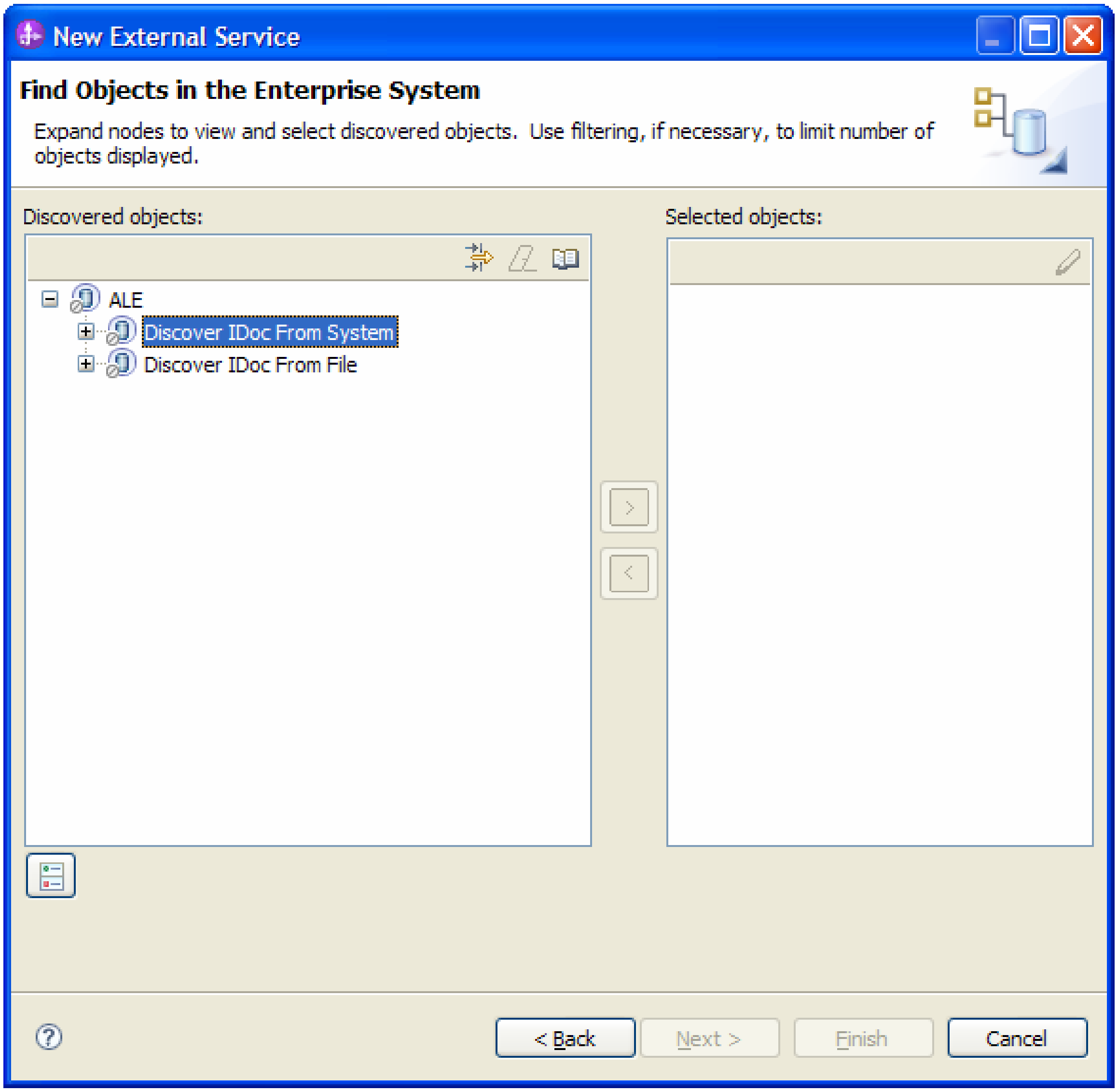
Password: * *********

SAP interface name: ALE

Figure: Select ALE as the interface

Selecting the Business Objects and services to be used with the adapter

Under Find Objects in the Enterprise System, expand the ALE node, click Discover IDoc From System.

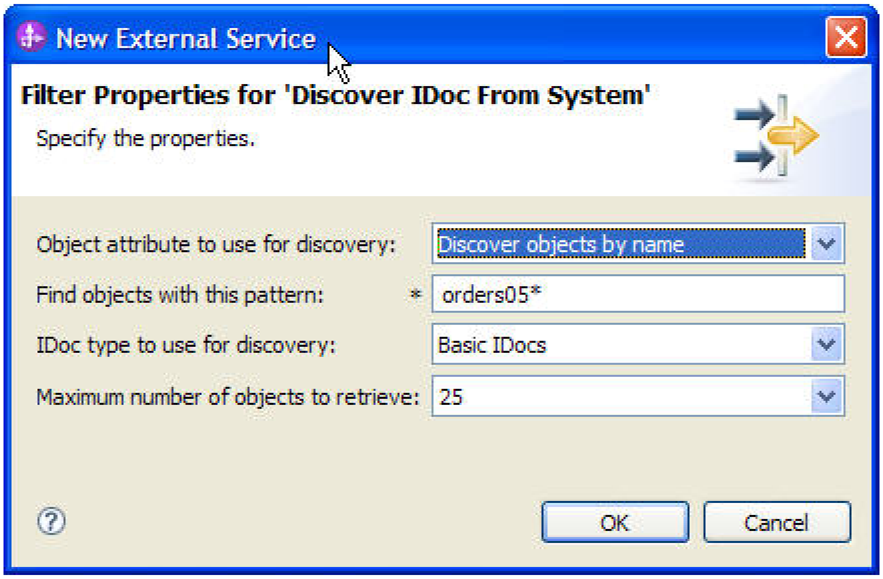


New External Service
Find Objects in the Enterprise System
Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.
Discovered objects:
Selected objects:
ALE
Discover IDoc From System
Discover IDoc From File
< Back
Next >
Finish
Cancel

Figure: Object Discovery and Selection

Click the ⇉ button.

Enter **Alereq01** (the name of the ALE in SAP system) in the **Filter Properties for 'Discover IDoc From System'** screen.



New External Service

Filter Properties for 'Discover IDoc From System'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: * orders05*

IDoc type to use for discovery: Basic IDocs

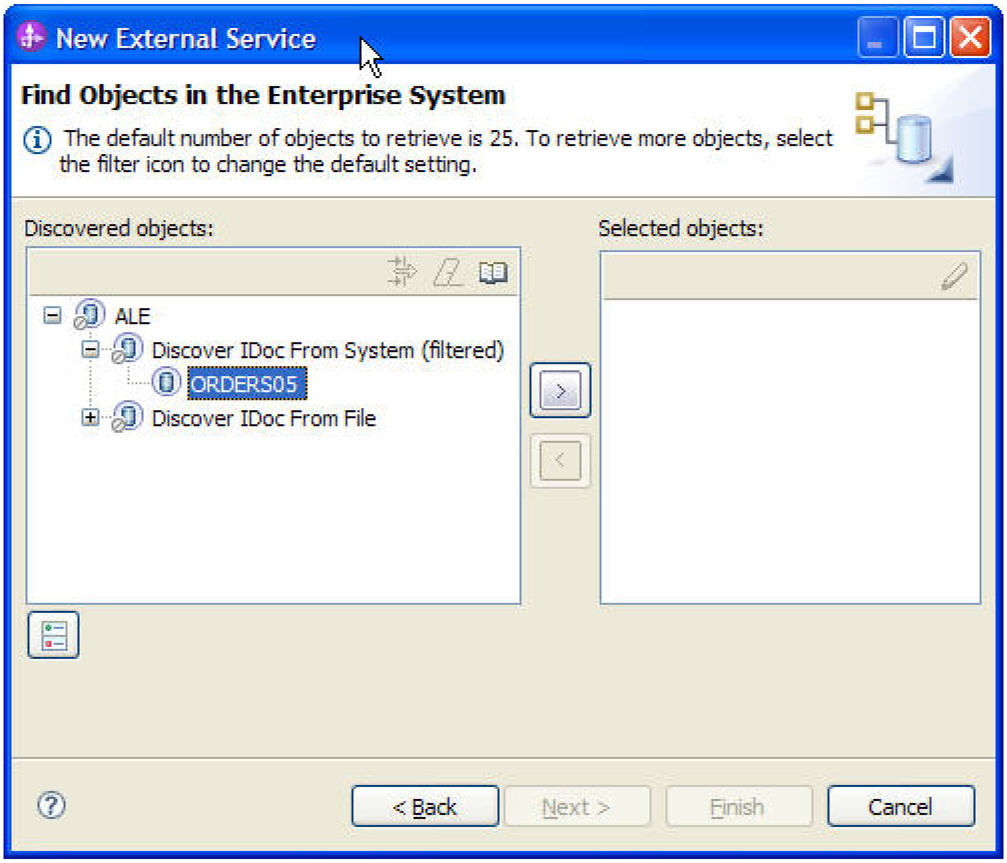
Maximum number of objects to retrieve: 25

Figure: Filter Properties for 'Discover IDoc from System'

Click **OK**.

Expand Discover IDoc From System node.

Select **ORDERS05** and click the > button.



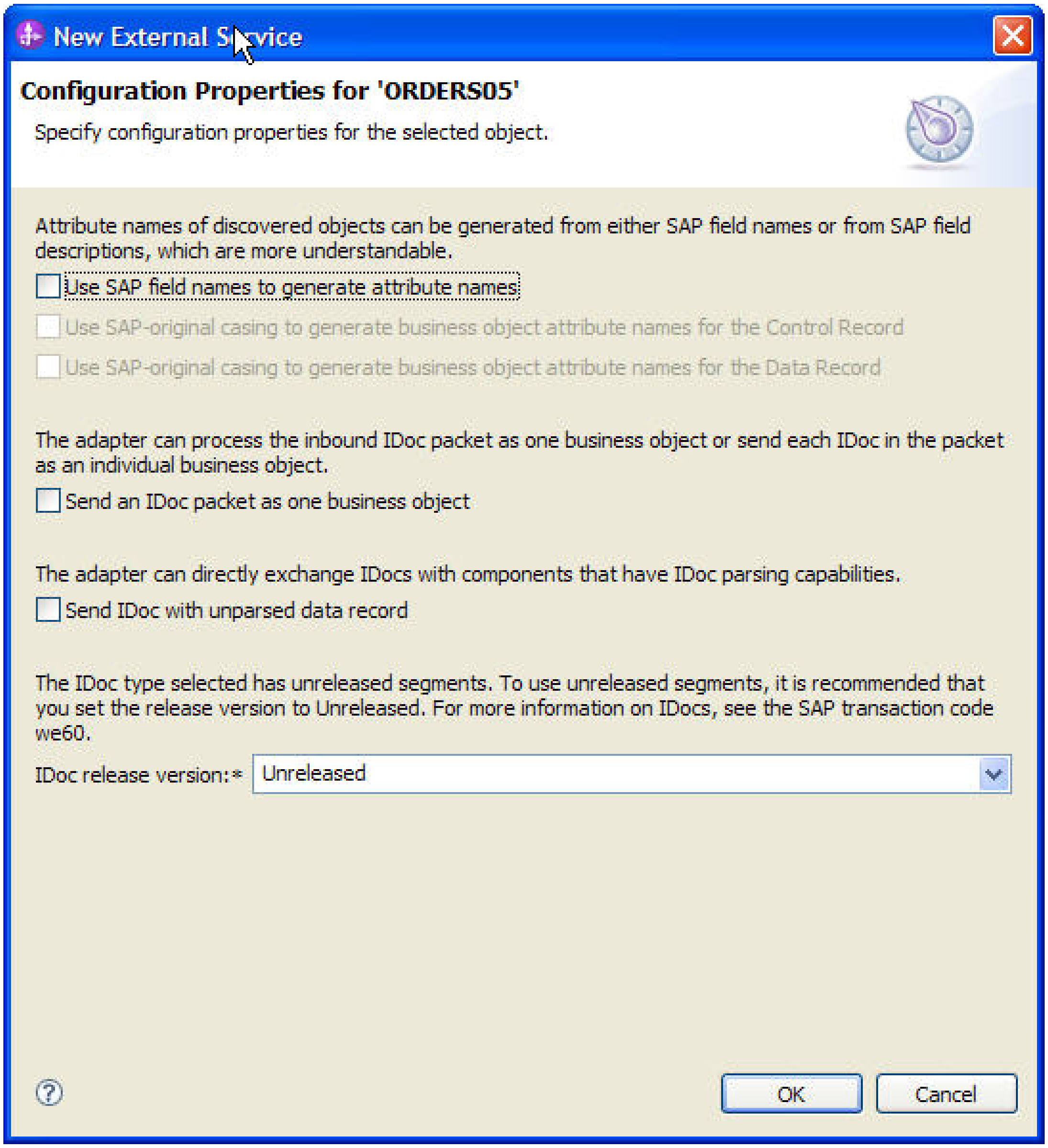
New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Figure: Discovered ORDERS05 IDoc

In the **Configuration Parameters** screen, choose the default values and click **OK**.



New External Service

Configuration Properties for 'ORDERS05'

Specify configuration properties for the selected object.

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use SAP-original casing to generate business object attribute names for the Control Record

□ Use SAP-original casing to generate business object attribute names for the Data Record

The adapter can process the inbound IDoc packet as one business object or send each IDoc in the packet as an individual business object.

□ Send an IDoc packet as one business object

The adapter can directly exchange IDocs with components that have IDoc parsing capabilities.

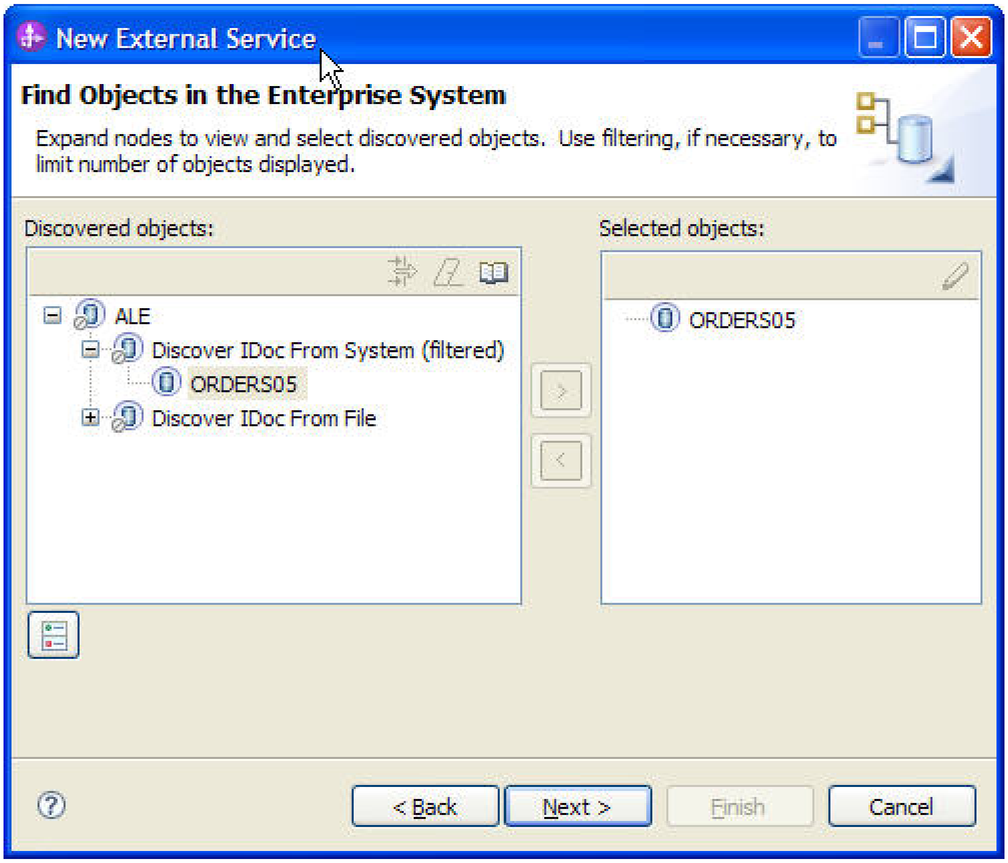
□ Send IDoc with unparsed data record

The IDoc type selected has unreleased segments. To use unreleased segments, it is recommended that you set the release version to Unreleased. For more information on IDocs, see the SAP transaction code we60.

IDoc release version:* Unreleased

Figure: Setting configuration parameters for the ALE selected

ORDERS05 has now been added to the list of Business Objects to be imported.


New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

- ALE
  - Discover IDoc From System (filtered)
    - ORDERS05
  - Discover IDoc From File

Selected objects:

- ORDERS05

Figure: Selected ALE added to the Objects to be imported

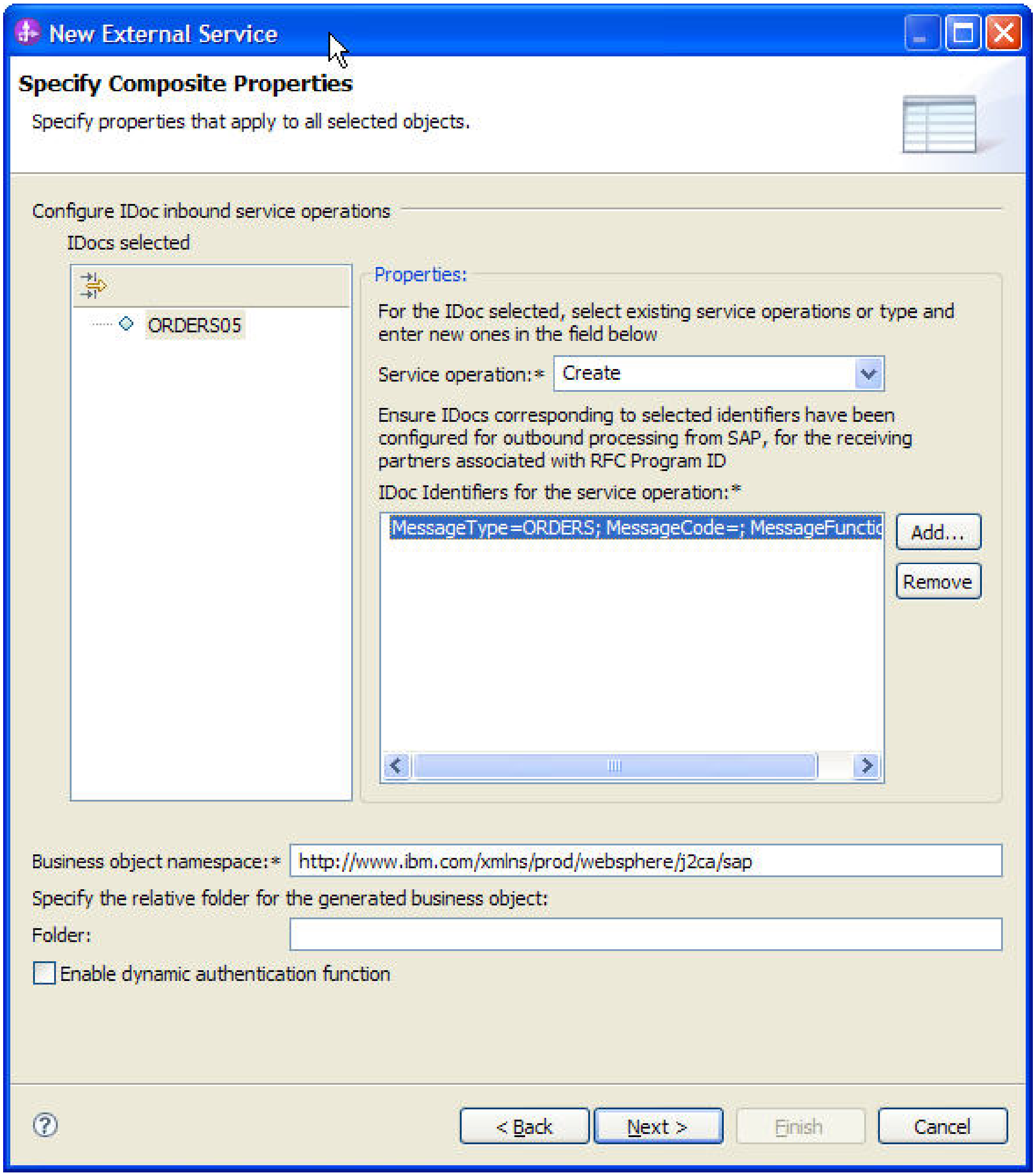
Click **Next**.

Generating Business Object definitions and related artifacts

1. In the **Specify Composite Properties** screen, select the Service operation as **Create.**

2. Add MessageType=ALEREQ; MessageCode=; MessageFunction=; as IDoc Identifiers for the service operation by clicking on **Add** button.

3. Enter **bodefs** as the name of the relative folder for the generated Business Object.



New External Service

Specify Composite Properties

Specify properties that apply to all selected objects.

Configure IDoc inbound service operations

IDocs selected

ORDERS05

Properties:

For the IDoc selected, select existing service operations or type and enter new ones in the field below

Service operation:* Create

Ensure IDocs corresponding to selected identifiers have been configured for outbound processing from SAP, for the receiving partners associated with RFC Program ID

IDoc Identifiers for the service operation:*

MessageType=ORDERS; MessageCode=; MessageFunctio

Business object namespace:* http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

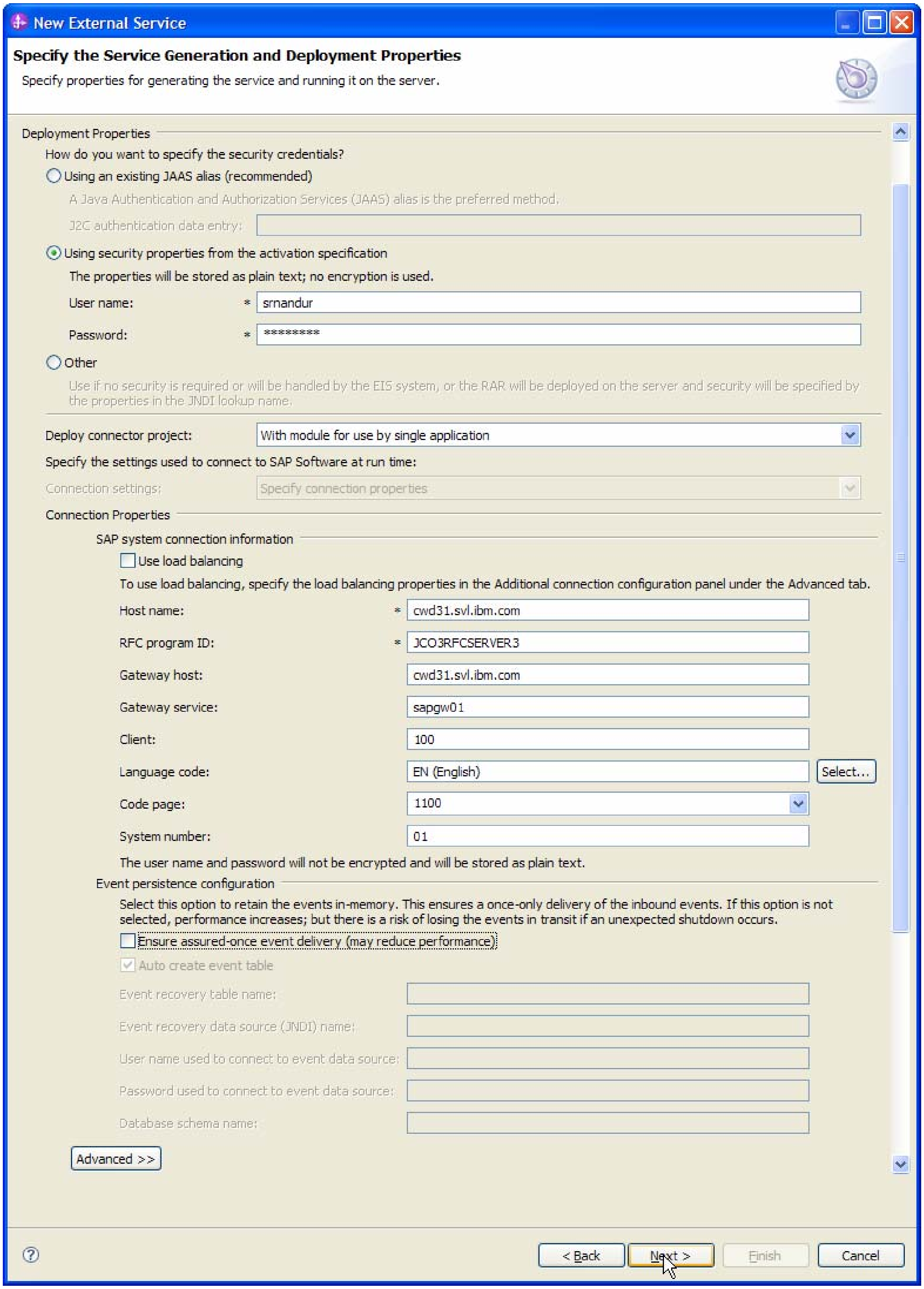
Folder:

□ Enable dynamic authentication function

Figur : Specify Composite properties

4. Click **Next**

5. In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the activation specification

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID: * JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English) Select...

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

Event persistence configuration

Select this option to retain the events in-memory. This ensures a once-only delivery of the inbound events. If this option is not selected, performance increases; but there is a risk of losing the events in transit if an unexpected shutdown occurs.

□ Ensure assured-once event delivery (may reduce performance)

☑ Auto create event table

Event recovery table name:

Event recovery data source (JNDI) name:

User name used to connect to event data source:

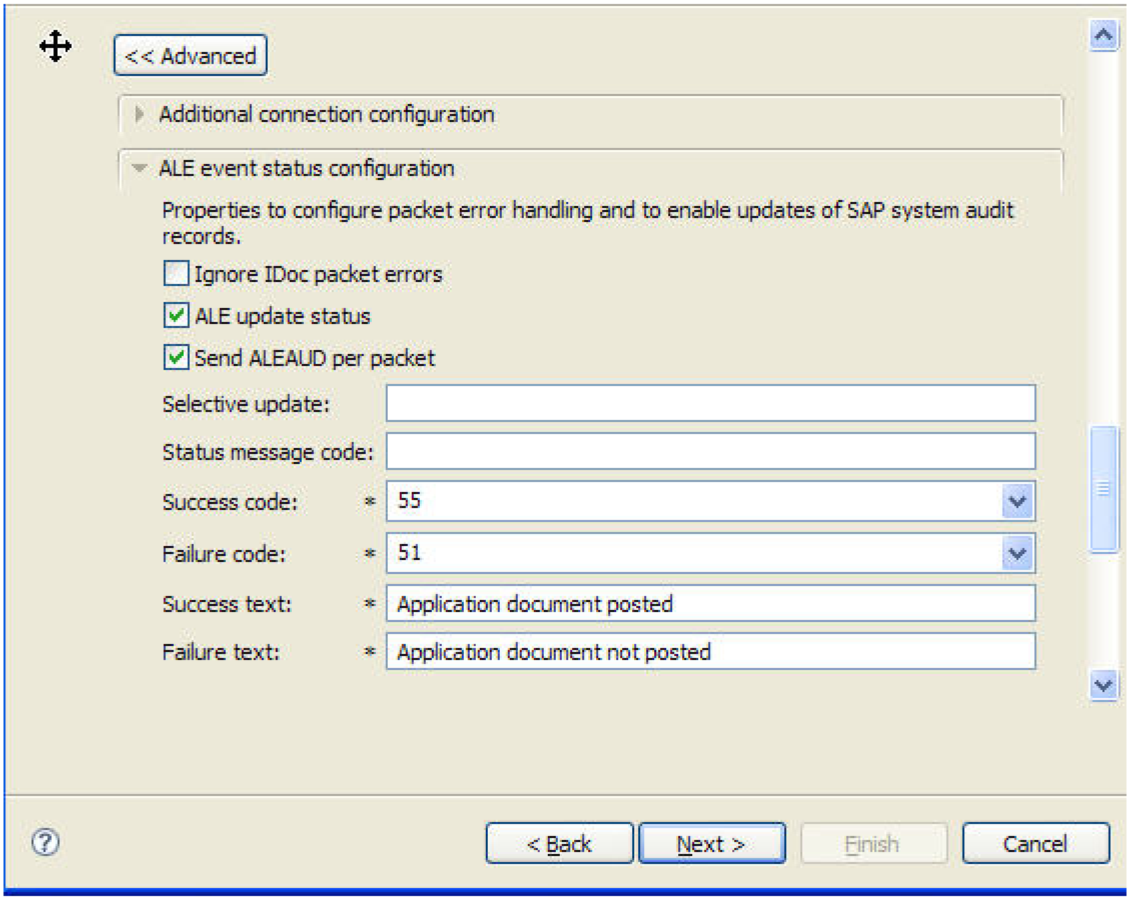
Password used to connect to event data source:

Database schema name:

Figure: Service Generation and Deployment Configuration

NOTE: You can either enter Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system. Also enter the RFCProgramID (as shown in figure). This must have been already configured in the SAP system.

6. Click **Advanced** button, click **ALE event status configuration** and check the options **ALE update status** and **Send ALEAUD per packet**.



<< Advanced
Additional connection configuration
ALE event status configuration
< Back
Next >
Finish
Cancel

Properties to configure packet error handling and to enable updates of SAP system audit records.

□ Ignore IDoc packet errors

☑ ALE update status

☑ Send ALEAUD per packet

Selective update:

Status message code:

Success code: * 55

Failure code: * 51

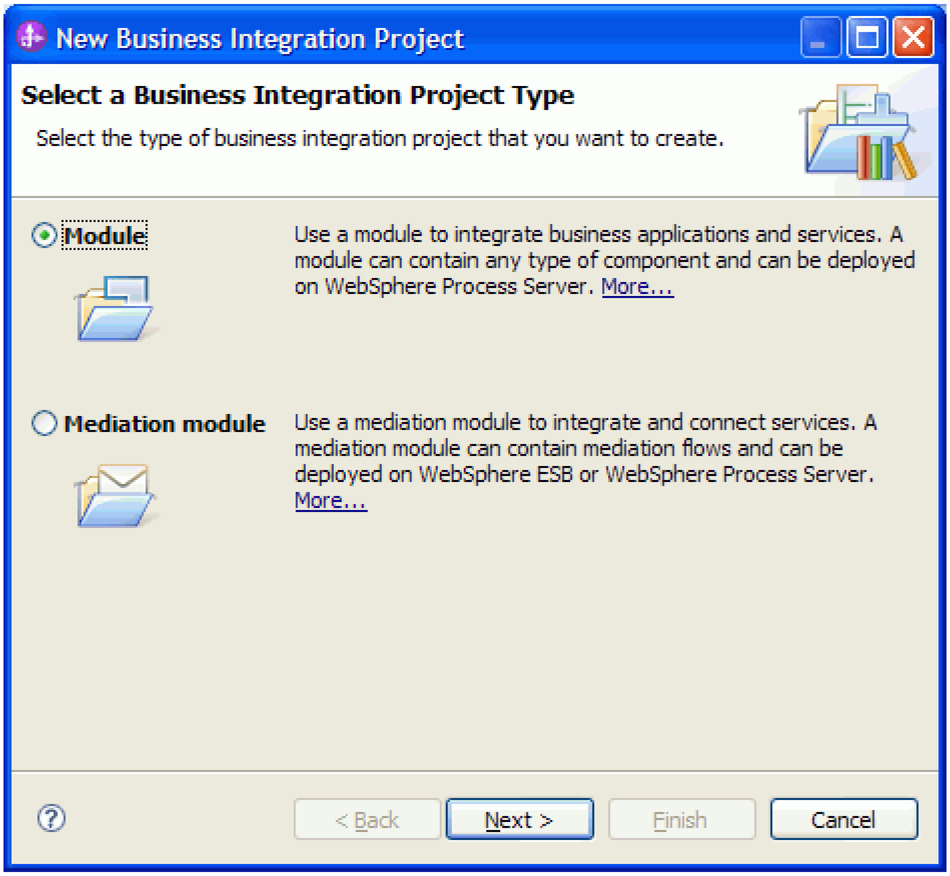
Success text: * Application document posted

Failure text: * Application document not posted

7. Click **Next.**

8. In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

9. When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

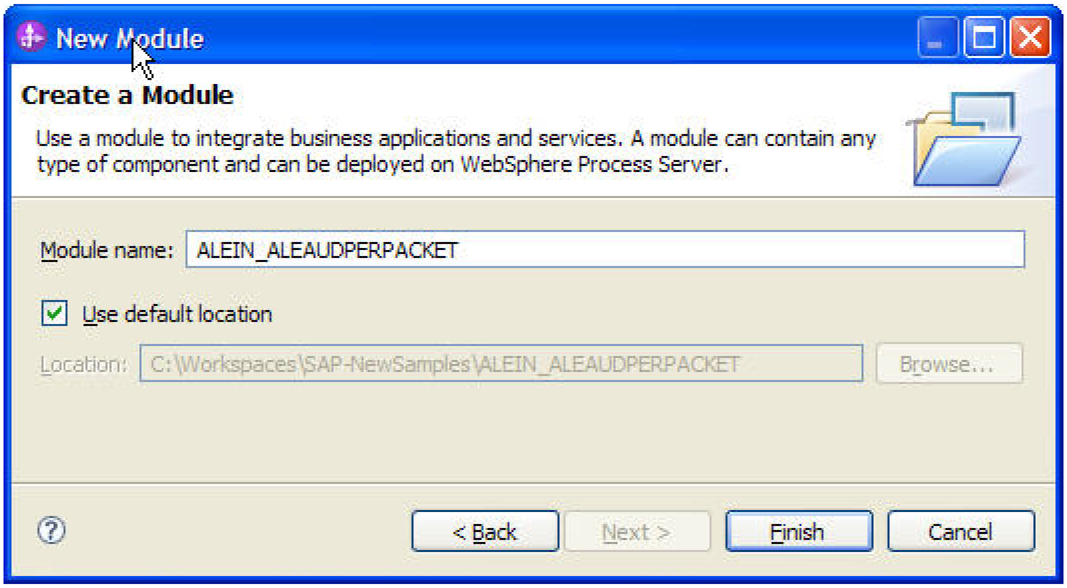
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

7. In the **New Module** screen, type **ALEIN_ALEAUDPERPACKET** in the **Module Name** field, and then click **Finish**.



New Module

Create a Module

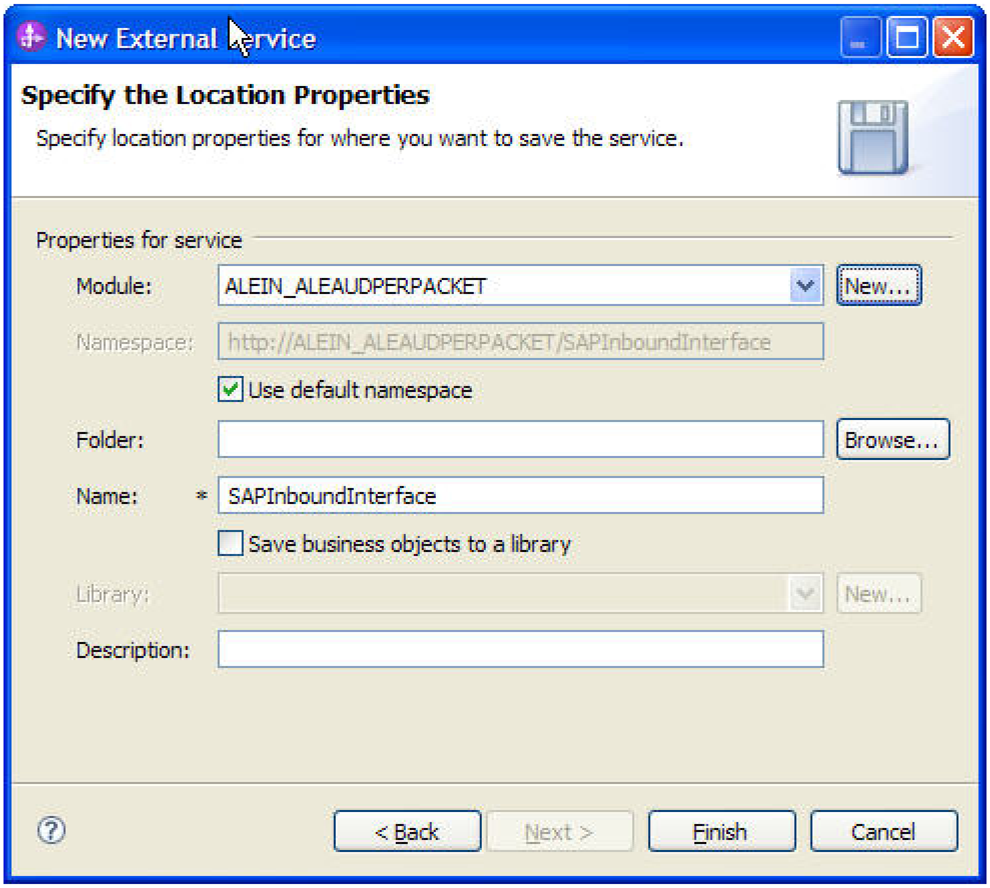
Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

Module name: ALEIN_ALEAUDPERPACKET

☑ Use default location

Location: C:\Workspaces\SAP-NewSamples\ALEIN_ALEAUDPERPACKET

10. Click **Finish** on the screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: ALEIN_ALEAUDPERPACKET

Namespace: http://ALEIN_ALEAUDPERPACKET/SAPInboundInterface

☑ Use default namespace

Folder:

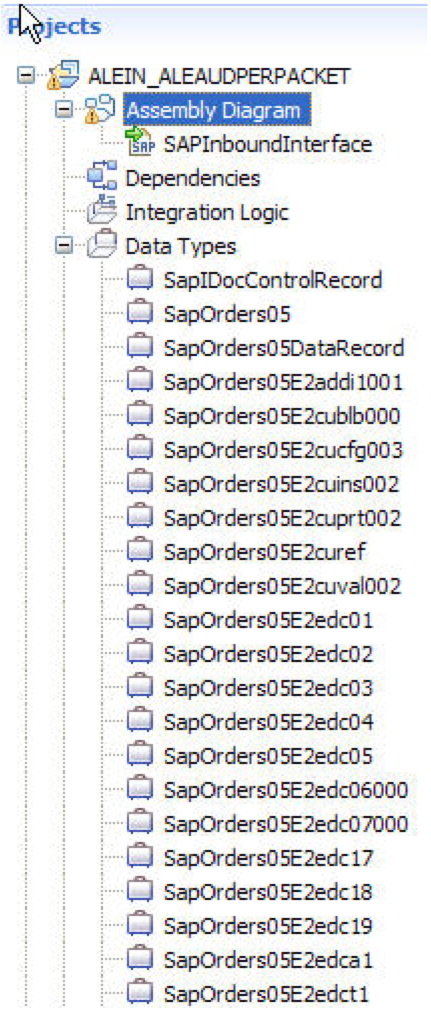
Name: * SAPInboundInterface

□ Save business objects to a library

Library:

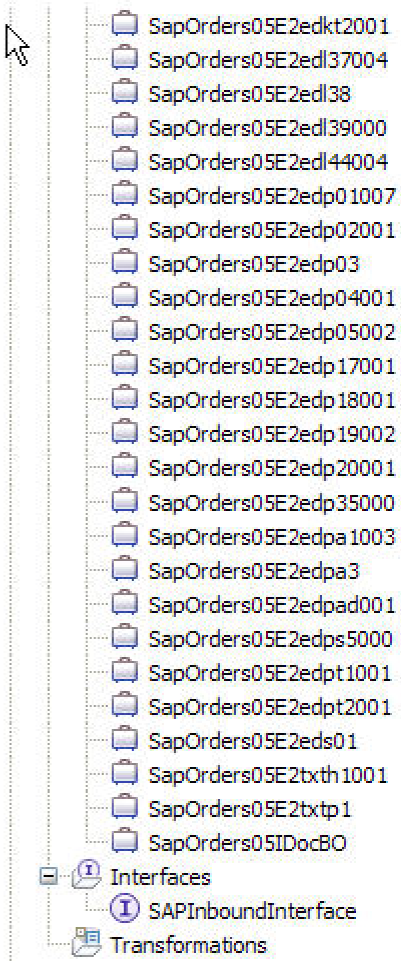
Description:

11. Verify the results.



Projects

- ALEIN_ALEAUDPERPACKET
  - Assembly Diagram
    - SAPInboundInterface
  - Dependencies
  - Integration Logic
  - Data Types
    - SapIDocControlRecord
    - SapOrders05
    - SapOrders05DataRecord
    - SapOrders05E2addi1001
    - SapOrders05E2cublb000
    - SapOrders05E2cucfg003
    - SapOrders05E2cuins002
    - SapOrders05E2cuprt002
    - SapOrders05E2curef
    - SapOrders05E2cuval002
    - SapOrders05E2edc01
    - SapOrders05E2edc02
    - SapOrders05E2edc03
    - SapOrders05E2edc04
    - SapOrders05E2edc05
    - SapOrders05E2edc06000
    - SapOrders05E2edc07000
    - SapOrders05E2edc17
    - SapOrders05E2edc18
    - SapOrders05E2edc19
    - SapOrders05E2edca1
    - SapOrders05E2edct1

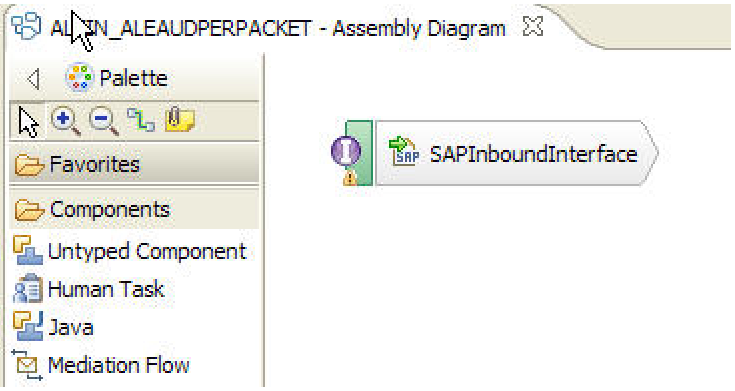


SapOrders05E2edkt2001
SapOrders05E2edl37004
SapOrders05E2edl38
SapOrders05E2edl39000
SapOrders05E2edl44004
SapOrders05E2edp01007
SapOrders05E2edp02001
SapOrders05E2edp03
SapOrders05E2edp04001
SapOrders05E2edp05002
SapOrders05E2edp17001
SapOrders05E2edp18001
SapOrders05E2edp19002
SapOrders05E2edp20001
SapOrders05E2edp35000
SapOrders05E2edpa1003
SapOrders05E2edpa3
SapOrders05E2edpad001
SapOrders05E2edps5000
SapOrders05E2edpt1001
SapOrders05E2edpt2001
SapOrders05E2eds01
SapOrders05E2txth1001
SapOrders05E2txtp1
SapOrders05IDocBO
Interfaces
SAPInboundInterface
Transformations

Generating Reference Bindings

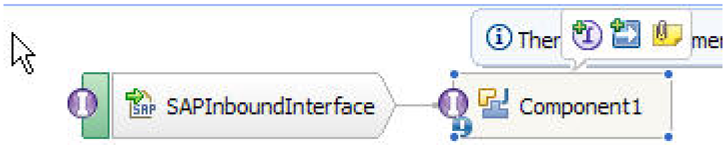
In the Business Integration Perspective of WebSphere Integration Developer, expand the **ALEIN_ALEAUDPERPACKET** SCA module, and double click the **Assembly Diagram**. The Assembly Diagram screen appears with the module‘s Export component in view.

1. To create a new component, click the button java component from the **Palette**.

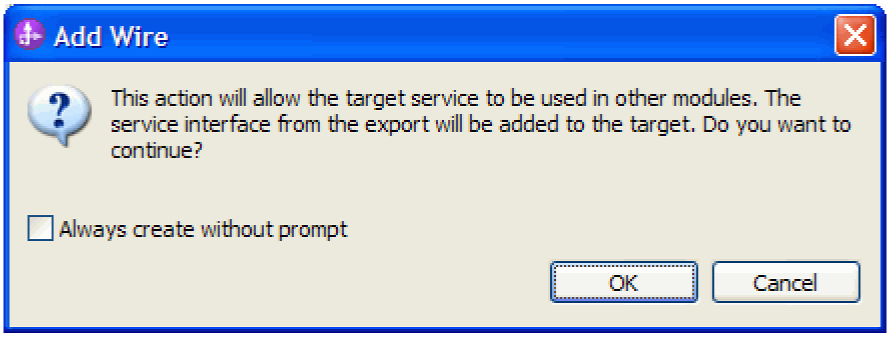


2. Click and drag the java component to add the new component to the Assembly Diagram screen.

3. Add a Wire between the **SAPInboundInterface** and the Java component.



4. In the Add Wire screen, click **OK**.



This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Confirmation Dialog

Right-click on the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

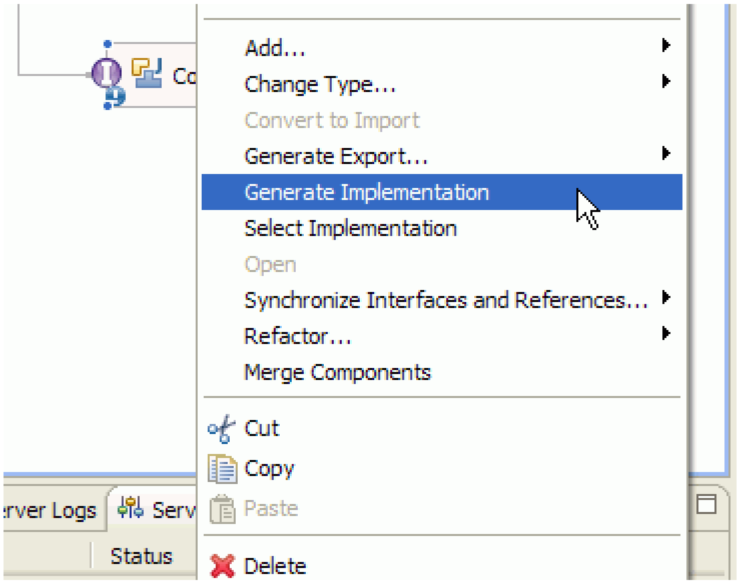
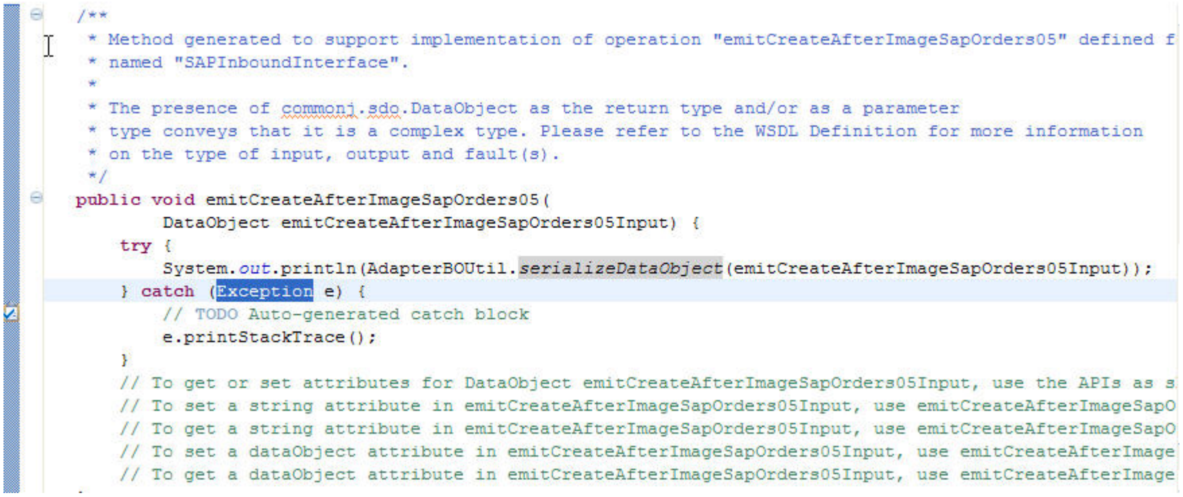


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapOrders05" defined f
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void emitCreateAfterImageSapOrders05(
        DataObject emitCreateAfterImageSapOrders05Input) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapOrders05Input));
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
    // To get or set attributes for DataObject emitCreateAfterImageSapOrders05Input, use the APIs as s
    // To set a string attribute in emitCreateAfterImageSapOrders05Input, use emitCreateAfterImageSapO
    // To get a string attribute in emitCreateAfterImageSapOrders05Input, use emitCreateAfterImageSapO
    // To set a dataObject attribute in emitCreateAfterImageSapOrders05Input, use emitCreateAfterImage
    // To get a dataObject attribute in emitCreateAfterImageSapOrders05Input, use emitCreateAfterImage
```

Save the Java file

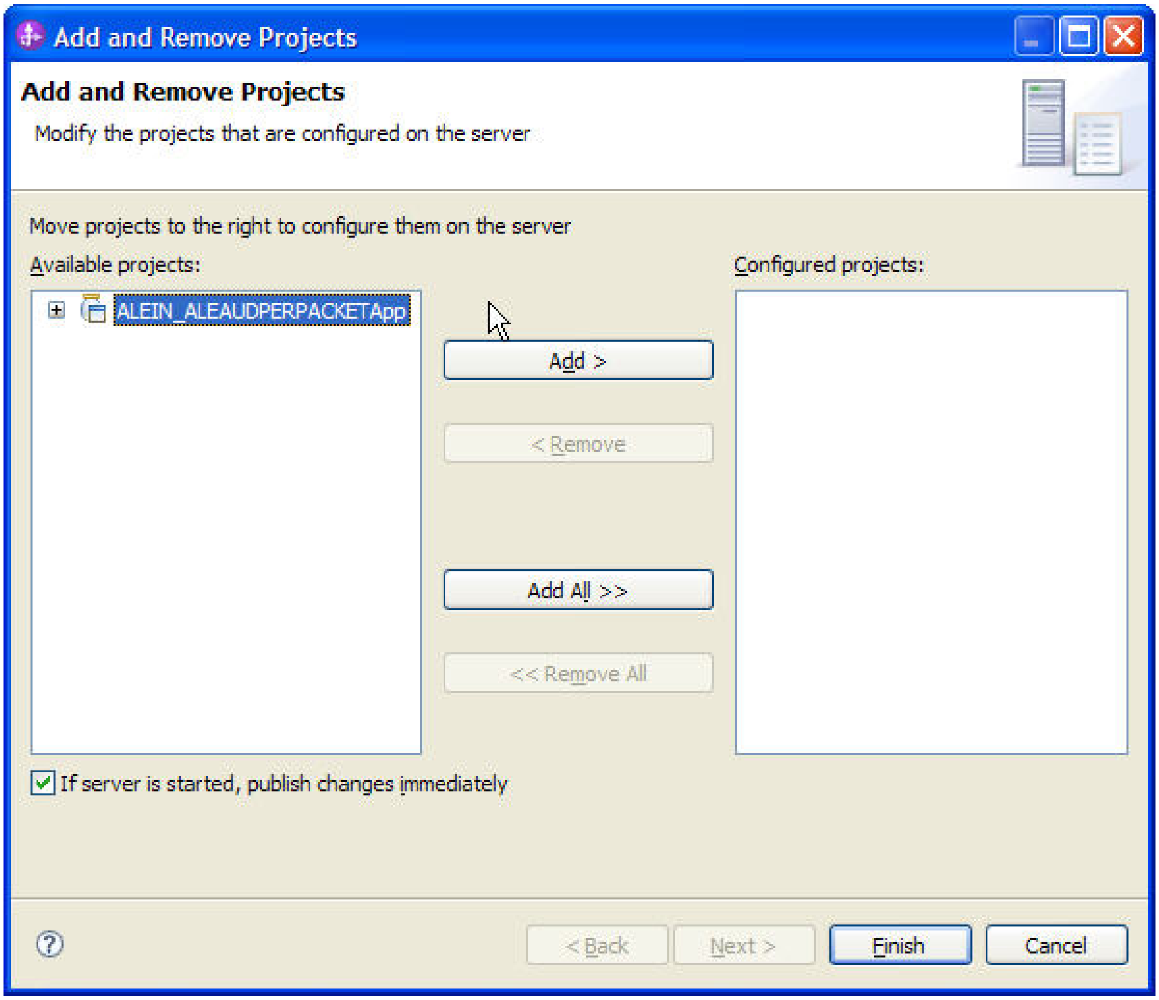
Save assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module ALEIN_ALEAUDPERPACKET by selecting **Add and Remove Projects**.

The project ALEIN_ALEAUDPERPACKETApp will be listed under **Available projects**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

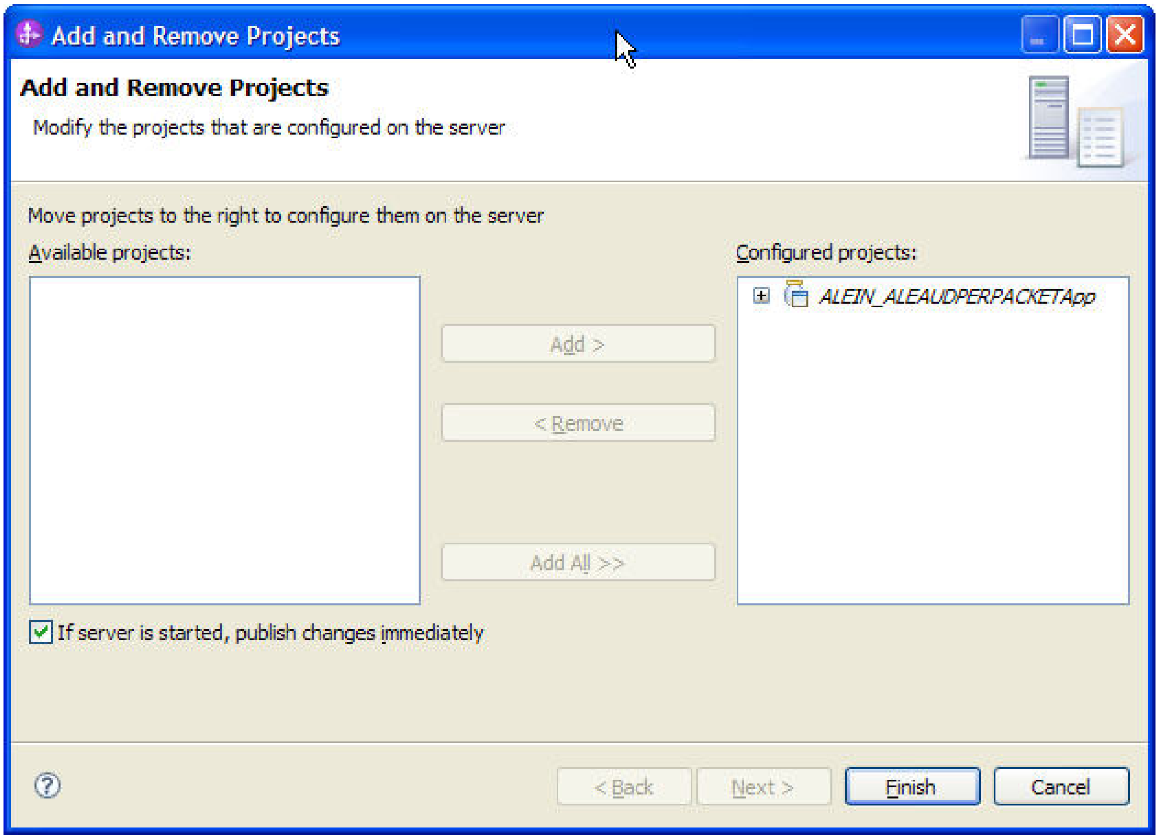
Available projects:

ALEIN_ALEAUDPERPACKETApp

Configured projects:

☑ If server is started, publish changes immediately

After adding the project, the added project should appear under the Configured projects. Add the SCA module to the server by clicking on **Finish**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

Configured projects:

- ALEIN_ALEAUDPERPACKETApp

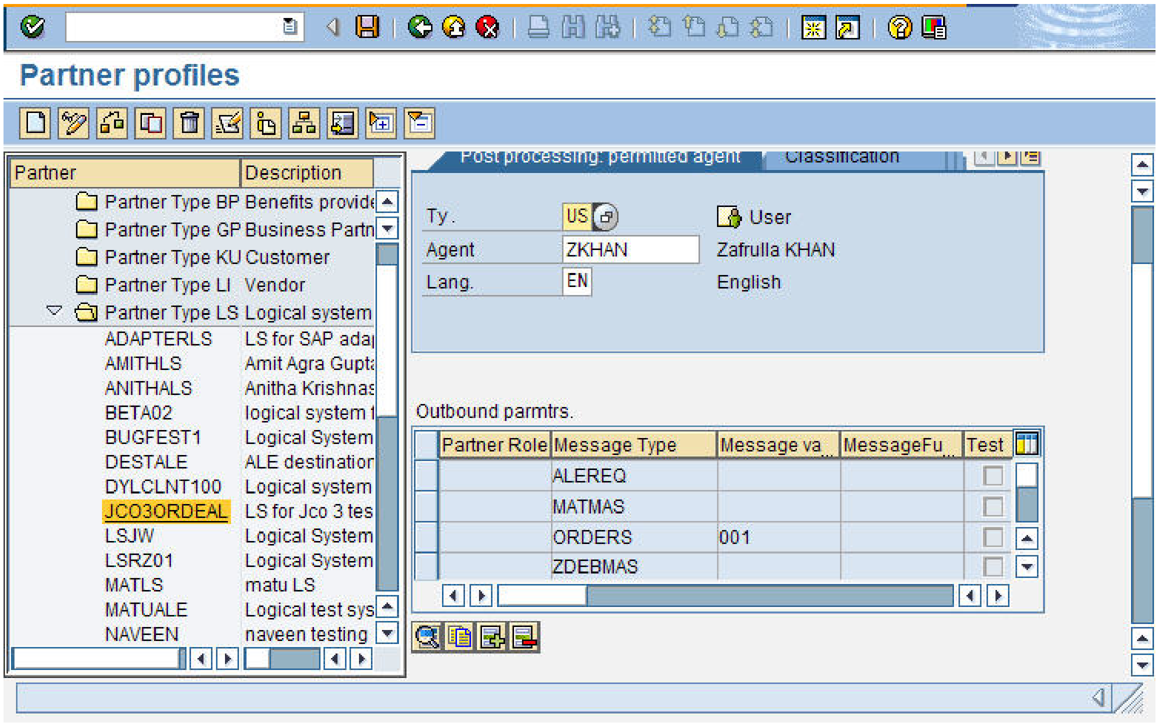
☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

Start the Transaction WE20.

Open the appropriate partner profile and set the packet size for the message type configured during EMD.



Partner profiles

Partner	Description
Partner Type BP	Benefits provide
Partner Type GP	Business Partn
Partner Type KU	Customer
Partner Type LI	Vendor
Partner Type LS	Logical system
ADAPTERLS	LS for SAP ada
AMITHLS	Amit Agra Gupt
ANITHALS	Anitha Krishnas
BETA02	logical system f
BUGFEST1	Logical System
DESTALE	ALE destination
DYLCLNT100	Logical system
JCO3ORDEAL	LS for Jco 3 tes
LSJW	Logical System
LSRZ01	Logical System
MATLS	matu LS
MATUALE	Logical test sys
NAVEEN	naveen testing

Post processing: permitted agent | Classification

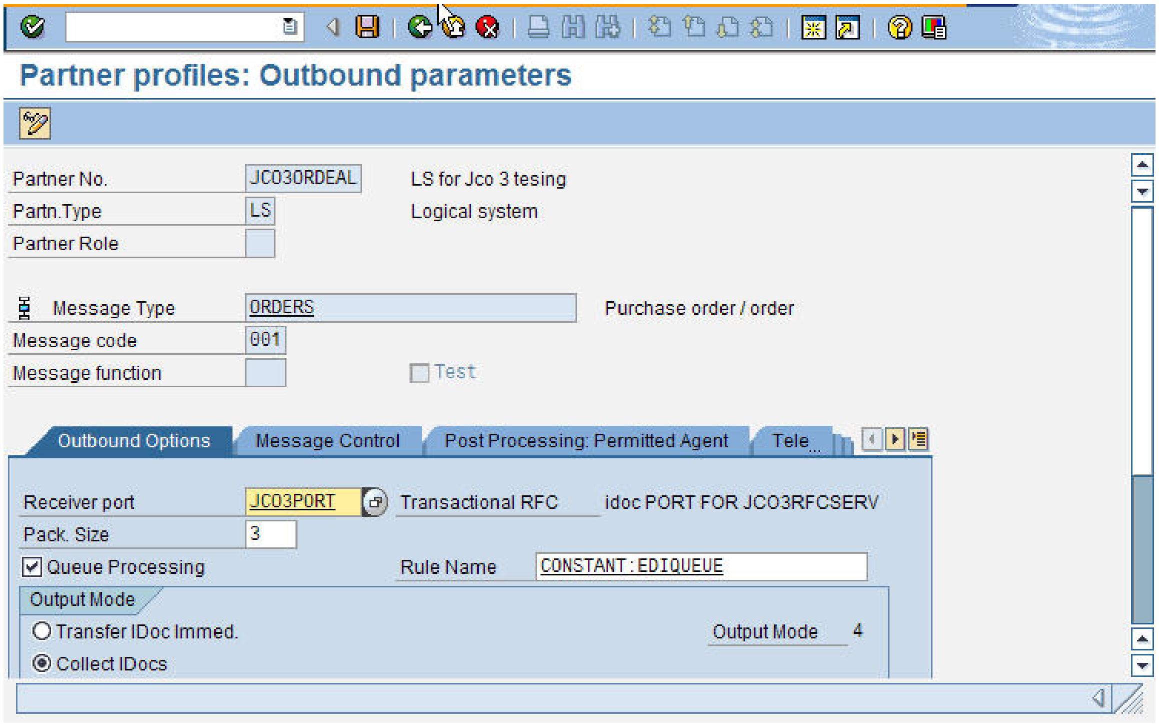
Ty.	US	User
Agent	ZKHAN	Zafrulla KHAN
Lang.	EN	English

Outbound parmtrs.

Partner Role	Message Type	Message va	MessageFu	Test
	ALEREQ			□
	MATMAS			□
	ORDERS	001		□
	ZDEBMAS			□

In the Partner Profiles screen, double click on ALEREQ listed under Outbound parmtrs.

Change the **Packet Size** to 3 and select the radio button **Collect IDocs** and select the option **Collect IDocs**. Click **Save**.



Partner profiles: Outbound parameters

Partner No.	JCO3ORDEAL	LS for Jco 3 tesing
Partn.Type	LS	Logical system
Partner Role		
Message Type	ORDERS	Purchase order / order
Message code	001	
Message function		□ Test

Outbound Options | Message Control | Post Processing: Permitted Agent | Tele...

Receiver port JCO3PORT Transactional RFC idoc PORT FOR JCO3RFCSERV

Pack. Size 3

☑ Queue Processing Rule Name CONSTANT:EDIQUEUE

Output Mode

○ Transfer IDoc Immed. Output Mode 4

● Collect IDocs

Start the Transaction WE19.

Choose the radio button **Existing IDoc.**

Select an existing IDoc **ORDERS05** that you want to send

Set appropriate values in IDoc.

Select Standard Outbound Processing button.

Change the No. of IDocs to be generated to any number. Select **Continue** in the pop-up box.

Note: If packet size is configured as 3 in SAP system and No. of IDocs to be generated is 6 then, it means that we are trying to send 2 packets. Hence 2 ALEAUD will be generated.

Start the transaction WE02. This opens the browser IDoc List. Give appropriate value for Creation On and click execute.

The next screen shows the Outbound IDocs and Inbound IDocs.

6 Outbound IDocs with packet size as 3 will result in 3 ALEAUD.

This creates an ALE inbound event for the ALE inbound application deployed earlier.

Chapter 19. Tutorial 14: ALE Audit support for Pass through IDocs (Generating ALEAUD per IDoc for ALE Pass through IDocs)

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

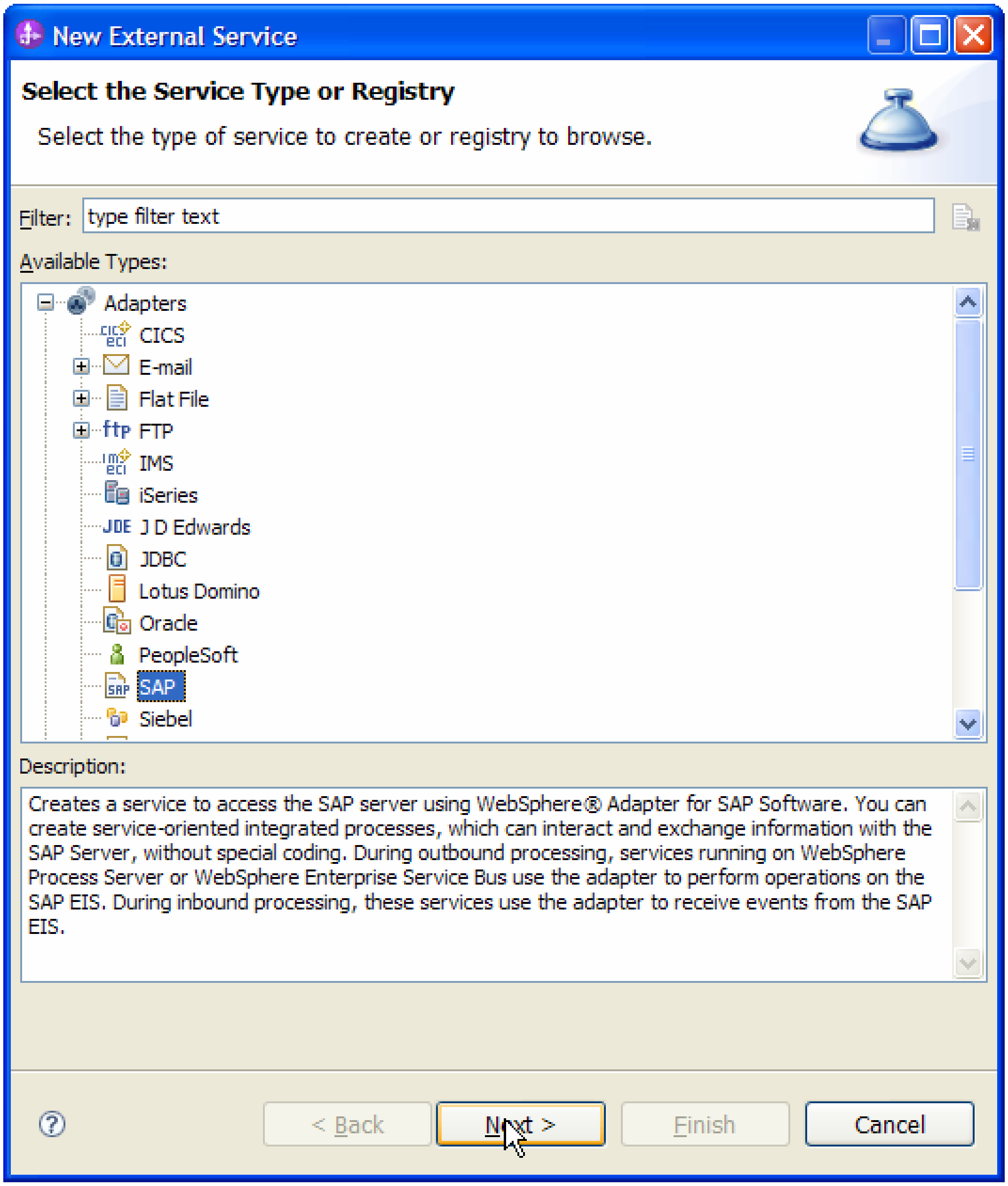
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**.

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

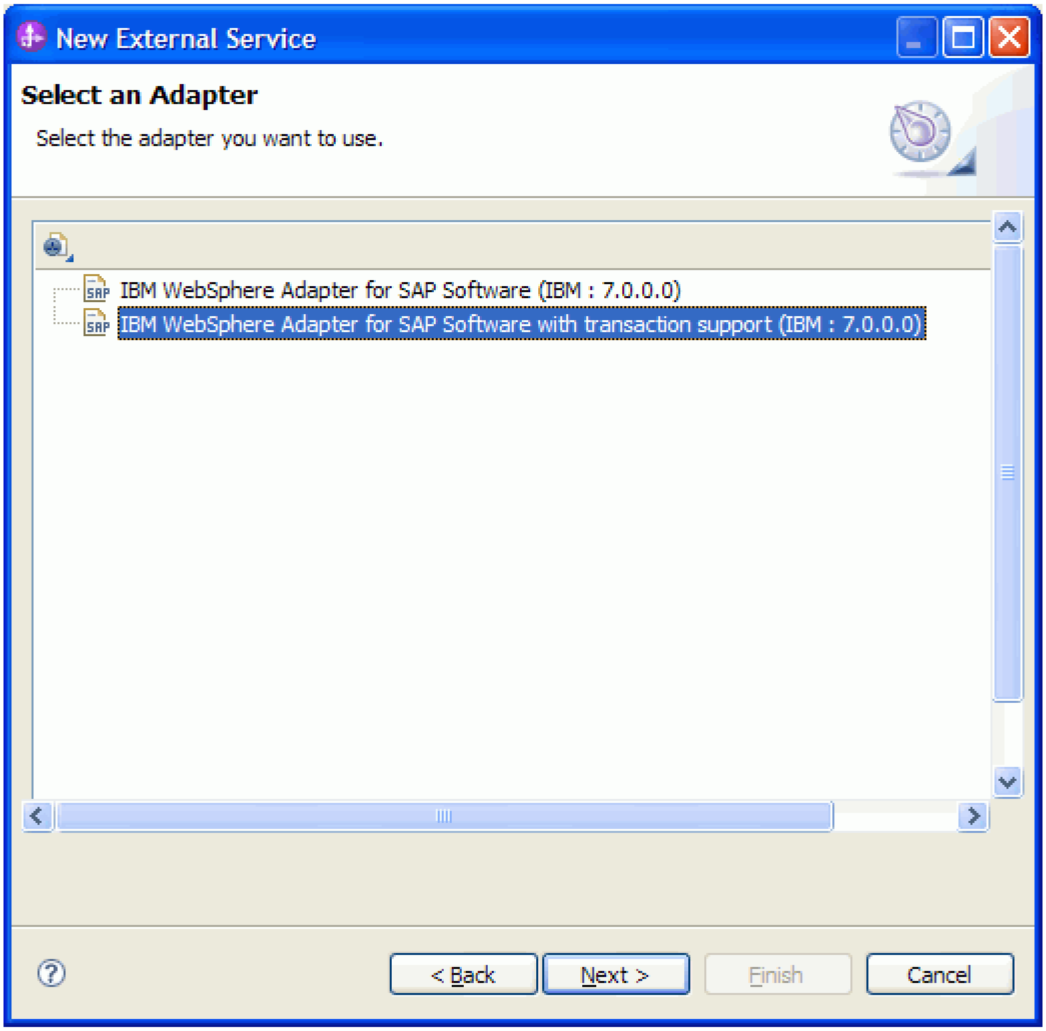
Available Types:

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



New External Service

Select an Adapter

Select the adapter you want to use.

IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

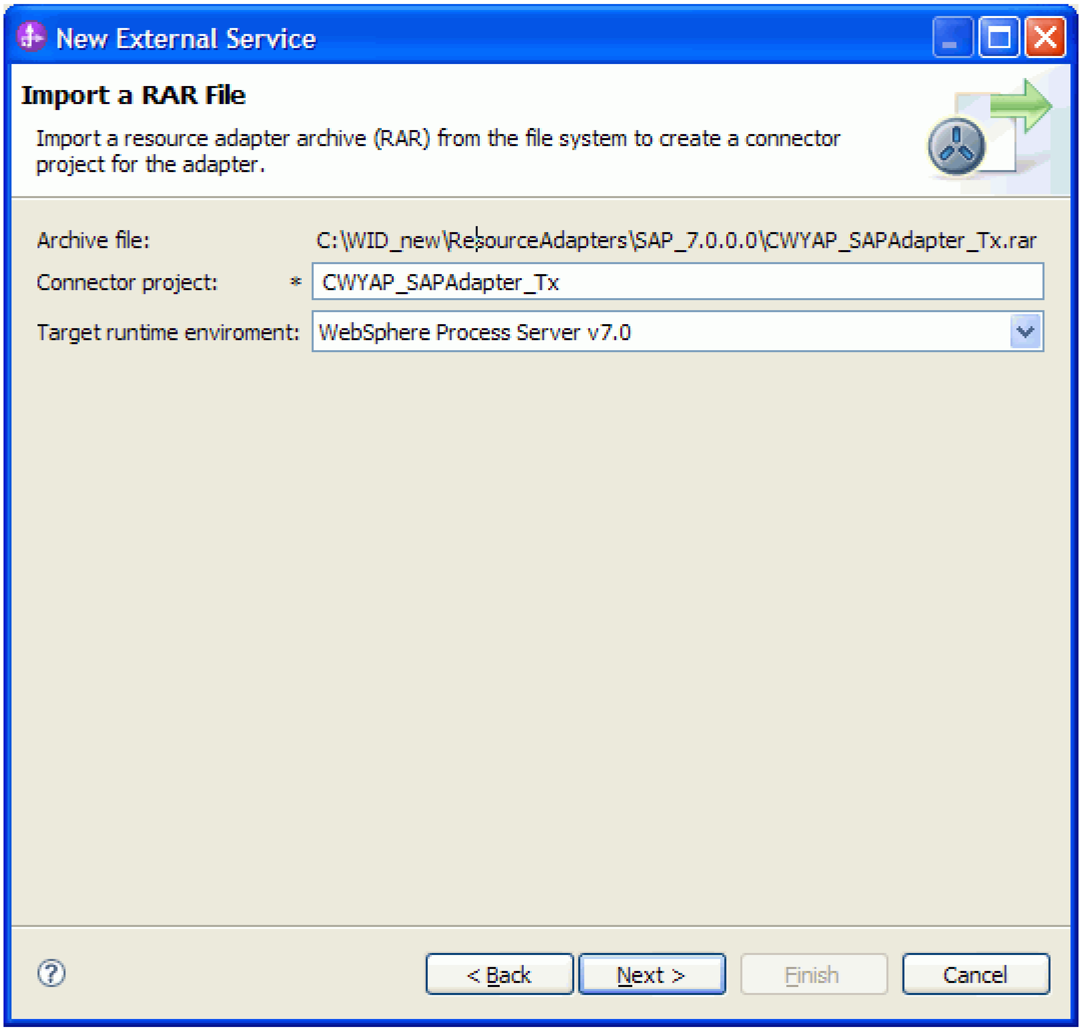
IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next**.



Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

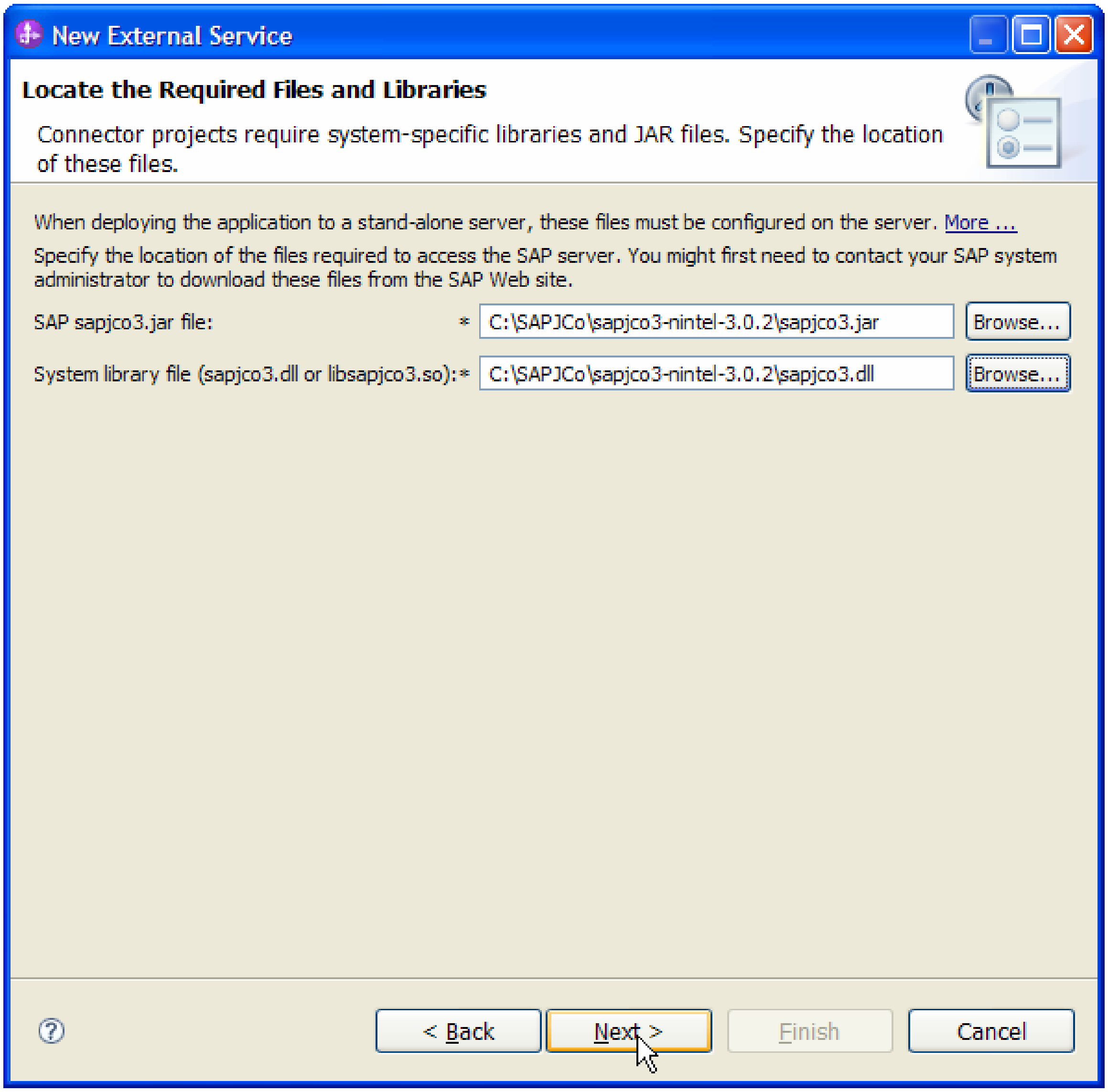
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

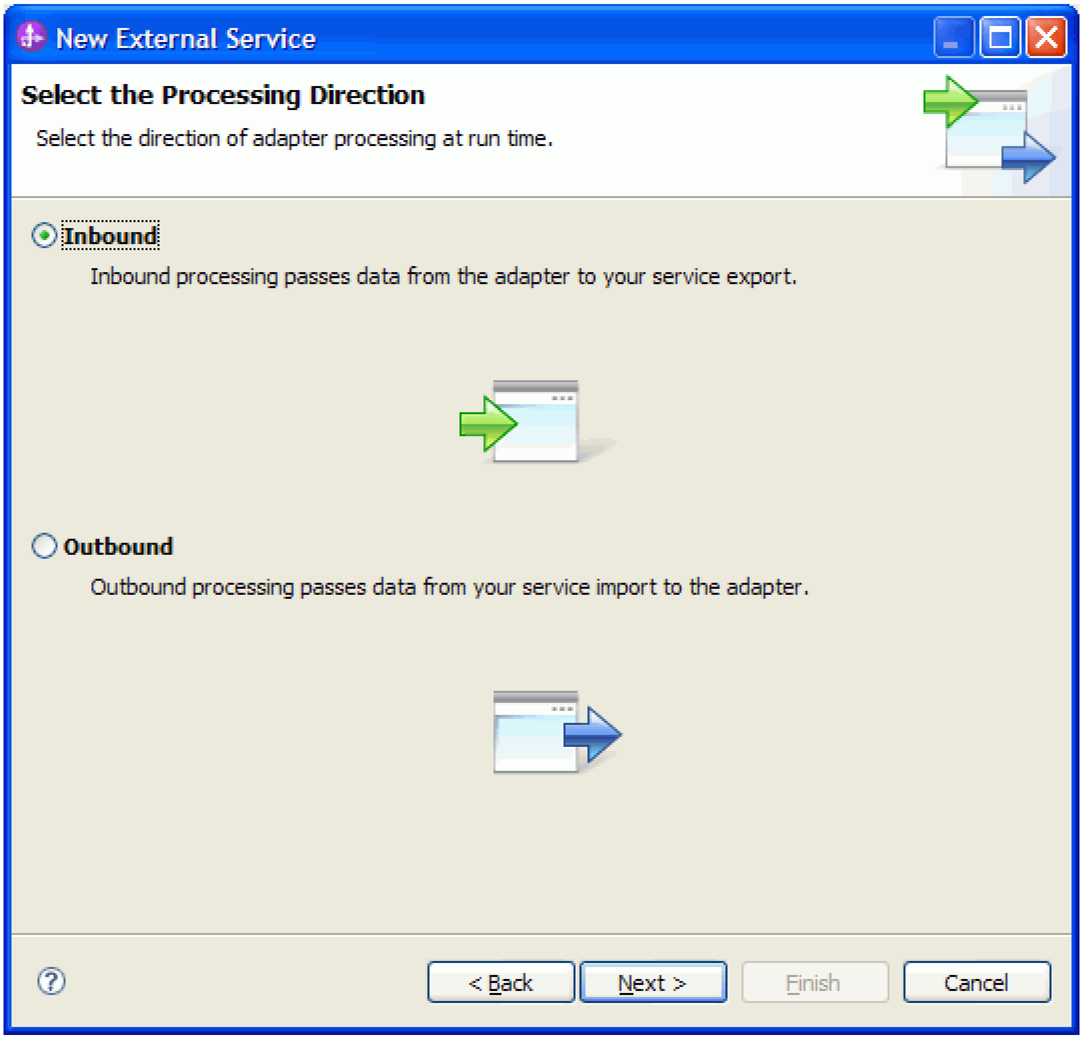
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select **Inbound** radio button, then click **Next** button.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Figure: Select the processing direction

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

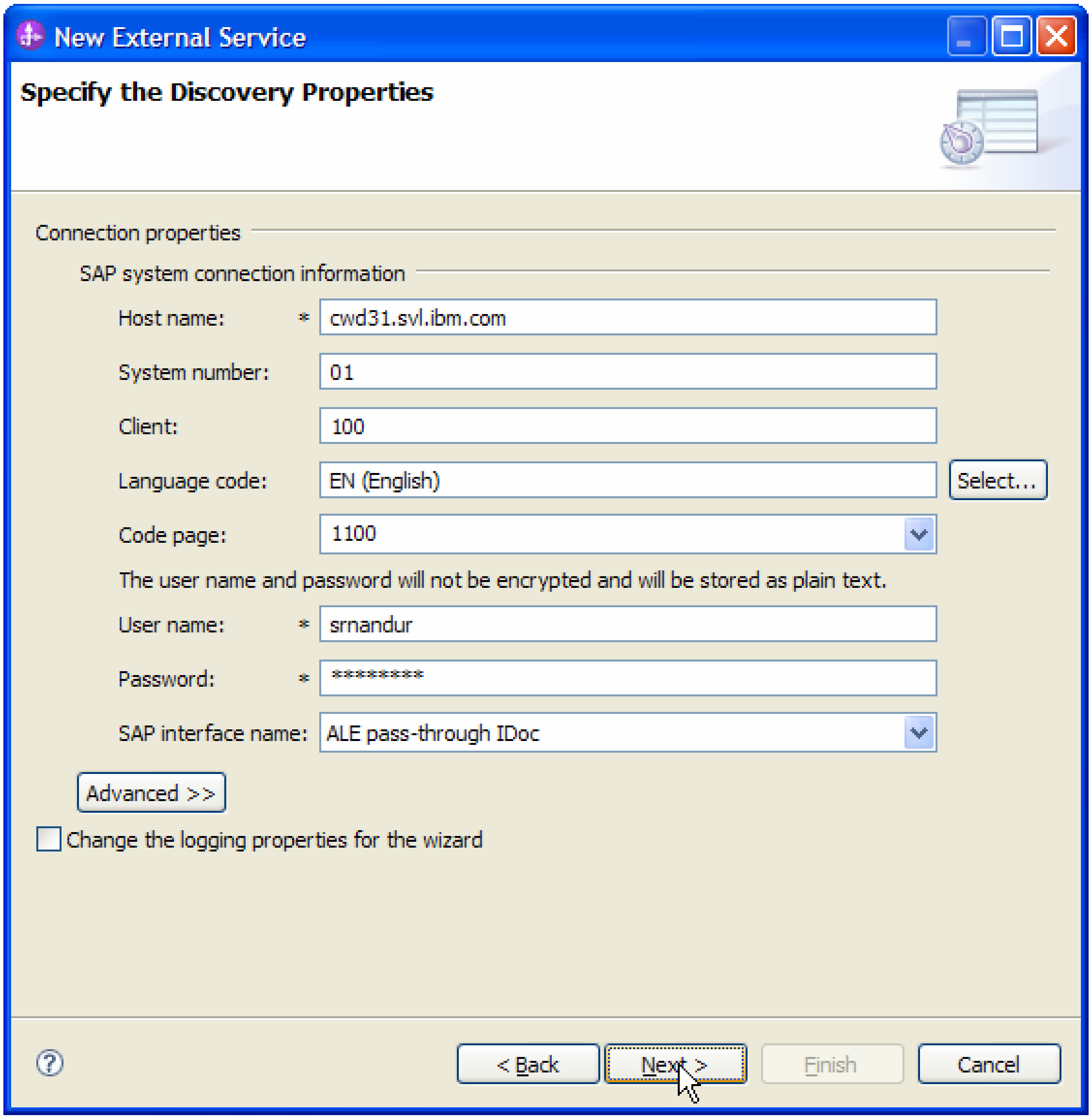
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select **ALE Pass-through IDoc** as the SAP Interface name.

Click Next.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: *	cwd31.svl.ibm.com
System number:	01
Client:	100
Language code:	EN (English)
Code page:	1100

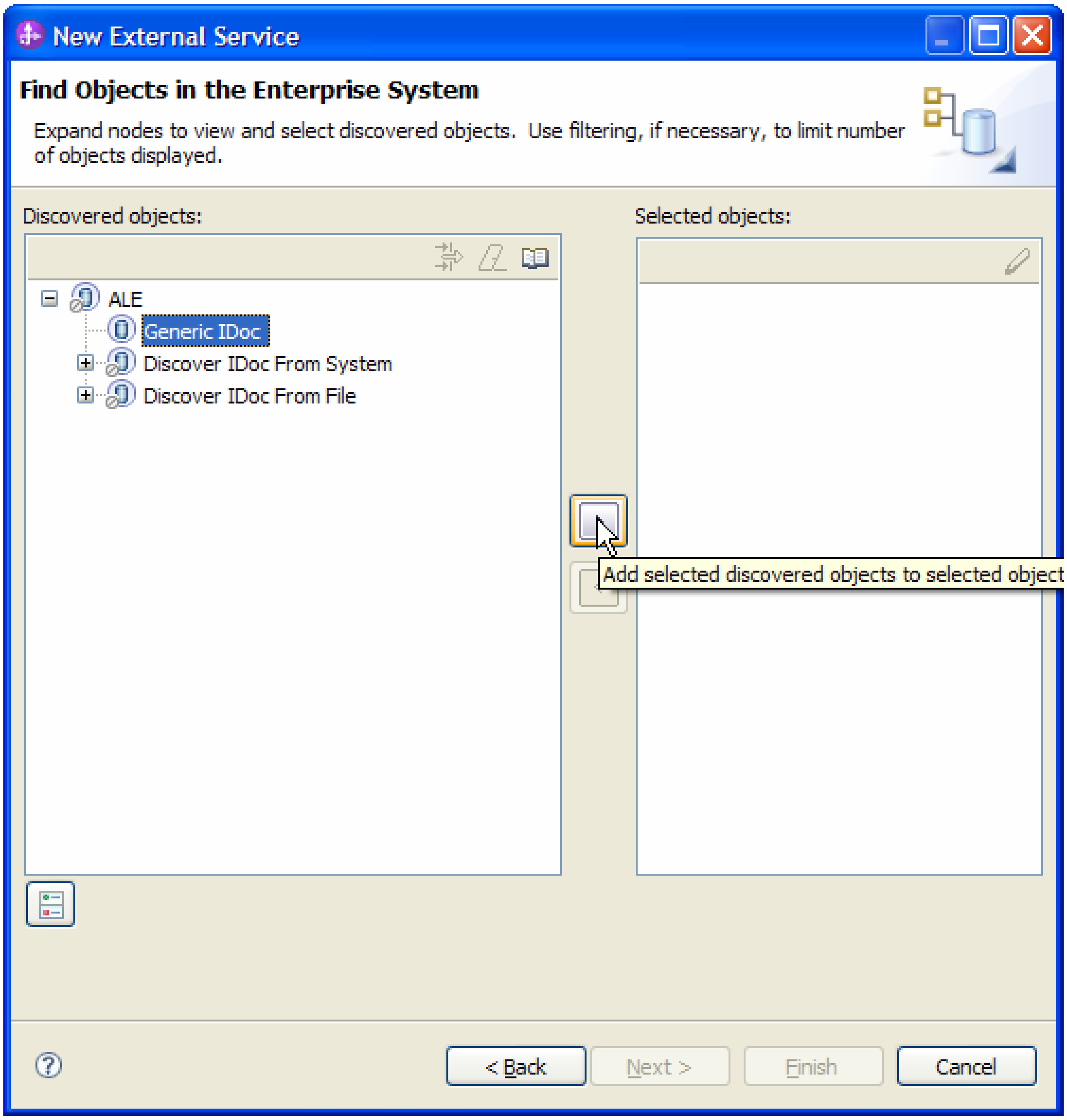
The user name and password will not be encrypted and will be stored as plain text.

User name: *	srnandur
Password: *	*********
SAP interface name:	ALE pass-through IDoc

Figure: Select ALE pass-through IDoc as the interface

Selecting the Business Objects and services to be used with the adapter

Under **Find Objects in the Enterprise System**, expand the **ALE** node, select **Generic IDoc** and click the > button to add to the selected objects.



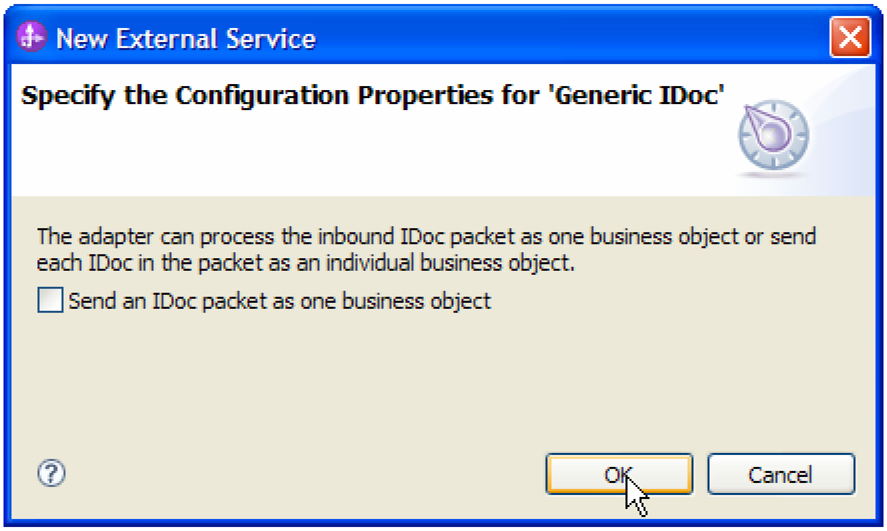
New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Figure: Object Discovery and Selection

In the Configuration Parameters screen, choose the default values and click **OK**.



New External Service

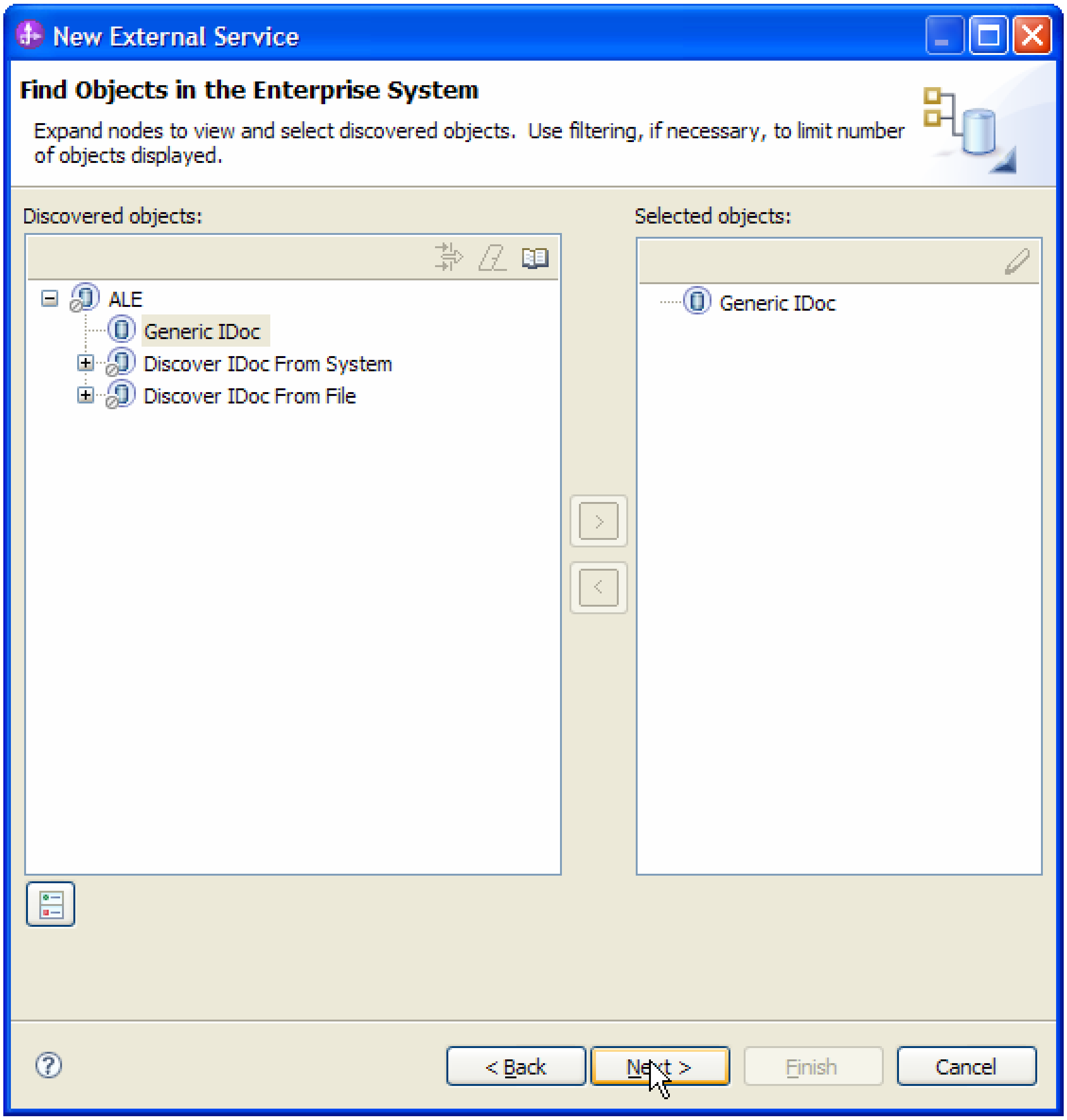
Specify the Configuration Properties for 'Generic IDoc'

The adapter can process the inbound IDoc packet as one business object or send each IDoc in the packet as an individual business object.

☐ Send an IDoc packet as one business object

Figure: Configuration properties for 'Generic IDoc'

Generic IDoc has now been added to the list of Business Objects to be imported.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Discovered objects:

- ALE
  - Generic IDoc
  - Discover IDoc From System
  - Discover IDoc From File

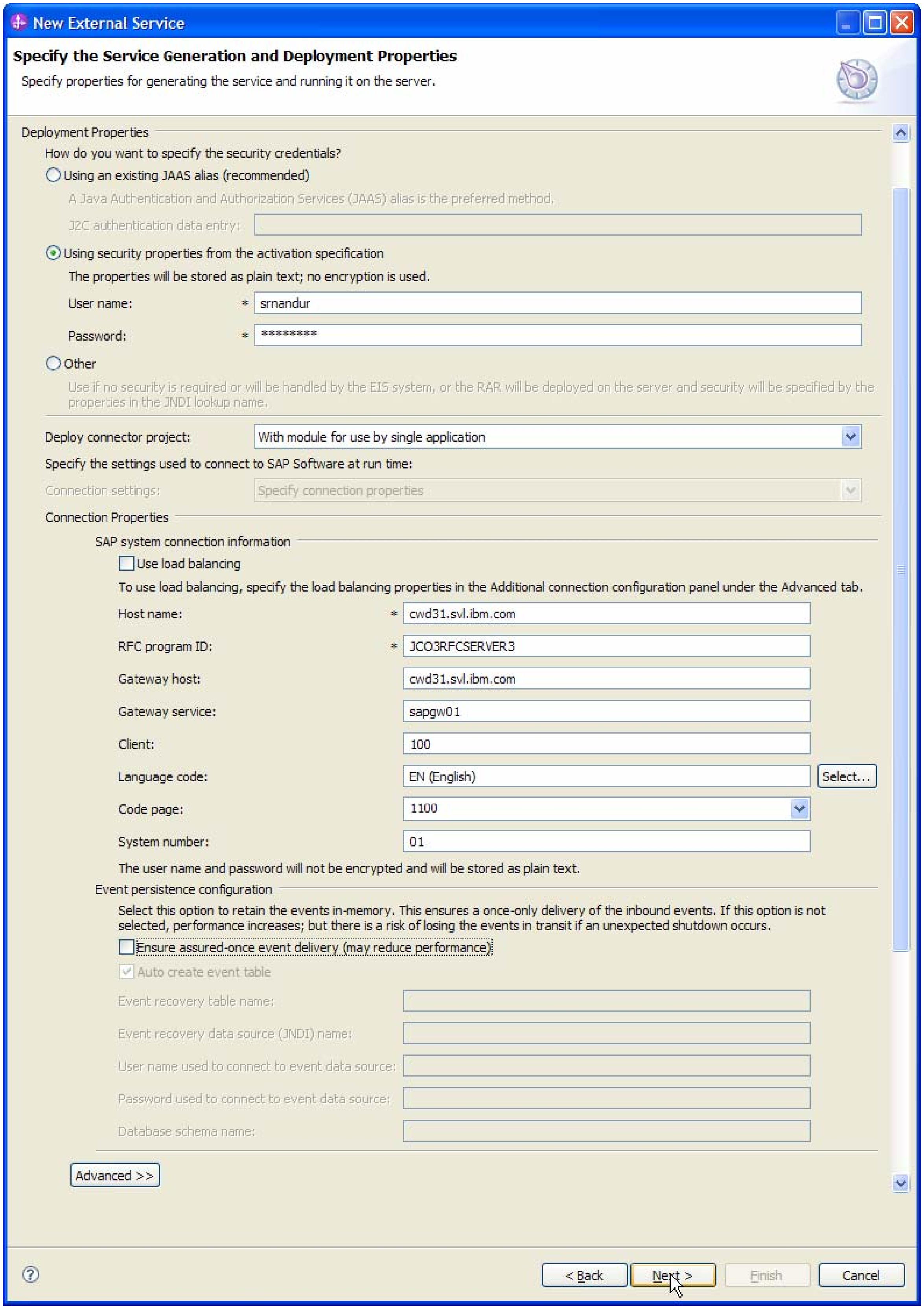
Selected objects:

- Generic IDoc

Figure: Selected Generic IDoc added to the Objects to be imported

Click **Next.**

On the **Service Generation and Deployment Configuration** screen, enter the connection information.



Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the activation specification

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

☐ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID: * JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English) Select...

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

Event persistence configuration

Select this option to retain the events in-memory. This ensures a once-only delivery of the inbound events. If this option is not selected, performance increases; but there is a risk of losing the events in transit if an unexpected shutdown occurs.

☐ Ensure assured-once event delivery (may reduce performance)

☑ Auto create event table

Event recovery table name:

Event recovery data source (JNDI) name:

User name used to connect to event data source:

Password used to connect to event data source:

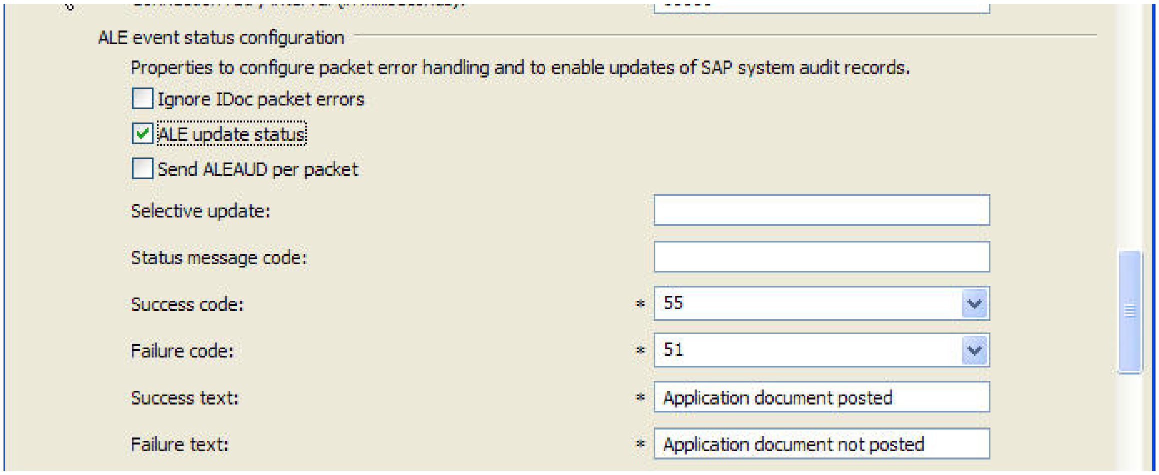
Database schema name:

Figure: Service Generation and Deployment Configuration

NOTE: You can either enter Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or enter the username and password used to login in to the SAP.

Also enter the RFCProgramID (as shown in figure). This must have been already configured in the SAP system.

Click the Advanced tab and in ALE event status configuration select ALE update status.



ALE event status configuration

Properties to configure packet error handling and to enable updates of SAP system audit records.

□ Ignore IDoc packet errors

☑ ALE update status

□ Send ALEAUD per packet

Selective update:

Status message code:

Success code: * 55

Failure code: * 51

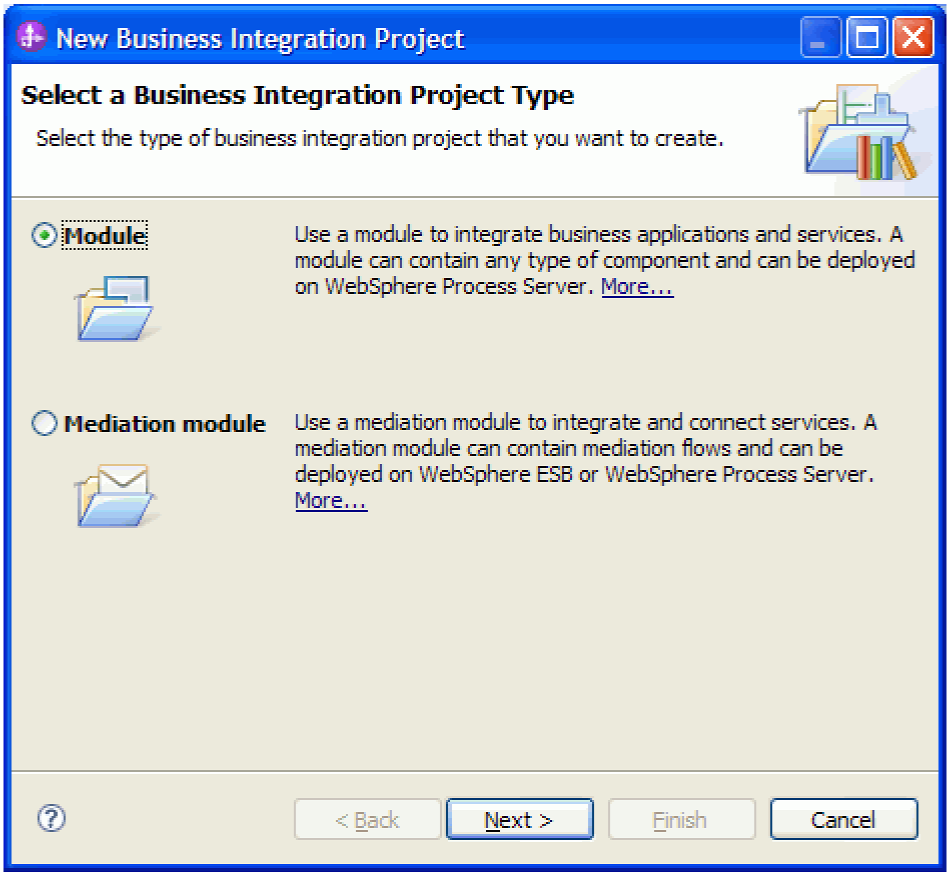
Success text: * Application document posted

Failure text: * Application document not posted

Click **Next.**

In the Specify the Location Properties screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



New Business Integration Project

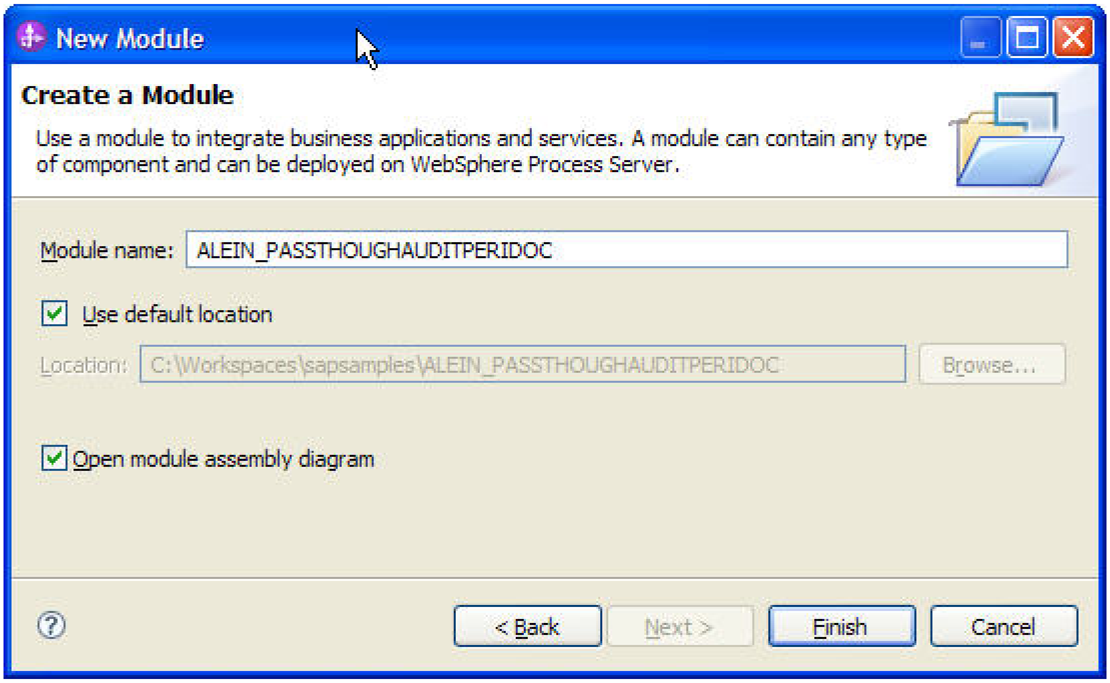
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● Module — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ Mediation module — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **ALEIN_PASSTHOUGHAUDITPERIDOC** in the Module Name field, and then click **Finish**.



New Module

Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

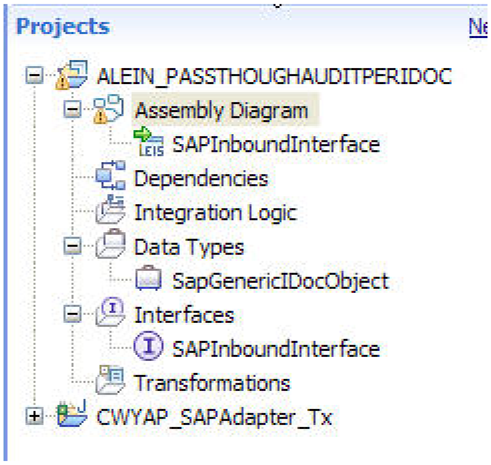
Module name: ALEIN_PASSTHOUGHAUDITPERIDOC

☑ Use default location

Location: C:\Workspaces\sapsamples\ALEIN_PASSTHOUGHAUDITPERIDOC

☑ Open module assembly diagram

Verify results.



```
Projects
ALEIN_PASSTHOUGHAUDITPERIDOC
    Assembly Diagram
        SAPInboundInterface
    Dependencies
    Integration Logic
    Data Types
        SapGenericIDocObject
    Interfaces
        SAPInboundInterface
    Transformations
CWYAP_SAPAdapter_Tx
```

Figure: Artifacts created after the EMD run for ALE pass-through Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **ALEIN_PASSTHROUGHAUDITPERIDOC** SCA module, and double click on the **Assembly Diagram**. The Assembly Diagram screen appears with the module's Export component in view.

1. To create a new component, click the button of Java component from the **Palette**.

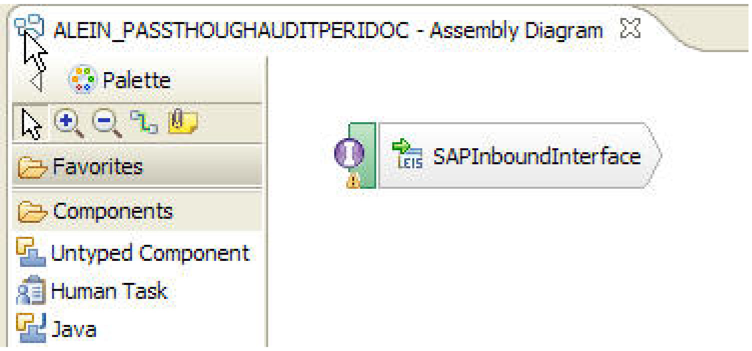


Figure: ALE pass-through Inbound interface in the Assembly editor

Click and drag the java component to add the new component to the Assembly Diagram screen.

Add a Wire between the **SAPInboundInterface** and the Java component.

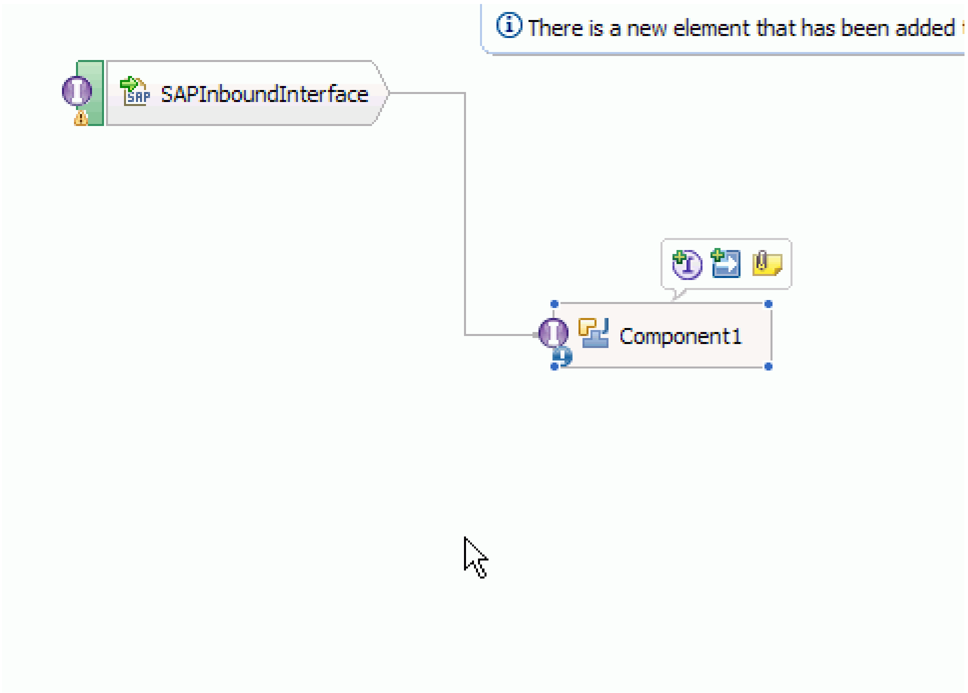
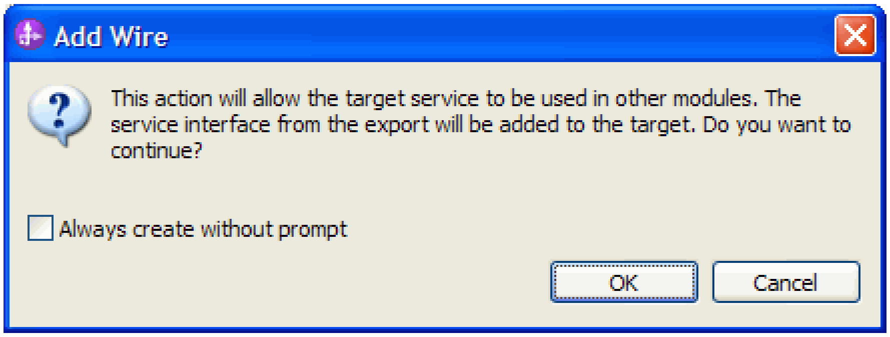


Figure: ALE pass-through Inbound interface being wired to a target Component(end-point)

In the Add Wire screen, click OK.



Add Wire

This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Confirmation Dialog

Right-click on the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

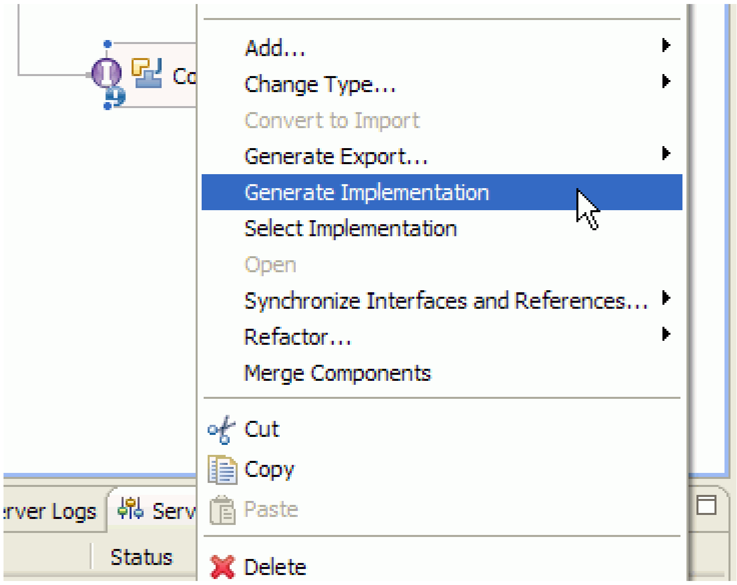
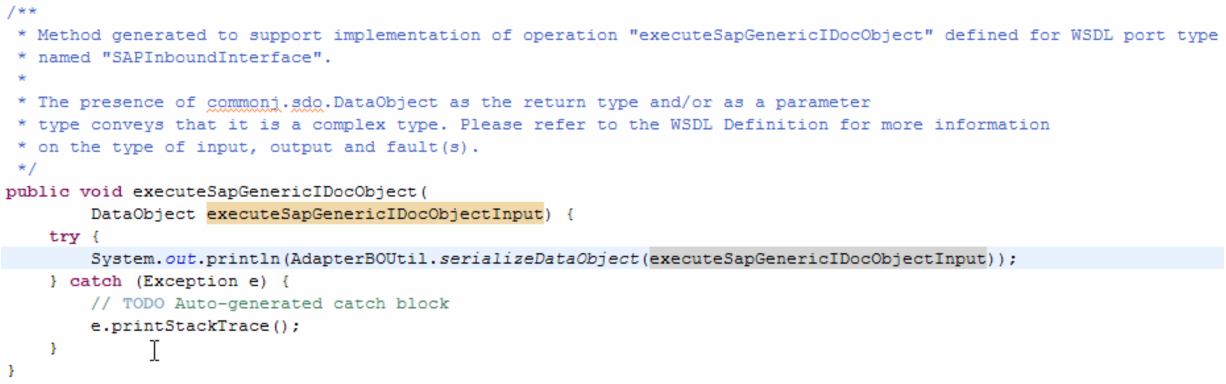


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "executeSapGenericIDocObject" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void executeSapGenericIDocObject(
        DataObject executeSapGenericIDocObjectInput) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(executeSapGenericIDocObjectInput));
    } catch (Exception e) {
        // TODO Auto-generated catch block
        e.printStackTrace();
    }
}
```

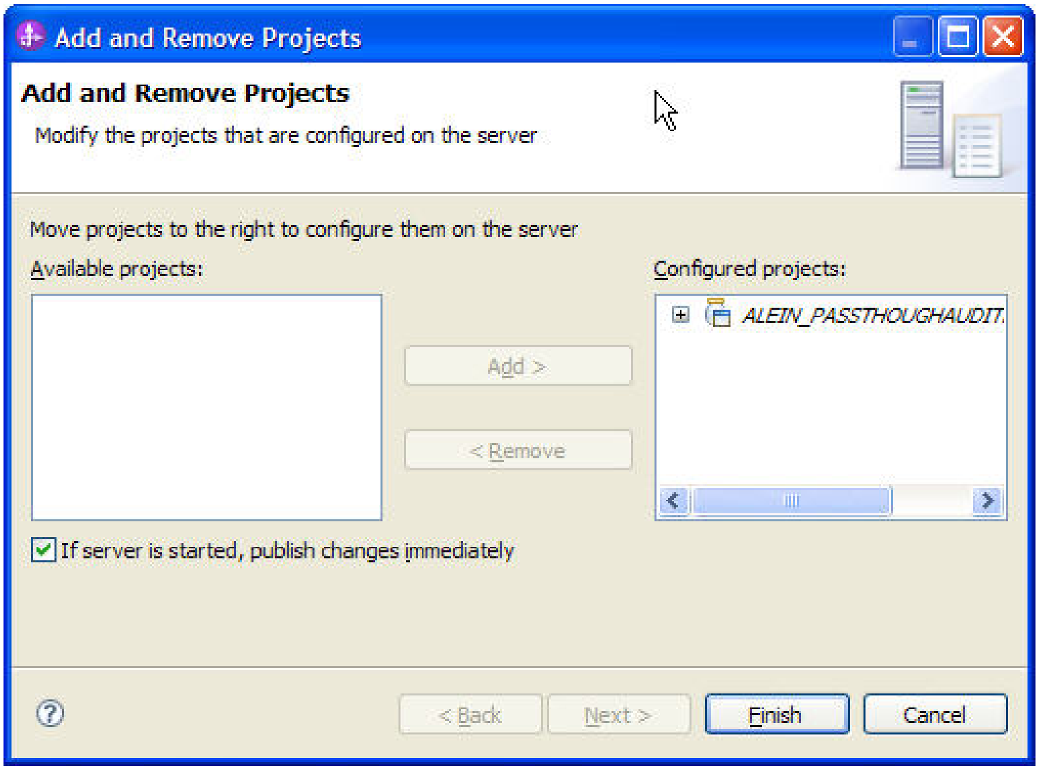
Save the Java file

Save assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module ALEIN_PASSTHOUGHAUDITPERIDOC by selecting **Add and Remove Projects**.



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

Configured projects:

ALEIN_PASSTHOUGHAUDIT

☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

Start the Transaction WE19.

Choose the radio button **Existing IDoc**

Select an existing IDoc **ALEREQ01** that you want to send

Set appropriate values in IDoc.

Select Standard Outbound Processing button

Select **Continue** in the pop-up box

Start the transaction WE02. This opens the browser IDoc List. Give appropriate value for Creation On and click execute.

The next screen shows the Outbound IDocs and Inbound IDocs.

An ALEAUD packet is generated for each outbound IDoc.

This creates an ALE inbound event for the ALE inbound application deployed earlier.

The event should reach the Java end point, indicated by the output of ALEREQ01 Business Object on the console of WebSphere Integration Developer.

Chapter 20. Tutorial 15: Sending data from SAP (INBOUND processing) using tRFC BAPI

Following sections explain inbound scenarios for the BAPI interface.

Configuration prerequisites

Note: If you have previously configured prerequisites, skip this step and move to the next step.

After you create the connector project, you must add the required external dependencies into the project. SAP Java Connector interface is an external dependency that the adapter has for connecting to the SAP software application. The adapter uses this interface to make calls to the SAP native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector interface to the imported project. All external libraries and JAR files must first be copied to the appropriate locations on WebSphere Process Server:

Copy the dependency library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If WID is installed generally the WebSphere Process Server instance is installed under <WID_INSTALL_DIR>/runtimes/bi_v7).

(For z/OS users) add the *.so libraries to the <WAS_INSTALL>/lib directory.

(Windows users) Install the msvcp71.dll and msvcr71.dll files in the Windows system path.

You need the sapjco3.dll file to run the EMD wizard.

Copy sapjco3.jar to the <WPS_INSTALL>/lib directory.

(For z/OS users) add ${WAS_INSTALL_ROOT}/lib/sapjco3.jar to WAS_SERVER_ONLY_server_region_classpath

You need the sapjco3.jar file to run the EMD wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

(For z/OS users) add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

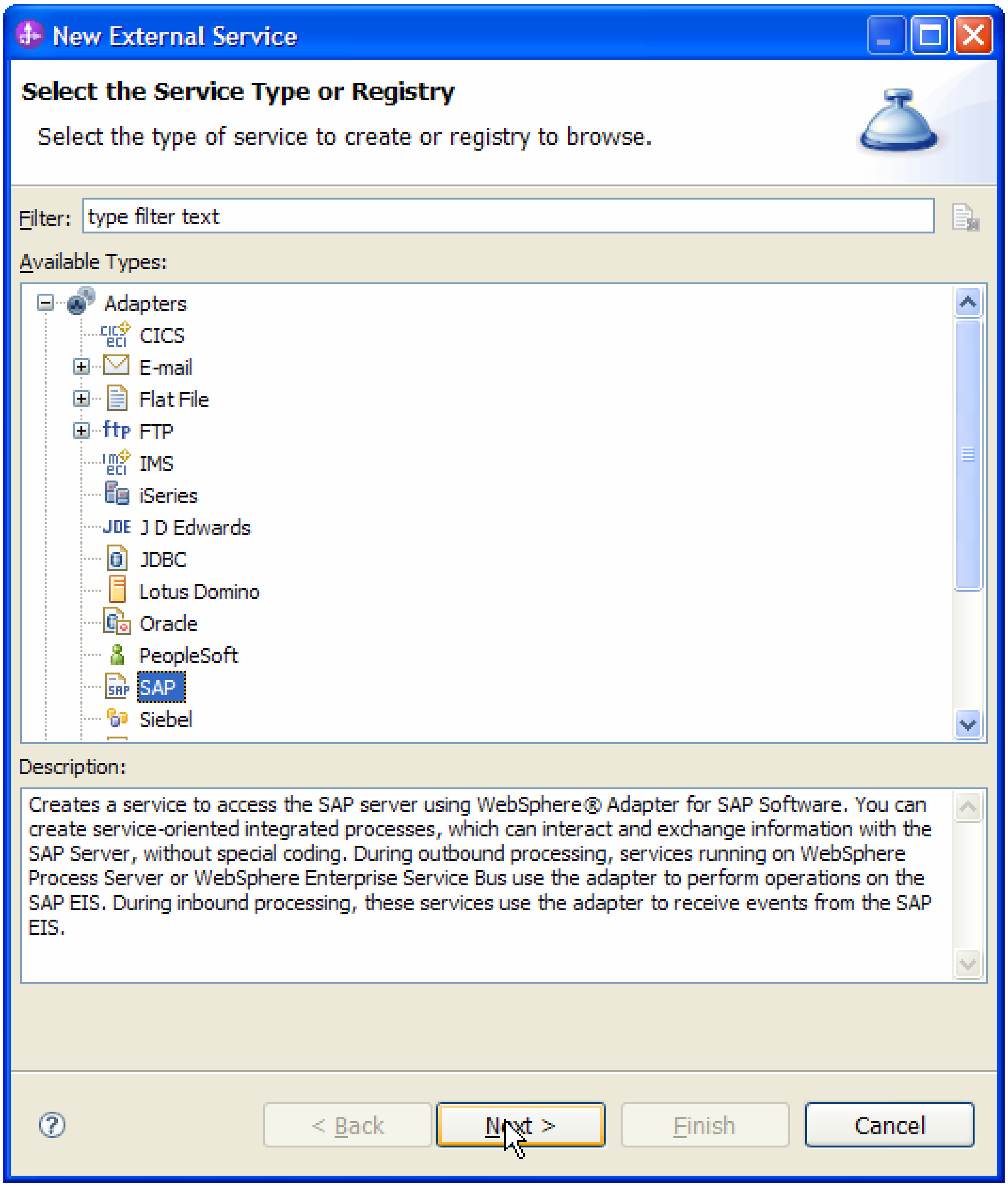
Configuring the adapter for inbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next**.



Select the Service Type or Registry

Select the type of service to create or registry to browse.

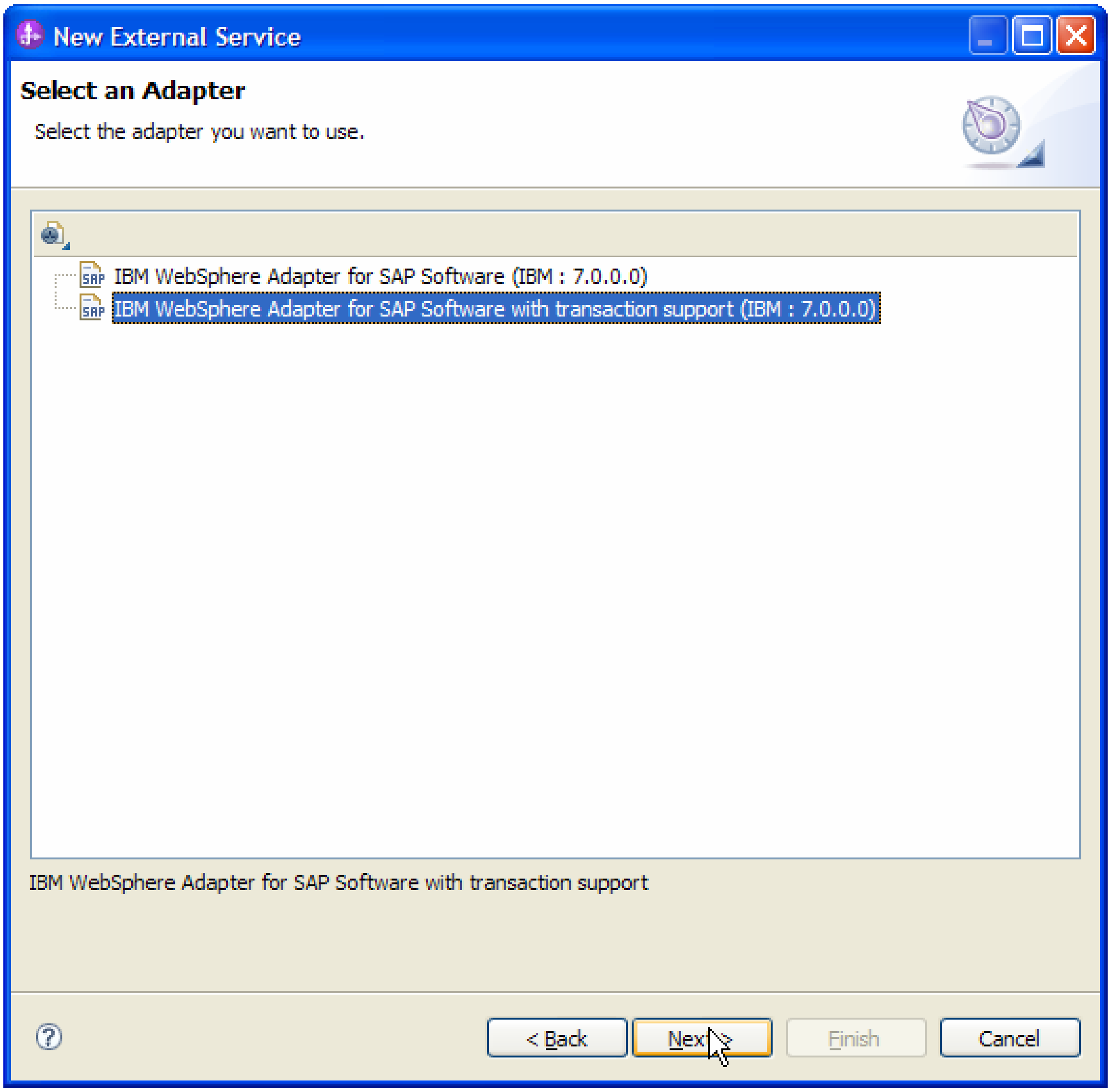
Filter: type filter text

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0**) from the **Select an Adapter** screen and click **Next**.



IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)

IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

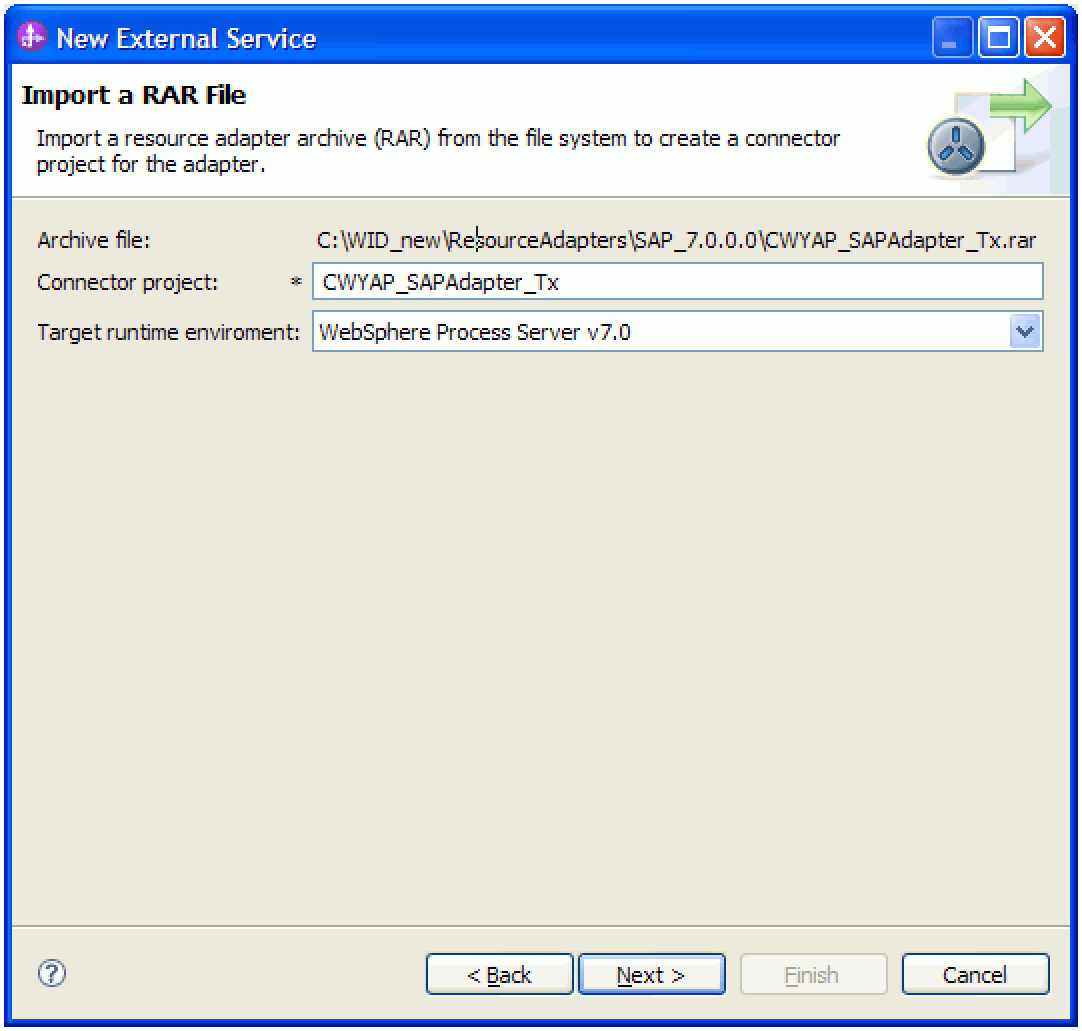
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the **Import a RAR File** screen and click **Next.**



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

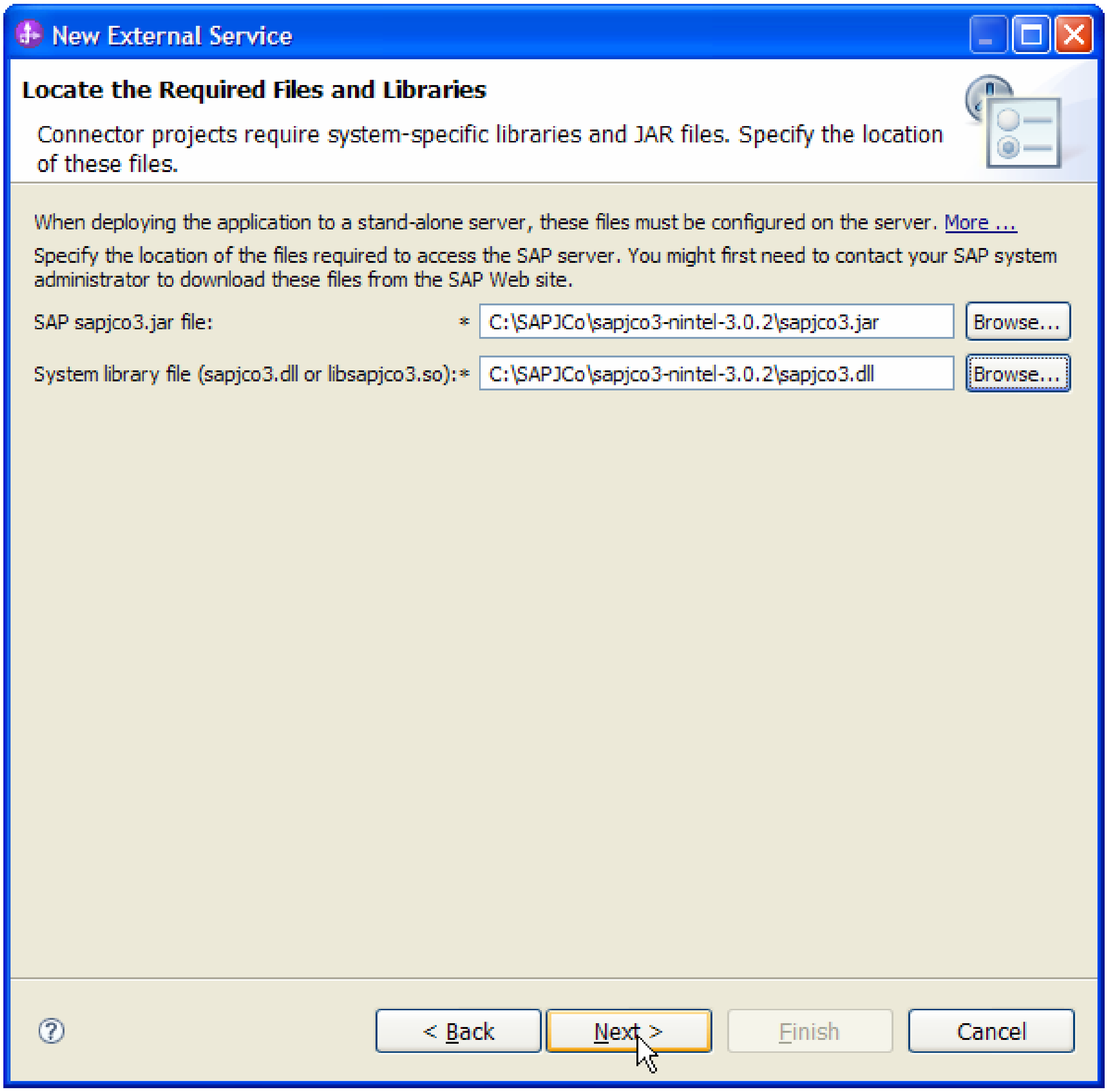
Archive file: C:\WID_new\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files. Specify the location of these files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

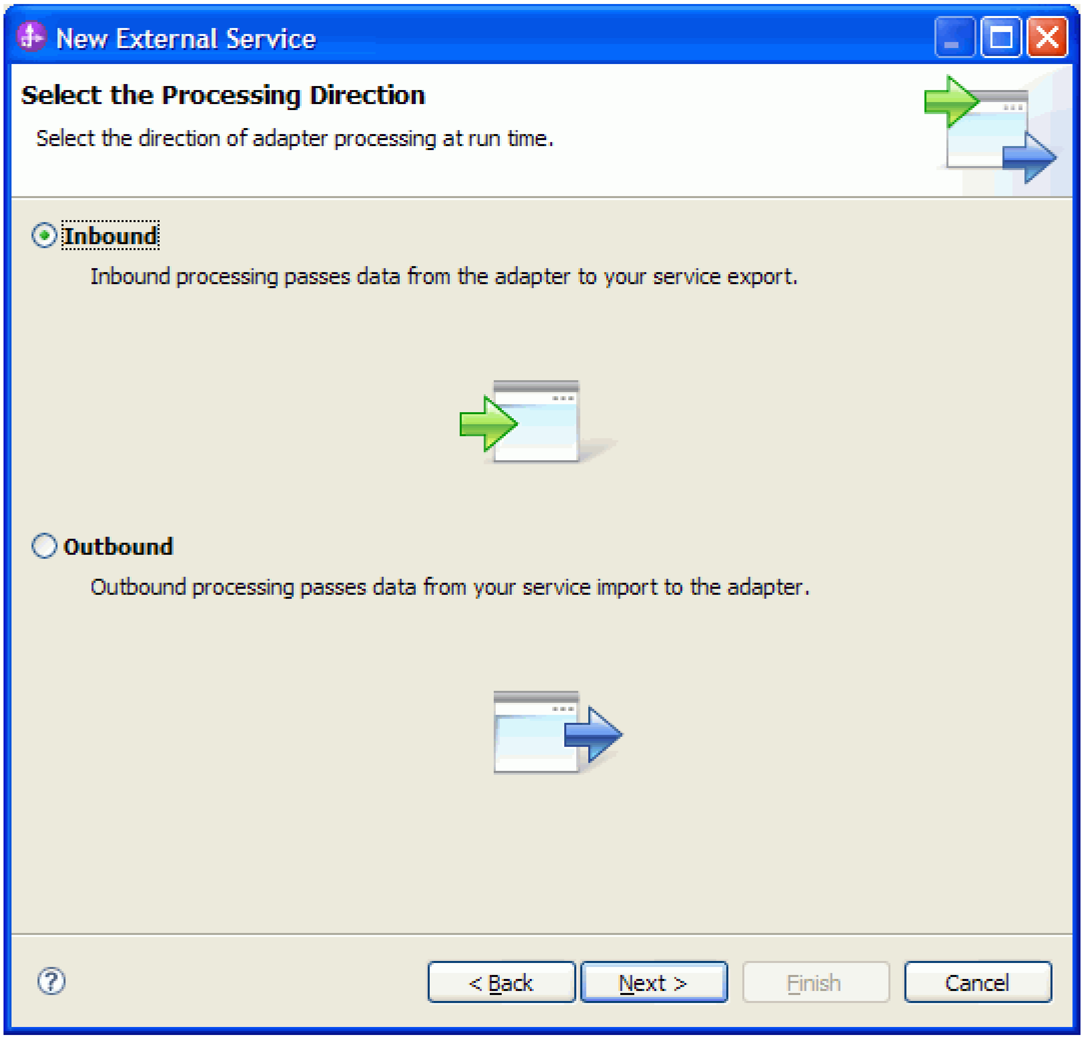
SAP sapjco3.jar file: * C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.jar

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco3-nintel-3.0.2\sapjco3.dll

Figure: Locate the required files and Libraries screen

5. Click **Next**.

6. In the **Select the Processing Direction** screen, select **Inbound** radio button, then click **Next** button.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

● **Inbound**

Inbound processing passes data from the adapter to your service export.

○ **Outbound**

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

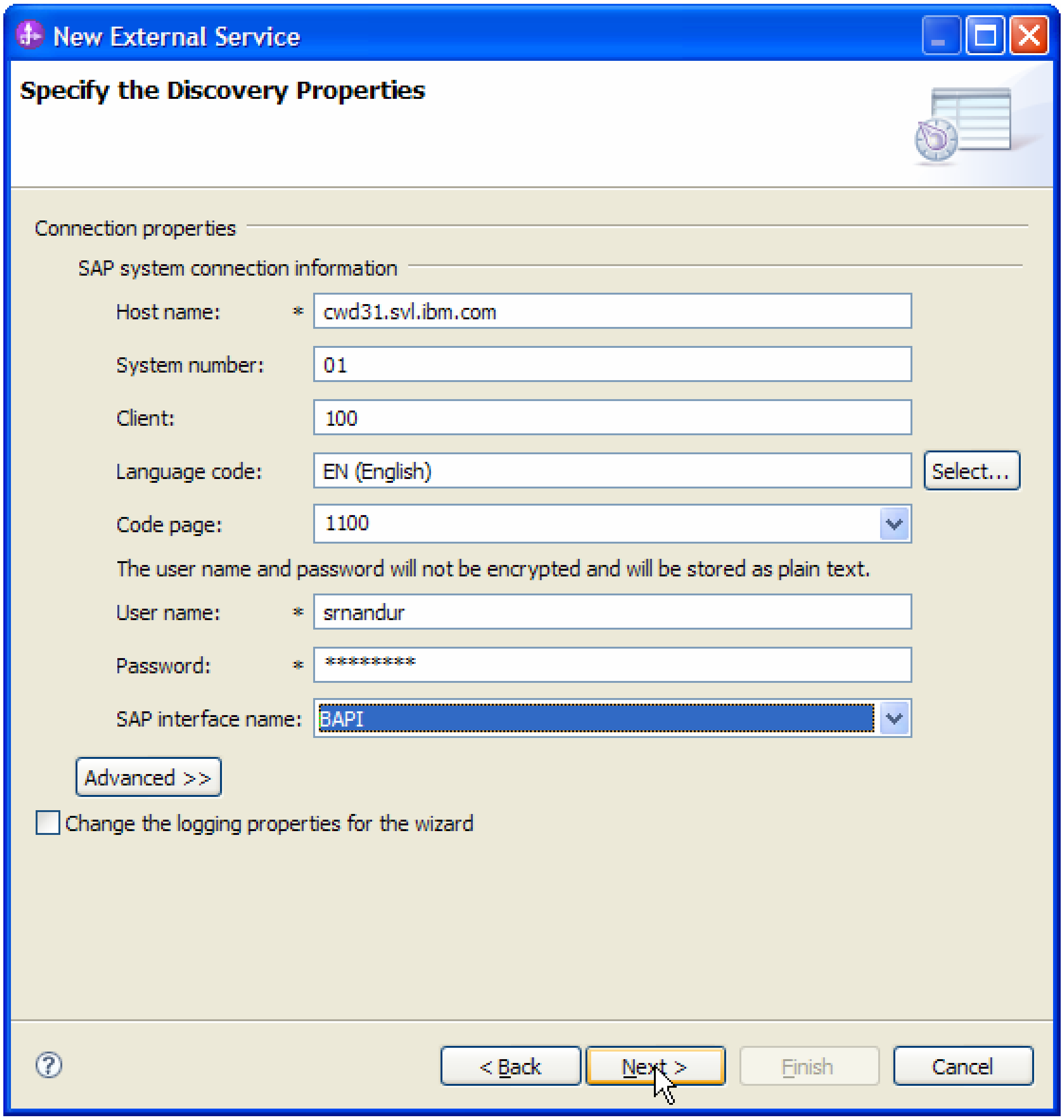
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English) Select...

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

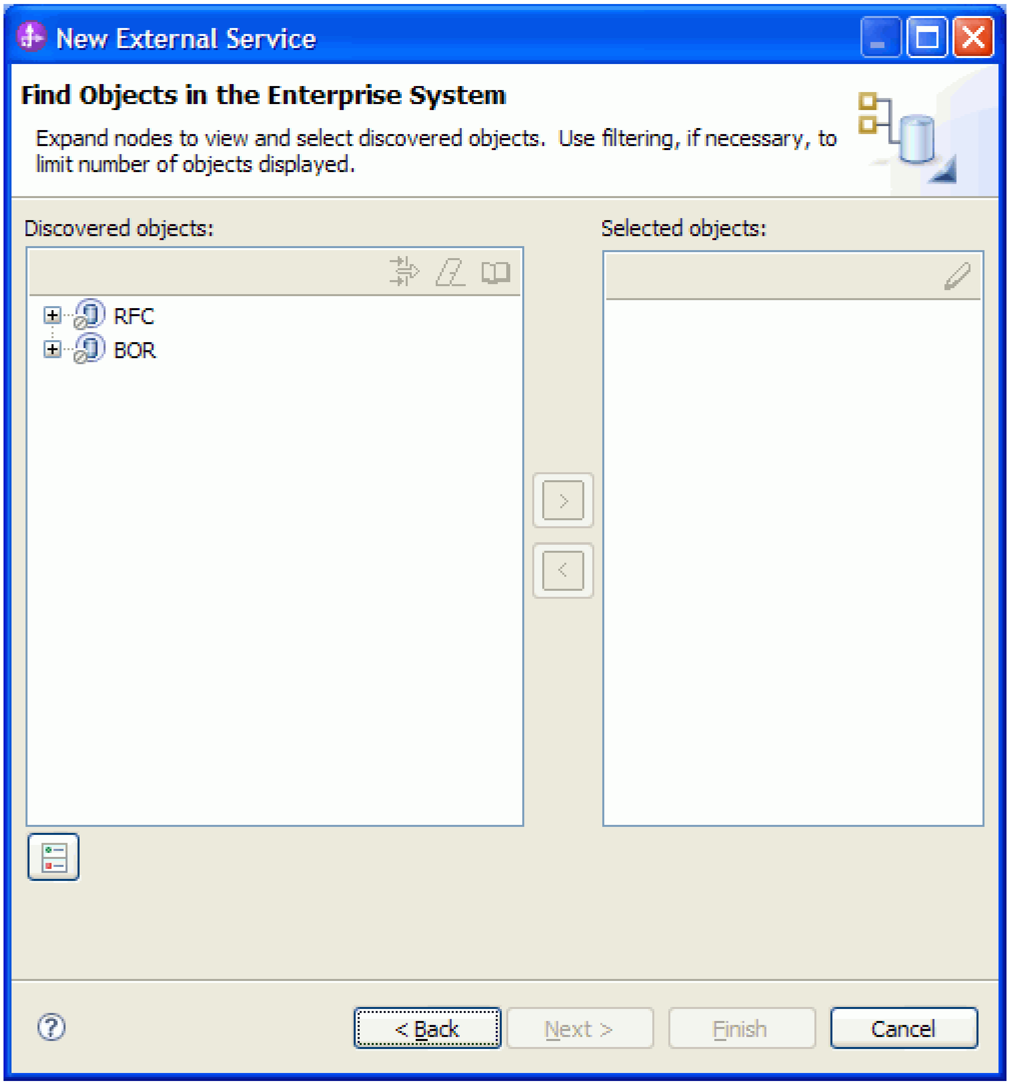
Password: * *********

SAP interface name: BAPI

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

Under **Find Objects in the Enterprise System**, click on RFC node. Then click the button.



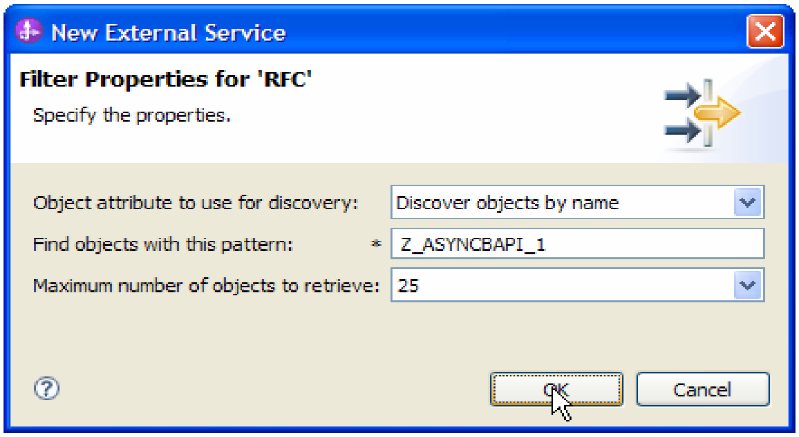
New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

Figure: Object Discovery and Selection

Enter **Z_ASYNCBAPI_1** (the name of the BAPI in SAP) in the **Filter Properties for 'RFC'** screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

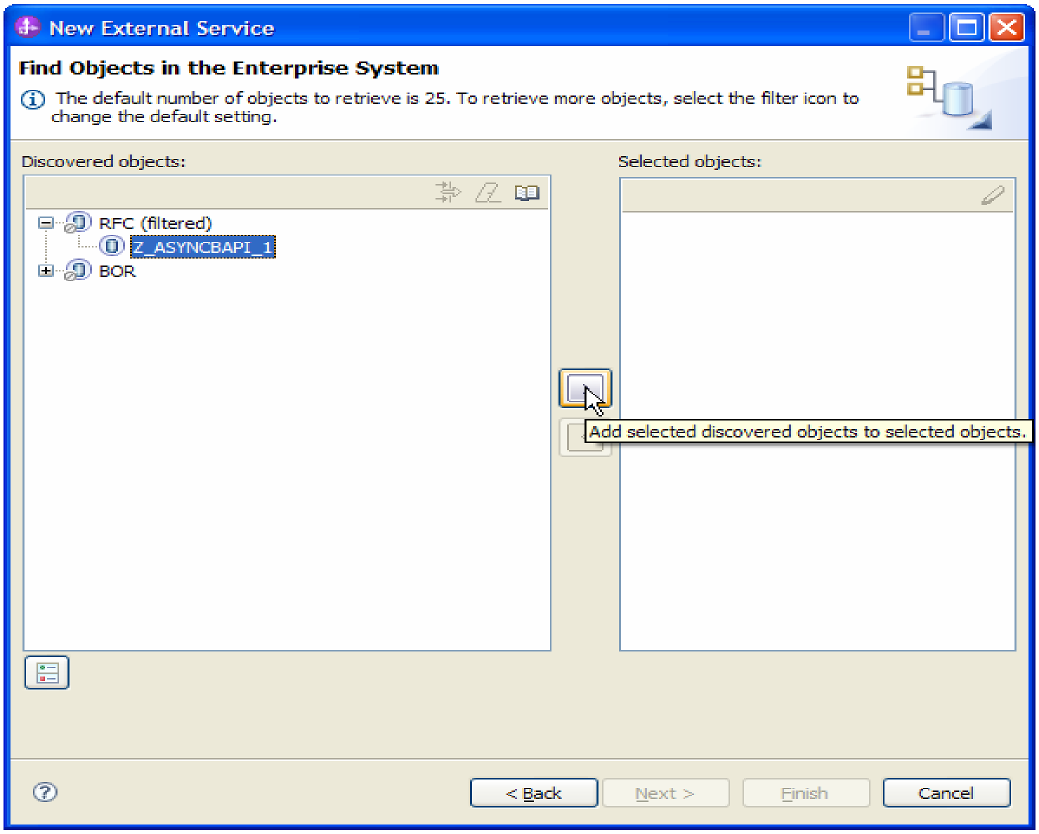
Find objects with this pattern: * Z_ASYNCBAPI_1

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **RFC** node.



New External Service

Find Objects in the Enterprise System

The default number of objects to retrieve is 25. To retrieve more objects, select the filter icon to change the default setting.

Discovered objects:

- RFC (filtered)
  - Z_ASYNCBAPI_1
- BOR

Selected objects:

Add selected discovered objects to selected objects.

Figure: Retrieved BAPIs' based on search criteria

Select the **Z_ASYNCBAPI_1** from the metadata tree.

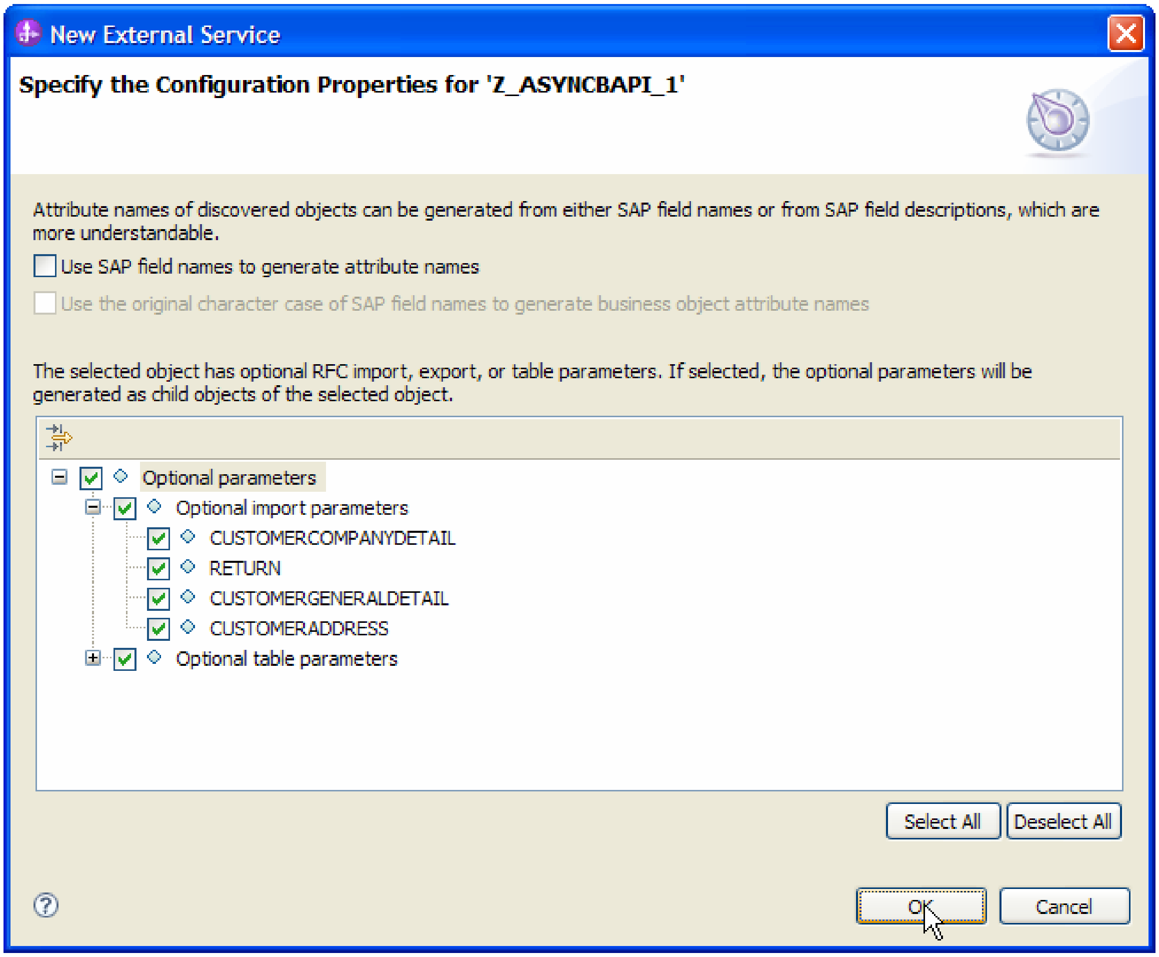
Click the > button.

A popup will appear containing the Configuration properties for the **Z_ASYNCBAPI_1** object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI.

Click **OK**.



Specify the Configuration Properties for 'Z_ASYNCBAPI_1'

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

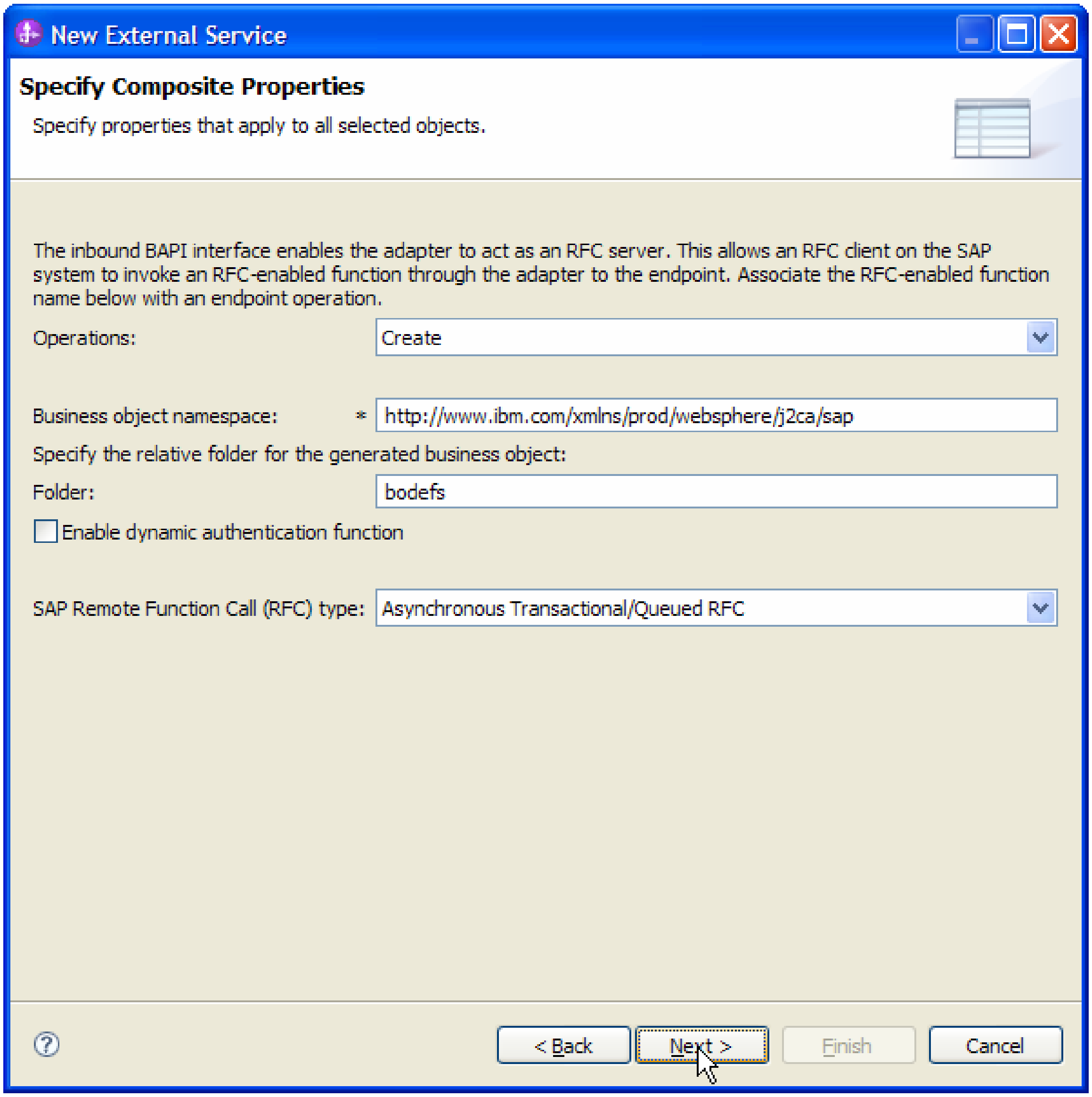
- ☑ Optional parameters
  - ☑ Optional import parameters
    - ☑ CUSTOMERCOMPANYDETAIL
    - ☑ RETURN
    - ☑ CUSTOMERGENERALDETAIL
    - ☑ CUSTOMERADDRESS
  - ☑ Optional table parameters

Figure: Setting configuration parameters for the BAPI 'Z_ASYNCBAPI_1'

Click **Next.**

Generating Business Object definitions and related artifacts

In the **Specify Composite Properties** screen, select **Create** as the operation, **bodefs** as the folder name for the Business Objects generated and choose the RFC Function Call Type as **Asynchronous Transactional/Queued RFC.**



Specify Composite Properties

Specify properties that apply to all selected objects.

The inbound BAPI interface enables the adapter to act as an RFC server. This allows an RFC client on the SAP system to invoke an RFC-enabled function through the adapter to the endpoint. Associate the RFC-enabled function name below with an endpoint operation.

Operations: Create

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

Specify the relative folder for the generated business object:

Folder: bodefs

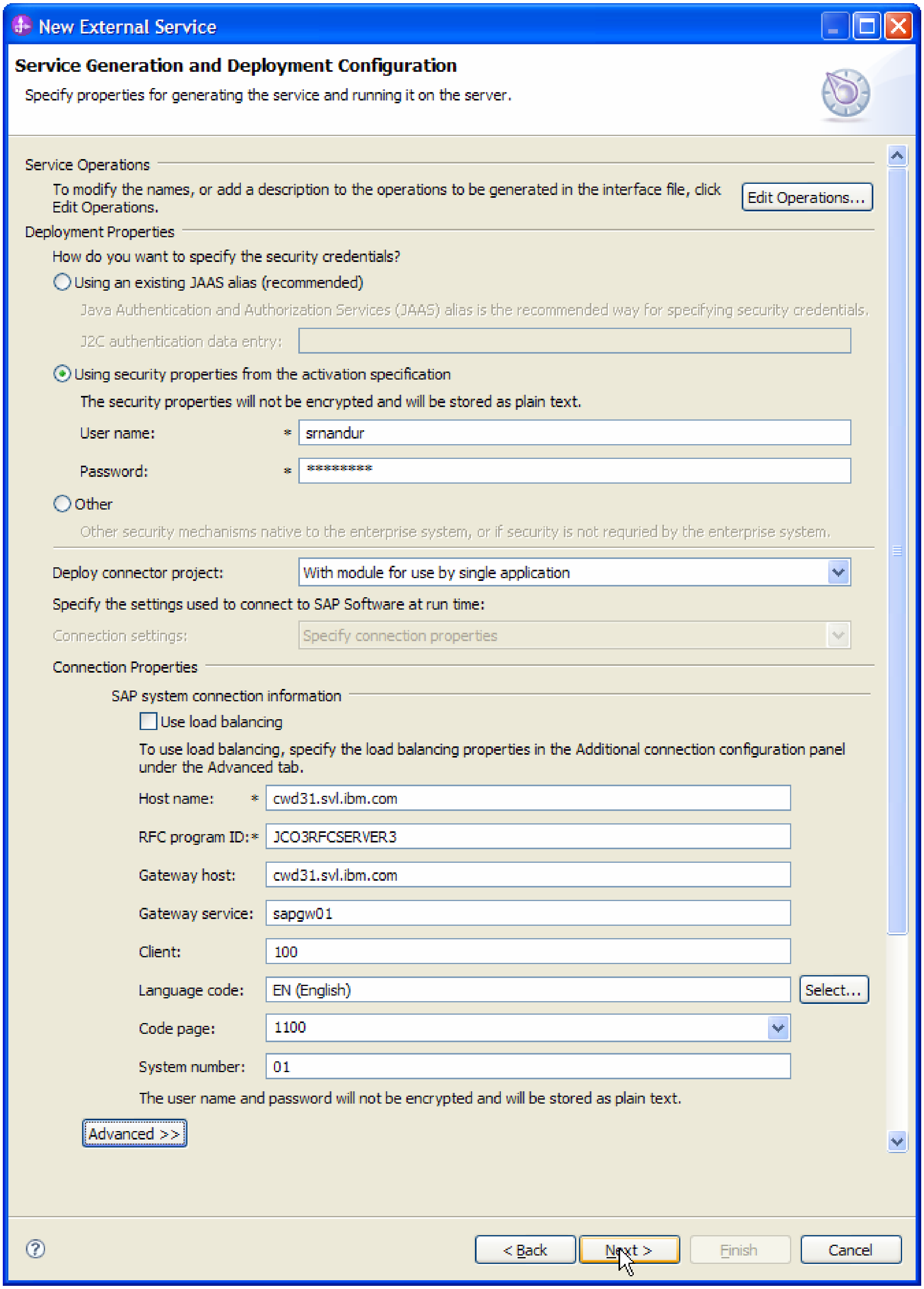
□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Asynchronous Transactional/Queued RFC

Figure: Specify Composite Properties

Click **Next**.

In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Service Generation and Deployment Configuration

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

Java Authentication and Authorization Services (JAAS) alias is the recommended way for specifying security credentials.

J2C authentication data entry:

● Using security properties from the activation specification

The security properties will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

○ Other

Other security mechanisms native to the enterprise system, or if security is not requried by the enterprise system.

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

RFC program ID:* JCO3RFCSERVER3

Gateway host: cwd31.svl.ibm.com

Gateway service: sapgw01

Client: 100

Language code: EN (English)

Code page: 1100

System number: 01

The user name and password will not be encrypted and will be stored as plain text.

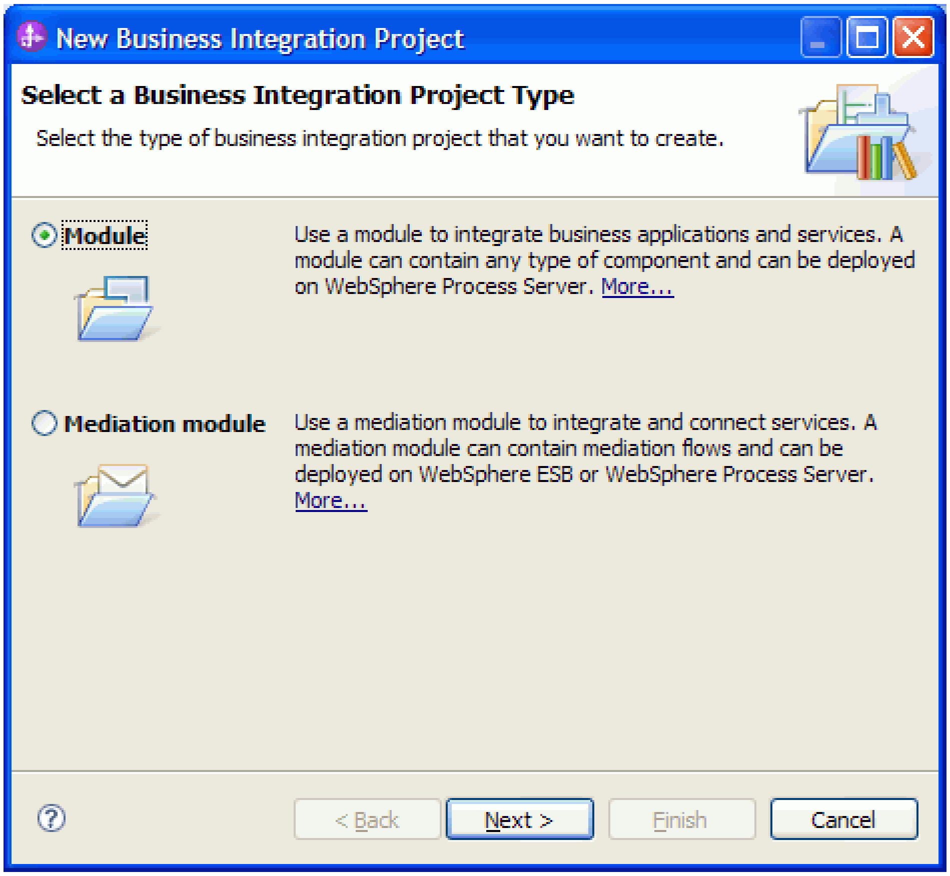
Figure: Service Generation and Deployment Configuration

Note: You can either enter Authentication Alias previously created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP system. Also enter the RFCProgramID (as shown in figure). This must have been already configured in the SAP system.

Click **Next**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



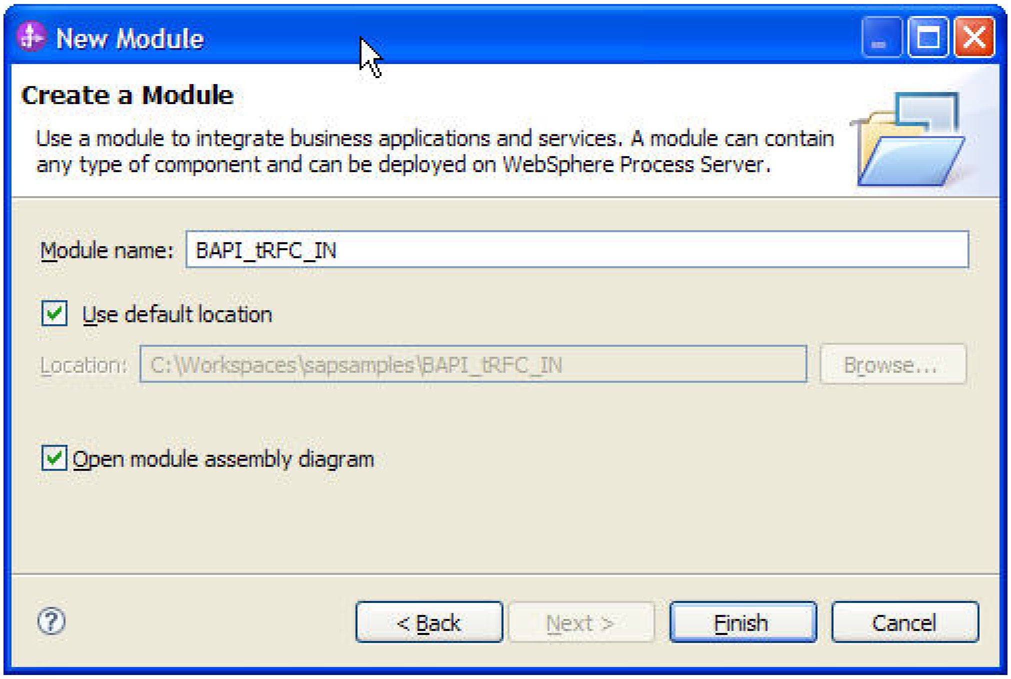
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the **New Module** screen, type **BAPI_tRFC_IN** in the **Module Name** field, and then click **Finish**.



New Module

Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

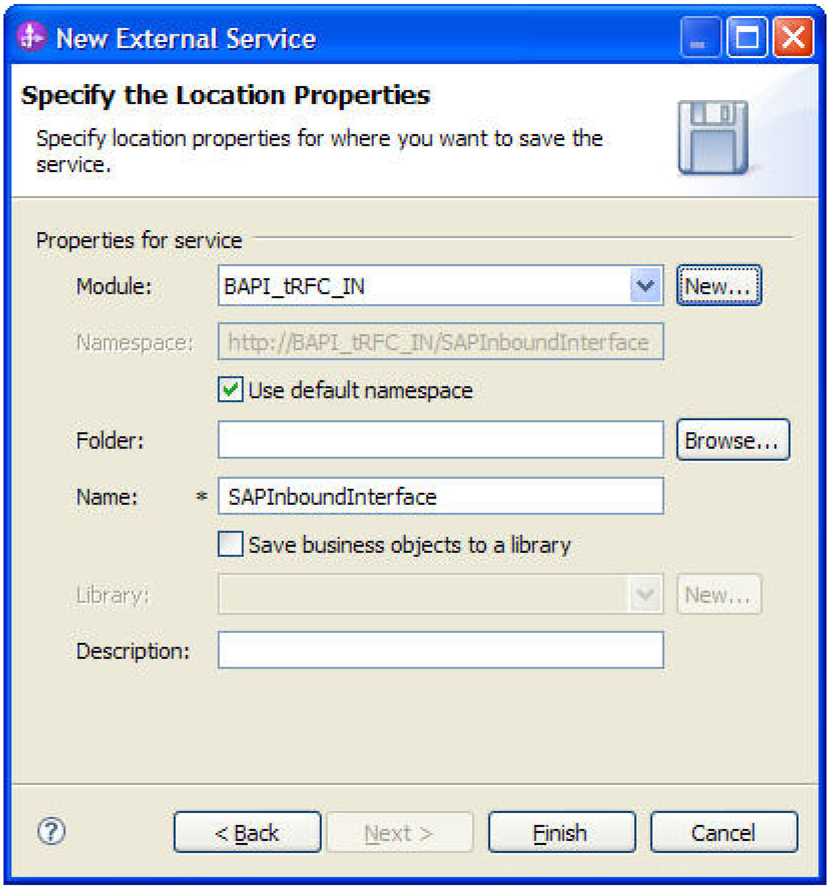
Module name: BAPI_tRFC_IN

☑ Use default location

Location: C:\Workspaces\sapsamples\BAPI_tRFC_IN

☑ Open module assembly diagram

Click Finish on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: BAPI_tRFC_IN

Namespace: http://BAPI_tRFC_IN/SAPInboundInterface

☑ Use default namespace

Folder:

Name: * SAPInboundInterface

□ Save business objects to a library

Library:

Description:

Verify the results.

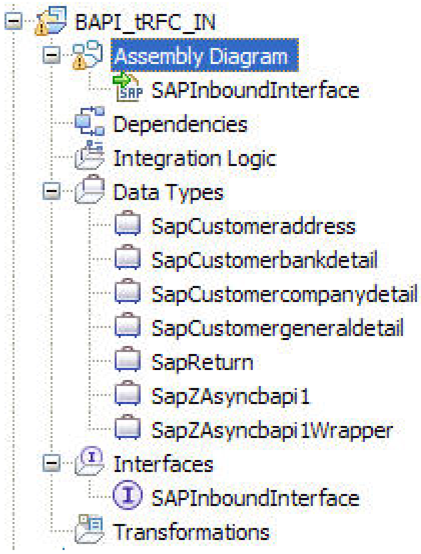


Figure: Artifacts created after the EMD run fore BAPI tRFC Inbound Module

Generating Reference Bindings

In the Business Integration Perspective of WebSphere Integration Developer, expand the **BAPI_tRFC_IN** SCA module, and double click on the **Assembly Diagram**. The Assembly Diagram screen appears with the module‘s Export component in view.

1. To create a new component, click the button of Java component from the **Palette**.

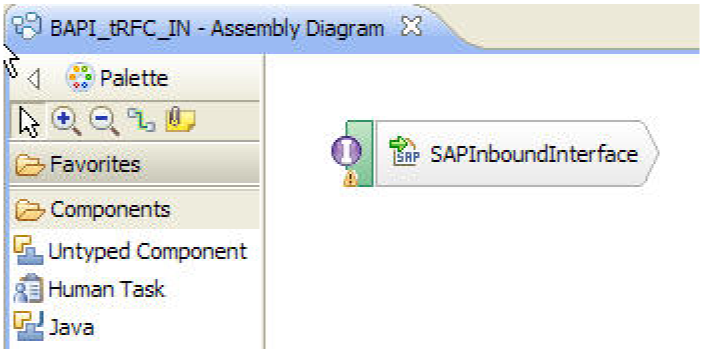


Figure: BAPI tRFC Inbound interface in the Assembly editor

2. Click and drag the Java component to add the new component to the Assembly Diagram screen.

3. Add a wire between the **SAPInboundInterface** and the Java component.

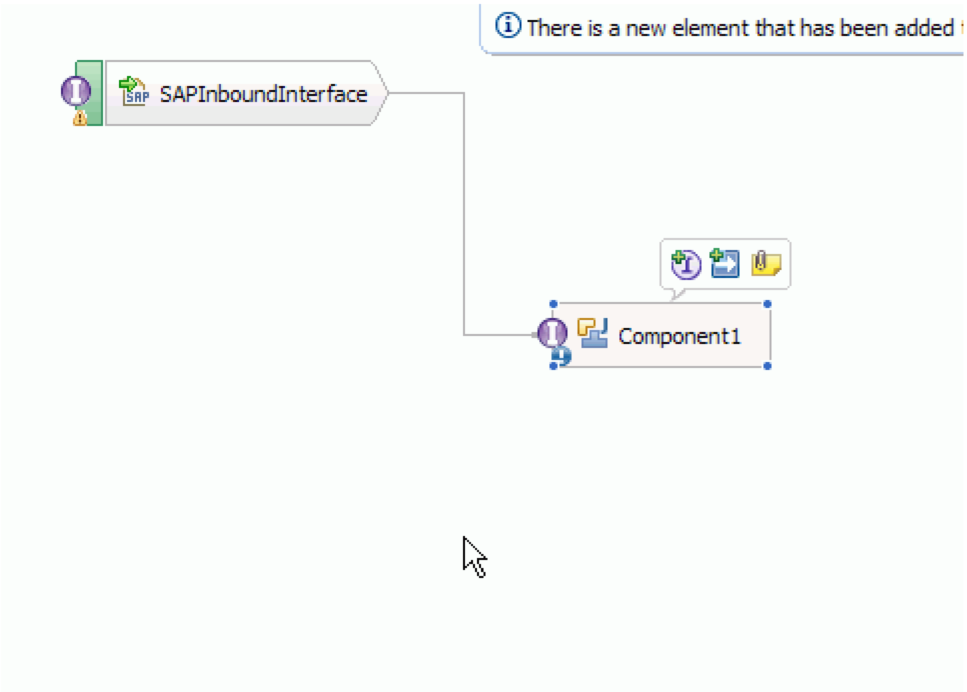
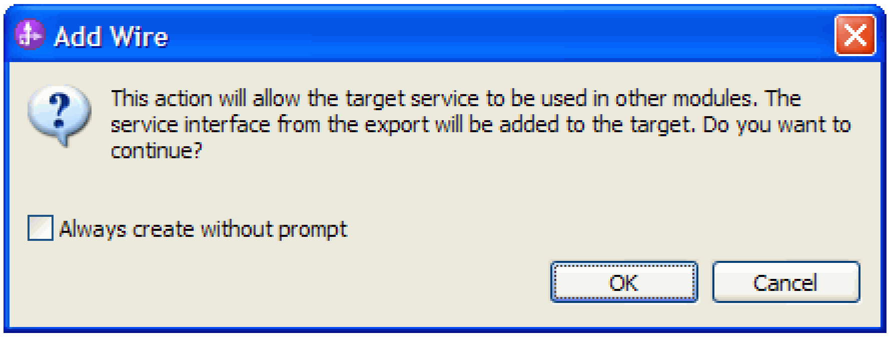


Figure: BAPI Inbound interface being wired to a target Component(end-point)

4. In the **Add Wire** screen, click **OK**.


Add Wire

This action will allow the target service to be used in other modules. The service interface from the export will be added to the target. Do you want to continue?

□ Always create without prompt

Figure: Add Wire Screen

5. Right-click the new component and select **Generate Implementation**. This creates a Java component that will act as an endpoint.

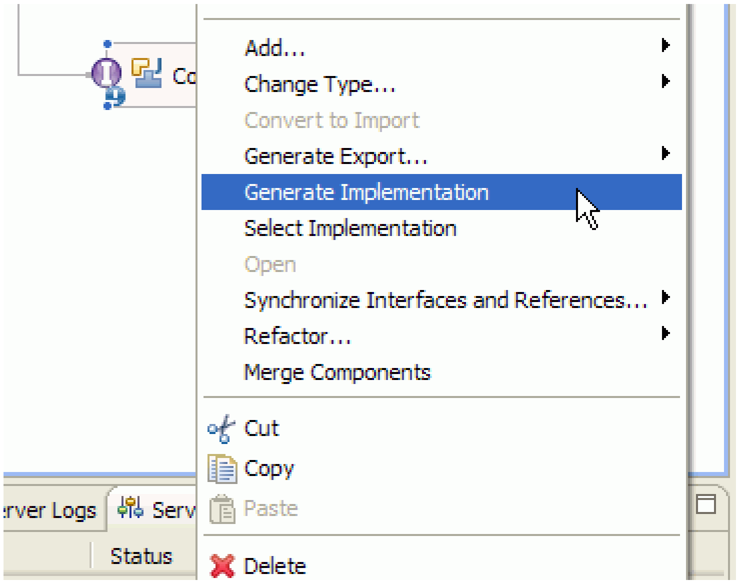
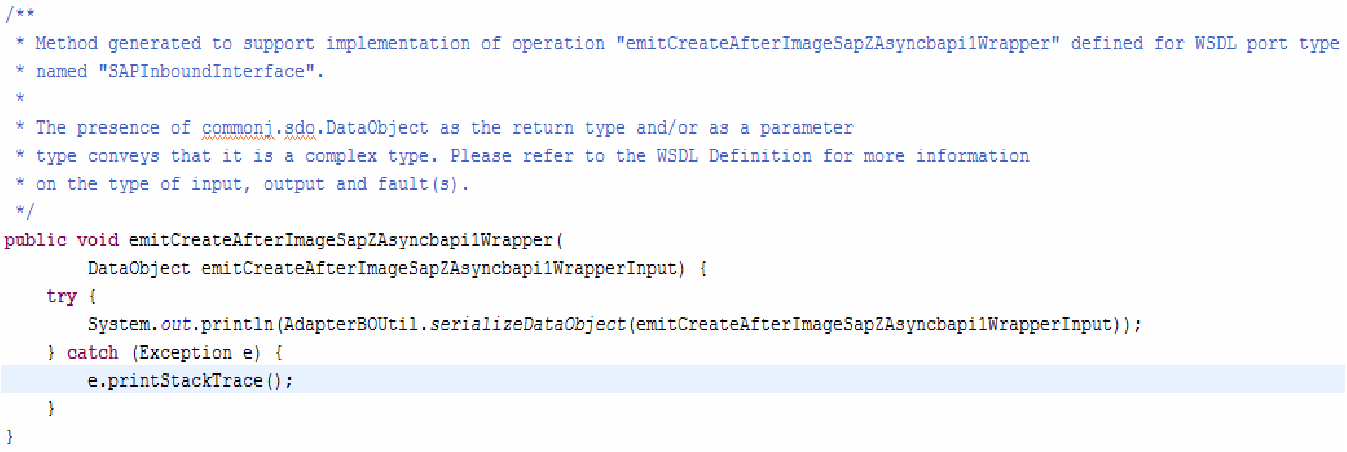


Figure: Creating Java implementation for the target Component.

In the **Generate Implementation** screen, select the package in which the Java code will be created and click **OK**. A Java file in an editor screen appears.

Edit the Java file if you may wish to write code to print trace and log messages or Data Object.

Ensure that the package com.ibm.j2ca.base.AdapterBOUtil is imported.



```
/**
 * Method generated to support implementation of operation "emitCreateAfterImageSapZAsyncbapi1Wrapper" defined for WSDL port type
 * named "SAPInboundInterface".
 *
 * The presence of commonj.sdo.DataObject as the return type and/or as a parameter
 * type conveys that it is a complex type. Please refer to the WSDL Definition for more information
 * on the type of input, output and fault(s).
 */
public void emitCreateAfterImageSapZAsyncbapi1Wrapper(
        DataObject emitCreateAfterImageSapZAsyncbapi1WrapperInput) {
    try {
        System.out.println(AdapterBOUtil.serializeDataObject(emitCreateAfterImageSapZAsyncbapi1WrapperInput));
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```

Save the Java file

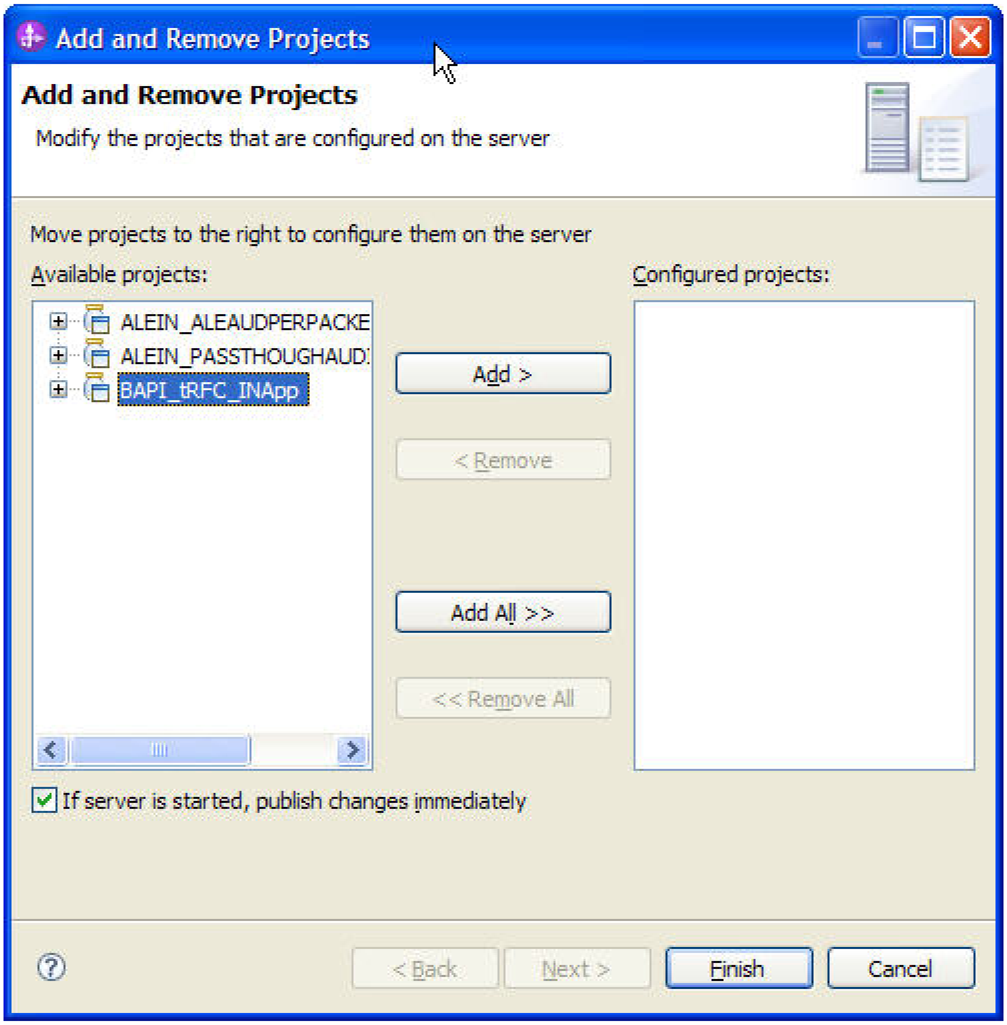
Save assembly diagram.

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_qRFC_IN by selecting **Add and Remove Projects**.

The project BAPI_qRFC_INApp will be listed under **Available projects**.



Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

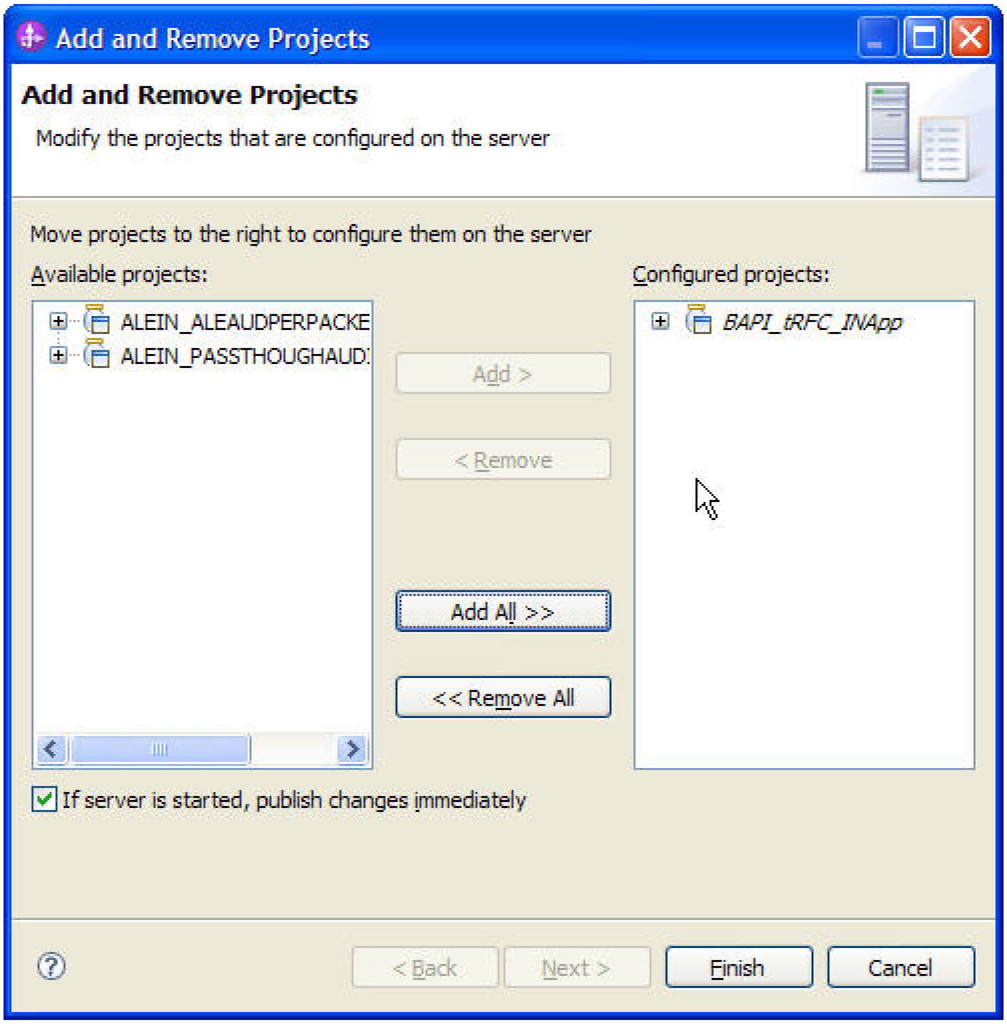
Available projects:

- ALEIN_ALEAUDPERPACKE
- ALEIN_PASSTHOUGHAUD:
- BAPI_tRFC_INApp

Configured projects:

☑ If server is started, publish changes immediately

After adding the project, the added project should appear under the **Configured projects**. Add the SCA module to the server by clicking on **Finish.**



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- ALEIN_ALEAUDPERPACKE
- ALEIN_PASSTHOUGHAUD

Configured projects:

- *BAPI_tRFC_INApp*

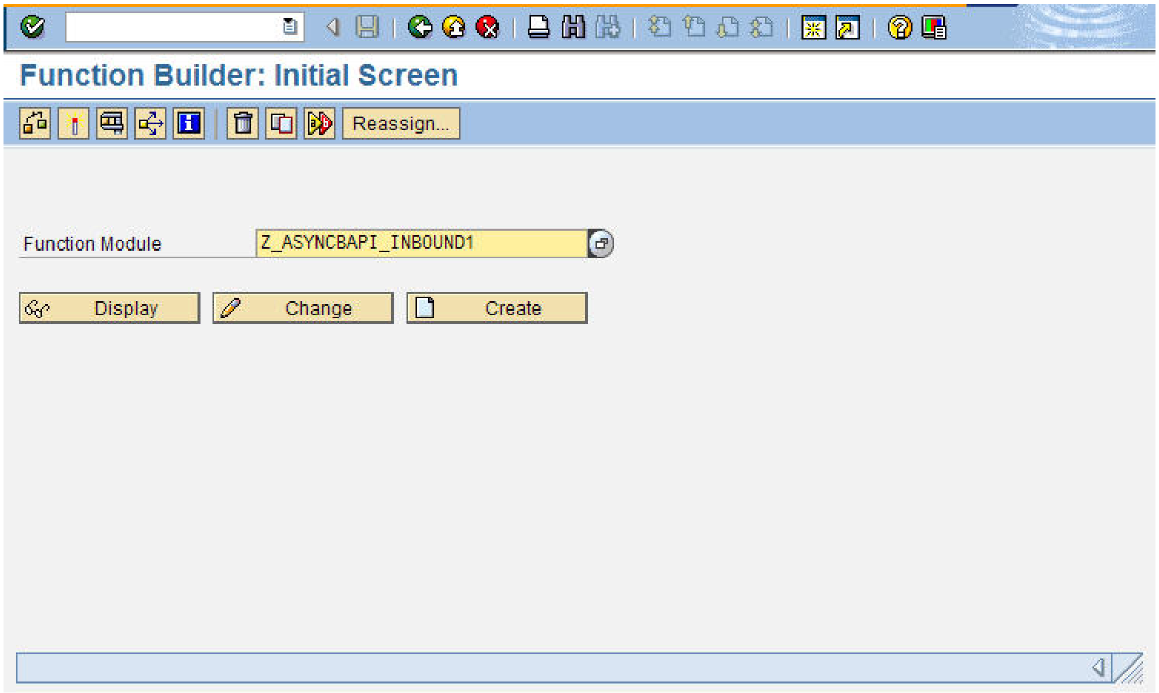
☑ If server is started, publish changes immediately

Testing the assembled adapter application

Launch the SAP GUI.

Start the transaction SE 3.

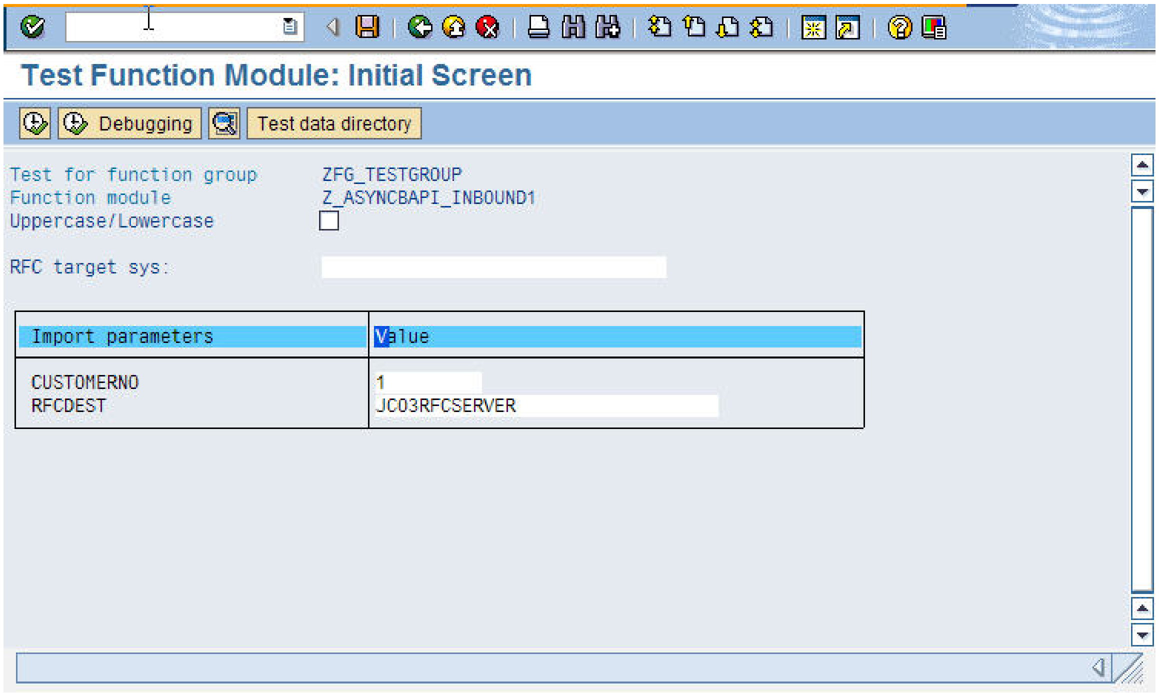
Enter the function module name as Z_ASYNCBAPI_INBOUND1 click execute (F8).



Function Builder: Initial Screen

Function Module Z_ASYNCBAPI_INBOUND1

Give appropriate values to the fields CUSTOMERNO and RFCDEST. Click execute.



Test Function Module: Initial Screen

Test for function group ZFG_TESTGROUP
Function module Z_ASYNCBAPI_INBOUND1
Uppercase/Lowercase □

RFC target sys:

Import parameters	Value
CUSTOMERNO	1
RFCDEST	JCO3RFCSERVER

In the console of WebSphere Integration Developer, you could see the BAPI Business Object printed (as we entered a print statement in the Component implementation above).

Chapter 21. Tutorial 16: Sending data to an SAP system (Outbound processing) using tRFC BAPI

Following sections explain inbound scenarios for the BAPI interface.

Configuration prerequisites

Note: You do not have to perform this step if you have already done so for another scenario.

After you create the connector project, you must add the required external dependencies into the project. The SAP Java Connector (JCo) interface is an external dependency that the adapter requires in order to connect to SAP systems. The adapter uses SAP JCo to call SAP's native interfaces.

Use WebSphere Integration Developer to add the SAP Java Connector library to the imported project. You must copy all external libraries and JAR files to the appropriate locations on the WebSphere Process Server:

Copy the native library (sapjco3.dll or libsapjco3.so files) to the <WPS_INSTALL>/bin directory (If the WebSphere Process Server v7.0 bundled with WebSphere Integration Developer v7.0 is used, it will be installed at <WID_INSTALL_DIR>/runtimes/bi_v7).

When working with WebSphere Process Server v7.0 on z/OS , add the *.so libraries to the <WPS_INSTALL>/lib directory.

When working with WebSphere Integration Developer v7.0 on Windows, ensure that msvcp71.dll and msvcr71.dll exist in the Windows system path.

The sapjco3.dll file is required to run the New External Service wizard.

Copy the sapjco3.jar file to the <WPS_INSTALL>/lib directory.

When working with WebSphere Process Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/the sapjco3.jar file to WAS_SERVER_ONLY_server_region_classpath

The sapjco3.jar is required to run the New External Service wizard.

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

Copy **CWYAP_SAPAdapterExt.jar** to the <WPS_INSTALL>/lib directory.

When working with WebSphere Application Server on z/OS, add ${WAS_INSTALL_ROOT}/lib/ **CWYAP_SAPAdapterExt.jar** to WAS_SERVER_ONLY_server_region_classpath

<WPS_INSTALL> represents the WebSphere Process Server installation directory.

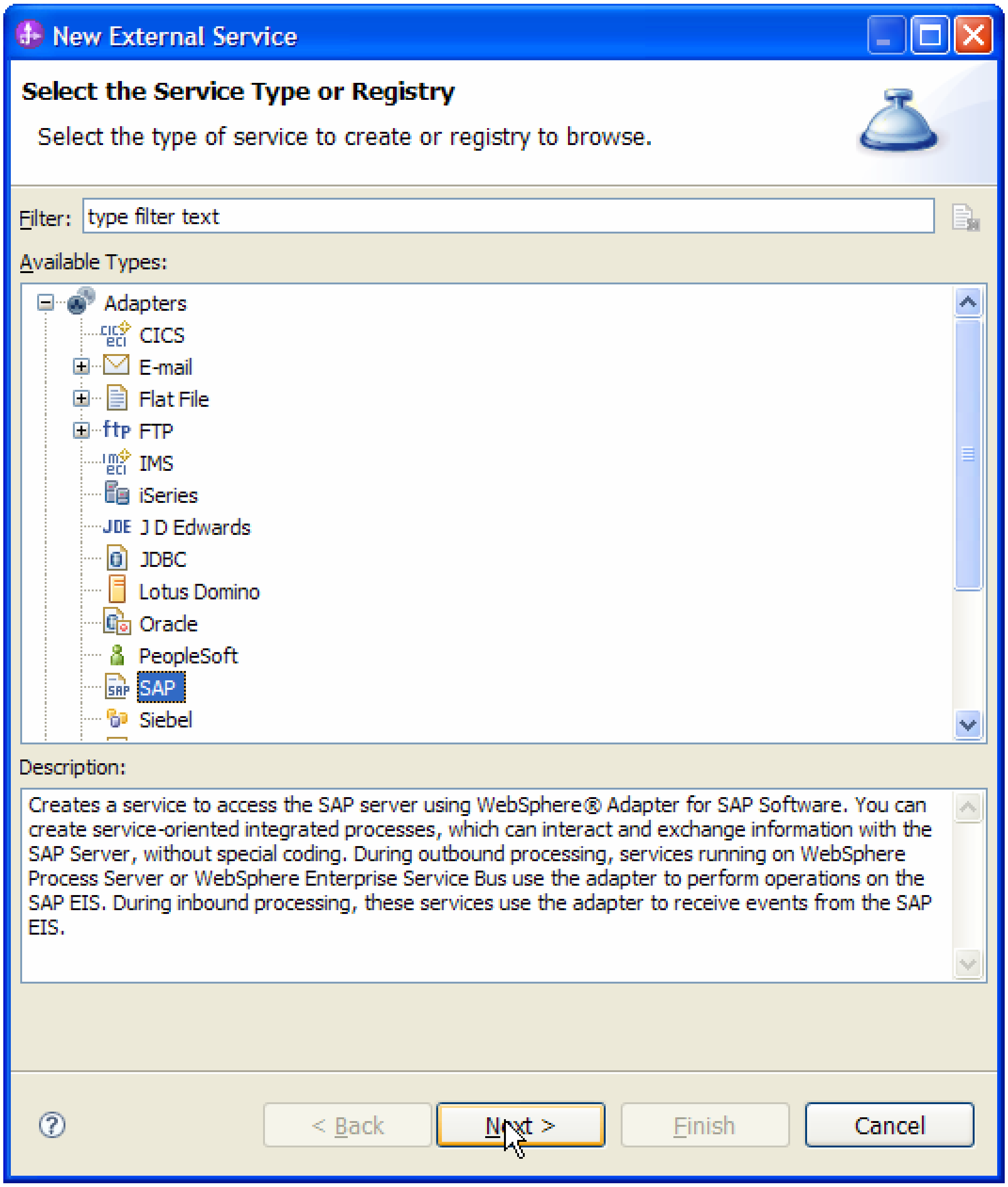
Configuring the adapter for outbound processing

Run the **New External Service wizard** to generate Business Objects, Services, and configuration to be used in this tutorial.

After opening WebSphere Integration Developer, the default perspective is usually **Business Integration**

Start the New External Service wizard by choosing: **File**-> **New** -> **External Service**

1. Select **Adapters > SAP** from the **Select the Service Type of Registry** screen and click **Next.**



New External Service

Select the Service Type or Registry

Select the type of service to create or registry to browse.

Filter: type filter text

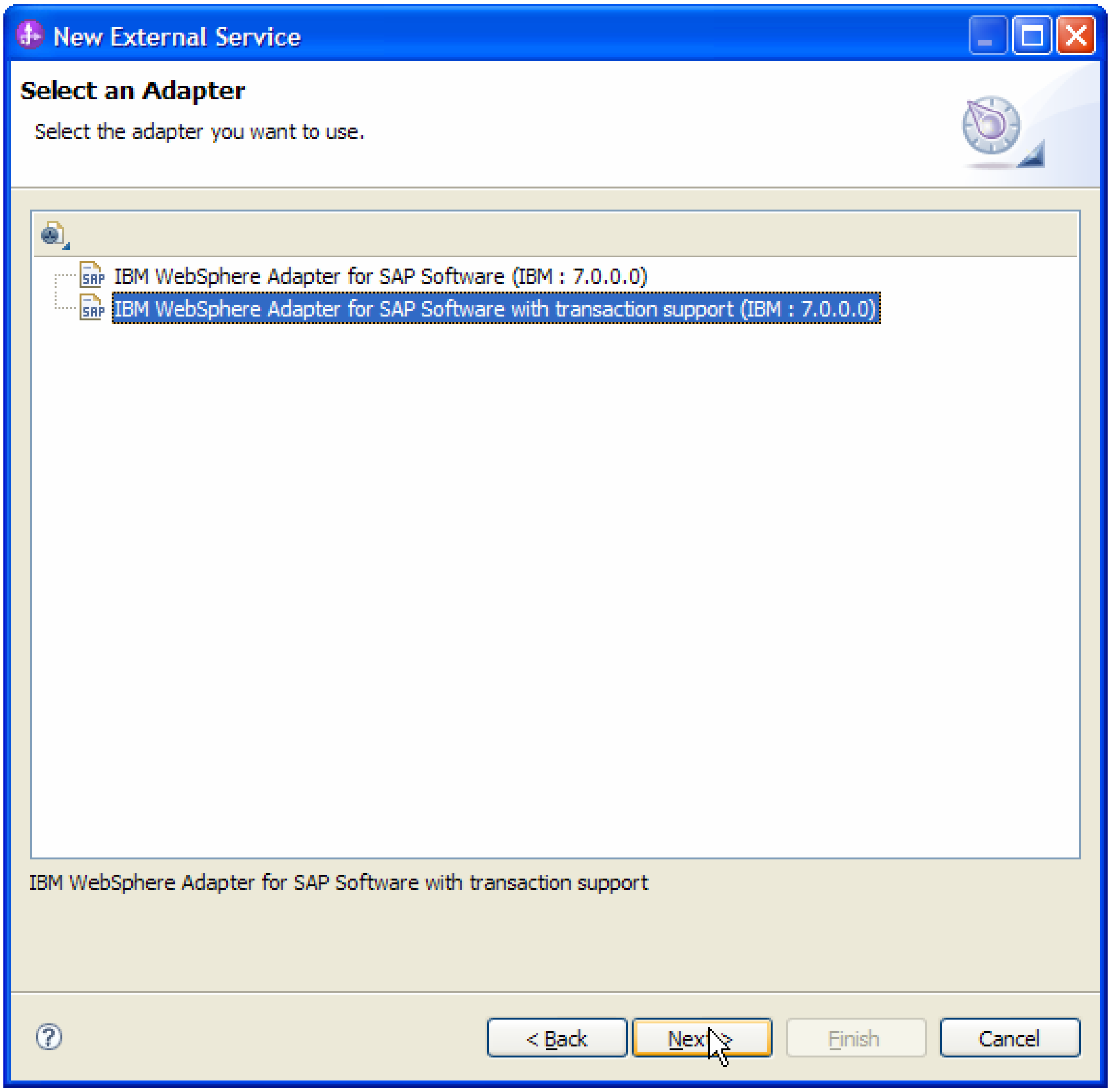
Available Types:

Description:

Creates a service to access the SAP server using WebSphere® Adapter for SAP Software. You can create service-oriented integrated processes, which can interact and exchange information with the SAP Server, without special coding. During outbound processing, services running on WebSphere Process Server or WebSphere Enterprise Service Bus use the adapter to perform operations on the SAP EIS. During inbound processing, these services use the adapter to receive events from the SAP EIS.

Figure: Select the Service Type or Registry screen

2. Select the **IBM WebSphere Adapter for SAP Software with transaction support (IBM: 7.0.0.0)** from the **Select an Adapter** screen and click **Next**.



IBM WebSphere Adapter for SAP Software (IBM : 7.0.0.0)
IBM WebSphere Adapter for SAP Software with transaction support (IBM : 7.0.0.0)

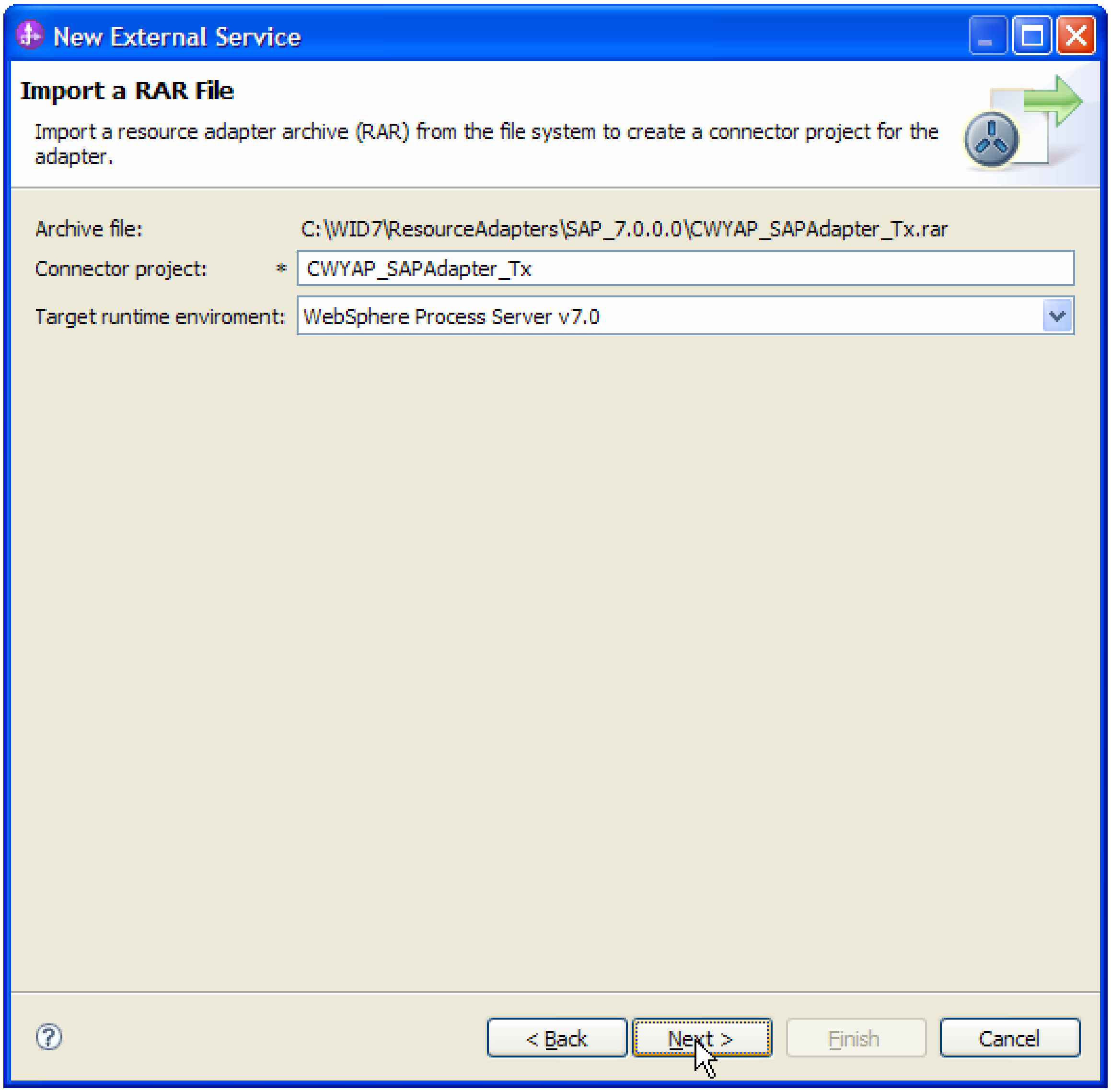
IBM WebSphere Adapter for SAP Software with transaction support

Figure: Select an Adapter screen

Note: If you have run the **New External Service** wizard earlier using the **IBM WebSphere Adapter for SAP Software with transaction support** in the current workspace, you can choose one from a list of configurations cached by WebSphere Integration Developer.

Select the correct configuration by expanding the **IBM WebSphere Adapter for SAP Software with transaction support** node.

3. Specify a Connector Project name in the Import a RAR File screen and proceed by clicking on **Next.**



New External Service

Import a RAR File

Import a resource adapter archive (RAR) from the file system to create a connector project for the adapter.

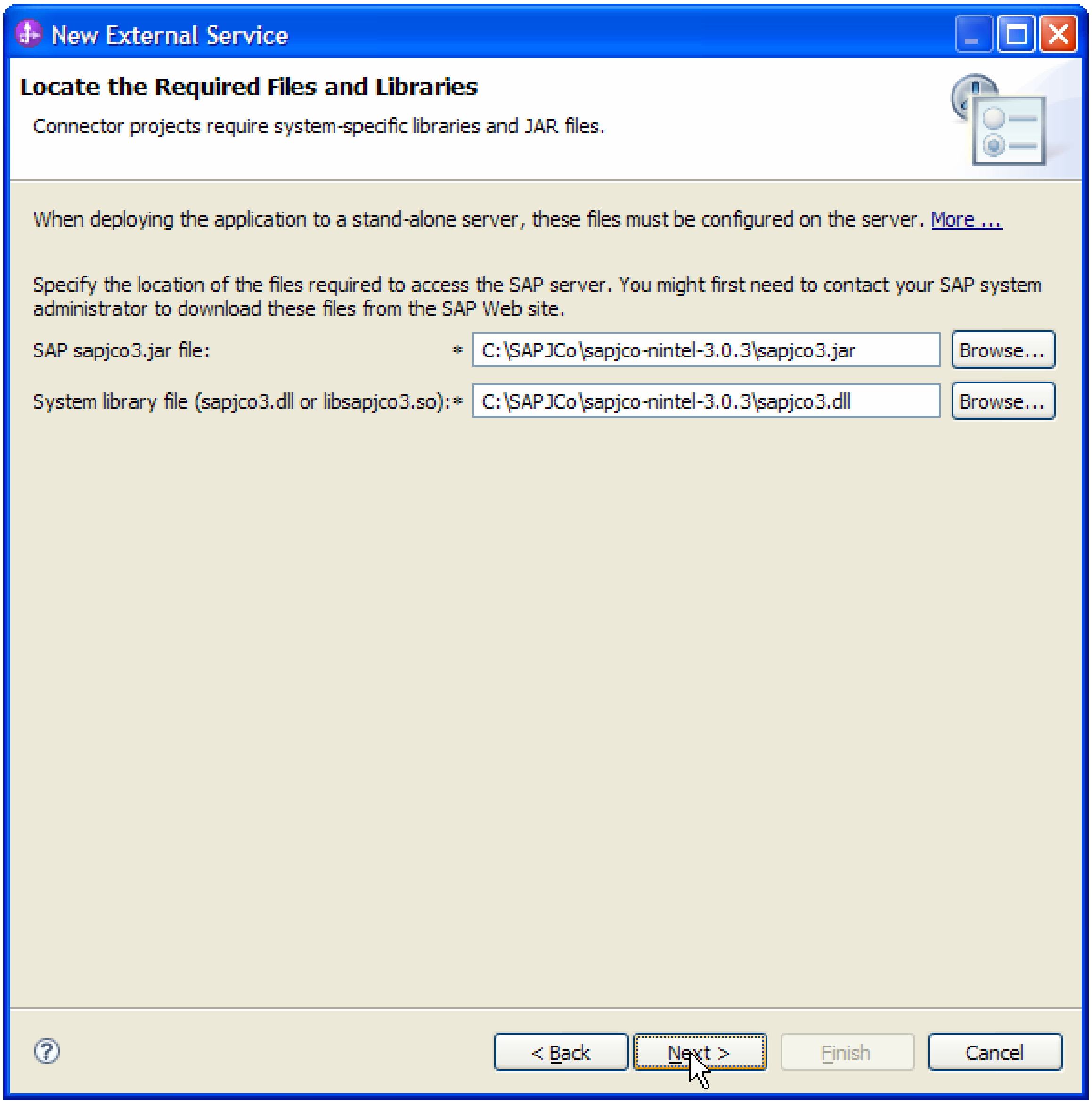
Archive file: C:\WID7\ResourceAdapters\SAP_7.0.0.0\CWYAP_SAPAdapter_Tx.rar

Connector project: * CWYAP_SAPAdapter_Tx

Target runtime enviroment: WebSphere Process Server v7.0

Figure: Import a RAR file screen

4. In the **Locate the Required Files and Libraries** screen, provide the location of the **sapjco3.jar** file and the **sapjco3.dll** or **libsapjco3.so** files.



New External Service

Locate the Required Files and Libraries

Connector projects require system-specific libraries and JAR files.

When deploying the application to a stand-alone server, these files must be configured on the server. More ...

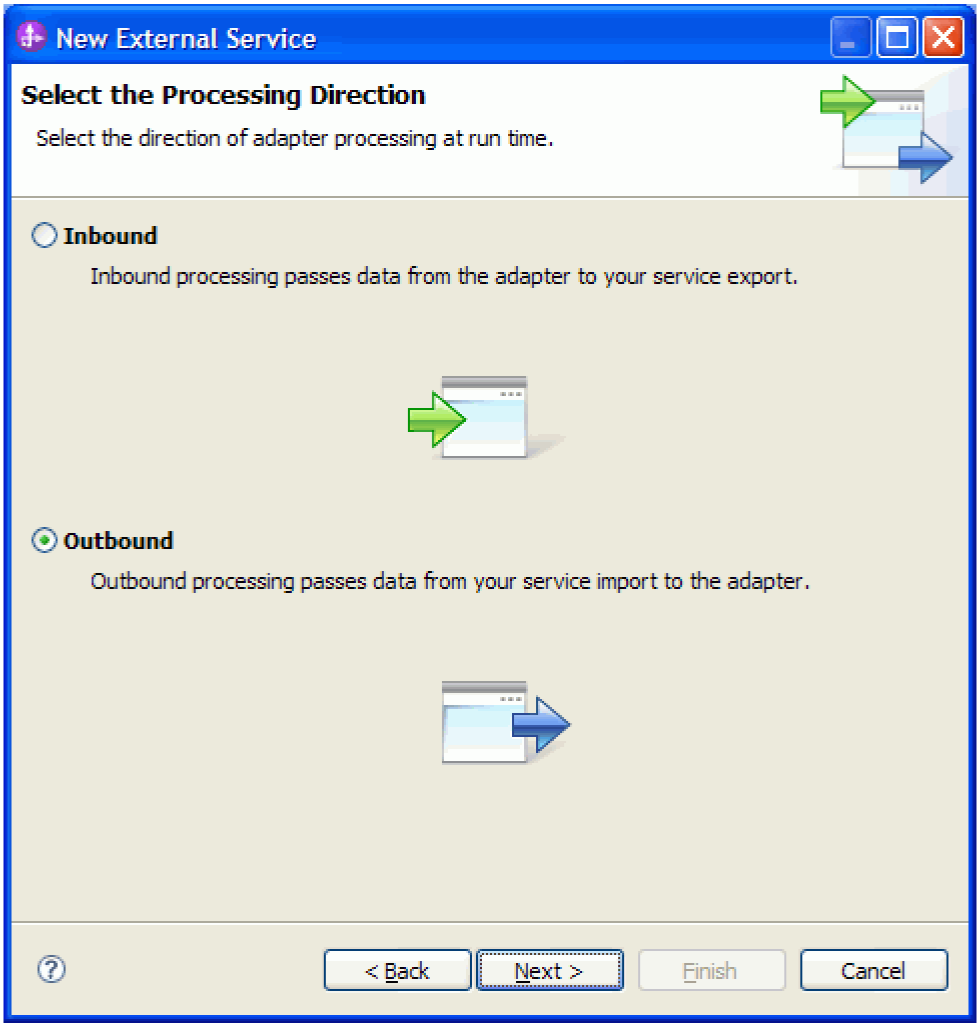
Specify the location of the files required to access the SAP server. You might first need to contact your SAP system administrator to download these files from the SAP Web site.

SAP sapjco3.jar file: * C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.jar Browse...

System library file (sapjco3.dll or libsapjco3.so):* C:\SAPJCo\sapjco-nintel-3.0.3\sapjco3.dll Browse...

5. Click **Next.**

6. In the **Select the Processing Direction** screen, select **Outbound** radio button and click **Next**.



New External Service

Select the Processing Direction

Select the direction of adapter processing at run time.

○ Inbound

Inbound processing passes data from the adapter to your service export.

● Outbound

Outbound processing passes data from your service import to the adapter.

Setting connection properties for the New External Service wizard

You must provide the following information in the **Discovery Configuration** screen:

User name

Password

Host name

System number

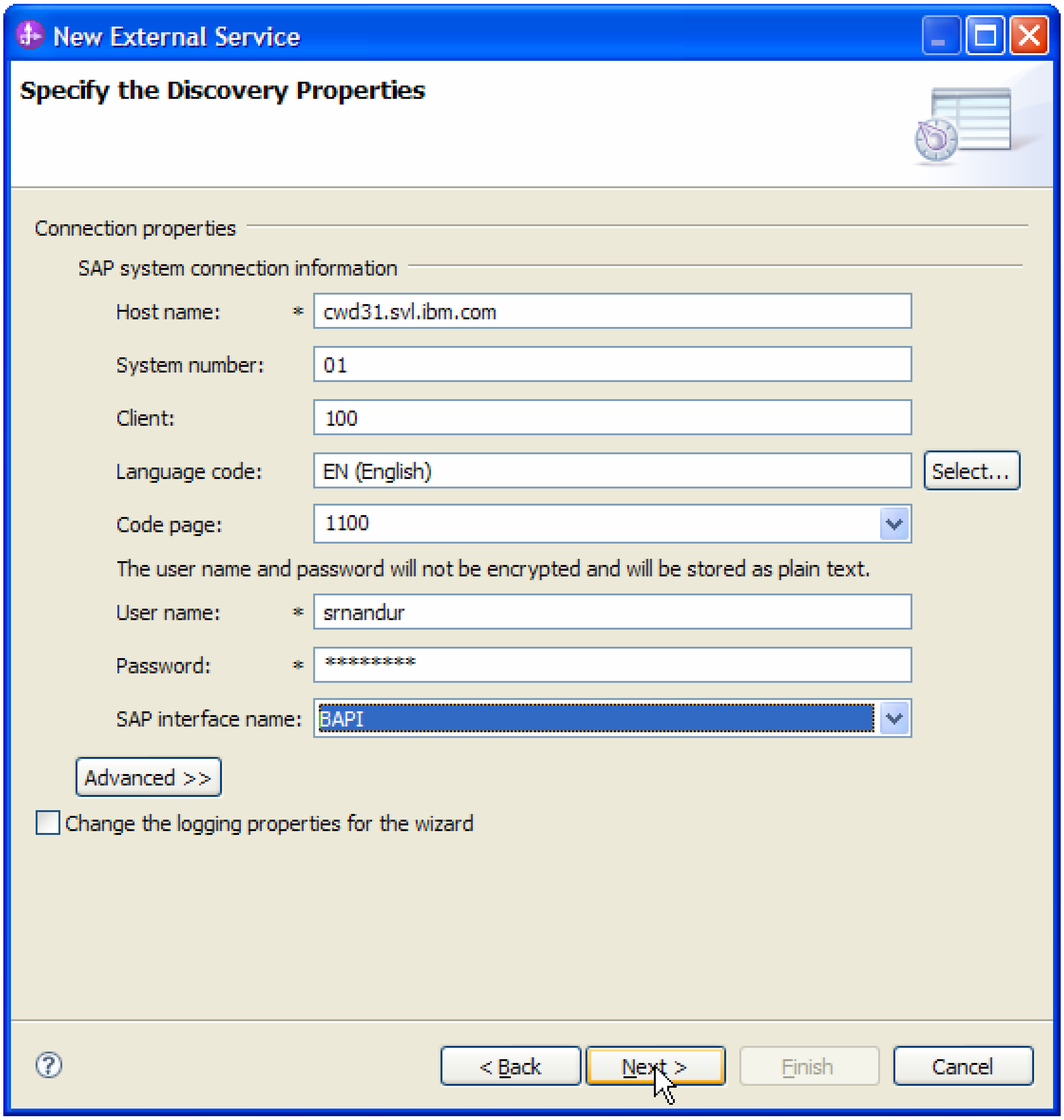
SAP Client connection

Click Select to change the default Language code from English

Use the drop down option to change the default Code page from 1100.

Select BAPI as the SAP Interface name.

Click **Next**.



New External Service

Specify the Discovery Properties

Connection properties

SAP system connection information

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

The user name and password will not be encrypted and will be stored as plain text.

User name: * srnandur

Password: * *********

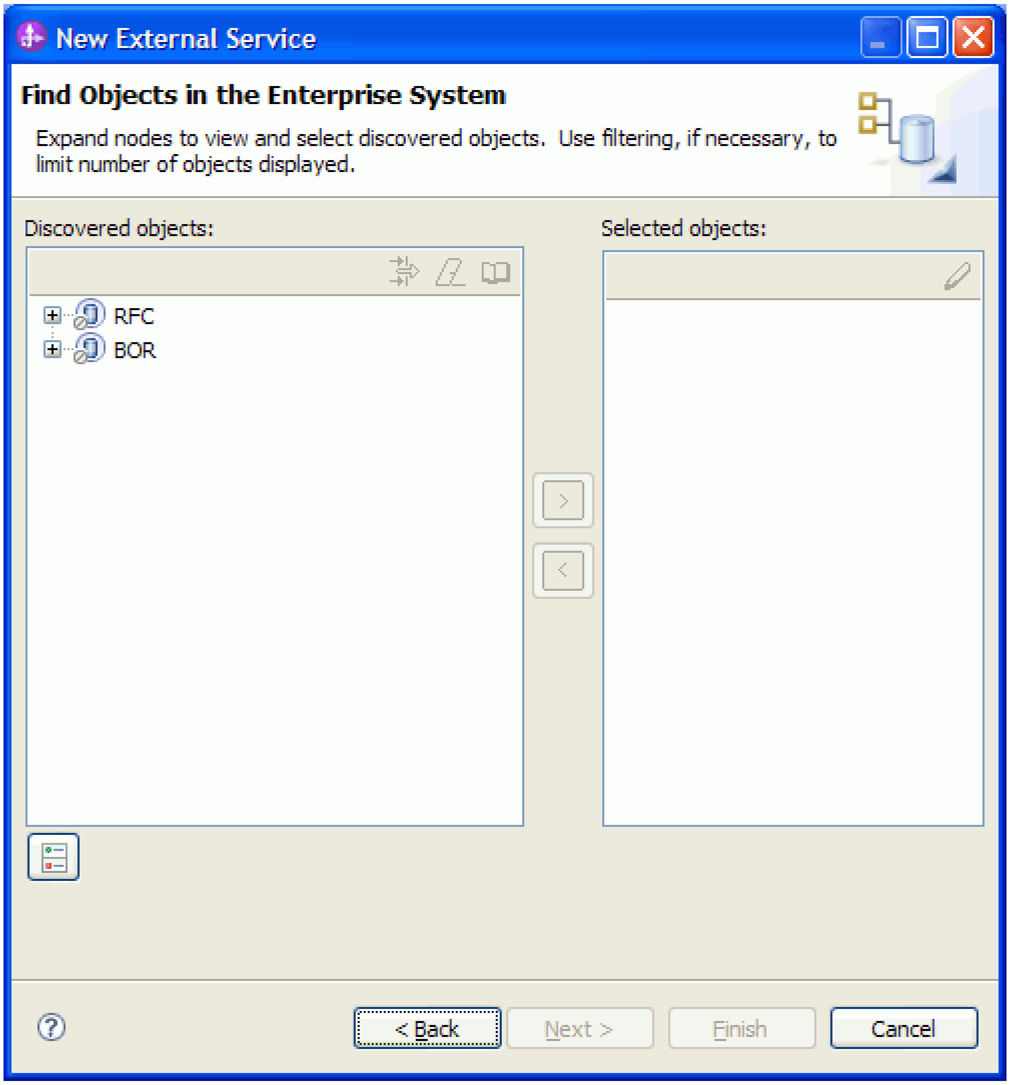
SAP interface name: BAPI

□ Change the logging properties for the wizard

Figure: Select BAPI as the interface

Selecting the Business Objects and services to be used with the adapter

In the **Find objects in the Enterprise System** screen, click RFC node. Then click the ⇉ button.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

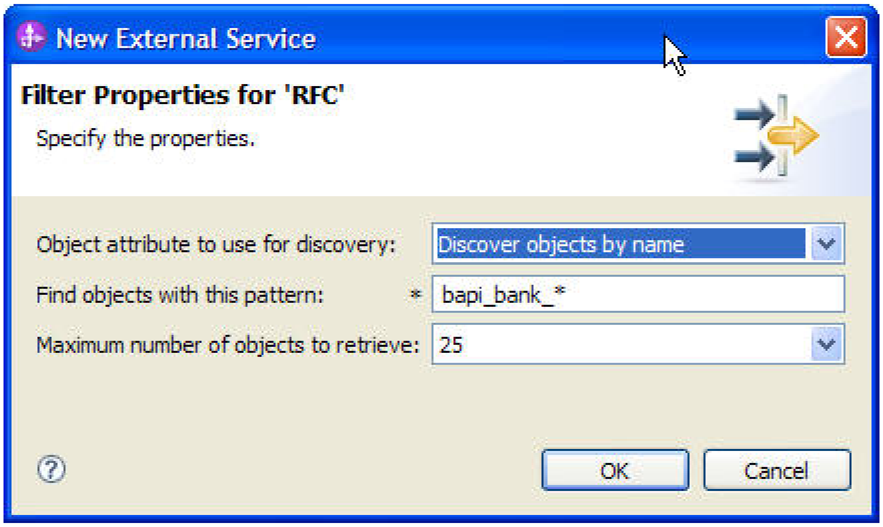
Discovered objects:

- RFC
- BOR

Selected objects:

Figure: Object Discovery and Selection

Enter **bapi_bank_*** (the name of the BAPI in SAP) in the **Filter Properties for 'RFC'** screen.



New External Service

Filter Properties for 'RFC'

Specify the properties.

Object attribute to use for discovery: Discover objects by name

Find objects with this pattern: * bapi_bank_*

Maximum number of objects to retrieve: 25

Figure: Filter Properties for RFC

Click **OK**.

Expand the **RFC** node.

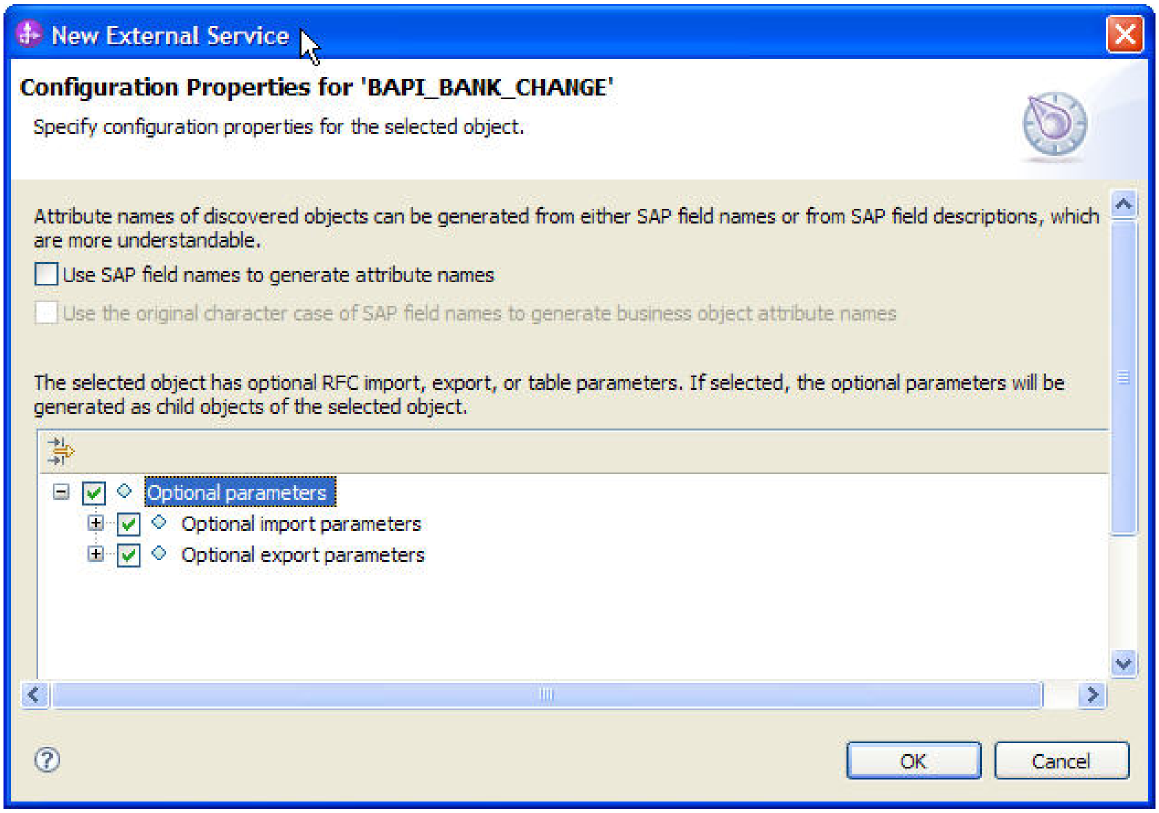
Select the **BAPI_BANK_CHANGE** from the metadata tree.

Click the > button.

A popup will appear containing the Configuration properties for the **BAPI_BANK_CHANGE** object.

Check the **Use SAP filed names to generate attributes names checkbox** if you want the Business Object attribute names to be generated using SAP field Names.

You can choose to create attributes in the Business Object for any optional parameter in the BAPI. Click **OK**.



Configuration Properties for 'BAPI_BANK_CHANGE'

Specify configuration properties for the selected object.

Attribute names of discovered objects can be generated from either SAP field names or from SAP field descriptions, which are more understandable.

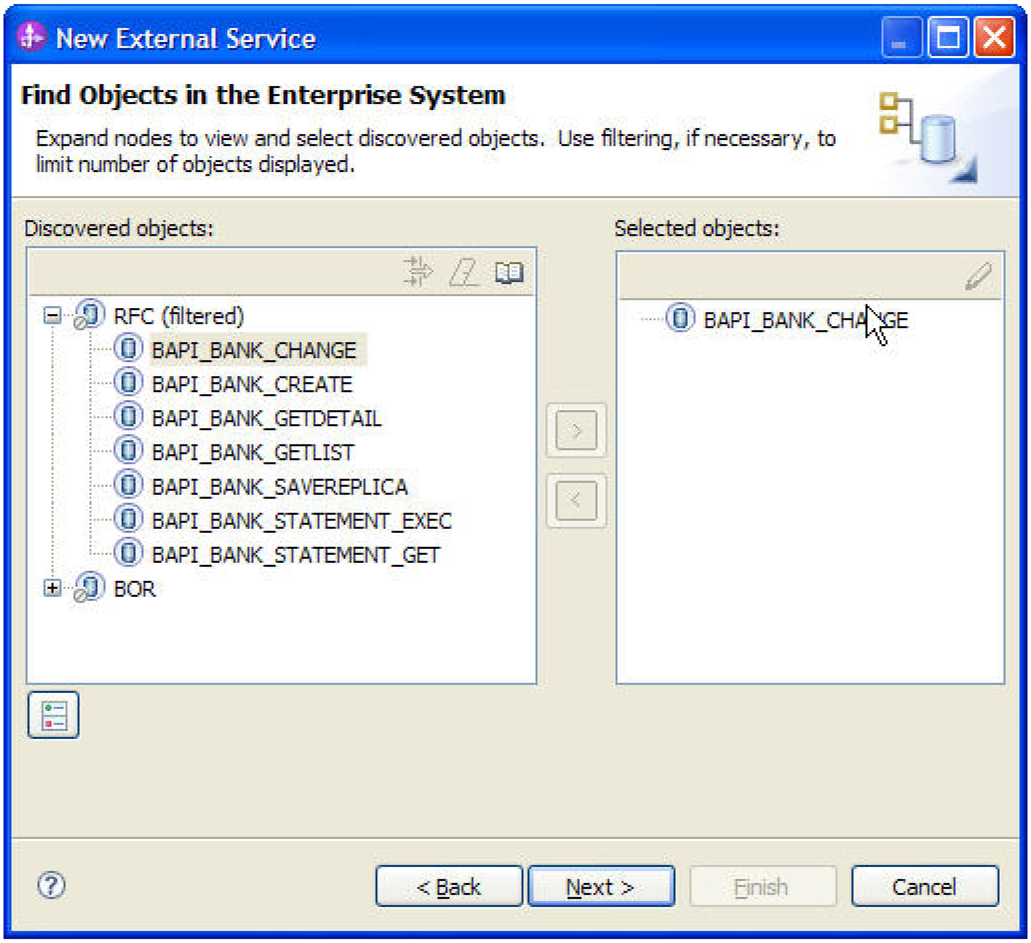
□ Use SAP field names to generate attribute names

□ Use the original character case of SAP field names to generate business object attribute names

The selected object has optional RFC import, export, or table parameters. If selected, the optional parameters will be generated as child objects of the selected object.

- ☑ Optional parameters
  - ☑ Optional import parameters
  - ☑ Optional export parameters

Click OK.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

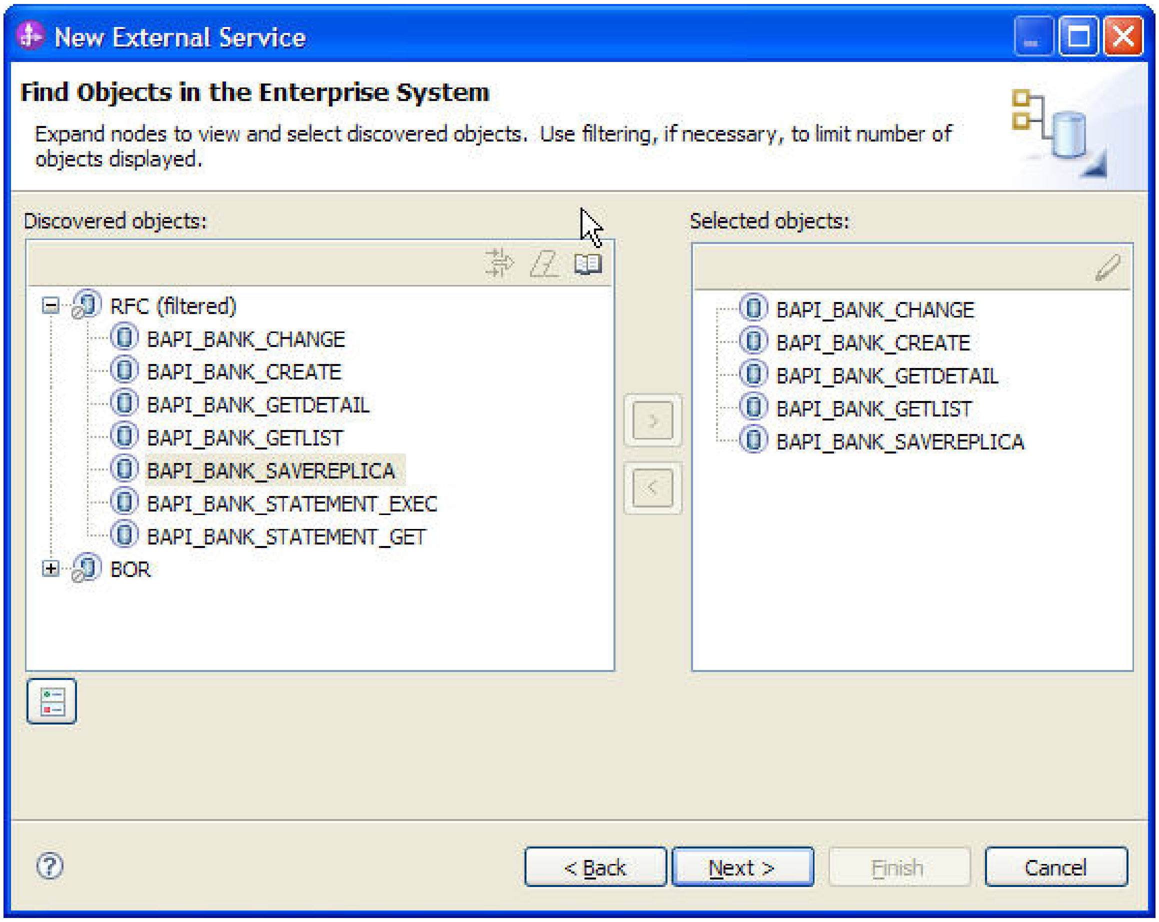
Discovered objects:

- RFC (filtered)
  - BAPI_BANK_CHANGE
  - BAPI_BANK_CREATE
  - BAPI_BANK_GETDETAIL
  - BAPI_BANK_GETLIST
  - BAPI_BANK_SAVEREPLICA
  - BAPI_BANK_STATEMENT_EXEC
  - BAPI_BANK_STATEMENT_GET
- BOR

Selected objects:

- BAPI_BANK_CHANGE

Similarly add BAPI_BAND_CREATE, BAPI_BANK_GETDETAIL, BAPI_BANK_GETLIST and BAPI_BANL_SAVEREPLICA.



New External Service

Find Objects in the Enterprise System

Expand nodes to view and select discovered objects. Use filtering, if necessary, to limit number of objects displayed.

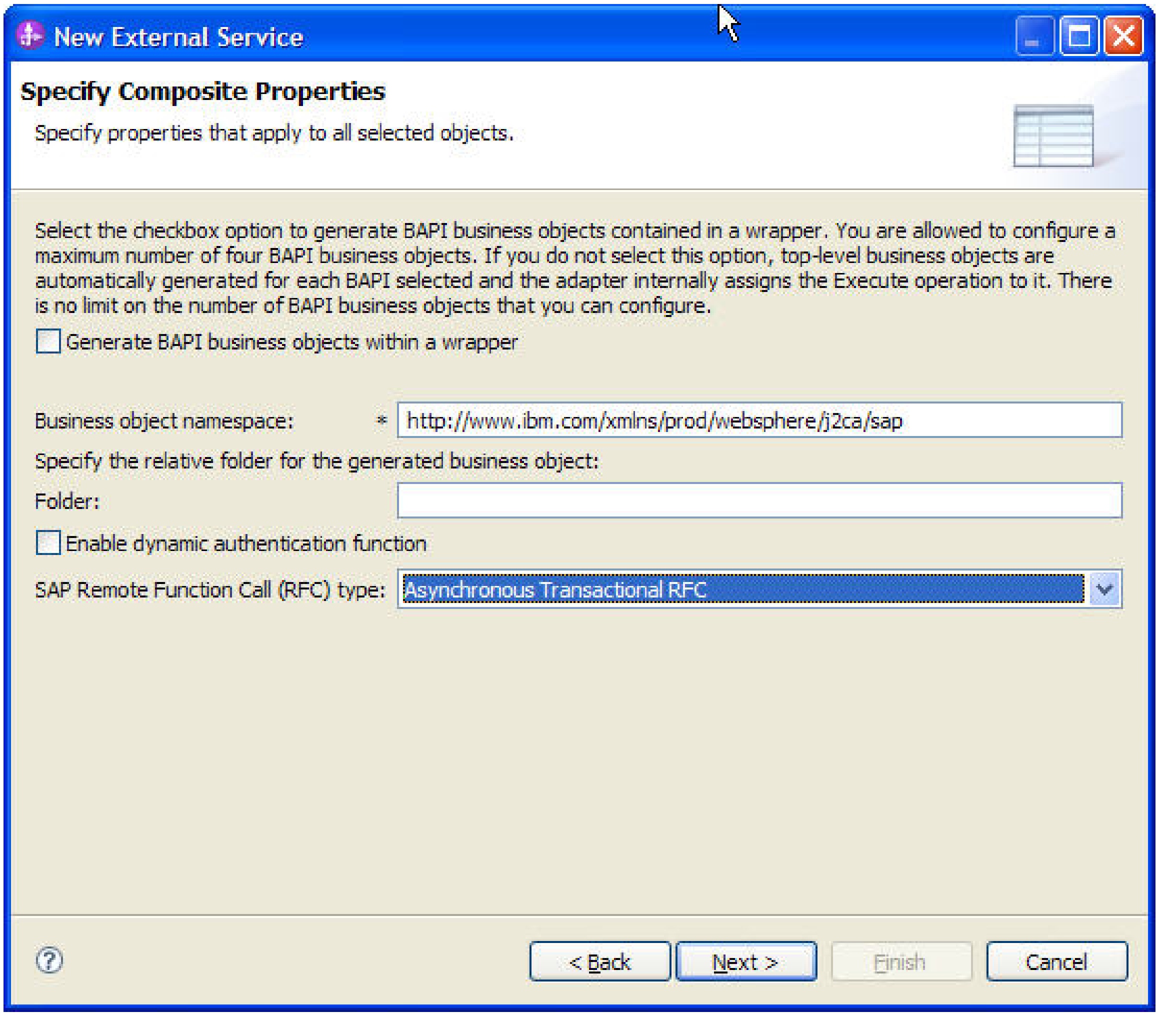
Discovered objects:

- RFC (filtered)
  - BAPI_BANK_CHANGE
  - BAPI_BANK_CREATE
  - BAPI_BANK_GETDETAIL
  - BAPI_BANK_GETLIST
  - BAPI_BANK_SAVEREPLICA
  - BAPI_BANK_STATEMENT_EXEC
  - BAPI_BANK_STATEMENT_GET
- BOR

Selected objects:

- BAPI_BANK_CHANGE
- BAPI_BANK_CREATE
- BAPI_BANK_GETDETAIL
- BAPI_BANK_GETLIST
- BAPI_BANK_SAVEREPLICA

Click **Next**.



Specify Composite Properties

Specify properties that apply to all selected objects.

Select the checkbox option to generate BAPI business objects contained in a wrapper. You are allowed to configure a maximum number of four BAPI business objects. If you do not select this option, top-level business objects are automatically generated for each BAPI selected and the adapter internally assigns the Execute operation to it. There is no limit on the number of BAPI business objects that you can configure.

□ Generate BAPI business objects within a wrapper

Business object namespace: * http://www.ibm.com/xmlns/prod/websphere/j2ca/sap

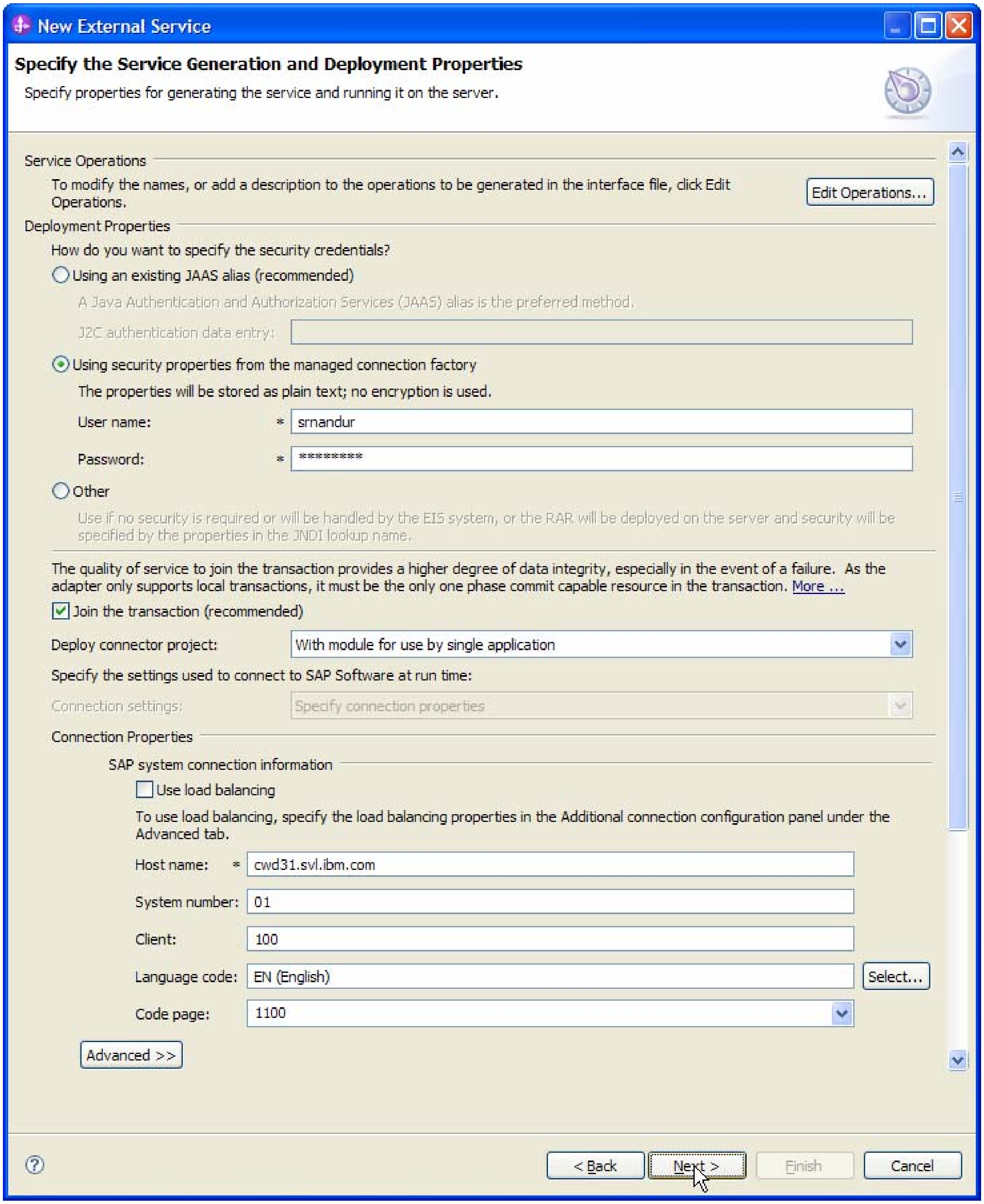
Specify the relative folder for the generated business object:

Folder:

□ Enable dynamic authentication function

SAP Remote Function Call (RFC) type: Asynchronous Transactional RFC

In the **Service Generation and Deployment Configuration** screen enter the connection properties and deployment properties.



New External Service

Specify the Service Generation and Deployment Properties

Specify properties for generating the service and running it on the server.

Service Operations

To modify the names, or add a description to the operations to be generated in the interface file, click Edit Operations.

Deployment Properties

How do you want to specify the security credentials?

○ Using an existing JAAS alias (recommended)

A Java Authentication and Authorization Services (JAAS) alias is the preferred method.

J2C authentication data entry:

● Using security properties from the managed connection factory

The properties will be stored as plain text; no encryption is used.

User name: * srnandur

Password: * *********

○ Other

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

The quality of service to join the transaction provides a higher degree of data integrity, especially in the event of a failure. As the adapter only supports local transactions, it must be the only one phase commit capable resource in the transaction. More ...

☑ Join the transaction (recommended)

Deploy connector project: With module for use by single application

Specify the settings used to connect to SAP Software at run time:

Connection settings: Specify connection properties

Connection Properties

SAP system connection information

□ Use load balancing

To use load balancing, specify the load balancing properties in the Additional connection configuration panel under the Advanced tab.

Host name: * cwd31.svl.ibm.com

System number: 01

Client: 100

Language code: EN (English)

Code page: 1100

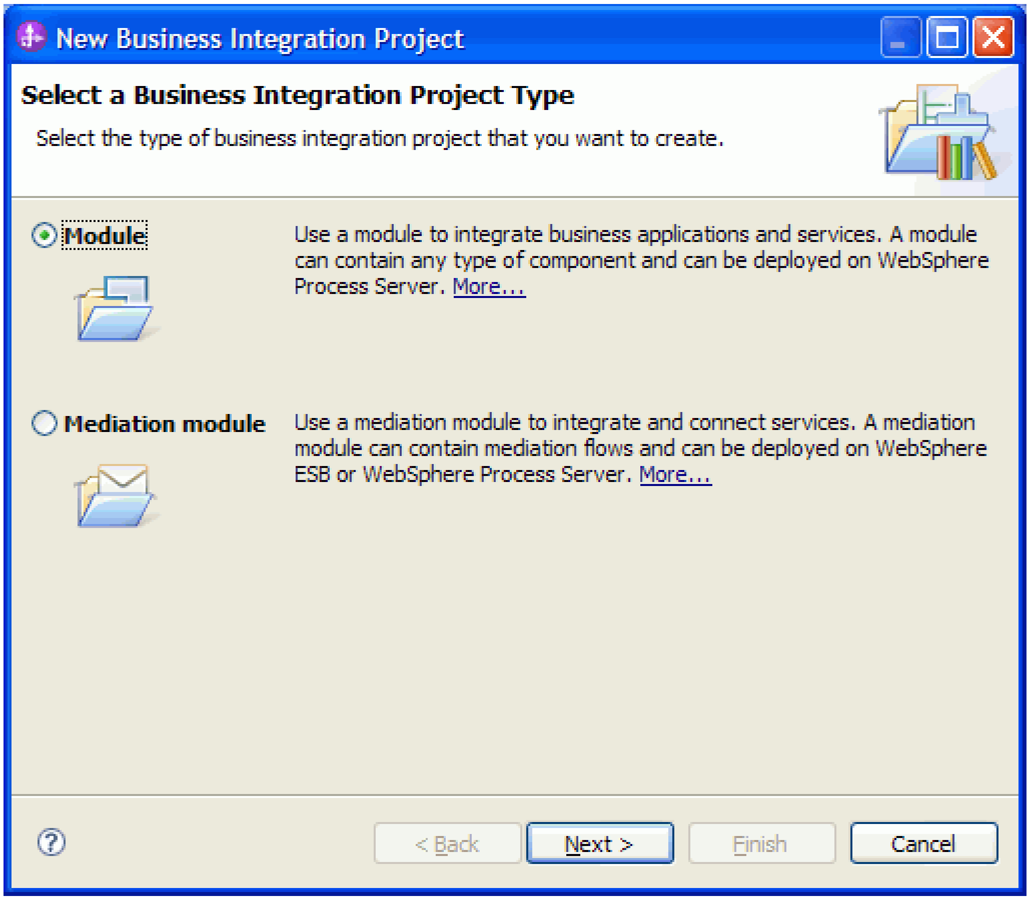
Figure: Service Generation and Deployment Configuration

Note: You can either enter Authentication Alias already created using the **Administrative Console** of the WebSphere Process Server or simply enter the username and password used to login in to the SAP.

Click **Next.**

In the **Specify the Location Properties** screen, click the **New** button next to the Module field to create a new module.

When the **New Business Integration Project** screen appears, select **Module** radio button and click **Next.**



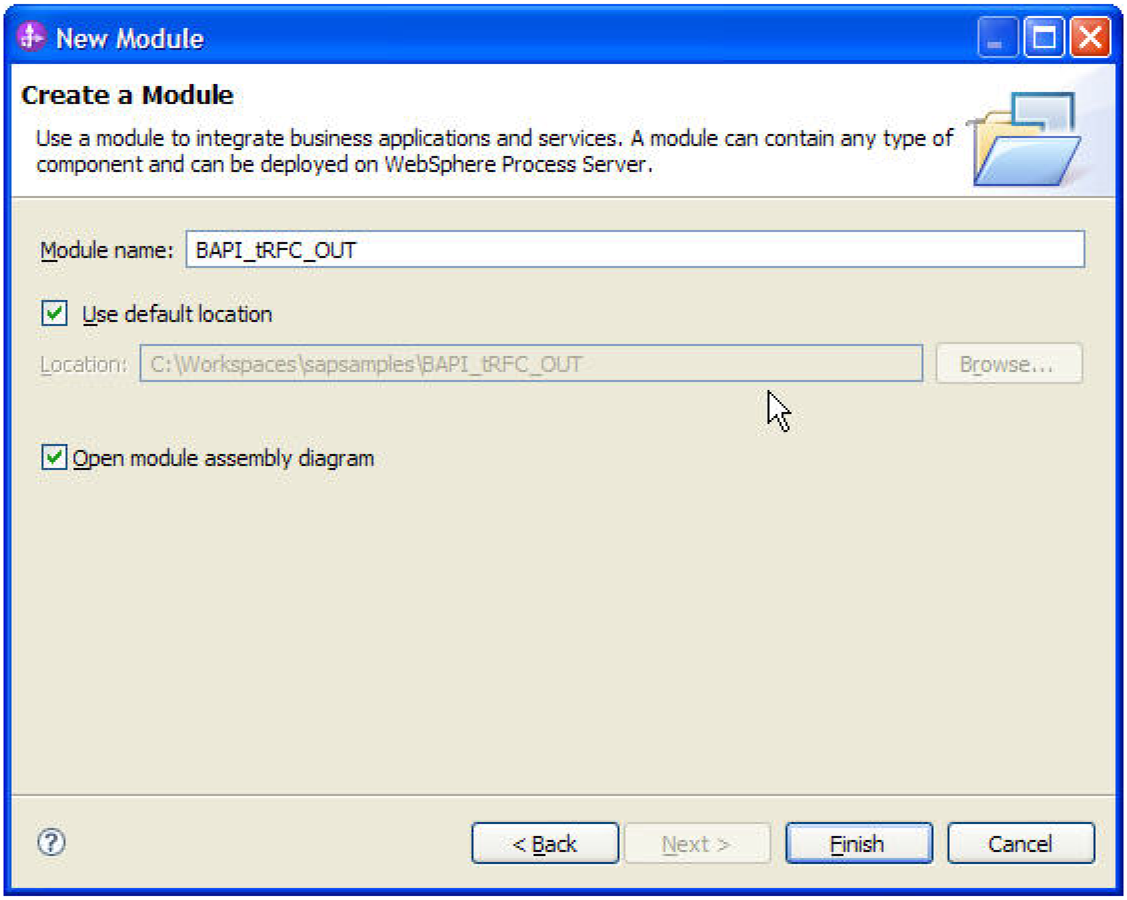
Select a Business Integration Project Type

Select the type of business integration project that you want to create.

● **Module** — Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server. More...

○ **Mediation module** — Use a mediation module to integrate and connect services. A mediation module can contain mediation flows and can be deployed on WebSphere ESB or WebSphere Process Server. More...

In the New Module screen, type **BAPI_qRFC_OUT** in the Module Name field, and then click **Finish**.



Create a Module

Use a module to integrate business applications and services. A module can contain any type of component and can be deployed on WebSphere Process Server.

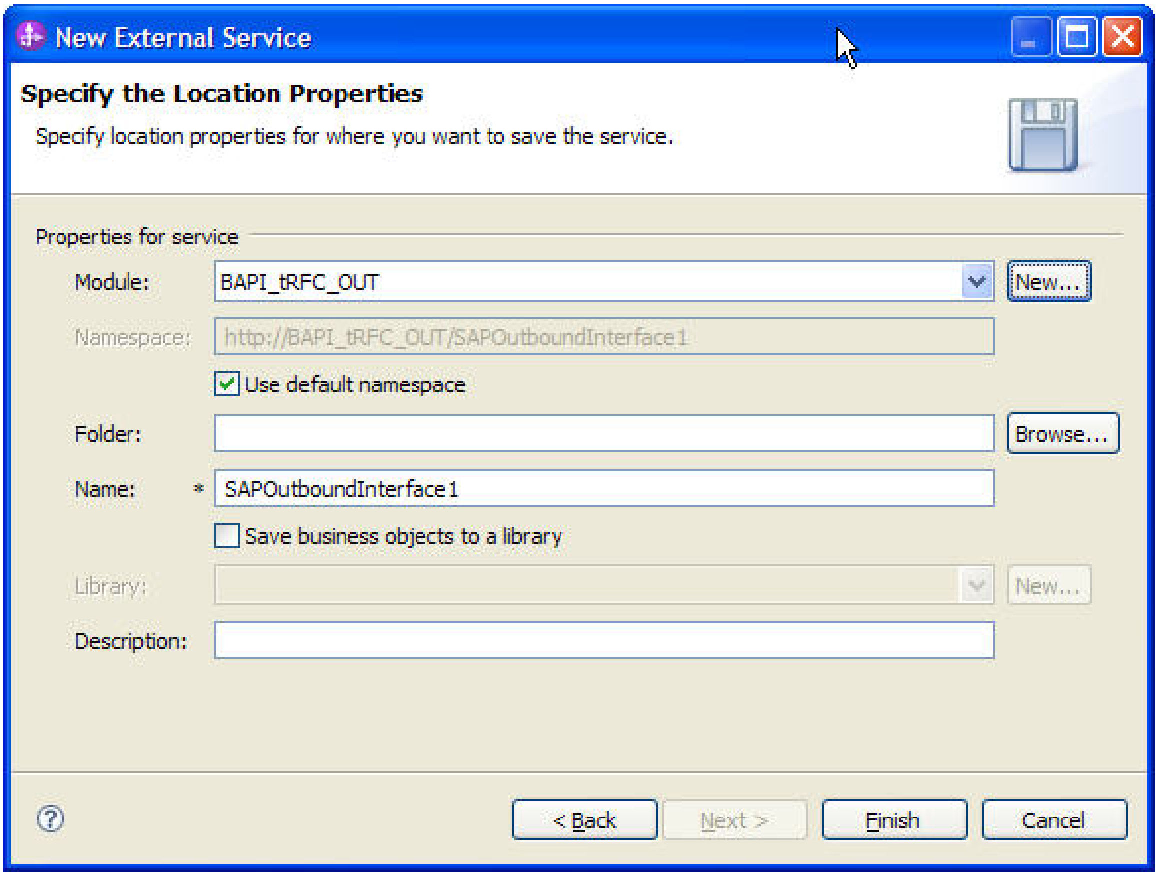
Module name: BAPI_tRFC_OUT

☑ Use default location

Location: C:\Workspaces\sapsamples\BAPI_tRFC_OUT

☑ Open module assembly diagram

Click Finish on the Specify the Location Properties screen.



New External Service

Specify the Location Properties

Specify location properties for where you want to save the service.

Properties for service

Module: BAPI_tRFC_OUT

Namespace: http://BAPI_tRFC_OUT/SAPOutboundInterface1

☑ Use default namespace

Folder:

Name: * SAPOutboundInterface1

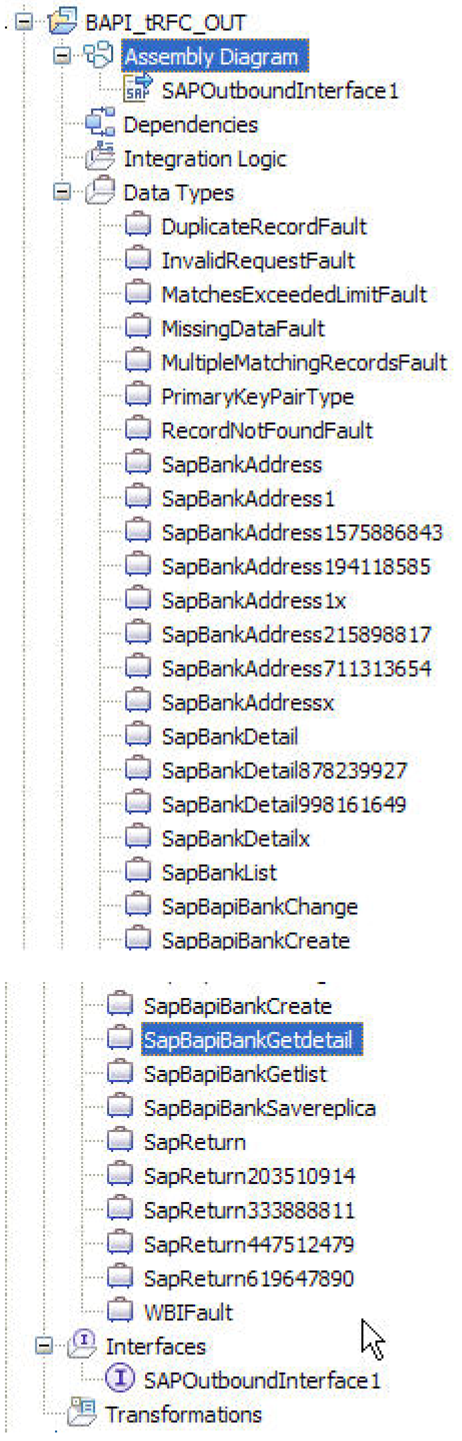
□ Save business objects to a library

Library:

Description:

Click **Finish**.

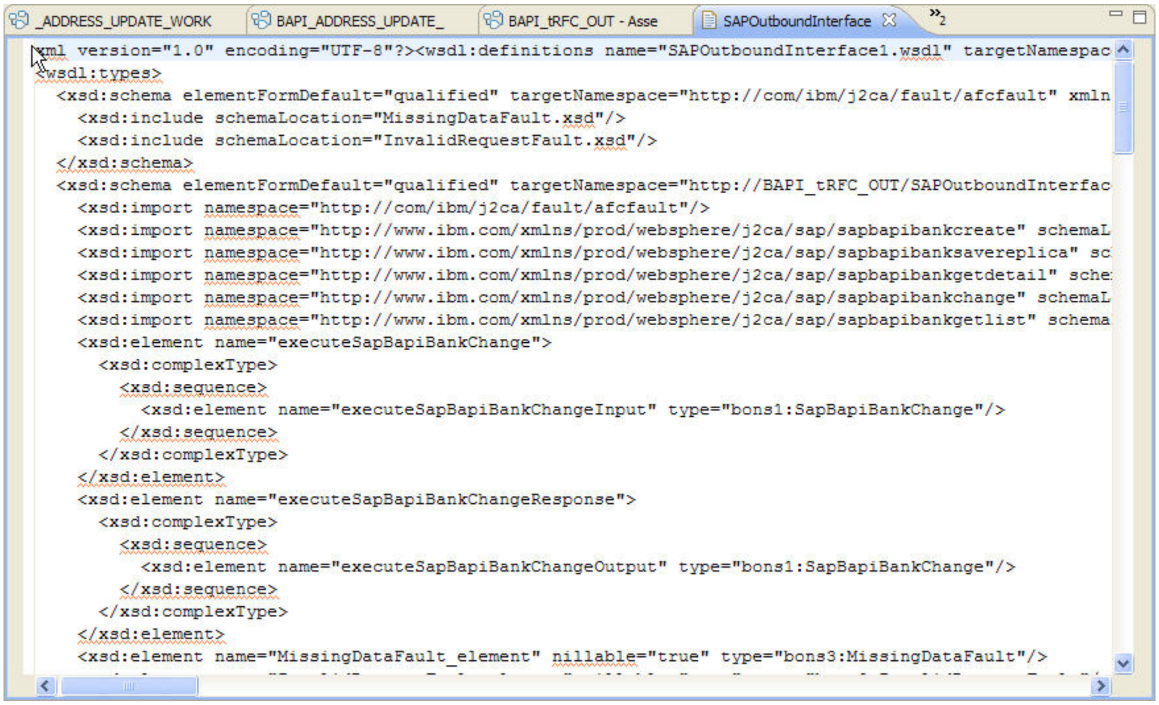
Verify the Results.



- BAPI_tRFC_OUT
  - Assembly Diagram
    - SAPOutboundInterface1
  - Dependencies
  - Integration Logic
  - Data Types
    - DuplicateRecordFault
    - InvalidRequestFault
    - MatchesExceededLimitFault
    - MissingDataFault
    - MultipleMatchingRecordsFault
    - PrimaryKeyPairType
    - RecordNotFoundFault
    - SapBankAddress
    - SapBankAddress1
    - SapBankAddress1575886843
    - SapBankAddress194118585
    - SapBankAddress1x
    - SapBankAddress215898817
    - SapBankAddress711313654
    - SapBankAddressx
    - SapBankDetail
    - SapBankDetail878239927
    - SapBankDetail998161649
    - SapBankDetailx
    - SapBankList
    - SapBapiBankChange
    - SapBapiBankCreate
    - SapBapiBankCreate
    - SapBapiBankGetdetail
    - SapBapiBankGetlist
    - SapBapiBankSavereplica
    - SapReturn
    - SapReturn203510914
    - SapReturn333888811
    - SapReturn447512479
    - SapReturn619647890
    - WBIFault
  - Interfaces
    - SAPOutboundInterface1
  - Transformations

Figure: Artifacts created after the EMD run for the BAPI qRFC Module

The WSDL file generated during the **New External Service** wizard run shows that more than four BAPIs can be selected at the same time.



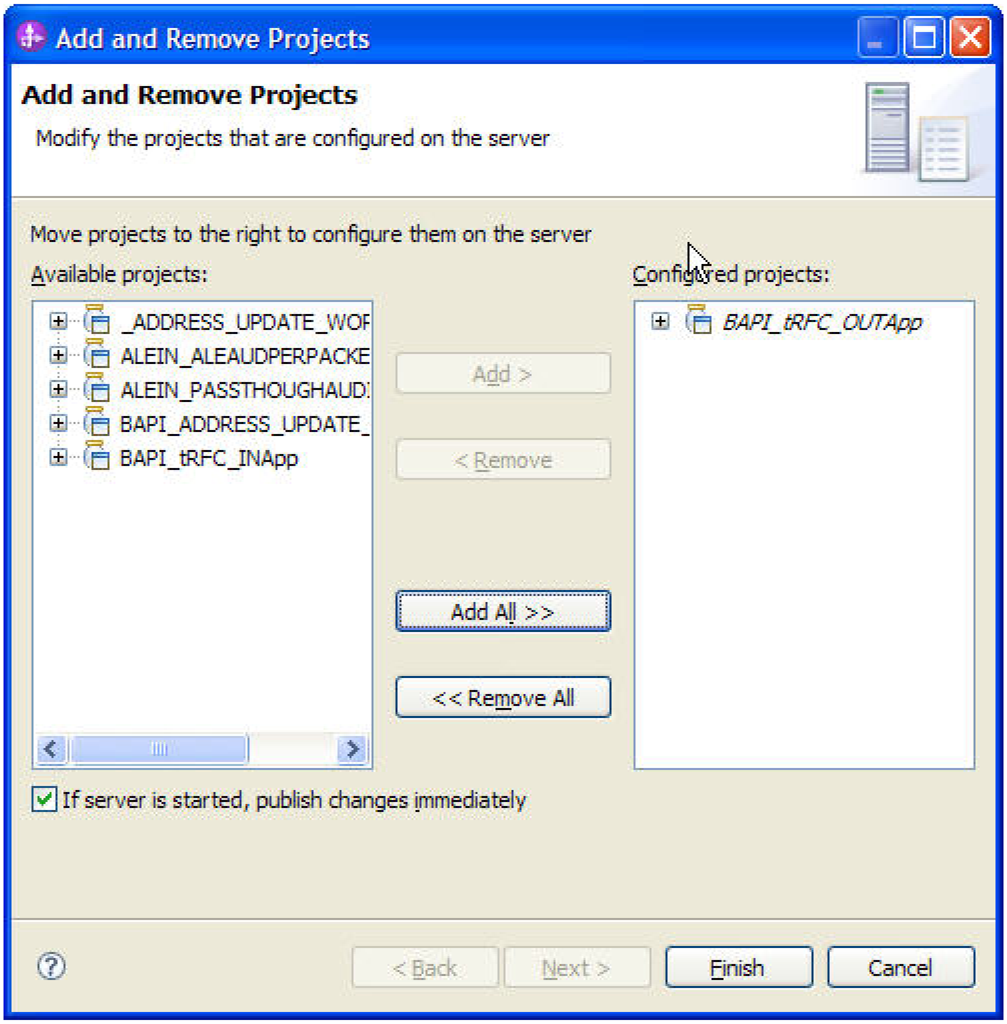
```
xml version="1.0" encoding="UTF-8"?><wsdl:definitions name="SAPOutboundInterface1.wsdl" targetNamespac
<wsdl:types>
  <xsd:schema elementFormDefault="qualified" targetNamespace="http://com/ibm/j2ca/fault/afcfault" xmln
    <xsd:include schemaLocation="MissingDataFault.xsd"/>
    <xsd:include schemaLocation="InvalidRequestFault.xsd"/>
  </xsd:schema>
  <xsd:schema elementFormDefault="qualified" targetNamespace="http://BAPI_tRFC_OUT/SAPOutboundInterfac
    <xsd:import namespace="http://com/ibm/j2ca/fault/afcfault"/>
    <xsd:import namespace="http://www.ibm.com/xmlns/prod/websphere/j2ca/sap/sapbapibankcreate" schemaL
    <xsd:import namespace="http://www.ibm.com/xmlns/prod/websphere/j2ca/sap/sapbapibanksavereplica" sc
    <xsd:import namespace="http://www.ibm.com/xmlns/prod/websphere/j2ca/sap/sapbapibankgetdetail" sche
    <xsd:import namespace="http://www.ibm.com/xmlns/prod/websphere/j2ca/sap/sapbapibankchange" schemaL
    <xsd:import namespace="http://www.ibm.com/xmlns/prod/websphere/j2ca/sap/sapbapibankgetlist" schema
    <xsd:element name="executeSapBapiBankChange">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="executeSapBapiBankChangeInput" type="bons1:SapBapiBankChange"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="executeSapBapiBankChangeResponse">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="executeSapBapiBankChangeOutput" type="bons1:SapBapiBankChange"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="MissingDataFault_element" nillable="true" type="bons3:MissingDataFault"/>
```

Deploying the module in the test environment

After completing the New External Service wizard, an SCA module gets generated with EIS Import or Export options. This module must be installed in the WebSphere Integration Developer's Test Client.

Right click on your server node in the Server tab and add the module BAPI_qRFC_IN by selecting **Add and Remove Projects**.

The project BAPI_qRFC_INApp will be listed under **Available projects.**



Add and Remove Projects

Add and Remove Projects

Modify the projects that are configured on the server

Move projects to the right to configure them on the server

Available projects:

- _ADDRESS_UPDATE_WOF
- ALEIN_ALEAUDPERPACKE
- ALEIN_PASSTHOUGHAUDI
- BAPI_ADDRESS_UPDATE_
- BAPI_tRFC_INApp

Configured projects:

- *BAPI_tRFC_OUTApp*

☑ If server is started, publish changes immediately

Click **Finish**.

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