Information Builders

iWay

iWay Application Adapter for SAP ERP User's Guide

Version 7.0.x and Higher

August 16, 2018

Contents

Preface

This documentation describes how to configure and use the iWay Application Adapter for SAP ERP.

Note: This Release 7.0.x content is currently being updated to support iWay Release 8.0.x software. In the meantime, it can serve as a reference for your use of iWay Release 8. If you have any questions, please contact *Customer_Success@ibi.com*.

How This Manual Is Organized

This manual includes the following chapters:

	Chapter/Appendix	Contents
1	Introducing the iWay Application Adapter for SAP ERP	Provides an overview of the iWay Application Adapter for SAP ERP. Describes key features and functionality of the adapter.
2	SAP Supported Platforms Matrix	Specifies version, platform, and database support information for iWay Application Adapter for SAP ERP.
3	SAP ERP Quick Start Guide	Provides a quick start guide for the iWay Application Adapter for SAP ERP.
4	SAP ERP Getting Started	Provides a quick start guide to use the iWay Application Adapter for SAP ERP.
5	Configuring SAP ERP Inbound Processing	Describes how to configure your SAP ERP system for inbound (client) processing.
6	Configuring SAP ERP Adapter Targets and Creating XML Schemas	Describes how to use iWay Explorer to configure adapter targets and create XML schemas for integration between the iWay Application Adapter for SAP ERP and a SAP ERP system.
7	Creating and Publishing iWay Business Services	Describes how to create and publish iWay Business Services using iWay Explorer for the iWay Application Adapter for SAP ERP.
8	Understanding SAP ERP Events	Describes how to configure and test your SAP ERP system for event processing.

	Chapter/Appendix	Contents
9	Configuring SAP ERP Event Handling	Describes how to create ports and channels using iWay Explorer for the iWay Application Adapter for SAP ERP to listen for SAP ERP events.
10	Configuring the SAP ERP Adapter in an iWay Environment	Describes how the adapter can be assigned to an iWay Service Manager channel.
11	SAP ERP Troubleshooting Guidelines	Provides useful troubleshooting guidelines for the iWay Application Adapter for SAP ERP.

Documentation Conventions

The following table describes the documentation conventions that are used in this manual.

Convention	Description
THIS TYPEFACE or this typeface	Denotes syntax that you must enter exactly as shown.
this typeface	Represents a placeholder (or variable), a cross-reference, or an important term. It may also indicate a button, menu item, or dialog box option that you can click or select.
underscore	Indicates a default setting.
Key + Key	Indicates keys that you must press simultaneously.
{ }	Indicates two or three choices. Type one of them, not the braces.
|	Separates mutually exclusive choices in syntax. Type one of them, not the symbol.
...	Indicates that you can enter a parameter multiple times. Type only the parameter, not the ellipsis (...).
. . .	Indicates that there are (or could be) intervening or additional commands.

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Help Us to Serve You Better

To help our consultants answer your questions effectively, be prepared to provide specifications and sample files and to answer questions about errors and problems.

The following tables list the environment information our consultants require.

Platform	
Operating System	
OS Version	

JVM Vendor	
JVM Version	

The following table lists the deployment information our consultants require.

Adapter Deployment	For example, JCA, Business Services Provider, iWay Service Manager
Container	For example, WebSphere
Version	
Enterprise Information System (EIS) - if any	
EIS Release Level	
EIS Service Pack	
EIS Platform	

The following table lists iWay-related information needed by our consultants.

iWay Adapter	
iWay Release Level	
iWay Patch	

The following table lists additional questions to help us serve you better.

Request/Question	Error/Problem Details or Information
Did the problem arise through a service or event?	
Provide usage scenarios or summarize the application that produces the problem.	

Request/Question	Error/Problem Details or Information
When did the problem start?	
Can you reproduce this problem consistently?	
Describe the problem.	
Describe the steps to reproduce the problem.	
Specify the error message(s).	
Any change in the application environment: software configuration, EIS/database configuration, application, and so forth?	
Under what circumstance does the problem *not* occur?	

The following is a list of error/problem files that might be applicable.

- ❑ Input documents (XML instance, XML schema, non-XML documents)
- ❑ Transformation files
- ❑ Error screen shots
- ❑ Error output files
- ❑ Trace files
- ❑ Service Manager package to reproduce problem
- ❑ Custom functions and agents in use
- ❑ Diagnostic Zip
- ❑ Transaction log

For information on tracing, see the *iWay Service Manager User's Guide*.

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Chapter 1

Introducing the iWay Application Adapter for SAP ERP

The following section provides an overview of the iWay Application Adapter for SAP ERP.

In this chapter:

Features of the iWay Application Adapter for SAP ERP

The iWay Application Adapter for SAP ERPprovides a means to exchange real-time business data between SAP ERP Enterprise Central Component (ECC) 5.0 and 6.0 systems, and other application, database, or external business partner systems. The adapter enables external applications for inbound and outbound processing with SAP ERP.

The adapter uses XML messages to enable non-SAP ERP applications to communicate and exchange transactions with SAP ERP using one of the following two methods.

- **Service Adapter.** Applications use this capability when they must initiate a SAP ERP business event.
- **Event Adapter.** Applications use this capability if they require access to SAP ERP data only when a SAP ERP business event occurs.

The iWay Application Adapter for SAP ERP provides:

- Message interactions through the adapter may be of type request and response, event and reply, or event receive.
- SAP object repository metadata browser support to build XML schemas and web services to handle adapter requests or event data.

- Support for the following interfaces to SAP:
  - Remote Function Modules (RFM)
  - Business Application Programming Interfaces (BAPI)
  - Intermediate Documents (IDoc)

Considerations for SAP ERP (SAP JCo 3.x)

SAP has released SAP Java Connector (JCo) Version 3 for Java Versions 1.5, 1.6, and 1.7 support. iWay Software has also released the SAP ERP adapter (using SAP JCo 3.x) to supersede the SAP ERP adapter (using SAP JCo 2.x). iWay Software recommends that all customers migrate to the latest version to take advantage of the speed and stability that is offered by SAP JCo 3.x and the new features that have been added to the SAP ERP adapter. The latest release of the SAP ERP adapter contains all of the fixes made to the previous version of the adapter. In addition, all new feature enhancements are being developed in the SAP ERP adapter (using SAP JCo 3.x).

For specific releases of SAP JCo 3.x, see SAP note 1077727. iWay Software has separately announced the advanced notification of End Of Support (EOS) for the SAP ERP adapter (using SAP JCo 2.x) effective 12/31/2011.

iWay Software released the SAP ERP adapter for SAP JCo version 2.1.x in 2007. The SAP JCo 2.1.x support is limited to Java Version 1.4 support. Note that while SAP has extended the life of JCo 2.x until 2013, iWay Software can only support this connector for SUN JVM Version 1.4 under the terms of SAP note 549268.

If you are running critical applications with the SAP ERP adapter (using SAP JCo 2.x), it is recommended to contact iWay Software Customer Support Services for the migration path to the SAP ERP adapter (using SAP JCo 3.x).

Classic SAP ERP Technologies for ABAP

The iWay Application Adapter for SAP ERP is designed to provide standard access to SAP ERP interfaces such as Remote Function Call (RFC) modules, BAPIs (Business Application Programming Interfaces), and IDocs (Intermediate Documents), that are used to support existing business processes.

The adapter only supports Enterprise Central Components (ECC) APIs that are accessed by classic SAP ERP technologies. If you require support for additional SAP ERP functionality and components, please contact your iWay Software Sales Representative.

These business components and methods are available to the adapter as requests of SAP ERP and to the event adapter when SAP ERP invokes its remote requests and work in the following ways:

- **Business Application Programming Interfaces (BAPIs).** Interfaces within the business framework that are used to link SAP ERP components to one another or to third-party components. BAPIs are called synchronously and return information.
- **Remote Function Call (RFC) Modules.** SAP ERP application interfaces that enable clients to invoke SAP ERP technologies and receive responses.

  Note: Depending on the release or service pack installed, certain RFCs may not exist in your particular SAP ERP system. Therefore, the examples included in this documentation may not be relevant to your system. If this is the case, you should use the examples as a general reference for adapter functionality and choose an RFC that exists within your SAP ERP application environment.

  As described in SAP Release Note 109533, SAP ERP Function Modules (RFCs) can be delivered with different release statuses. SAP ERP supports only RFCs that are marked with the *Released for Customer* status. There is no claim to the continued existence/ functionality of modules not marked with this status. For more information on the status of a specific function module, consult the SAP Service Marketplace.
- **Intermediate Documents (IDocs).** The *logical messages* that correspond to different business processes. They enable different application systems to be linked by a message-based interface. The IDoc type indicates the SAP ERP format to use to transfer the data for a business transaction. An IDoc is a real business process in the form of an IDoc type that can transfer several message types. An IDoc type is described by the following components:
  - **Control records.** A control record contains data that identifies the sender, the receiver, and the IDoc structure. An IDoc contains one control record.
  - **Data records.** A data record consists of a fixed administration part and a data part (segment). The number and format of the segments can be different for each IDoc type.
  - **Status records.** A status record describes the processing stages through which an IDoc passes.

    The following scenario is an example of IDoc functionality and its components:

Purchase order number 4711 is to be sent to a vendor through an IDoc. The purchase order corresponds to the *logical* message ORDERS. The physical IDoc type ORDERS01 IDoc number 0815 is created and has the status records *created* and *passed to port ok*. If a STATUS IDoc is used, the IDoc status is then updated to *dispatched ok*.

Supported Versions and Platforms

The following SAP ERP platforms are supported by the iWay Application Adapter for SAP ERP:

- SAP R/3 Enterprise 47x100
- SAP R/3 Enterprise 47x200
- SAP ERP Central Component 5.0 running on SAP Server Basis Component 7.0 - 7.5
- SAP ERP Central Component 6.0 running on SAP Server Basis Component 7.0 - 7.5

Note: For SAP ERP Central Component (ECC) Server Version 7.03 and higher, the new security model has all function module access denied unless granted. You must create authorizations using the S_RFC authorization object and grant access to specific function groups or function modules for use with the adapter.

The following is a general list of operating systems that are supported by the iWay Application Adapter for SAP ERP:

- Windows 32-bit (Windows 7, 8, 8.1, and 10. Windows Server 2008, 2012, and 2012R2)
- Windows 64-bit (Windows 7, 8, 8.1, and 10. Windows Server 2008, 2012, and 2012R2)
- Linux (Intel processor only) - (32-bit and 64-bit)
- HP-UX PA-RISC - (64-bit only)
- HP-UX Itanium - (64-bit only)
- Solaris - (64-bit only)
- AIX - (64-bit only)

For supported JVM information that corresponds to each operating system, see the *SAP Note #1077727* in the *SAP Service Marketplace*.

The iWay Application Adapter for SAP ERP uses the release of iWay Service Manager (iSM) that it is contained within. For more information on the current version of Java that is supported by iSM, see the *iWay New Features Bulletin and Release Notes*. For additional support, see *SAP Note #1077727* in the *SAP Service Marketplace*.

The iWay Application Adapter for SAP ERP uses the SAP Java Connector (JCo) and the SAP RFC library to communicate with SAP ERP ABAP server targets. To the extent these interfaces and their associated object types are supported, the adapter can function within the established protocols for the following object types:

- SAP ALE Intermediate Document (IDOC)
- Remote Function Call (RFC)
- Business API (BAPI)

Other connection methods or interface types are not supported. For releases that are not listed in this document, or for more information about specific applications or servers, please consult your iWay Software Customer Service Representative.

Note: SAP JCo files must match the JVM mode (32- or 64-bit). Strictly mixed mode JVM is not supported. It is possible to run the entire 32-bit stack on a 64-bit machine, but 64-bit can only be run on 64-bit machine types.

For more information on installing the SAP ERP adapter, see *SAP ERP Getting Started* on page 31 and the *iWay Installation and Configuration Guide*.

Integrating With SAP ERP

You can use the iWay Application Adapter for SAP ERP to invoke an SAP ERP business process (for example, add/update account) or you can use the adapter as part of an integration effort to connect SAP ERP and non-SAP ERP systems.

All calls through the SAP JCo are synchronous, meaning both parties must be present to each other for the duration of the call. Some functions (specifically IDocs), are transmitted synchronously, but processing in ALE IDocs is done asynchronously.

In service mode, the iWay Application Adapter for SAP ERP can send requests to SAP ERP using the BAPI, RFC, or ALE interfaces.

The adapter quickly and easily integrates your SAP ERP IDocs, RFCs, and BAPIs with mission critical SAP ERP system applications and other enterprise applications. The benefits of the adapter include:

- Elimination of the requirement for custom coding.
- Consistent data representation.
- Provides a standard XML representation of event data and request/response documents for SAP ERP.

- The developer is freed from the specific details of the SAP ERP interface (BAPI, RFC, IDoc) and the specific configuration details of the target SAP ERP system.
- iWay Application Adapter for SAP ERP is certified by SAP for correct implementation of standards for IDoc processing and transformation in the SAP ICC.

During event processing, the adapter receives RFCs and IDocs directly from SAP ERP. The SAP ERP system can be configured to send an IDoc or RFC to a logical system when a certain event occurs, in this case to the adapter. The output sent by SAP ERP can be in any of the following forms:

- An RFC request, for example, RFC_SYSTEM_INFO.
- An IDoc.

BAPIs have no external events, being reserved by SAP ERP for internal event processing. You can use the RFC form of the BAPI to send BAPI data outbound. You can also create IDocs from BAPIs inside SAP ERP, and then process these through regular IDoc channels. This is called asynchronous BAPI processing, and can be used for inbound and outbound processing. Configuring BAPIs for ALE is done by an SAP administrator through the BDBG transaction. BAPIs can then be added to regular ALE distribution models and partner profiles and sent through IDoc channels.

Component Information for the iWay Application Adapter for SAP ERP

The iWay Application Adapter for SAP ERP works in conjunction with one of the following components:

- iWay Service Manager
- iWay Explorer
- iWay Business Services Provider (iBSP)

When hosted in an iWay environment, the adapter is configured through iWay Service Manager and iWay Explorer. iWay Explorer is used to configure adapter connections, create web services, and configure event capabilities.

When the adapter is hosted in a third party application server environment, iWay Explorer (used to configure SAP ERP connections, create web services, and configure event capabilities) can be configured to work in a web services environment in conjunction with iBSP.

Component Information Roadmap

The following table lists the deployment component and the location of component information for the iWay Application Adapter for SAP ERP.

Deployed Component	For more information, see
iWay Service Manager	Chapter 9 of this guide *iWay Service Manager User's Guide*
iWay Explorer	Chapters 4, 5, 6, and 7 of this guide *iWay Service Manager User's Guide*
iWay Business Services Provider (iBSP)	*iWay Installation and Configuration Guide*

iWay Service Manager

iWay Service Manager is the heart of the Universal Adapter Framework and is an open transport service bus. Service Manager uses graphical tools to create sophisticated integration services without writing custom integration code by:

- Creating metadata from target applications.
- Transforming and mapping interfaces.
- Managing stateless processes.

Its capability to manage complex adapter interactions makes it ideally suited to be the foundation of a service-oriented architecture.

iWay Explorer

iWay Explorer uses a tree interface to introspect the SAP ERP system metadata. The explorer enables you to create XML schemas and web services for the associated object. In addition, you can create ports and channels to listen for events in SAP ERP. External applications that access SAP ERP through the iWay Application Adapter for SAP ERP use either XML schemas or web services to pass data between the external application and the adapter.

iWay Business Services Provider

The iWay Business Services Provider (iBSP) exposes, as web services, enterprise assets that are accessible from adapters regardless of the programming language or the particular operating system.

iBSP simplifies the creation and execution of web services when running:

- Custom and legacy applications.

- Database queries and stored procedures.
- Packaged applications.
- Terminal emulation and screen-based systems.
- Transactional systems.

Coupled with a platform and language independent messaging protocol called SOAP (Simple Object Access Protocol), XML enables application development and integration by assembling previously built components from multiple web services.

Web Services and Java Connector Architecture Functionality

The following topics describe how the iWay Application Adapter for SAP ERP can incorporate web services and Java Connector Architecture technology.

Web Services

Web services enable SAP ERP calls to be made across the Internet or an intranet, using specialized versions of the XML language that allow a developer to specify the parameters, connections methods, and remote calls and store them for reference in a repository. At run time, a person, an interface, or another function, can read this repository and automatically invoke the service. Web services currently do not have industry standards for transactional behavior. Web services are useful when your function calls must be made across firewall boundaries. Using web services, you can use functions provided by external providers, assuming you know the function interface.

Web Services Example:

A web service exposes the *cup* interface, which provides a teacup. The Acme Company exposes the *tea* web service, which provides a brown liquid when the correct parameter *money* is provided. A cup of tea can be received by invoking the *tea* web service and passing the *money* parameter. Additional components are not required to receive tea using the *tea* web service.

Chapter 2

SAP Supported Platforms Matrix

iWay Software is committed to support the diverse environments and varied systems of our users through support for leading enterprise applications, platforms, and databases.

This section specifies version, platform, and database support information for iWay Application Adapter for SAP ERP (SAP JCo 3.x). It is designed to provide a consolidated view of SAP ERP (SAP JCo 3.x) releases and the various operating systems and databases, on which they are supported.

In this chapter:

SAP Supported Platform Overview

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports SAP ERP 6.0 on SAP NetWeaver server 7.0 and higher. It is backwards compatible with older SAP releases (such as SAP R/3) that are not on the SAP maintenance cycle. Contact your local branch for the extended maintenance required for these releases. The minimum level is SAP R/3 4.5B. iWay Application Adapter for SAP ERP (SAP JCo 3.x) adapter communicates to SAP applications through the SAP Java Connector. For the current SAP supported release of the Java Connector, see SAP Note 1077727.

Supported SAP Versions

iWay Application Adapter for SAP ERP (SAP JCo 3.x) is intended for use on SAP ERP 5 and SAP ERP 6 on SAP NetWeaver application servers with release level 700 to 740. For more information on the current SAP supported release levels of these products, see the SAP Product Availability Matrix (PAM) on the SAP Service Marketplace (service.sap.com).

The SAP Business Suite (CRM,SRM,SCM and PLM) is supported at the 7.0 level for Remote Function calls (including IDocs) and the interface styles described above. No application specific support is implied or explicitly stated.

Support for the SAP Industry Solutions is at the most current SAP release level and used only for Remote Function calls (including IDocs) and the interface styles described above.

Earlier releases of SAP R/3 that are not on the official SAP support matrix can be used with the adapter. Contact the local Information Builders branch and ask about extended SAP support.

This adapter may not be used on any other SAP product that is not stated in *Supported SAP Versions* on page 22.

This adapter cannot be used without connection to an SAP system as one endpoint.

Operating Systems for SAP ERP

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports all of the operating systems that are listed in the *iWay Installation and Configuration Guide* under *Operating System Requirements*.

Databases

iWay Application Adapter for SAP ERP (SAP JCo 3.x) does not function directly with databases, and only operates at the API level.

Java Development Kit (JDK)

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports the Java Development Kit (JDK) versions that are listed in the *iWay Installation and Configuration Guide* under *Java Requirements*.

SAP ERP Communication Modes

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports the following communication modes:

- **Services (Outbound).** iWay Application Adapter for SAP ERP (SAP JCo 3.x) can send messages to SAP.
- **Events (Inbound).** iWay Application Adapter for SAP ERP (SAP JCo 3.x) can receive messages from SAP.

SAP ERP Object Types and Interfaces

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports the following SAP Object Types and Interfaces:

- **Business Application Interface** (BAPI, attribute style)
- **Remote Function Call** (element style)
- **Intermediate Document** (iDoc) either XML element or SAP positional.

SAP ERP Communication Types

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports the following communication types:

- Outbound to SAP (Adapter is client):
  - **Business API (BAPI).** Synchronous Request/Response
  - **Remote Function Module.** Synchronous Request/Response
  - **IDoc.** Synchronous Transactional/Asynchronous Processing
- Inbound from SAP (Adapter is server):
  - **Remote Function Module.** Synchronous event/reply
  - **IDoc.** Asynchronous Processing/Synchronous Transactional

  Note: BAPI events are internal to the SAP server, use RFM events for outbound processing.

Note: All communications through the SAP JCo are synchronous, but processing may differ between types and direction.

SAP ERP Operations

The operations performed depend on the Remote Function call type and the authorization level of the user calling the function. iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports the following basic functions:

- **Business API (BAPI).** All remotely callable methods (non-dialog).
- **Remote Function Module.** All remotely callable functions.
- **IDoc.** Receive and send.

SAP ERP Data Types

iWay Application Adapter for SAP ERP (SAP JCo 3.x) supports SAP JCo data types including:

- Integer ABAP type I
- Floating Point ABAP type F
- Packed ABAP type P
- Character ABAP type C
- Date as YYMMDD ABAP type D
- Numeric character ABAP type N
- Time ABAP type T
- Hexadecimal (as Base64 encoded) ABAP type X

The following data types are not supported through the adapter:

- TYPE_BOX
- TYPE_DECF16
- TYPE_DECF34
- TYPE ABAP_OBJECT
- TYPE_GENERIC_BOX

Other SAP ERP Functions

The following list shows the other functions for iWay Application Adapter for SAP ERP (SAP JCo 3.x).

- Jco Connection Pooling
- Transactional RFC
- Synchronous external events

Known SAP ERP Limitations

This section lists known issues for iWay Application Adapter for SAP ERP (SAP JCo 3.x).

- iWay Application Adapter for SAP ERP (SAP JCo 3.x) does not support DECF types.
- iWay Application Adapter for SAP ERP (SAP JCo 3.x) does not support ABAP Object exceptions.
- iWay Application Adapter for SAP ERP (SAP JCo 3.x) does not support Queued RFC protocol.

Related Information for SAP ERP in Specific iWay Releases

For more information, see the *iWay New Features Bulletin and Release Notes* documentation for a specific release (for example, iWay Version 7.0.2).

Chapter 3

SAP ERP Quick Start Guide

This chapter provides a quick start guide for the iWay Application Adapter for SAP ERP.

In this chapter:

SAP ERP Quick Start Overview

This quick start guide summarizes the high-level key steps that are required to install, configure, and use the iWay Application Adapter for SAP ERP (SAP JCo 3.x). The quick start guide does not elaborate on any of the steps in detail. Instead, cross-references are provided for the corresponding sections in the *iWay Application Adapter for SAP ERP User's Guide*. Users of the adapter are encouraged to follow the sequence of steps in this guide to quickly connect to SAP ERP and begin using the adapter. To gain a complete understanding about the adapter, it is recommended for users to review the entire *iWay Application Adapter for SAP ERP User's Guide*, as the quick start guide section is not a replacement for that level of detail.

Quick Start Guide for SAP ERP

This section lists and describes the key configuration steps for configuring the iWay Application Adapter for SAP ERP (SAP JCo 3.x) and then integrating with SAP ERP.

Service Mode

In this section, service mode functionality is described (sending documents to SAP ERP and receiving a response).

1. Ensure that you are using a supported environment, as described in *SAP Supported Platforms Matrix* on page 21.
2. Ensure that when you install iWay Service Manager (iWay Integration Suite) you select and install the *SAP ERP* adapter, which is grouped under the *Application Adapters* category.

   For more information, see the *iWay Installation and Configuration Guide*.
3. Obtain the appropriate version of the SAP Java Connector (SAP JCo) from the system administrator or SAP Service Marketplace, install SAP JCo, and then set the appropriate environment variables.

For more information, see *Installing the SAP Java Connector (SAP JCo) 3.x* on page 32.

4. Verify that the SAP JCo installation works before starting iWay Service Manager (iSM).

   For more information, see *Verifying the SAP Java Connector (SAP JCo)* on page 34.

5. Start iWay Service Manager (iSM) and iWay Integration Tools (iIT). Use the iWay Explorer to create a target (connection) to your SAP ERP system.

   For more information, see *Working With a Target* on page 84.

6. View and explore the different SAP API interface types and their objects.

   For more information, see *Viewing Application System Objects* on page 93.

7. Select an object and create an XML schema.

   For more information, see *Creating an XML Schema* on page 99.

8. Create an iWay Business Service from the SAP ERP object.

   For more information, see *Creating and Publishing iWay Business Services* on page 107.

9. Create an XML instance document based on the created XML schema or WSDL from an iWay Business Service and populate the fields with data according to the schema description.

10. If you are using an iWay Business Service, use the Test pane to upload or copy the XML instance document into the iWay Business Service.

    For more information, see *Creating Business Services With iWay Explorer* on page 108.

11. Alternately use the Channel Builder in iWay Integration Tools (iIT) to build and deploy a simple iWay application that can be started, stopped, and monitored from iIT.

    For more information, see the *iWay Integration Tools User's Guide* and *iWay Integration Application User's Guide*.

Event Mode

In this section, event mode functionality is described (receiving an event from SAP ERP).

1. Follow Steps 1 to 5 in the previous *Service Mode* section to install and configure iWay Application Adapter for SAP ERP (SAP JCo 3.x).
2. Create and register an SAP Program ID on the SAP ERP server using the SAP GUI.

   For more information, see *Registering Your Program ID in SAP GUI* on page 121

3. Create a SAP ERP listener using the iSM Administration Console.
4. Create a channel using the Channel Builder in iWay Integration Tools (iIT).

   For more information, see the *iWay Integration Tools User's Guide*.

5. Configure the channel in the Events node of iIT.

   For more information, see the *iWay Integration Tools User's Guide*.

Chapter 4

SAP ERP Getting Started

Task: In this section, you will learn how to:

- Install and configure the iWay Application Adapter for SAP ERP on an iWay system.
- Obtain, install, and verify the SAP Java Connector (JCo).
- Locate and configure the SAP ERP communication parameters for your system or systems.
- Verify a connection to SAP ERP.

In this chapter:

Installing the iWay Application Adapter for SAP ERP

To install the iWay Application Adapter for SAP ERP, you must first select it during the iWay Service Manager (iSM) 7.0 installation. This section provides a quick walk through of the installation process. For more detailed information, see the *iWay Installation and Configuration Guide*.

Procedure: How to Install the iWay Application Adapter for SAP ERP

To install the iWay Application Adapter for SAP ERP:

1. Start the iWay Service Manager (iSM) 7.0 installation by executing the iway70.exe file.

   The iWay 7.0 Service Manager Setup wizard opens.

2. Click *Next*.

   The License Agreement pane is displayed.

3. Review the license agreement and click *Yes* to continue.

   The Customer Information pane is displayed.

4. Enter your user name, company name, and site code.
5. Select the user group that will have access to the installed product. Options include:

   - Anyone who uses this computer (all users)
   - Only for me (Admin)

6. Click *Next*.

   The Setup Type pane is displayed.

7. Click *Next*.

   The Choose Destination Location pane is displayed.

8. Select a different destination folder on your file system for iSM 7.0 or accept the default (C:\Program Files\iway7\).
9. Click *Next*.

   The Adapter Selection pane is displayed.

   Important: By default, only the Technology Adapters group is selected. You must expand the Application Adapters group and expand *SAP ERP* from the list of adapters.

10. Verify that *SAP ERP JCO 30* is selected in the Application Adapters group.
11. Click *Next* and finish the remaining steps of the iSM 7.0 installation according to your requirements.

    For more detailed information, see the *iWay Installation and Configuration Guide*.

Installing the SAP Java Connector (SAP JCo) 3.x

The SAP Java Connector (SAP JCo) is a component provided by SAP ERP that enables the development of SAP ERP-compatible components and applications in Java. SAP JCo is required by the iWay Application Adapter for SAP ERP to support communication with the SAP ERP Server in both directions: inbound calls (Java calls ABAP) and outbound calls (ABAP calls Java). This section describes how to install SAP JCo.

The official supported platform for the iWay Application Adapter for SAP ERP is SAP JCo Version 3.*nn* for Java Version 1.*Rnn*. In this section, R refers to the major Java version (5,6, or 7) and *nn* refers to the minor releases. For a list of supported platforms and exact library names, refer to *SAP Note 1077727*.

The SAP JCo library files must be downloaded from the SAP Service Marketplace. A valid SAP support ID is required to access the SAP Service Marketplace. For assistance, contact your SAP ERP administrator.

Follow the SAP instructions on how to extract the SAP JCo from the delivery archive.

SAP JCo 3.x Library Files by Platform

Since the SAP JCo 3.x library files vary by operating system, the following section provides a useful reference that lists the required files by platform.

Platform	SAP JCo Library Files
Windows	❏ sapjco3.jar ❏ sapjco3.dll
Linux/Solaris/OS400	❏ sapjco3.jar ❏ libsapjco3.so
HP-UX	❏ sapjco3.jar ❏ libsapjco3.sl
AIX	❏ sapjco3.jar ❏ libsapjco3.so

Installing SAP JCo on Windows Platforms

The sapjco3.jar and sapjco3.dll files must be placed in the following directory:

<iWaySMHome>\lib

where:

<iWaySMHome>

Is the directory where iWay Service Manager (iSM) is installed.

The Windows PATH runtime variable must modified to reflect the path to the SAP JCo runtime .dll file (sapjco3.dll).

Note: Do not add the sapjco3.dll file into the *{windows-dir}*\System32 directory or the *{windows-dir}*\SysWow64 directory. This can cause versioning and compatibility issues with the sapjco3.jar file.

Installing SAP JCo on UNIX Platforms

On UNIX platforms, the directory in which the shared library files are located must be added to the shared library variable applicable to the operating system. The following is a list of platforms and associated variables:

AIX

- LIBPATH

HP-UX

- SHLIB_PATH

Other UNIX Platforms

- LD_LIBRARY_PATH

Verifying the SAP Java Connector (SAP JCo)

Once you have installed the SAP Java Connector (SAP JCo), as a best practice, you can verify the connector to make sure it is installed correctly and that all the required SAP JCo library files are available.

Verifying SAP JCo on Windows Platforms

This section describes how to verify SAP JCo on Windows platforms.

Procedure: How to Verify SAP JCo on Windows

Perform the following steps to verify SAP JCo on Windows:

1. Navigate to the following directory:

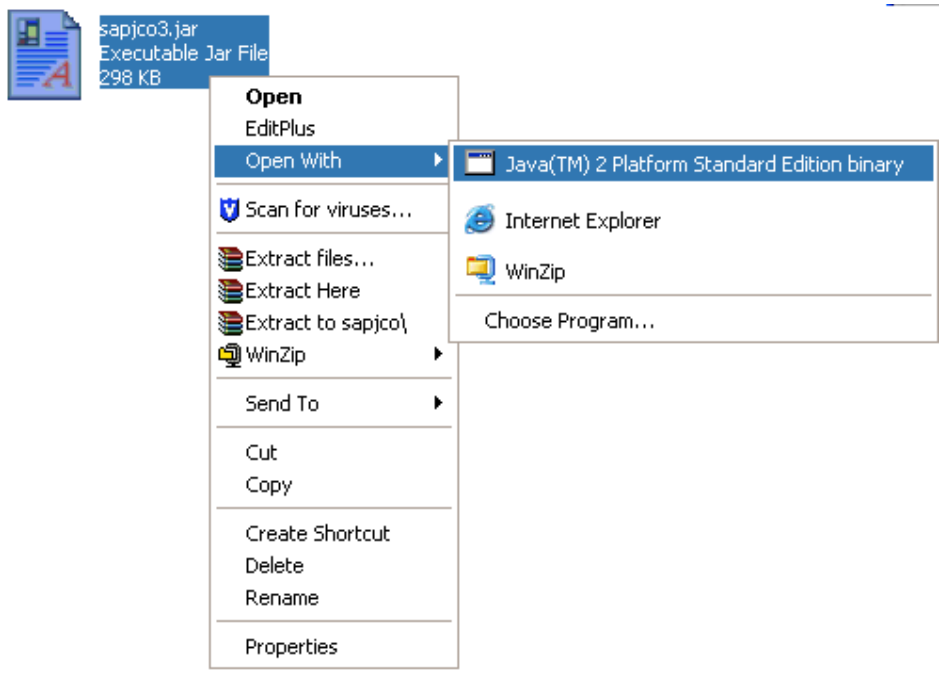
   <iWaySMHome>\lib

   where:

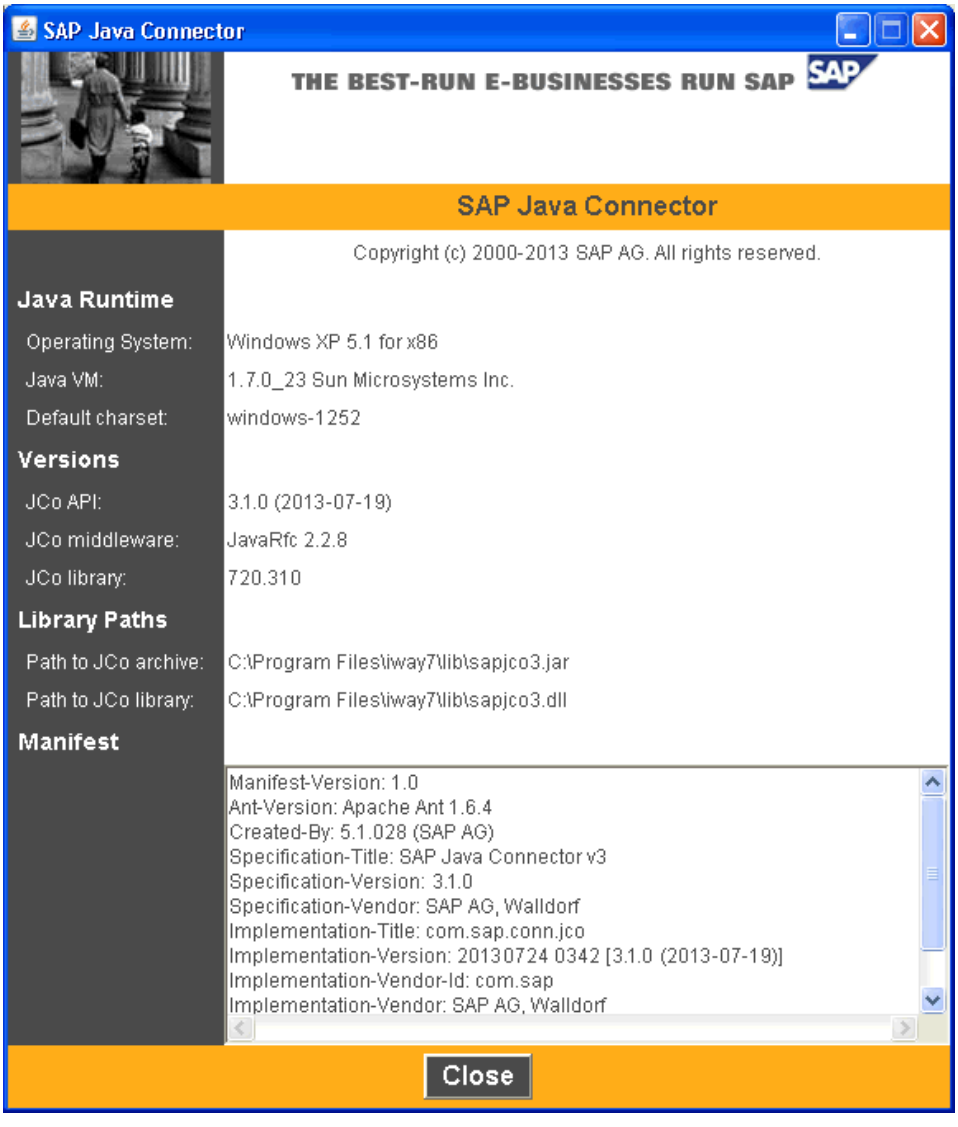
   <iWaySMHome>

   Is the directory where iWay Service Manager is installed

2. Right-click the sapjco3.jar file, select *Open With* from the context menu, and click *Java 2 Platform Standard Edition binary*.



The SAP Java Connector (JCo) dialog box opens, as shown in the following image.



All the required information that pertains to the SAP Java Connector on your Windows platform is provided.

3. Once you have reviewed the SAP Java Connector files, click *Close*.

Verifying SAP JCo on UNIX Platforms

This section describes how to verify SAP JCo on UNIX platforms.

Procedure: How to Verify SAP JCo on UNIX

Perform the following steps to verify SAP JCo on UNIX:

1. Navigate to a UNIX command prompt.
2. Type the following command:

   ```
   $ java -jar sapjco3.jar -stdout
   ```

3. Press *Enter* on your keyboard.

   All the required information that pertains to the SAP Java Connector on your UNIX platform is provided, as shown in the following example.

   ```
   ---------------------------------------------------------------------

   |                              SAP Java Connector (JCo)               |

   |                Copyright (c) 2000-2013 SAP AG. All rights reserved.|

   |                                Version Information                  |

   ---------------------------------------------------------------------

   Java Runtime:

    Operating System:    SunOS 5.7 for sparc

    Java VM:             1.7.0-23 Sun Microsystems Inc.

    Java Codepage:       ASCII

   Versions:

    JCo API:             3.1.0 (2013-07-19)

    JCo middleware:      3.1.0 (2013-07-19)

    JCo library:         3.1.0 (2013-07-19)

    RFC library:         640.0.165

   Paths:
   ```

```
 JCo classes:          /u4/fpgjpr/iWay7/lib/sapjco3.jar

 JCo library:          /u4/fpgjpr/iWay7/lib/libsapjco3.so

 RFC library:          System-defined path

---------------------------------------------------------------------

|                                      Manifest                     |

---------------------------------------------------------------------

Manifest-Version: 1.0

Ant-Version: Apache Ant 1.6.4

Created-By: 5.1.028 (Sun Microsystems Inc.)

Specification-Title: SAP Java Connector

Specification-Version: 3.1.0

Specification-Vendor: SAP AG, Walldorf

Implementation-Title: com.sap.mw.jco

Implementation-Version: 20130724 0342 [3.1.0 (2013-07-19)]

Implementation-Vendor-Id: com.sap

Implementation-Vendor: SAP AG, Walldorf

Main-Class: com.sap.mw.jco.About

---------------------------------------------------------------------

$
```

4. Review the information for the SAP Java Connector on your UNIX platform.

Identifying SAP ERP Logon Parameters

This section allows you to identify SAP ERP logon parameters, which are used to configure a connection to SAP ERP using the iWay Application Adapter for SAP ERP. This information can be used as a reference.

User Parameters

The following table lists and describes user parameters that are located in the User tab.

Parameter	Description	Example	Comment
Client	Identifies the SAP ERP client.	800	A self-contained unit in a SAP ERP system with separate master records and its own set of tables. A client can, for example, be a corporate group.
User	SAP ERP login ID.	abc123	It is recommended to use an SAP communication type ID.
Password	Confidential authentication information.	xyz999	A word or string of characters that identifies or authenticates a user for access to a SAP ERP system.
Language	Language	E	When you log onto the SAP ERP system, you must select a valid installed language.
Codepage	A valid SAP ERP code page (normally, do not set this parameter as conversions are done automatically). If you select an unknown codepage, the RFC terminates with the error SYSTEM_FAILURE.		Specify an initial, logon codepage. It is immediately changed by the SAP ERP client into the automatically detected version, depending on the locale information available to SAP JCo.

Parameter	Description	Example	Comment
Authentication Mode	How the connection is validated.	See the next column for available options.	❑ **Password.** Use the value in the supplied field. ❑ **Logon ticket (SSO2).** Specify the user to be `$SAPSSO2$` and pass the base64 encoded ticket as the password parameter. ❑ **Logon ticket (X509).** Specify the user to be `$X509CERT$` and pass the base64 encoded certificate as the password parameter. **Note:** The user and password parameters that are mentioned here refer to the User and Password parameter fields in iWay Explorer.

System (Application Server) Parameters

The following table lists and describes system parameters that are located in the System tab when defining an Application Server target type.

Parameter	Description	Example	Comment
Application Server	Connects to an ABAP application server.	iwjpsap	Application programs in an R/3 system are run on application servers. To obtain metadata information, a connection to an application server is required.

Parameter	Description	Example	Comment
System Number	Identifies a unique instance on the application server.	00	An application server may have different system numbers. Use the one provided by your administrator.
Explicit commit	Calls the BAPI_TRANSACTION_COMMIT function after every function call in the adapter.	true/false	Use this functionality only if you require explicit commit functionality as it can add to processing time. This command enables commit asynchronously. The commit function is called and returns immediately. It is still possible for the database commit to fail, but no notification would be received. This command is the equivalent to the COMMIT WORK ABAP statement.

System (Message Server) Parameters

The following table lists and describes system parameters that are located in the System tab when defining a Message Server target type.

Parameter	Description	Example	Comment
Message Server	Connects to an ABAP application server.	iwjpsap	For load balancing purposes, application servers from one SAP ERP system are usually configured in logon groups, where each group serves a particular kind of user. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to choose an appropriate server when a user logs onto the system.
R/3 Name	Identifies a unique instance.	P47	Symbolic SAP ERP system name used to identify the system.
Server Group	Identifies the logon group.		Logon group that the user ID belongs with.

Connection Pool Parameters

The following table lists and describes connection pool parameters that are located in the System tab.

Parameter	Description	Example	Comment
Connection pool size	Maximum number of connections for the pool.	2	Sets the maximum number of connections that can be allocated from the pool.
Connection timeout(min)	Maximum time to keep open a free connection (in minutes).	10 (minutes)	Connections that have not been used for at least the connection timeout interval will be closed.
Connection wait time(sec)	Maximum wait for a free connection.	30 (seconds)	Sets the maximum time to wait in a connection request for a free connection. If the pool is exhausted, and there is still no connection available after the specified time, a JCO.Exception with the key JCO_ERROR_RESOURCE will be thrown. The default value is 30 seconds.

SAP ERP Gateway Parameters

The following table lists and describes SAP ERP Gateway parameters that are located in the System tab when defining a Message Server target type.

Parameter	Description	Example	Comment
Gateway host	Enter the name of a SAP ERP Gateway server.	isdsrv2	The SAP ERP Gateway carries out CPI-C services within the SAP ERP world, which are based on TCP/IP. These services enable SAP ERP systems and external programs to communicate with one another.
Gateway service	Enter the service name (usually a compound of the service name and system number).	Sapgw00	Service name on the gateway host.

ALE Parameters

The following table lists and describes ALE parameters.

Parameter	Description	Example	Comment
EDI Version	Specifies the ALE version of the target system.	3	Version 3 (Release 4.0 onwards) should be selected in the port description for all R/3 partner systems with Release 4.0 or higher. Version 2 (release 3.0/3.1) must be set in the port description for all R/3 partner systems with releases lower than 4.0.

Parameter	Description	Example	Comment
IDOC Release	Specifies the version in which the IDOC definition was released.	Blank or a specific SAP ERP release version (for example, 46C).	You can assign segment definitions from previous releases to an IDoc type in the current release. This may be necessary if, for example, the partner is using an older release which supports your current IDoc type, but not your current segment definitions.
IDOC Release Provider	Specifies where the adapter will retrieve the release information.	See the next column for available options.	❑ **IDOC DOREL field.** Uses the information in the IDOC header. ❑ **SAP release.** Retrieves the information from the BASIS release version of the application server. ❑ **user input.** Uses the IDOC release field to retrieve the information. For more information, see *Understanding the User Input Option for the IDOC Release Provider Parameter* on page 45.

Understanding the User Input Option for the IDOC Release Provider Parameter

The *User Input* option for the IDOC Release Provider parameter uses the IDOC release field directly to retrieve this information.

Issues with receiving IDOCs through the adapter can occur when using a segment in the IDOC with a segment release version that is not the default metadata release for the targeted SAP system.

The segment metadata is retrieved for each segment in order. For example, for segment type *E1EDP01* of IDOC *Invoic02* in release 740, the segment definition is *E2EDP01010*, not *E2EDP008*.

Structure Editor: Display PT_SEGMENTS from Entry 1

Column Entry Metadata

28 Entries

NR	SEGMENTTYP	SEGMENTDEF	Q	SEGL	PARSEG
0001	E1EDK01	E2EDK01005		0357	
0002	E1EDKA1	E2EDKA1003	X	0995	
0003	E1EDK02	E2EDK02	X	0058	
0004	E1EDK03	E2EDK03	X	0017	
0005	E1EDK05	E2EDK05001	X	0185	
0006	E1EDK04	E2EDK04001	X	0107	
0007	E1EDK17	E2EDK17	X	0076	
0008	E1EDK18	E2EDK18	X	0089	
0009	E1EDK23	E2EDK23001	X	0047	
0010	E1EDK28	E2EDK28		0225	
0011	E1EDK29	E2EDK29003		0736	
0012	E1EDKT1	E2EDKT1002	X	0089	
0013	E1EDKT2	E2EDKT2001		0072	E1EDKT1
0014	E1EDK14	E2EDK14	X	0038	
0015	E1EDP01	E2EDP01010		0585	
0016	E1EDP02	E2EDP02001	X	0123	E1EDP01
0017	E1EDP03	E2EDP03	X	0017	E1EDP01
0018	E1EDP19	E2EDP19002	X	0242	E1EDP01
0019	E1EDP26	E2EDP26	X	0021	E1EDP01
0020	E1EDPA1	E2EDPA1003	X	0995	E1EDP01
0021	E1EDP05	E2EDP05002	X	0235	E1EDP01
0022	E1EDP04	E2EDP04001	X	0107	E1EDP01
0023	E1EDP28	E2EDP28003		0894	E1EDP01
0024	E1EDP08	E2EDP08		0453	E1EDP01
0025	E1EDP30	E2EDP30000	X	0033	E1EDP01
0026	E1EDPT1	E2EDPT1001	X	0009	E1EDP01
0027	E1EDPT2	E2EDPT2001		0072	E1EDPT1
0028	E1EDS01	E2EDS01	X	0027	

Entering a value of *700* would not work because the release level of the segment definition for *700* is *E2EDP01007*.

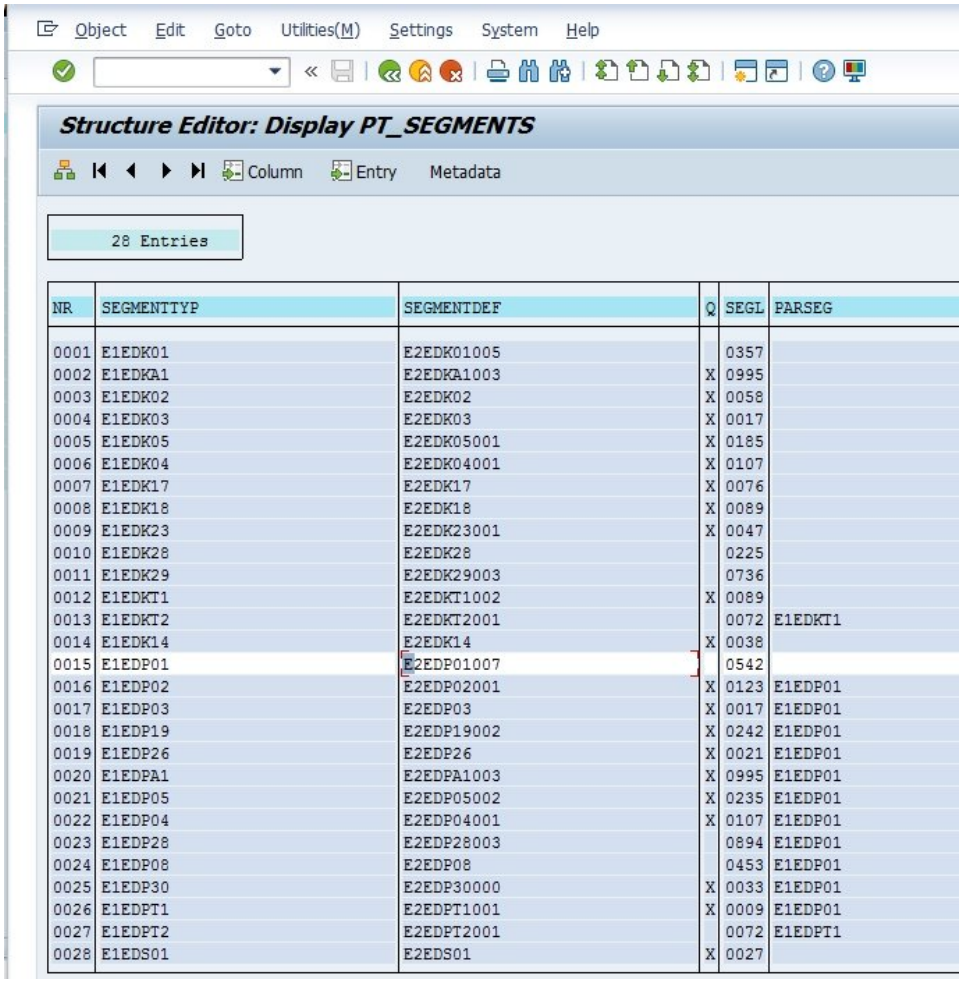
The correct release level is *730* for *E2EDP01008*.

Leaving the IDOC Release Provider parameter and the IDOC release number empty resolves the issue, however, this workaround is not related to the adapter. It is a property of the SAP system.

When the IDOC release is set to blank (" "), the function on SAP that executes provides the highest version of the metadata and does not check for an exact match. Unless you know the exact release installed on your SAP system, specifying the *User Input* option for the IDOC Release Provider parameter and leaving the IDOC Release parameter blank is the only possible solution when the IDOC data does not match the IDOC metadata.

Using the highest version of the metadata is generally harmless, as SAP adds new fields at the end of the metadata record, and the metadata is parsed only when there is data.

The following image shows a segment ending in *731* for release 731.



Object Edit Goto Utilities(M) Settings System Help

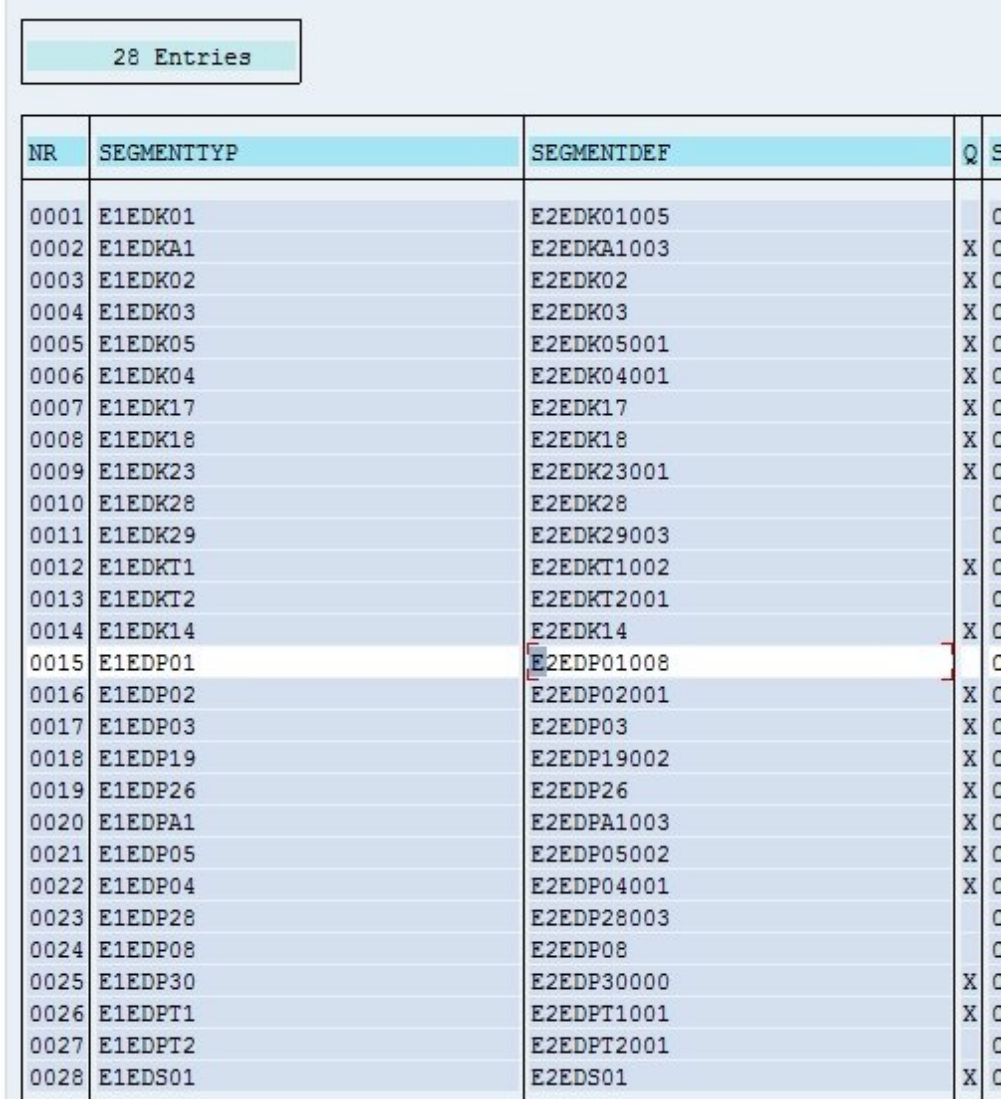
Structure Editor: Display PT_SEGMENTS

Column Entry Metadata

28 Entries

NR	SEGMENTTYP	SEGMENTDEF	Q	SEGL	PARSEG
0001	E1EDK01	E2EDK01005		0357	
0002	E1EDKA1	E2EDKA1003	X	0995	
0003	E1EDK02	E2EDK02	X	0058	
0004	E1EDK03	E2EDK03	X	0017	
0005	E1EDK05	E2EDK05001	X	0185	
0006	E1EDK04	E2EDK04001	X	0107	
0007	E1EDK17	E2EDK17	X	0076	
0008	E1EDK18	E2EDK18	X	0089	
0009	E1EDK23	E2EDK23001	X	0047	
0010	E1EDK28	E2EDK28		0225	
0011	E1EDK29	E2EDK29003		0736	
0012	E1EDKT1	E2EDKT1002	X	0089	
0013	E1EDKT2	E2EDKT2001		0072	E1EDKT1
0014	E1EDK14	E2EDK14	X	0038	
0015	E1EDP01	E2EDP01007		0542	
0016	E1EDP02	E2EDP02001	X	0123	E1EDP01
0017	E1EDP03	E2EDP03	X	0017	E1EDP01
0018	E1EDP19	E2EDP19002	X	0242	E1EDP01
0019	E1EDP26	E2EDP26	X	0021	E1EDP01
0020	E1EDPA1	E2EDPA1003	X	0995	E1EDP01
0021	E1EDP05	E2EDP05002	X	0235	E1EDP01
0022	E1EDP04	E2EDP04001	X	0107	E1EDP01
0023	E1EDP28	E2EDP28003		0894	E1EDP01
0024	E1EDP08	E2EDP08		0453	E1EDP01
0025	E1EDP30	E2EDP30000	X	0033	E1EDP01
0026	E1EDPT1	E2EDPT1001	X	0009	E1EDP01
0027	E1EDPT2	E2EDPT2001		0072	E1EDPT1
0028	E1EDS01	E2EDS01	X	0027	

The following image shows a segment ending in *811* for release 700.



28 Entries

NR	SEGMENTTYP	SEGMENTDEF	Q	S
0001	E1EDK01	E2EDK01005		C
0002	E1EDKA1	E2EDKA1003	X	C
0003	E1EDK02	E2EDK02	X	C
0004	E1EDK03	E2EDK03	X	C
0005	E1EDK05	E2EDK05001	X	C
0006	E1EDK04	E2EDK04001	X	C
0007	E1EDK17	E2EDK17	X	C
0008	E1EDK18	E2EDK18	X	C
0009	E1EDK23	E2EDK23001	X	C
0010	E1EDK28	E2EDK28		C
0011	E1EDK29	E2EDK29003		C
0012	E1EDKT1	E2EDKT1002	X	C
0013	E1EDKT2	E2EDKT2001		C
0014	E1EDK14	E2EDK14	X	C
0015	E1EDP01	E2EDP01008		C
0016	E1EDP02	E2EDP02001	X	C
0017	E1EDP03	E2EDP03	X	C
0018	E1EDP19	E2EDP19002	X	C
0019	E1EDP26	E2EDP26	X	C
0020	E1EDPA1	E2EDPA1003	X	C
0021	E1EDP05	E2EDP05002	X	C
0022	E1EDP04	E2EDP04001	X	C
0023	E1EDP28	E2EDP28003		C
0024	E1EDP08	E2EDP08		C
0025	E1EDP30	E2EDP30000	X	C
0026	E1EDPT1	E2EDPT1001	X	C
0027	E1EDPT2	E2EDPT2001		C
0028	E1EDS01	E2EDS01	X	C

Global Processing Parameters

The following table lists and describes global processing parameters that are located in the Advanced tab.

Parameter	Description	Example	Comment
Error Handling	Specifies the error handling method of the adapter.	See the next column for available options.	❑ **Throws Exception.** Writes an exception document with the full error text to the output destination. ❑ **Creates Error Document.** Creates a Java exception, which may or may not display the full error text depending on the underlying component error.
Commit with Wait	Specifies the commit behavior.	See the next column for available options.	❑ **Off** (default). Sends a commit request to the application server at the end of the document. If there is a commit error, it will not be reflected back (optimal performance). ❑ **ON.** Waits for a full database server commit at the end of the document before returning. Commit errors are reflected back to the adapter level (slowest performance). For the recommended setting that should be used, see your SAP DB administrator.

Parameter	Description	Example	Comment
SAP trace	Enables the SAP ERP Java connectors trace behavior.	See the next column for available options.	❑ **Off** (default). Only hard errors are written to the trace file (dev_rfc.trc) in append mode. ❑ **ON.** Individual rfc*.trc and JCO*.trc are written for each request. This is useful in finding errors, but not recommended in a production environment.
Trace level	Indicates the level of detail in the SAP ERP traces.	5	Select a value that ranges from 0 through 10 from the drop-down list.

SNC Parameters

The following table lists and describes the security (SNC) parameters that are located in the Security tab.

Parameter	Description	Example	Comment
SNC mode	Flag for activating SNC.	1 (on)	Required.
SNC partner	Specifies the application server's SNC name.	p:CN=ABC, O=MyCompany C=US	You can find the SNC name of the application server in the profile parameter snc/identity/as.

Parameter	Description	Example	Comment
SNC level	Specifies the level of protection to use for the connection.	See the next column for available options.	❑ **1.** Authentication only (default). ❑ **2.** Integrity protection ❑ **3.** Privacy protection. ❑ **8.** Use the value from snc/data_protection/use on the application server. ❑ **9.** Use the value from snc/data_protection/max on the application server.
SNC name	Specifies SNC name.	p:CN=SAPJ2EE O=MyCompany, C=US	Although this parameter is optional, it is not recommended for use to ensure that the correct SNC name is used for the connection.
SNC library path	Specifies the path and file name of the external library.	C:\SAPJ2EE_Engine\SAPCrypto-lib\sapcrypto.dll	The default is the system-defined library as defined in the SNC_LIB environment variable.

Verifying Connections to SAP ERP

This section allows you to verify a client and server connection to SAP ERP to ensure that the iWay Application Adapter for SAP ERP is installed and configured correctly.

Verifying a SAP ERP Client Connection

This section describes how to verify a SAP ERP client connection.

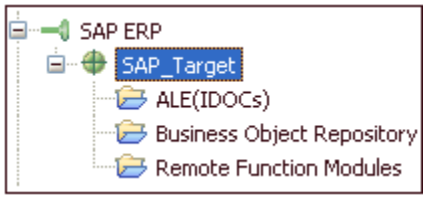
Procedure: How to Verify a SAP ERP Client Connection

To verify a SAP ERP client connection:

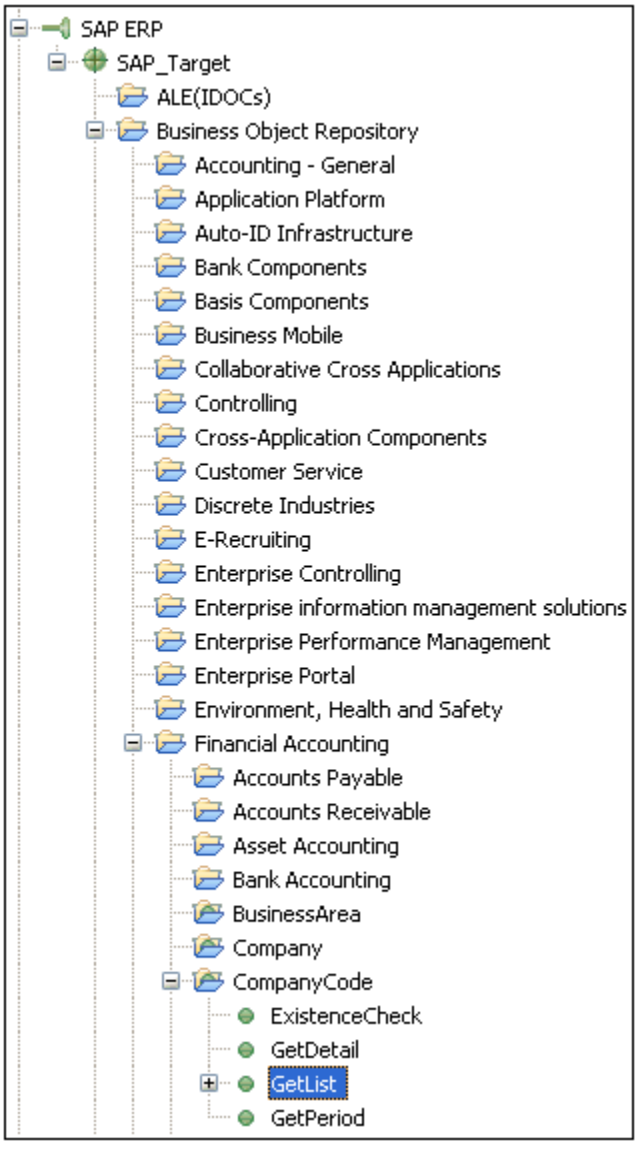
1. Create a SAP ERP target.

For more information on creating and connecting to SAP ERP targets, see *Configuring SAP ERP Adapter Targets and Creating XML Schemas* on page 73.

2. Connect to a SAP ERP target.
3. Expand the connected target node, as shown in the following image.

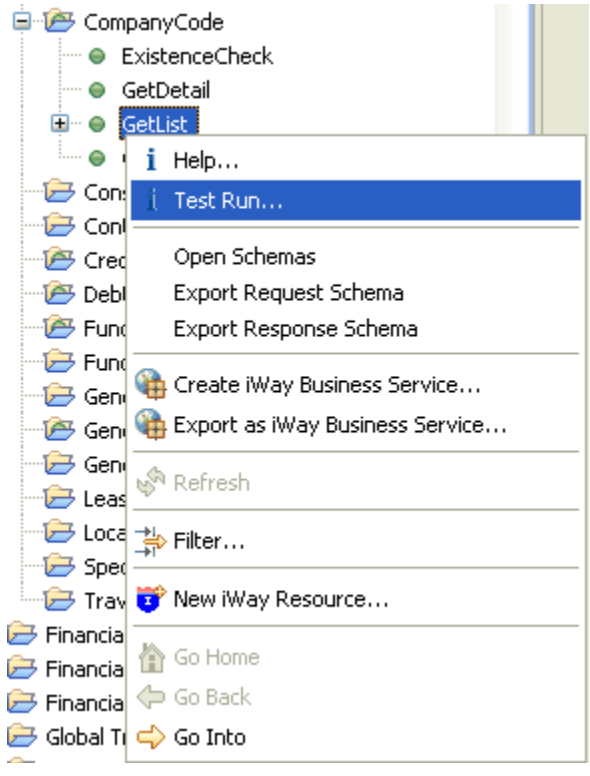


4. Expand the *Business Object Repository* node, as shown in the following image.

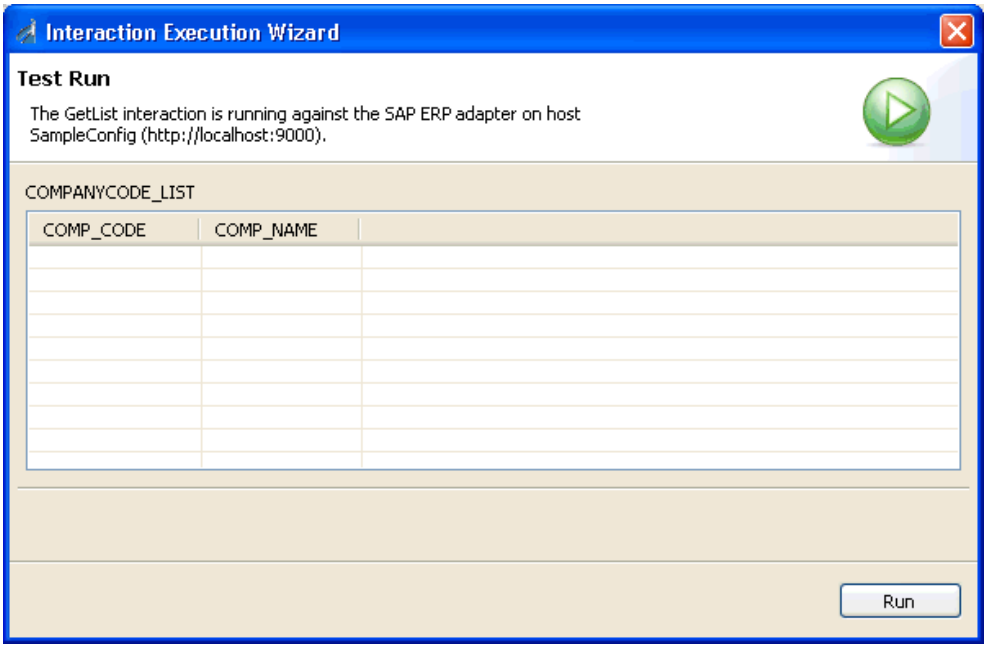


5. Expand *Financial Accounting*, followed by *CompanyCode*.
6. Select the *GetList* method.

7. Right-click the *GetList* method and select *Test Run* from the context menu, as shown in the following image.



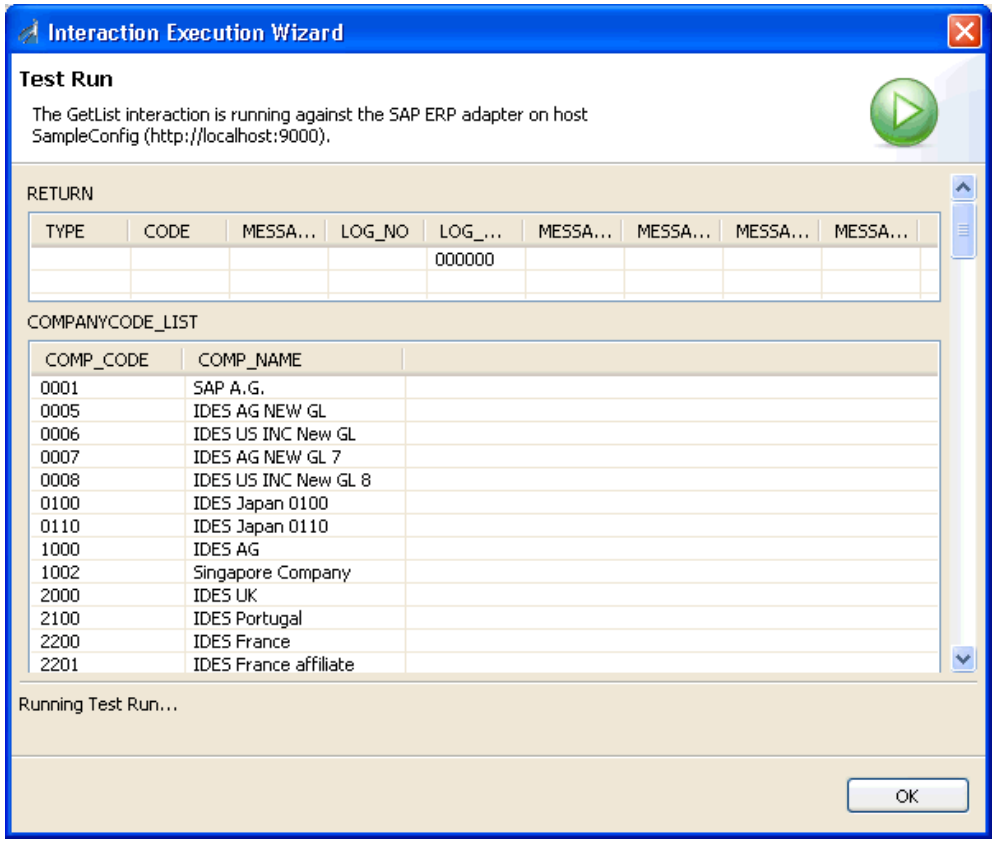
The Test Run dialog box opens, as shown in the following image.



Note: You must have authorization for this component in SAP ERP to proceed.

8. Click *Run*.

If the data is present on the system, a list of valid company codes is displayed, as shown in the following image.



9. Click *OK* when you have finished viewing the test results.

Verifying a SAP ERP Server Connection

To verify a SAP ERP server connection, have the RFC administrator run the Test Connection function in the RFC program administration transaction.

Chapter 5

Configuring SAP ERP Inbound Processing

The following section describes how to configure your SAP ERP system for inbound (client) processing.

In this chapter:

SAP ERP Adapter Process Overview

SAP Remote Function Calls (RFCs) and Business Application Programming Interfaces (BAPIs) do not require any additional system configuration other than values for the Connection Target parameters. If you do not intend to send IDocs to the SAP system, you may skip this chapter.

IDoc Overview

Most of the configuration for IDoc processing is performed on the SAP application server, not in the iWay Application Adapter for SAP ERP. For sending IDocs, you will configure the same type of connection target as for RFC or BAPI. For receiving IDocs, the event target configuration is the same as for receiving general events.

Task: In this section, you will learn about the components that are required to configure the SAP system to send IDocs from the adapter. Most configuration work for sending or receiving IDocs is done on the SAP system. This section provides an overview of the components and a step by step walk through to enable you to send or receive IDocs immediately.

SAP ECC is a process-oriented system. As a result, all configurations must be performed in sequence, and correctly, or the entire operation you are trying to perform will not be successful.

The process setup for SAP ALE (Application Link Enabling) on an SAP system consists of Partners, Messages, Distribution Models, and Ports, which are described in the following list:

- **Logical System.** Whether you configure SAP to send or receive an IDoc, you must first create a Logical System, which is a placeholder for a real system inside SAP that uniquely identifies the target system inside SAP and holds the configuration settings that will be used to configure and distribute IDocs.
- **Distribution Model.** You must then create and configure a Distribution Model, which is the map of the sending and receiving systems in your interactions. One party of the Distribution Model is the SAP system, the other is the logical system that identifies your target system where the iWay Application Adapter for SAP ERP is installed.
- **Partner Profile.** Your Partner Profile inside SAP ALE is identified by your Logical System, and contains the IDoc messages you want to send, and the technical details of performing the operations.
- **Port.** For sending IDocs from SAP, the messages must be bound to a port that you create in SAP. This port defines the connection type used and a link to an RFC Destination.
- **RFC Destination.** Created to store the connection data for a system.
- **SAP Registered Program ID.** Is contained in an RFC Destination, and from there, the actual physical connection to the target system running the iWay Application Adapter for SAP ERP containing the same Program ID by event configuration.

The transmission of IDocs is performed through transactional Remote Function Call (tRFC), which has a mechanism for preventing duplicate transactions in SAP and the iWay Application Adapter for SAP ERP. The actual physical transmission is done through a background SAP work process that is designed to *send and go*. The work process leaves the contents and as soon as it receives an OK from the other end, the process moves on to the next message. IDoc transmission cannot be used to verify content transmission. The IDoc interface is similar to email in this regard, that each message is synchronously processed and transmission errors will immediately be caught and handled, but the content and application processing of the messages is performed in a separate stage.

When sending an IDoc outbound to SAP inbound IDoc processing, the iWay Application Adapter for SAP ERP reads an XML input document and creates an SAP standard format IDoc. The adapter can also process documents in standard SAP positional relationship format. Once assembled as an IDoc, the document is sent to SAP for inbound processing. Multiple IDocs can also be assembled into a larger document for efficient processing. For more information, see the SAP ALE documentation.

The IDoc is *accepted*, that is, saved in the database. If all of the information in the IDoc passes verification, then the IDoc can be passed to an application for further processing.

When sending IDocs from the SAP system to the iWay Application Adapter for SAP ERP, the sending system transfers an message through the IDoc interface to the ALE port for the corresponding Logical System. The transmission is done through transactional Remote Function Call (tRFC).

Usually, IDocs are written directly to the database and read by the corresponding application in a workflow (for example, Purchasing for Purchase Orders). This can take time depending on the type of data and the application. The iWay Application Adapter for SAP ERP can *post to the database and return* or *post and wait*. This is defined in the Partner Profile on the host system. In either case, you may send a status IDoc message to obtain the status of your IDoc or use appropriate transaction codes in SAP to view the IDocs online.

Perform the following steps to configure sending an IDoc to SAP, on the SAP system:

1. Configure a logical system.
2. Configure a distribution model.
3. Define an inbound partner profile.

Configuring a Logical System

In a distributed environment, each participating system must have a unique ID to avoid confusion. In SAP ERP, the name of the logical system is used as the unique ID. This name is assigned explicitly to one client in an SAP ERP system.

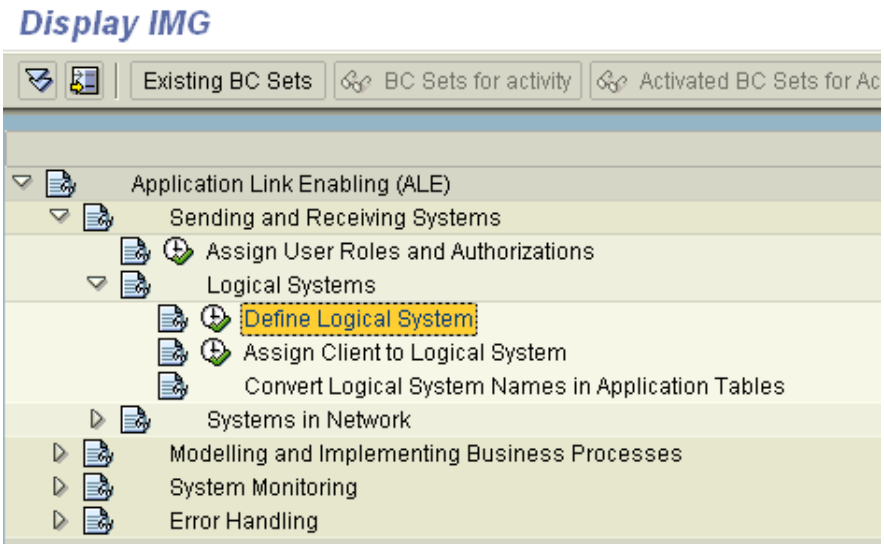
Procedure: How to Configure a Logical System

The following image shows the /nsale transaction in the field under the menu bar.

To configure a logical system:

1. Execute the *sale* transaction.

The Display IMG window opens as shown in the following image.

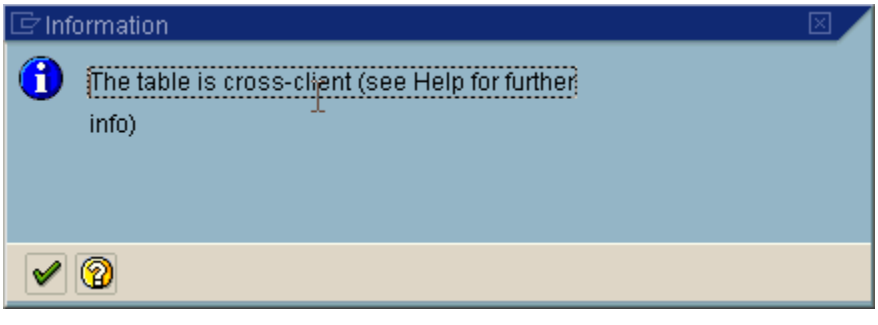


a. Expand *Sending and Receiving Systems* and then, *Logical Systems*.

b. Select *Define Logical System*.

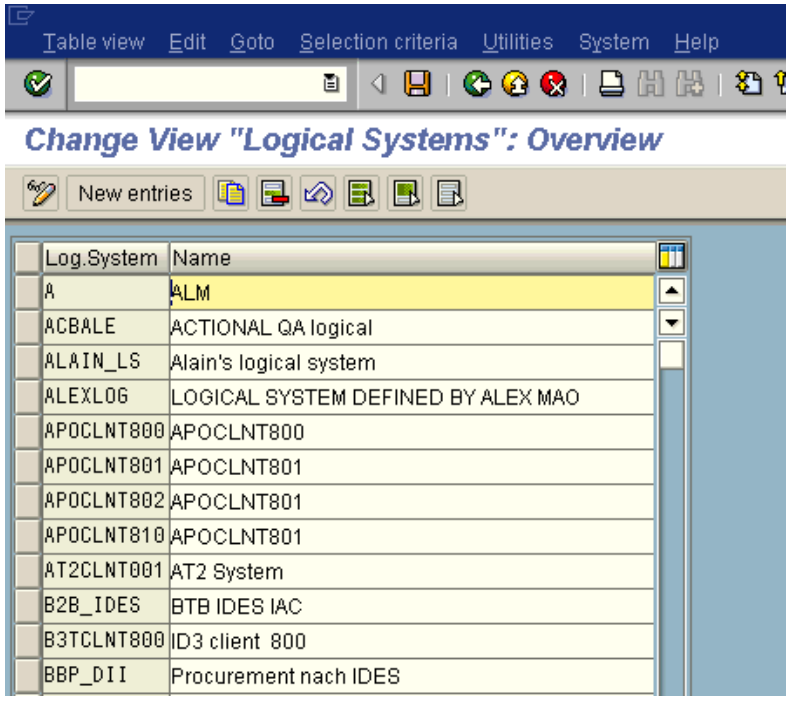
2. Click the *IMG - Activity* icon.

   An information window appears that informs you that the table is cross-client as shown in the following image.



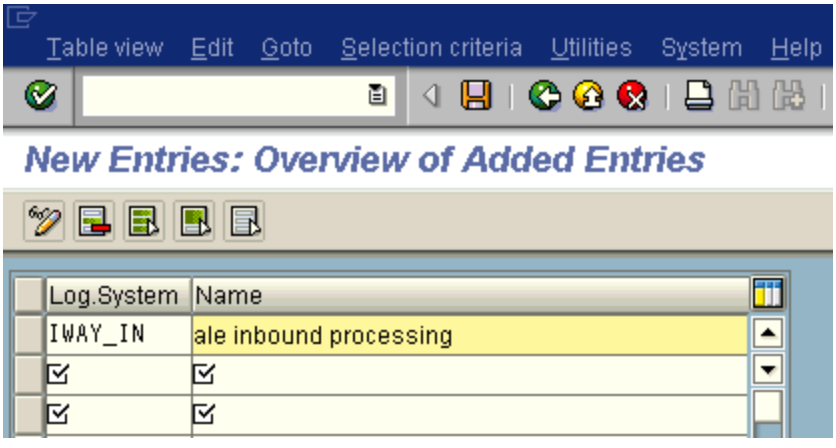
3. To continue, click the checkmark icon.

The Change View "Logical Systems" window opens with a list of logical systems and their names as shown in the following image.



4. Click the *New entries* button.

The New Entries window opens where you can type information for the logical system and its corresponding name as shown in the following image.

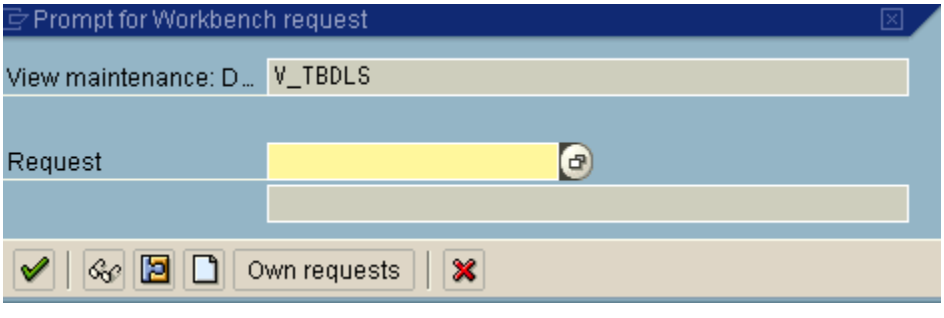


a. In the Log.System column, type the Logical System, for example, IWAY_IN.

b. In the Name column, type a corresponding description.

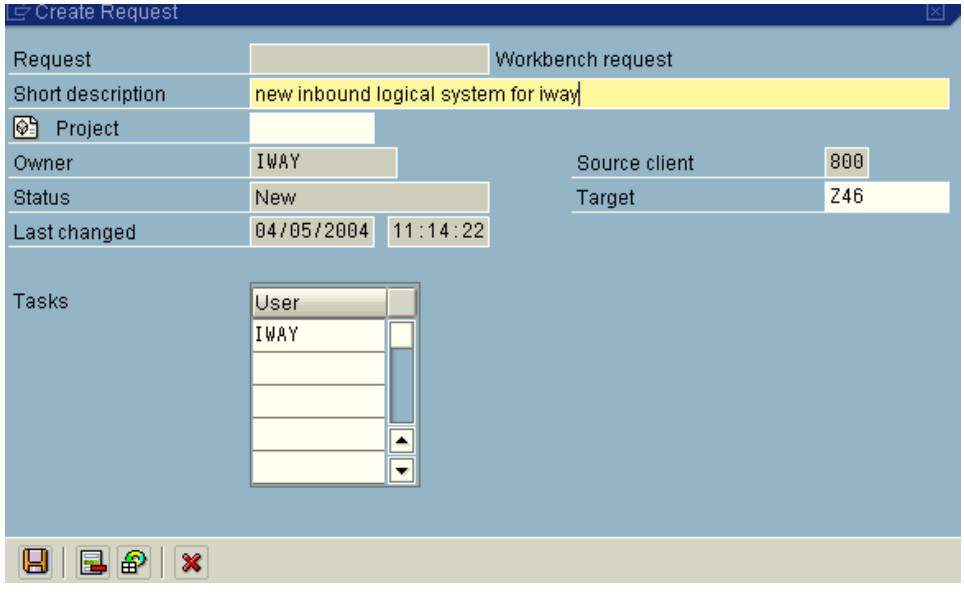
5. Click *Save*.

The Prompt for Workbench request window opens as shown in the following image. It includes fields for View maintenance and Request as well as several buttons.



6. Click the *Create Request* icon.

The Create Request window opens as shown in the following image. It includes fields that are already populated (such as Owner, Status, Last Changed, Source client, and so forth), empty fields (such as Request and Project) in which to specify information about your request, and a Tasks list.

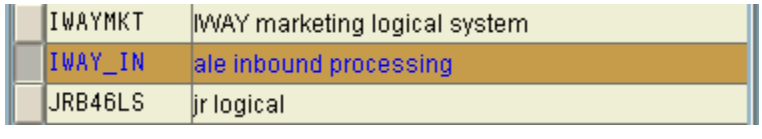


a. In the Request field, type a name.

b. In the Short description field, type a brief description of your request.

7. Click *Save*.

The logical system you configured, for example, IWAY_IN, appears in the list as shown in the following image.

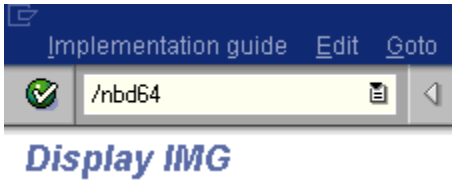


Configuring a Distribution Model

A distribution model is used to describe the ALE message flow between logical systems. Business objects are distributed to connected recipients according to a unique distribution model that can contain rules of varying complexity depending on the type of business objects involved.

Procedure: How to Configure a Distribution Model

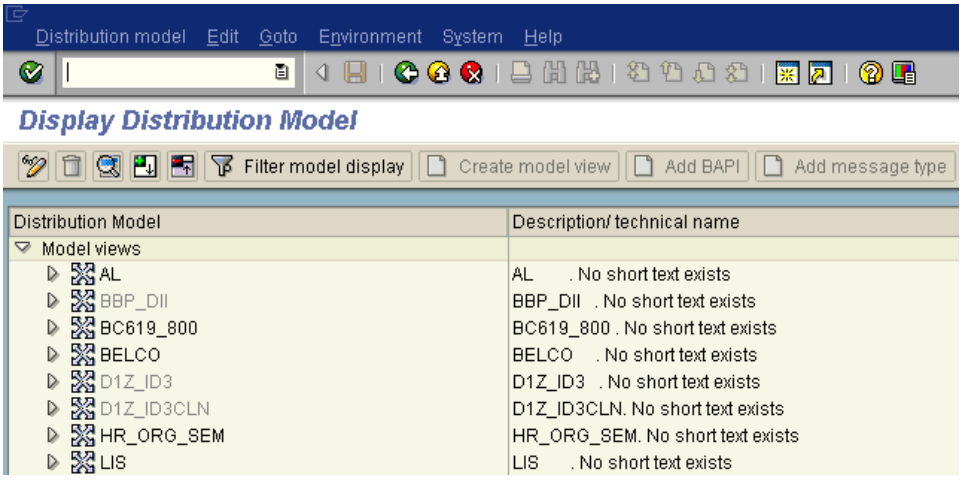
The following image shows the /nbd64 transaction in the field under the menu bar.



To configure a distribution model:

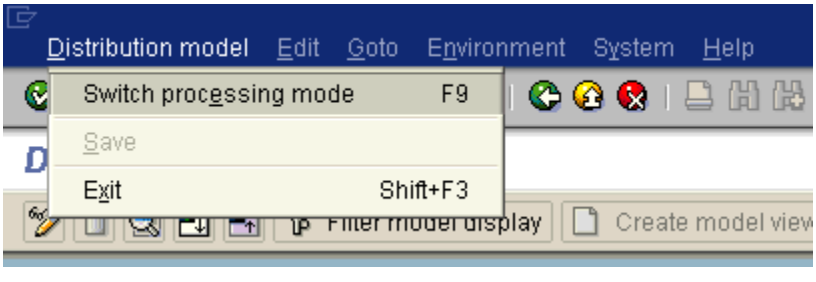
1. Execute the */bd64* transaction.

   The Display Distribution Model window opens and displays a list of available distribution models and their descriptions, as shown in the following image.



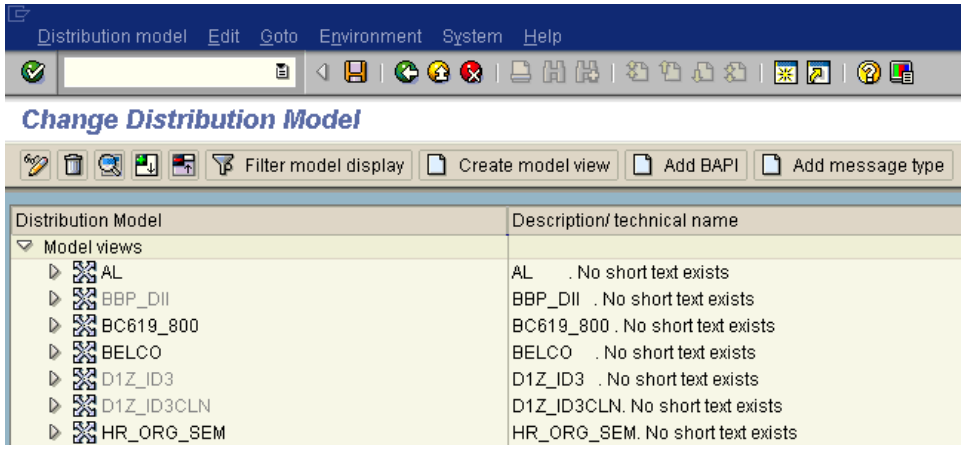
2. In the menu bar, click *Distribution model*.

   The Distribution model menu opens as shown in the following image.



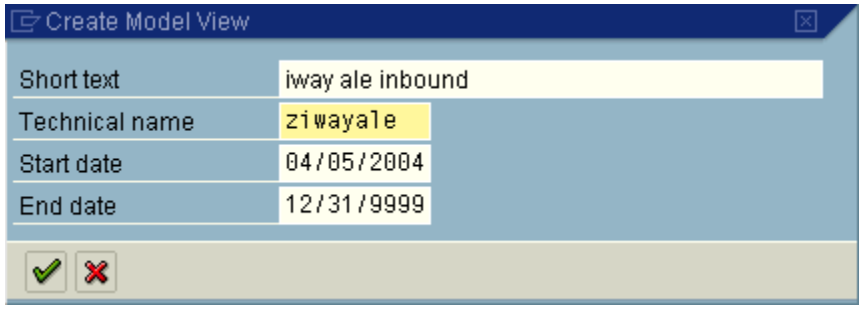
3. Select *Switch processing mode*.

   The Display Distribution Model window switches to the Change Distribution Model window, as shown in the following image.



4. Click the *Create model view* button.

   The Create Model View window opens and includes fields for the name of your distribution model and for Start and End dates, as shown in the following image.



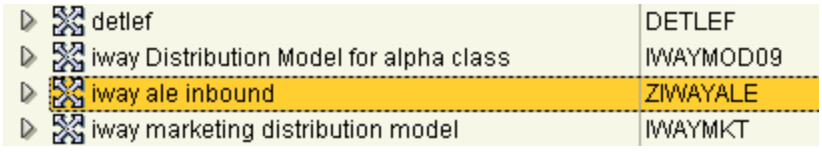
   a. In the Short text field, type a model view name, for example, iway ale inbound.

   b. In the Technical name filed, type a technical name, for example, ziwayale, which also serves as a description.

5. To enter the information, click the checkmark icon.

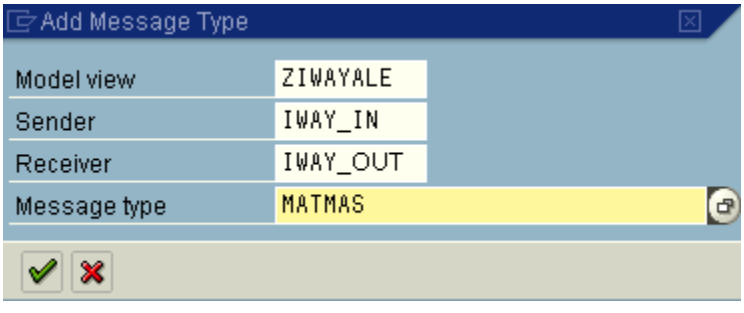
   You are returned to the main Change Distribution Model window.

The distribution model you configured is now added to the list as shown in the following image.



6. Click the *Add message type* button.

   The Add Message Type window opens and includes fields where you can name and specify your message type.



   a. In the Sender field, type the logical system you configured, for example, IWAY_IN.

   b. In the Receiver field, type the logical system you configured, for example, IWAY_OUT.

      To browse from a list of logical systems, you can click the icon to the right of each field.

   c. In the Message type field, type the message type to use, for example, MATMAS.

      To browse from a list of available message types, you can click the icon to the right of the field.

7. To enter the information, click the checkmark.

   You are returned to the main Change Distribution Model window.

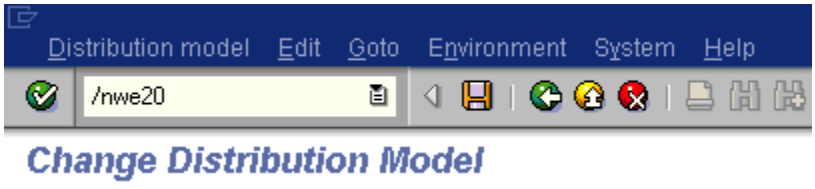
8. Click *Save*.

Defining a Partner Profile

Partner profiles are a requirement for data exchange. You define who can exchange messages with the SAP ERP system using a specified port.

Procedure: How to Define a Partner Profile

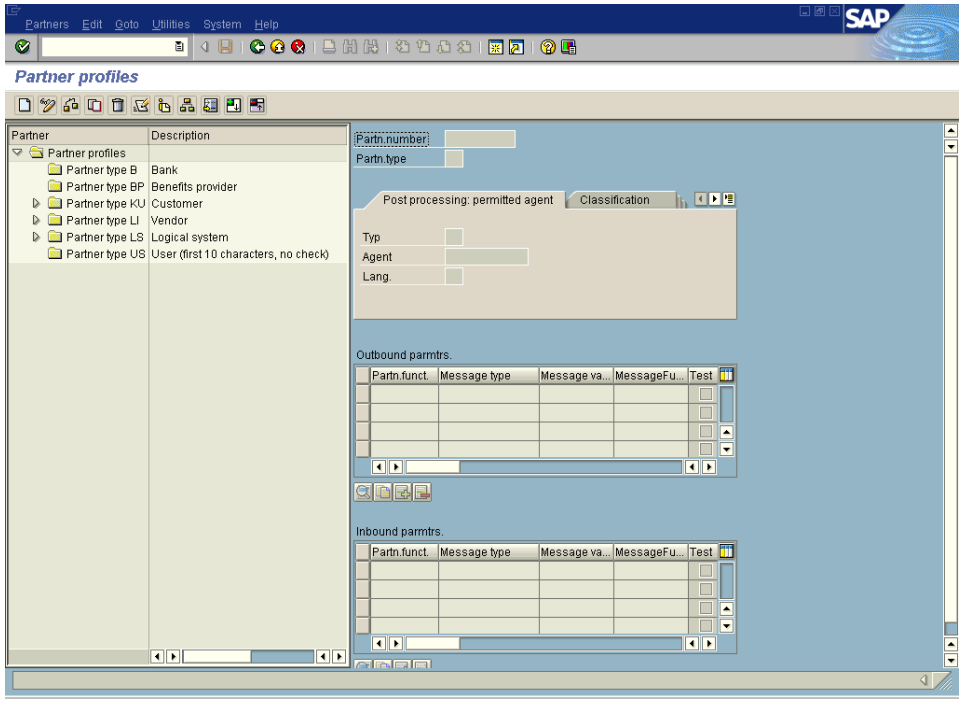
The following image shows the /nwe20 transaction in the field under the menu bar.



To define a partner profile for a specific IDoc:

1. Execute the *we20* transaction.

   The Partner profiles window opens and displays two panes with information about the logical system as shown in the following image.



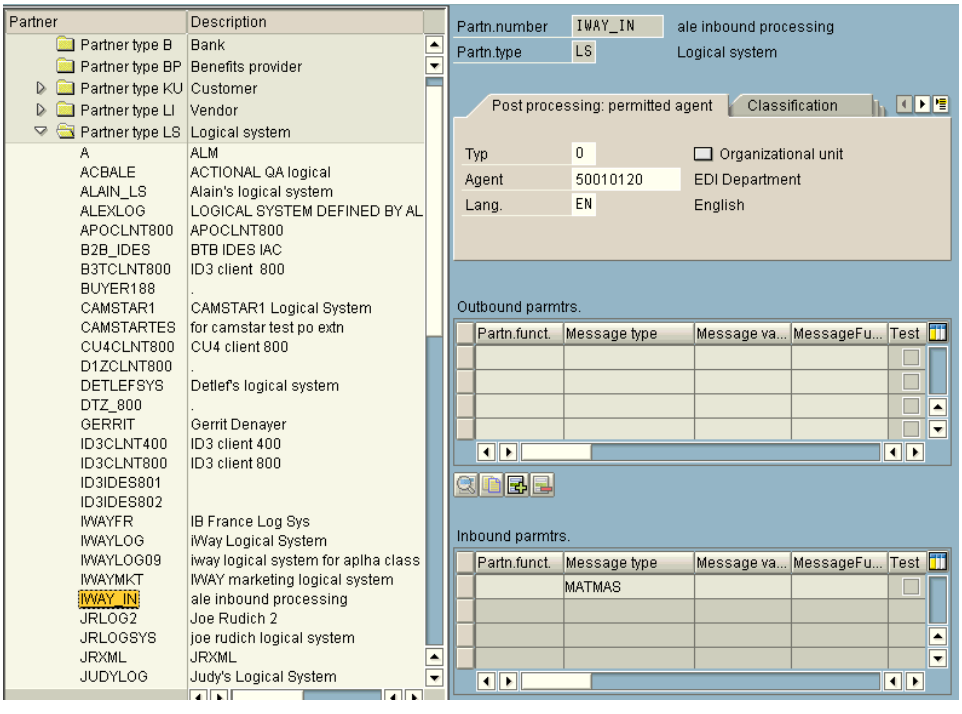
   a. If no Partner profile currently exists, click the *Create* icon on the tool bar or press *F5*.

   b. Click *Save* once you have created your Partner profile.

2. In the left pane, expand *Partner type LS* and select the logical system you configured from the list, for example, IWAY_IN.

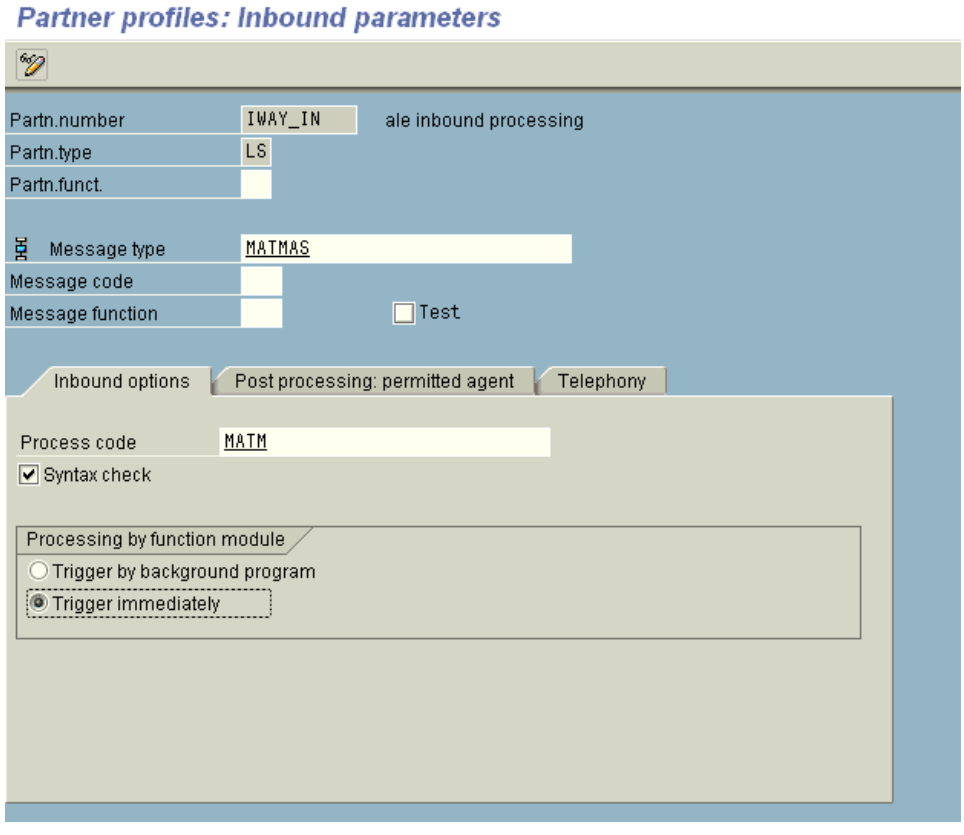
The right pane displays the details of the expanded folder including the logical system and type, language, and so forth, as shown in the following image.

Note: The Partn.number field refers to the name of the logical system.



3. Click *Save*.
4. From the Inbound parameters table in the lower right, click the *Create inbound parameter* icon.

The Partner profiles: Inbound parameters window opens as shown in the following image.



a. In the Message type field, type the message type to use, for example, MATMAS.

   To browse from a list of available message types, you can click the icon to the right of the field.

   The Inbound options tab is selected by default.

b. In the Process code field, enter the process code you want to use, for example, MATM.

   To browse from a list of available process codes, you can click the icon to the right of the field.

c. In the Processing by function module area, select one of the following options:

   - **Trigger by background program.** In this case, the iWay Application Adapter for SAP ERP writes IDocs to the SAP ERP database, which are processed immediately.

- **Trigger immediately.** In this case, the iWay Application Adapter for SAP ERP waits for the SAP ERP system to process IDocs. This can take from one to fifteen minutes.

5. Click *Save*.

Chapter 6

Configuring SAP ERP Adapter Targets and Creating XML Schemas

This section describes how to use iWay Explorer to configure adapter targets and create XML schemas for integration between the iWay Application Adapter for SAP ERP and a SAP ERP system.

In this chapter:

SAP ERP Adapter Targets Overview

The iWay Application Adapter for SAP ERP enables the processing of SAP ERP BAPIs, RFCs, and IDocs.

External applications that access SAP ERP through the adapter use either XML schemas or web services to pass data between the external application and the adapter. You can use iWay Explorer to create the required XML schemas and web services.

SAP ERP must be installed, configured, and available for client access. iWay Explorer need not reside on the same system as the application system being accessed, but network access is required.

Task:

In this section, you will explore SAP through the iWay Explorer. You will connect to SAP ERP, locate the function, BAPI or IDoc you want to integrate with and create the schemas or iWay business service (web service). You can familiarize yourself with the SAP ERP organizational methods. BAPIs, and Remote Function Modules are organized by functional area, and then by alphabetical order. IDocs are listed in alphabetical order by message type, and the same IDoc type can be found several times in the tree. The unique combination of message type and IDoc type determine the processing of the IDoc.

If you find a component with a name that contains a forward slash character (/), then it is an SAP ERP defined namespace (such as /IWAY/) and the components in that namespace are unique to that namespace. The adapter will escape the forward slash character (/) to an underscore character (_) for compatibility with XML formatting.

The document interface style of BAPIs is *attribute*, with the parameters defined as attributes of the business element, while RFC and IDoc are *element*, with the parameters or segment and field names defined as unique elements. Each BAPI has a Remote Function Module duplicate, the style is determined by the usage.

For Remote Function Modules, you can create request, response, event, and eventreply XML schemas. For BAPIs, you can create request and response XML schemas. For IDocs, you can create request, response, and event XML schemas.

Understanding SAP ERP Nested Structures and Nested Tables

SAP ERP Remote Function Modules can contain several types of parameter lists. The term *parameter* is used to name a variable, and to refer to one of the pieces of data provided as input to the function. All SAP ERP Remote Function Modules are *strongly typed*, which means that the types of data that can be passed to the parameters is defined beforehand in the definition of the function. A parameter list is grouped by the *kind* of parameter or *direction*. A function has the following types of parameter lists:

- **Import.** Values passed to the function.
- **Export.** Values passed from the function.
- **Changing.** Values that can be passed to the function and then modified by the function.
- **Tables.** Relational type data that can be passed to or from the function.

Exceptions: Some functions have strongly typed exceptions. These are not part of the schema, but will be formally generated by the function in the event of an error (in the form of *ABAP Exception*), with an error key and value.

The iWay Application Adapter for SAP ERP provides the following modes of operation:

- **Synchronous processing.** Sending RFCs and BAPIs to SAP ERP.
- **Asynchronous processing.** Synchronous sending (through Transactional RFC) to SAP ERP: IDoc-enabled BAPIs and IDocs.
- **Synchronous event receiving from SAP with reply to SAP.** RFCs and BAPIs in the form of RFCs
- **Asynchronous processing.** Synchronous receiving (through Transactional RFC) from SAP ERP: IDoc-enabled BAPIs and IDocs
- **Synchronous receiving only.** RFCs and BAPIs in the form of RFCs.

A Remote Function Call (RFC) can be defined with parameters defined as *optional* or *mandatory*. If a parameter is optional and no value is passed, then the parameter is marked as inactive. If a parameter is mandatory, then the function cannot be called until a value has been assigned to the parameter.

All data is passed to and from Remote Function Modules *by value*, which means that the actual values are sent along with the call.

All parameters must be defined with the data types that are defined in the SAP ERP Data Dictionary. The caller of the function can call this dictionary to find the types of the parameters, and then pass the appropriate values.

These are the ABAP data types that are defined as *elementary* and *complex*, and their usage helps define the parameter type as well as the data type. The available elementary types are:

Numeric:

- Integer - I
- Packed - P
- Floating - F

Character:

- Character - C
- Date - D
- Time - T
- Numeric - N

Byte:

- Hex - X

Complex data types are built from the elementary types and are defined in the SAP ERP Data Dictionary as:

- **Structures.** A grouping of elementary types (columns) defined with a name, and treated as a unit.
- **Tables.** A grouping of elementary types as in a Structure, and spanning multiple lines (rows).

The following data types handle variable length records:

- **STRING.** A grouping of characters and length is characters * character width.
- **XSTRING.** A grouping of bytes and length is the number of bytes.

Using STRING or XSTRING in a function parameter causes the function to run more slowly over RFC, as the data must be converted to XML, shipped over the transport, and then converted back to the data type. Using STRING or XSTRING or a Table in a Structure makes the Structure a *Deep Structure*.

In SAP ERP, the use of IMPORT and EXPORT parameters was limited to elementary data types or Structures. With the latest releases of SAP ERP ECC, the ability to allow any data type in any of the parameter lists has been added. Now, an IMPORT parameter can contain a Table just as it can contain an elementary type.

Flat Structures contain only elementary data types with a fixed length (no internal Tables or strings).

Nested Structures

A Structure can contain a column that is itself a Structure or a Table. This makes the Structure a *Nested Structure*. If any of the elements contain a variable length element or Table, then it becomes a *Deep Nested Structure*.

The following is a sample XML structure of a Nested Structure:

```
<REQHDR>
      <MESSGID/>
      <TMSTP/>
      <CORRID/>
      <CONSID/>
      <PROVID/>
      <TRINFO/>
            <TRACK>
                  <ZBUSID/>
                  <ZCONVID/>
                  <ZUSERID/>
            </TRACK>
</REQHDR>
```

The Structure REQHDR has a column called TRACK that is itself a Structure.

The following is a sample XML structure of a Deep Nested Structure:

```
<SYSTEMINFO>
      <FDPOS/>
      <COLNO/>
      <DTSTRING/>
            <SYST2>
                  <STINFO/>
                  <TABIX/>
                  <TFILER/>
            </SYST2>
<SYSTEMINFO>
```

The Structure SYSTEMINFO has a string called DTSTRING and a Structure called SYST2.

A Table can contain an elementary type, consist of elementary types, or contain Nested Structures and Tables.

The following list provides the combinations of types that are possible:

- Structures consisting of a series of elementary data types of fixed length (non-Nested, flat Structures).
- An internal Table whose line type is an elementary type.
- Internal Tables whose line type is a non-Nested structure, which can be considered a real table.
- Structures with Structures as components (Nested Structures, Flat or Deep).
- Structures containing internal tables as components (Deep Structures).
- Internal Tables whose line type contains further internal Tables.

The following is a sample XML structure of a Nested Table:

```
<INBOUNDINFO>
<_-SAPCND_-SRMA__LIN>
                  <item>
                        <CLIENT/>
                        <SCALE_ID/>
                        <SCALE_LINE_ID/>
                        <NUM_FLIGHTS/>
                        <DBACTION/>
                  </item>
</_-SAPCND_-SRMA__LIN>
<_-SAPCND_-SRMDEF>
                  <item>
                        <CLIENT/>
                        <SCALE_ID/>
                        <SCALE_BASE_TYPE/>
                        <SCALE_TYPE/>
                        <DBACTION/>
                  </item>
</_-SAPCND_-SRMDEF>
```

The iWay Application Adapter for SAP ERP supports all of these types, except for a Nested Table whose type (definition) is itself a line type. This is supported on request only because of the complexity of the Structure.

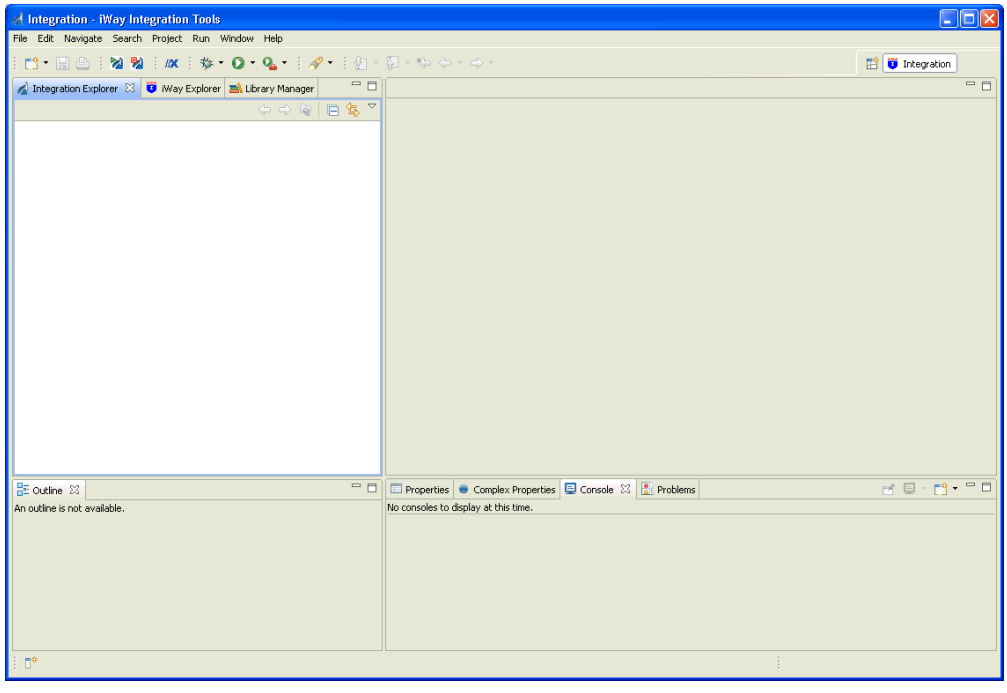
Starting iWay Explorer

This section describes how to start iWay Explorer.

Procedure: How to Open iWay Integration Tools

1. Navigate to your local drive where you have iIT installed, and open the *eclipse* folder.
2. Double-click *iit.exe*.

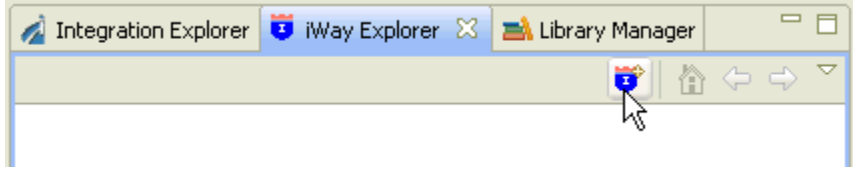
iWay Integration Tools suite opens.



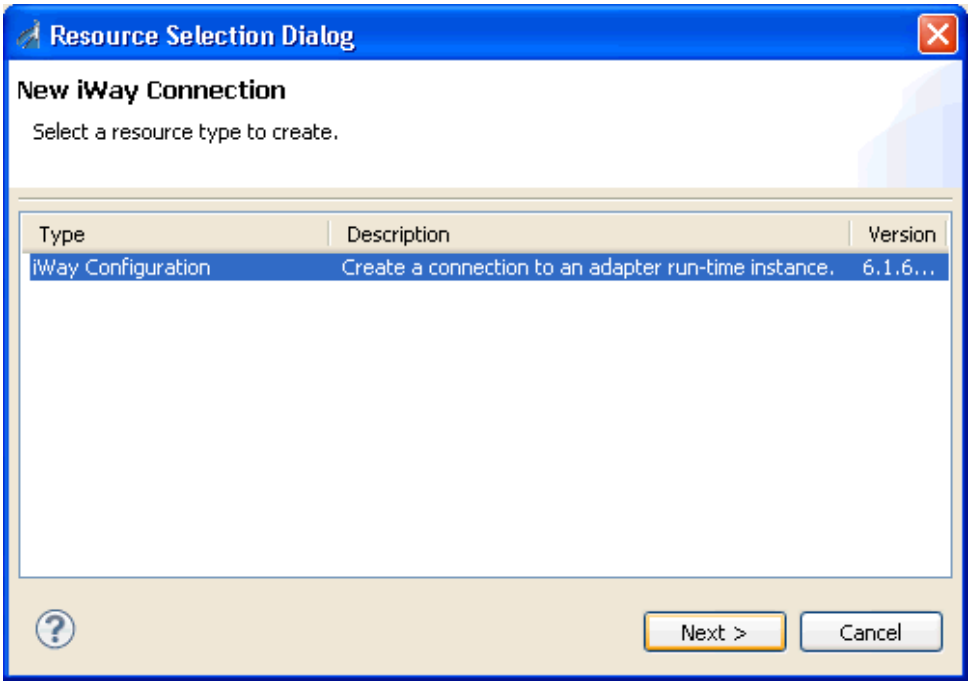
Procedure: How to Create an iWay Explorer Connection to an iSM Server

This procedure assumes that you have opened iWay Integration Tools (iIT) and are in the Workbench.

1. Click the *iWay Explorer* tab to make it active.
2. Click the *Launch iWay Resource Creator Wizard* button on the tool bar.
   In the following image, the iWay Explorer tab is active, and the cursor is pointing to the Launch iWay Resource Creator Wizard button.



When you click the button, the Resource Selection Dialog opens and displays the New iWay Connection pane, as shown in the following image.



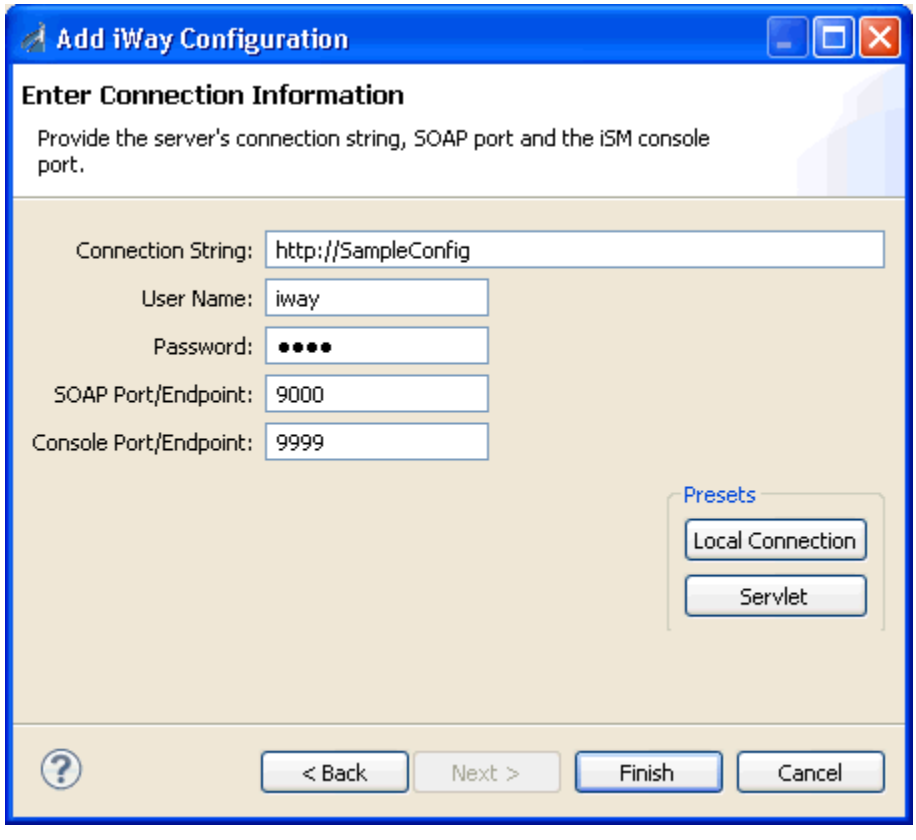
3. Under the Type heading, click *iWay Configuration*, which is the type of resource that you are going to create.
4. Click *Next*.

   The Add iWay Configuration dialog box opens and displays the Select Connection Types pane.
5. In the Configuration Alias field, type a name for the new configuration (for example, *SampleConfig*).

   Tip: The name that you supply is used only for display purposes in the tree. It is not a server connection property.
6. For Connection Type, click the radio button for the method that you are using to connect to iSM.
7. Optionally, select the *Connect to Host upon Wizard Completion* check box if you want iWay Explorer to automatically connect to this instance of iSM after you have created it. If you select this option, all the explorer environments under the new iSM connection are automatically connected to iSM when this procedure is finished.

If you do not select this option, the explorer environments are not automatically connected to iSM. You can connect to an individual explorer environment when you want to access it.

8. Click *Next* to continue the procedure.
9. If you selected an HTTP Connection, the Enter Connection Information pane opens, as shown in the following image.



- Verify the values in the three fields, or type the valid value or values.
  - The Connection String field contains the URL that connects to the iSM.
  - The SOAP Port/Endpoint field contains the SOAP port number.
  - The Console Port/Endpoint field contains the port number that the iSM Administration Console is listening on.
- Optionally, under Presets, click *Local Connection* to insert values for a local default iSM connection in the fields, or click *Servlet* to insert values for a sample servlet connection.

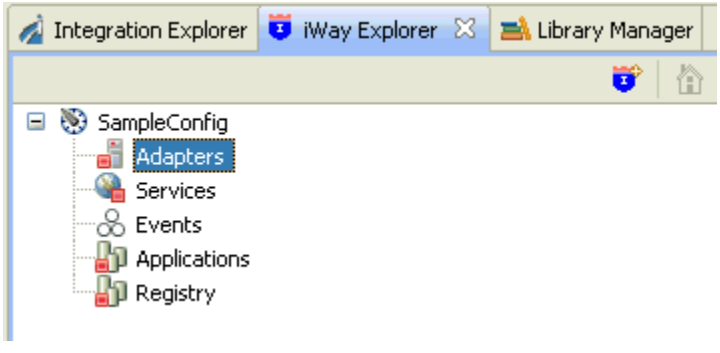
- Click *Finish*.
- In the File Path field, browse to the full path for your iWay installation directory and insert the path in the field. This path is used to locate the iWay adapters and store the XML schemas. For example:

  ```
  C:\Program Files\iWay7
  ```

- In the Configuration Name field, verify the name of your iWay server configuration. The base configuration is specified by default. Alternatively, you can type the name of the server configuration.
- Click *Finish*.

The new iSM connection is added to the tree on the iWay Explorer tab.

In the following image, an iSM connection named SampleConfig was added to iWay Explorer. The tree is expanded to show the five explorer environments that are available.



Adding the SAP ERP Adapter to iWay Explorer

iWay Explorer supports access to many different application systems. When you connect to and expand the Adapters node, the iWay adapters for the supported application systems are displayed. They are the iWay adapters that you have installed and are licensed to use.

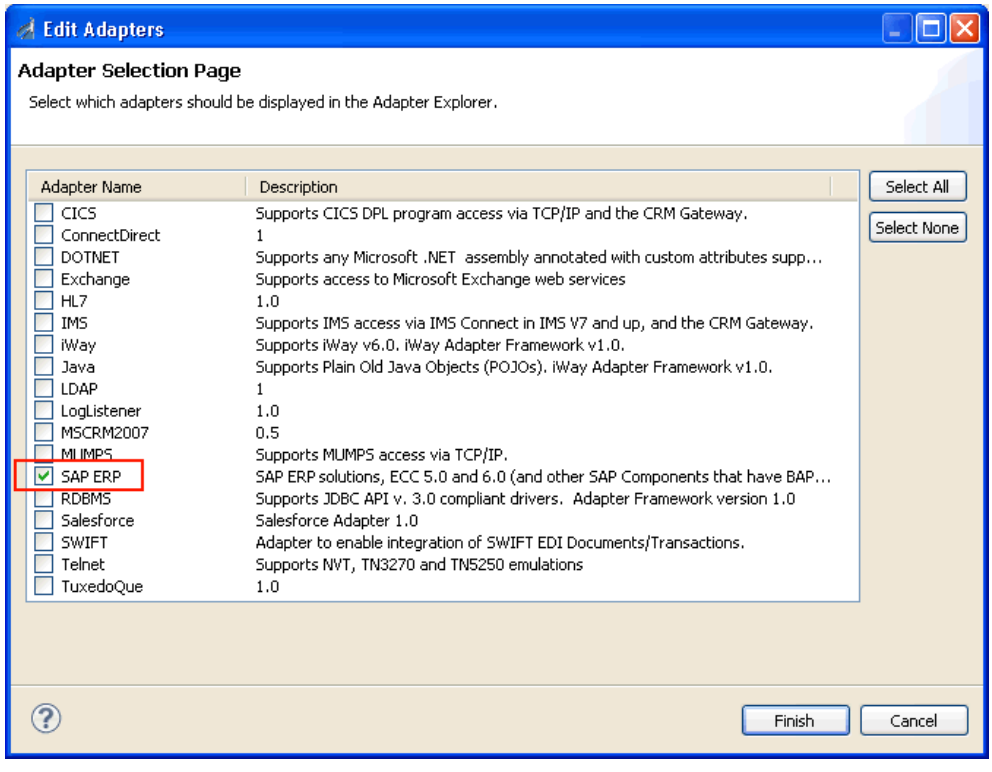
Procedure: How to Add the SAP ERP Adapter to iWay Explorer

In this procedure, you are going to add the iWay Application Adapter for SAP ERP to the list of adapters displayed in the Adapters node.

1. Right-click the *Adapters* node, and click *Edit* from the menu.

   The Edit Adapters dialog opens, prompting you to select the iWay adapter or adapters to add to iWay Explorer.

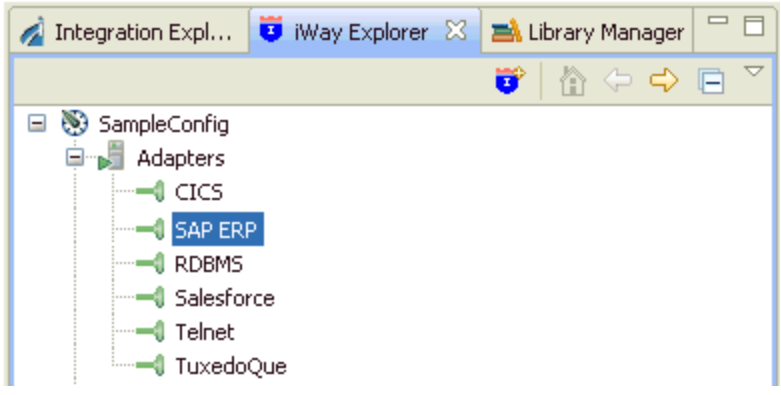
2. Select the check box for *SAP ERP*, as shown in the following image.



3. Click *Finish*.

   The tree is automatically refreshed and displays the new adapter.

In the following image, the SAP ERP node is displayed in the Adapters node of iWay Explorer, as shown in the following image.



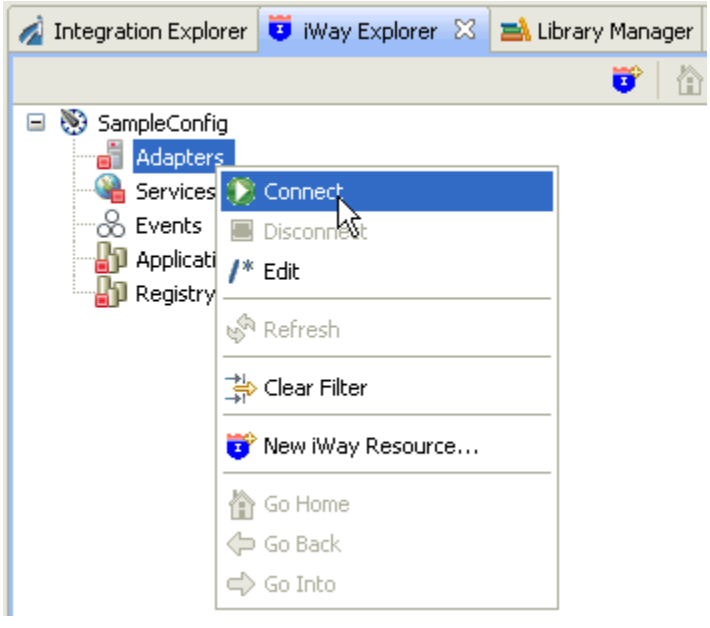
Working With a Target

To browse the business objects of an application system, you must create a target for that system. The target is the means by which you connect to the system. It contains the logon properties used to access the system.

Using the target, you must establish a connection to an application system every time you want to browse the system in iWay Explorer.

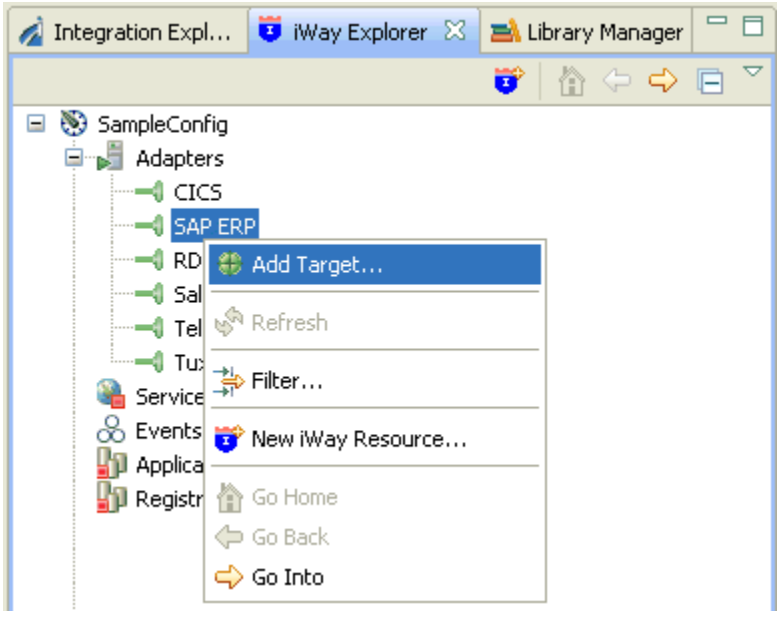
Procedure: How to Create a Target

1. Right-click the *Adapters* node, and click *Connect* from the menu, as shown in the following image.

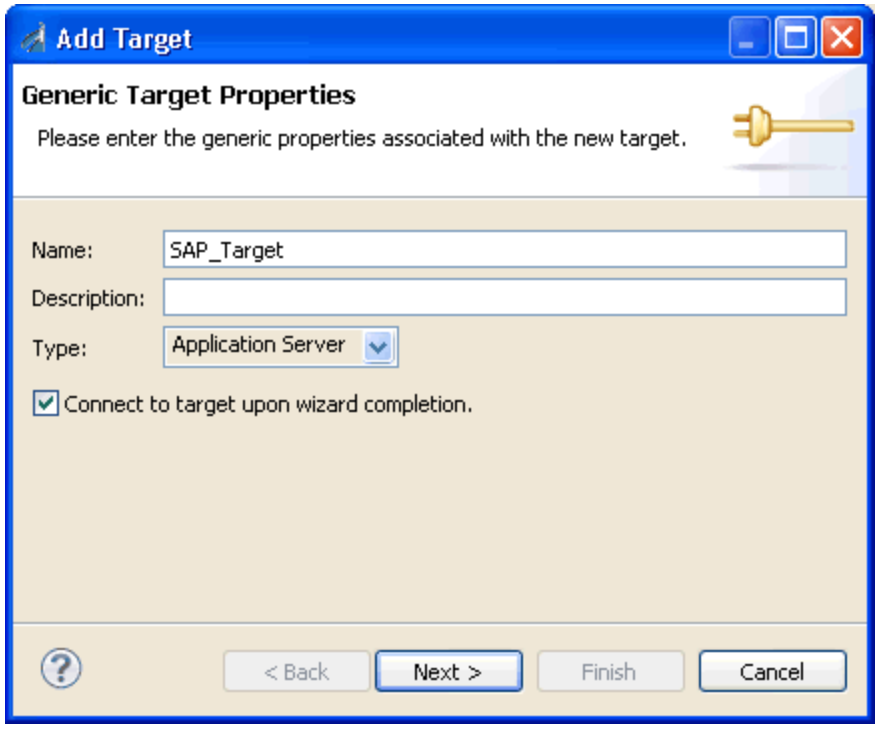


2. Once you are connected, expand the *Adapters* node.

3. Right-click *SAP ERP*, and click *Add Target* from the menu, as shown in the following image.



The Add Target dialog opens and displays the Generic Target Properties pane, as shown in the following image.



4. Supply the values for the fields on the dialog box as follows.

   a. In the Name field, type a descriptive name for the target (for example, *SAP_Target*).

   b. In the Description field, optionally type a brief description of the target.

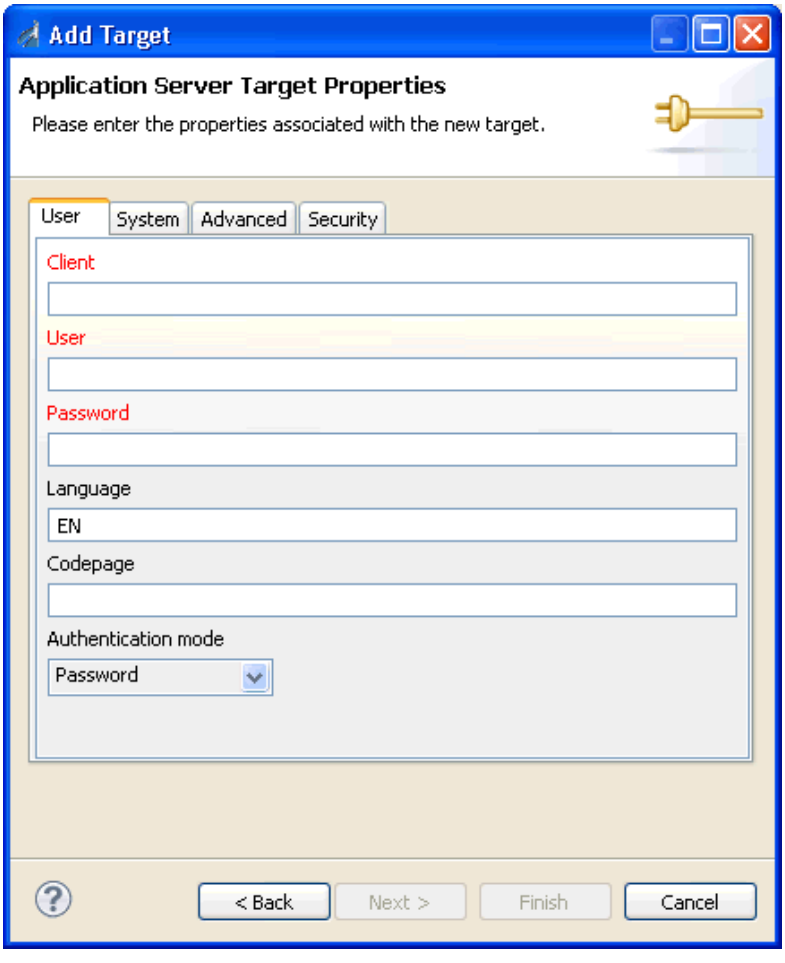
   c. From the Type drop-down list, select *Application Server* (default) or *Message Server*.

5. Select the *Connect to target upon wizard completion* check box if you want iWay Explorer to automatically connect to this target after it has been created.

   If you deselect this option, iWay Explorer will not automatically connect to the target. From the tree, you can connect to an individual target when you want to access the associated application system.

6. Click *Next*.

The Add Target dialog opens and displays the Application Server Target Properties pane, as shown in the following image.

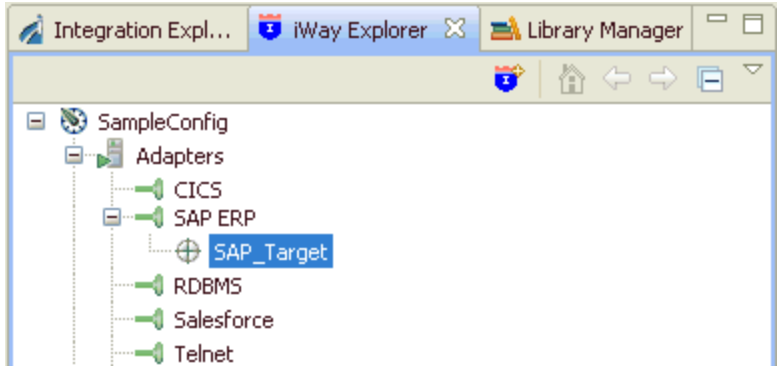


7. Supply the connection information for the SAP ERP system to which you are connecting.

   For a complete description of the available SAP ERP system parameters, see *Identifying SAP ERP Logon Parameters* on page 38.

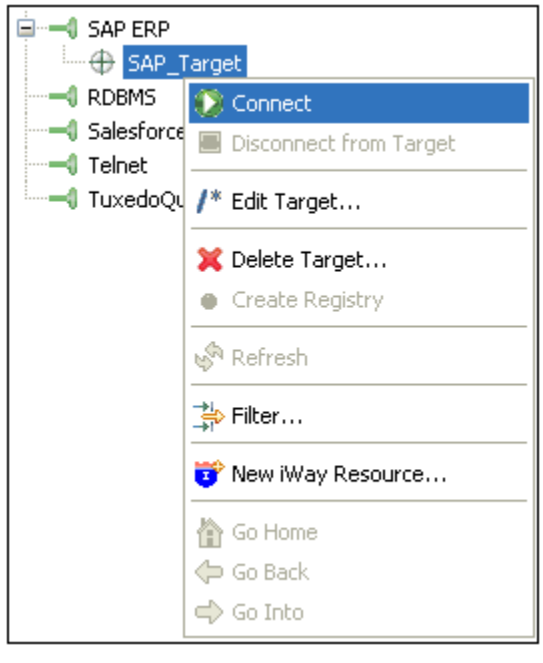
8. Click *Finish* when you are done.

The new target is added to the Adapters node of iWay Explorer, as shown in the following image.

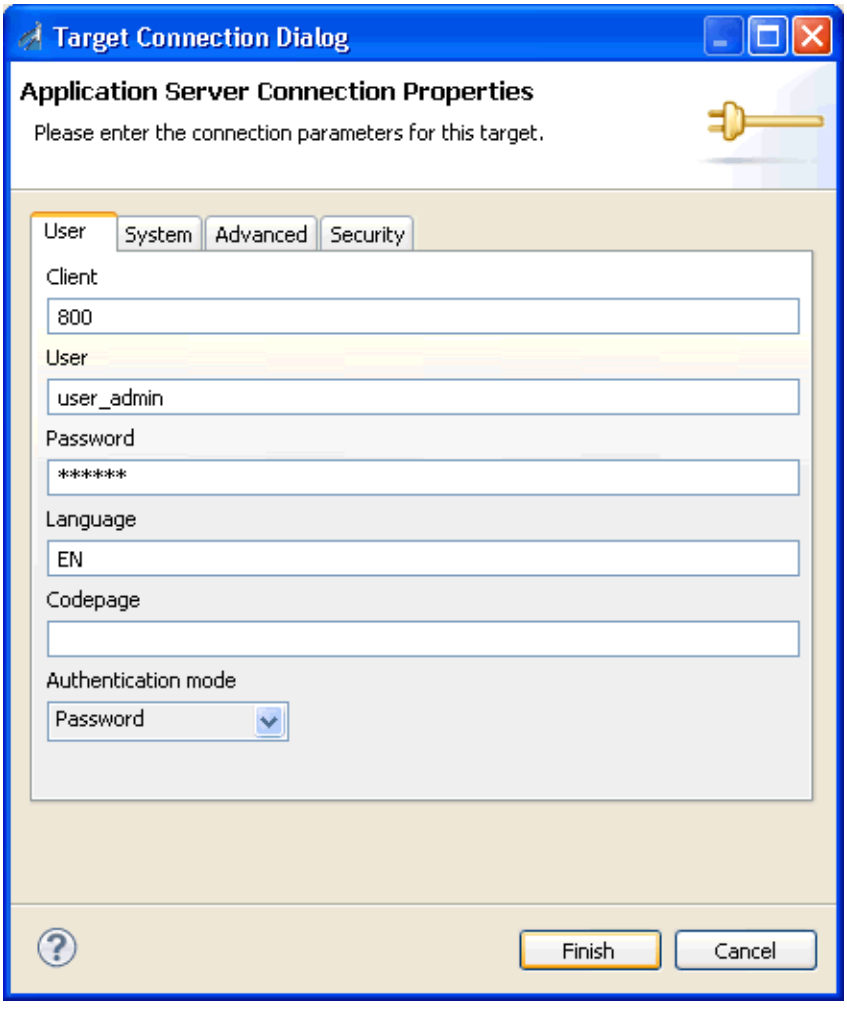


Procedure: How to Connect to a Target

1. Expand the *SAP ERP* node to locate the name of the target that you want to connect to, for example, *SAP_Target*.
2. Right-click the target, and click *Connect* from the menu, as shown in the following image.

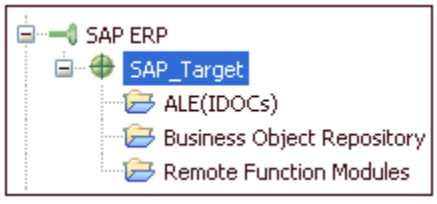


The Target Connection Dialog opens, as shown in the following image.



3. Enter a valid password for the configured SAP ERP target and click *Finish*.

The SAP_Target node icon changes to green, and three folders are displayed (ALE(IDOCs), Business Object Repository, and Remote Function Modules), reflecting a successful connection. You can click a folder and then expand it to display its contents.



Procedure: How to Disconnect From a Target

Although you can maintain multiple open connections to different application systems, it is a good practice to close a connection when you are not using it.

1. In the tree, expand the *SAP ERP* node to locate the name of the target from which you want to disconnect, for example, *SAP_Target*.
2. Right-click the target, and click *Disconnect from Target* from the menu.

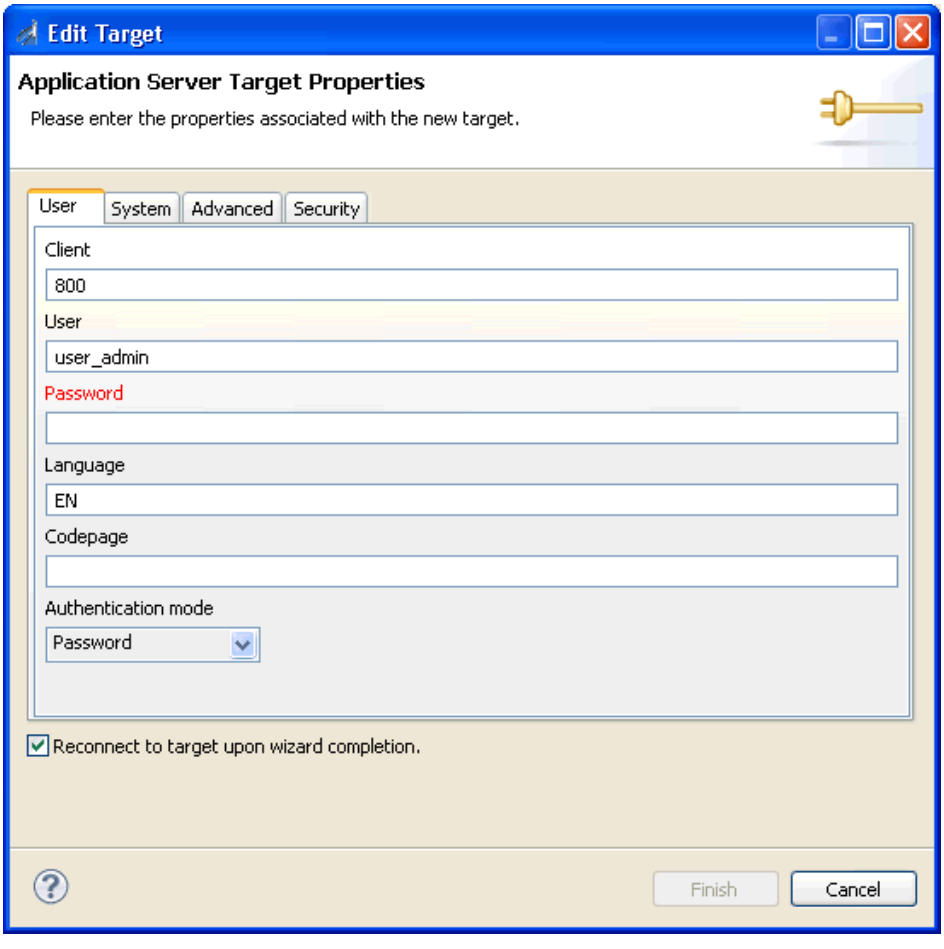
   The connection to the application system is closed.

Procedure: How to Edit a Target

After you create a target, you can edit the information that you provided during the creation procedure.

1. In the tree, expand the *SAP ERP* node to locate the name of the target that you want to edit, for example, *SAP_Target*.
2. Right-click the target, and click *Edit Target* from the menu.

The Edit Target dialog opens and displays the SAP ERP target properties, as shown in the following image.



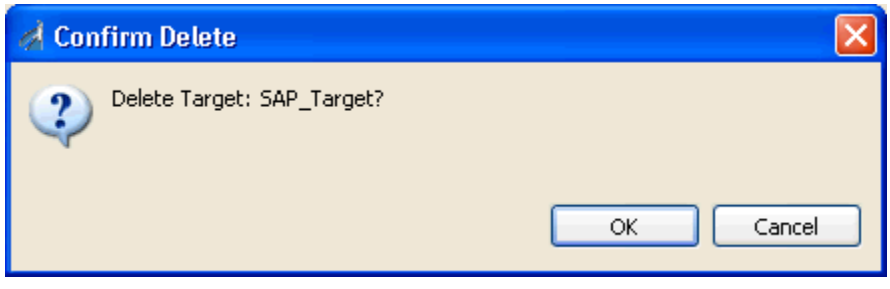
3. Modify the connection properties as required.
4. Optionally select the *Reconnect to target upon wizard completion* check box if you want iWay Explorer to automatically connect to this target after it has been edited. iWay Explorer will use the modified properties to connect.
5. Click *Finish* when you have made your edits.

Procedure: How to Delete a Target

You can delete a target that is no longer needed. You can delete it whether or not it is closed. If open, the target automatically closes before it is deleted.

1. In the tree, expand the *SAP ERP* node to locate the name of the target that you want to delete, for example, *SAP_Target*.
2. Right-click the target, and click *Delete Target* from the menu.

   iWay Explorer displays a prompt, asking you to confirm the deletion of the selected target, as shown in the following image.



3. Click *OK* to proceed with the deletion.

Viewing Application System Objects

After you are connected to SAP ERP, iWay Explorer enables you to explore and browse business object metadata. For example, iWay Explorer enables you to view SAP ERP BAPI, RFC, and IDoc metadata stored in the SAP ERP Business Object repository.

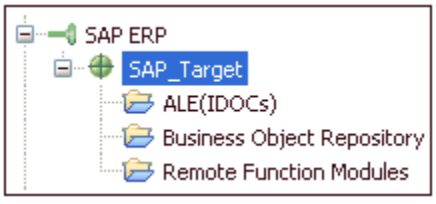
Note: Depending on the release or service pack installed, certain RFCs may not exist in your particular SAP ERP system. Therefore, the examples included in this documentation may not be relevant to your system. If this is the case, you should use the examples as a general reference for adapter functionality and choose an RFC that exists within your SAP ERP application environment.

Procedure: How to View Application System Objects

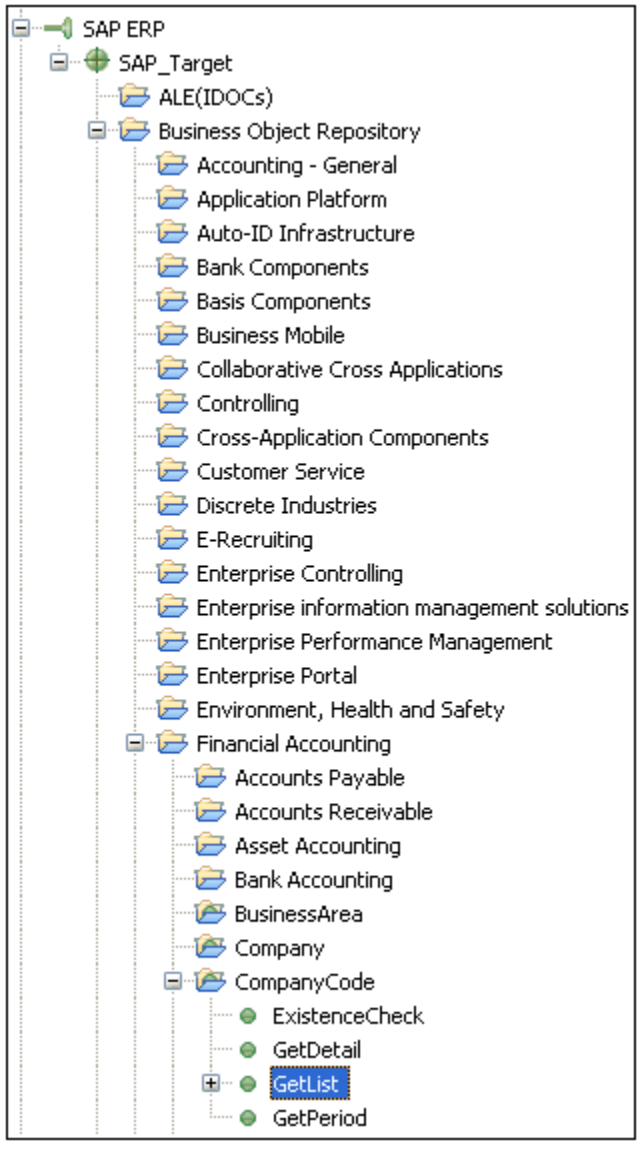
To view application system objects:

1. Click the icon to the left of the target name, for example, SAP_Target.

This expands the target to expose the available application system objects, as shown in the following image.

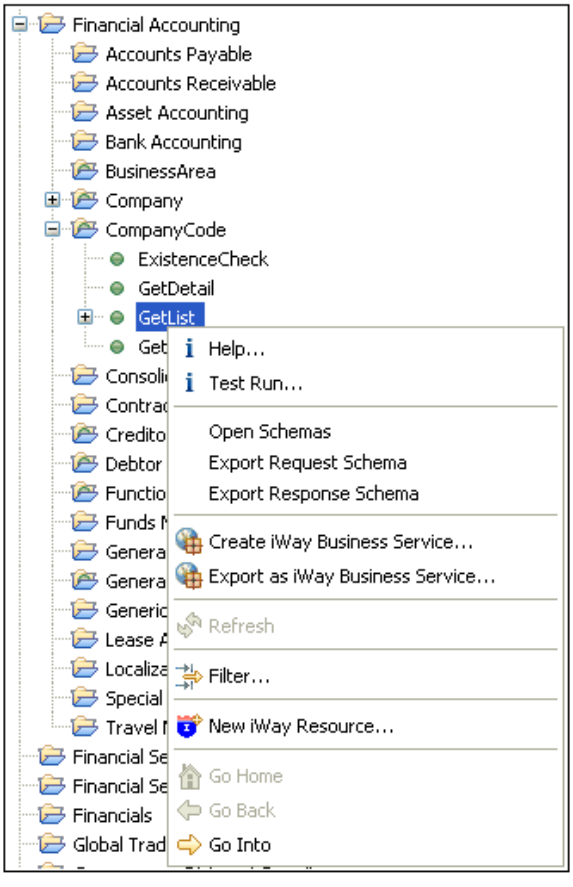


2. Expand the *Business Object Repository* node, as shown in the following image.



3. Expand *Financial Accounting*, followed by *CompanyCode*.
4. Select the *GetList* method.

5. Right-click the *GetList* method to display the menu options that are available, as shown in the following image.

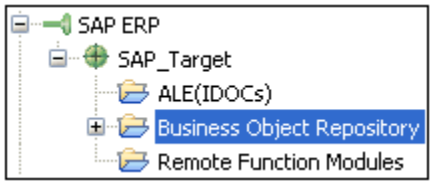


Procedure: How to Search for a Specific SAP ERP Business Object

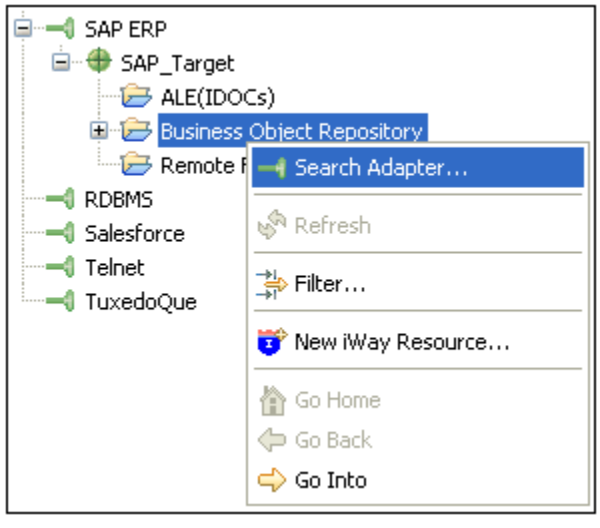
You can use the search function in iWay Explorer to locate a SAP ERP business object.

1. Start iWay Explorer and connect to your SAP ERP system target.
2. Expand the target and select ALE(IDOCs), Business Object Repository, or Remote Function Modules.

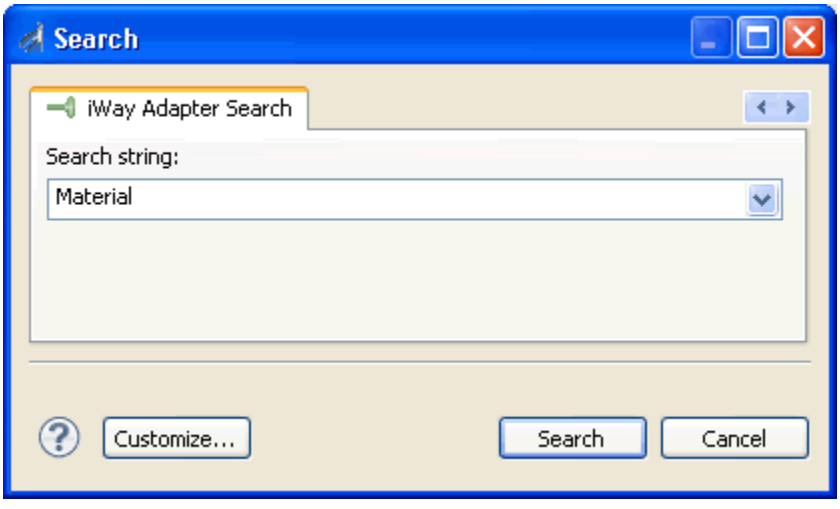
The following image shows Business Object Repository selected.



3. Right-click *Business Object Repository* and select *Search Adapter* from the context menu, as shown in the following image.

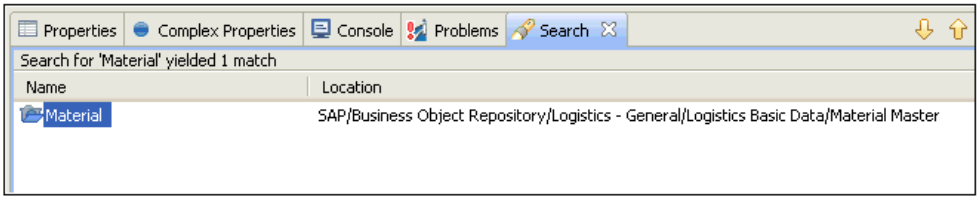


The Search dialog opens, as shown in the following image.



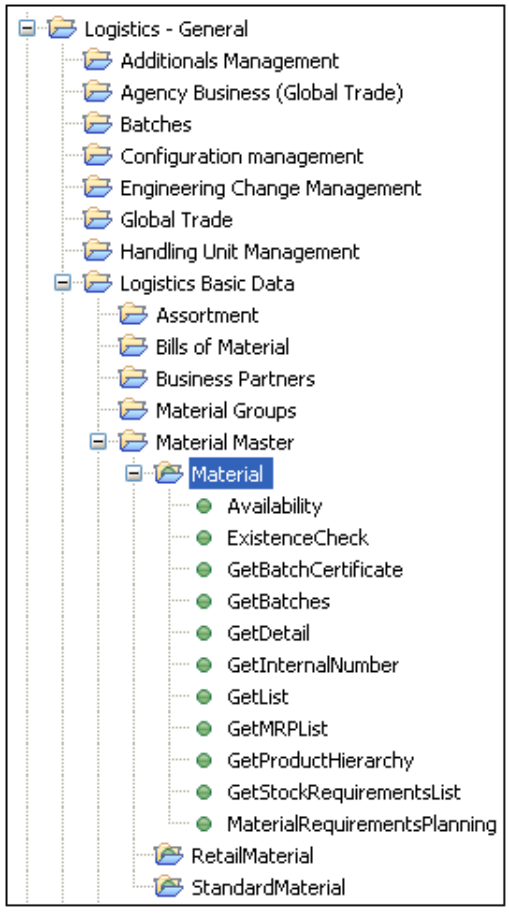
4. Enter the name of the business object you want to search for in the Search string field (for example, Material).
5. Click *Search*.

   The following image shows the Search tab that displays in the primary workspace area and the search results for Material within the Business Object Repository.



6. Double-click the search result (for example, *Material*).

iWay Explorer automatically navigates to the business object you selected in the Search tab, as shown in the following image.



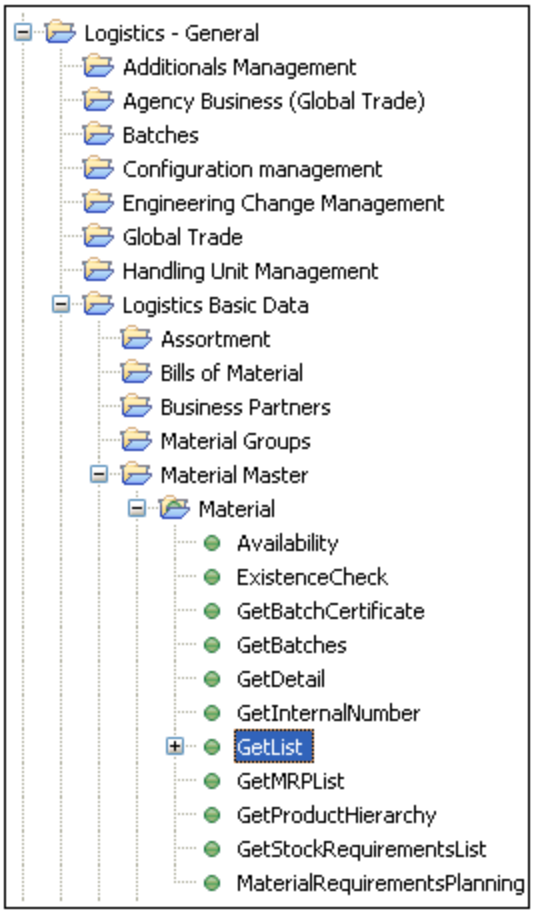
Creating an XML Schema

You can create XML request and response schemas for the SAP ERP metadata that you want to use with your adapter. Optionally, you can store the schemas in a folder (directory) on your file system, using the iWay Explorer export feature.

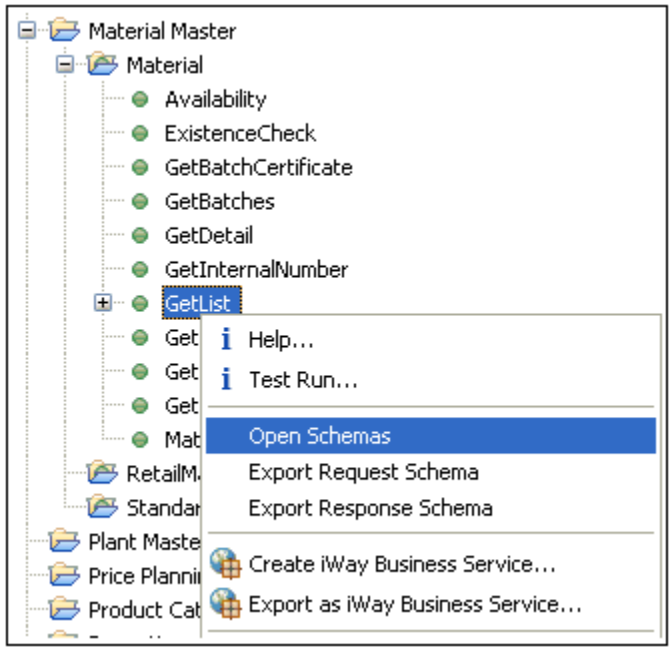
Procedure: How to Create an XML Schema

1. Expand the connected target node and locate the method for which you want to create XML request and response schemas.

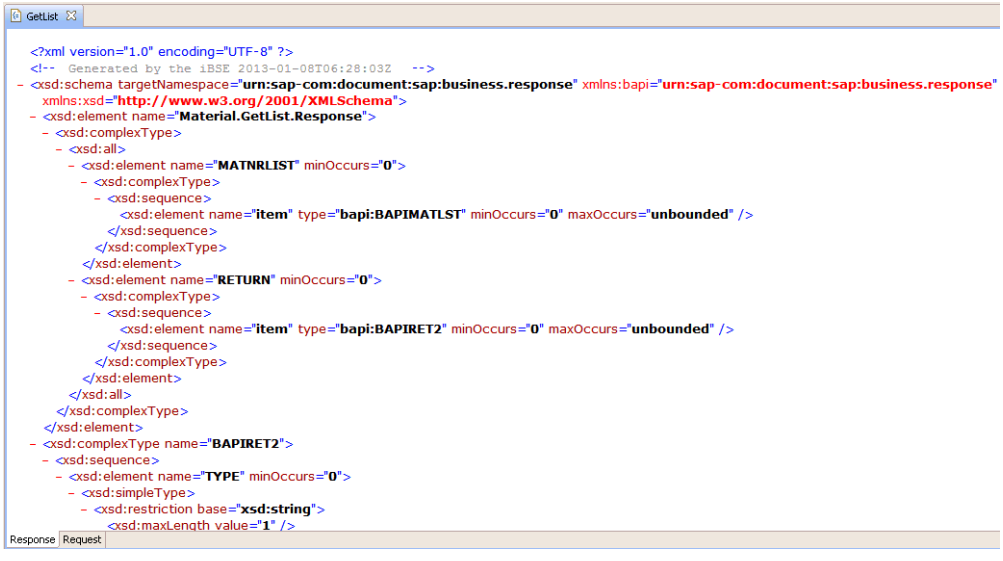
For example, for SAP ERP, expand *Business Object Repository*, *Logistics - General*, *Logistics Basic Data*, *Material Master*, *Material*, and select *GetList*, as shown in the following image.



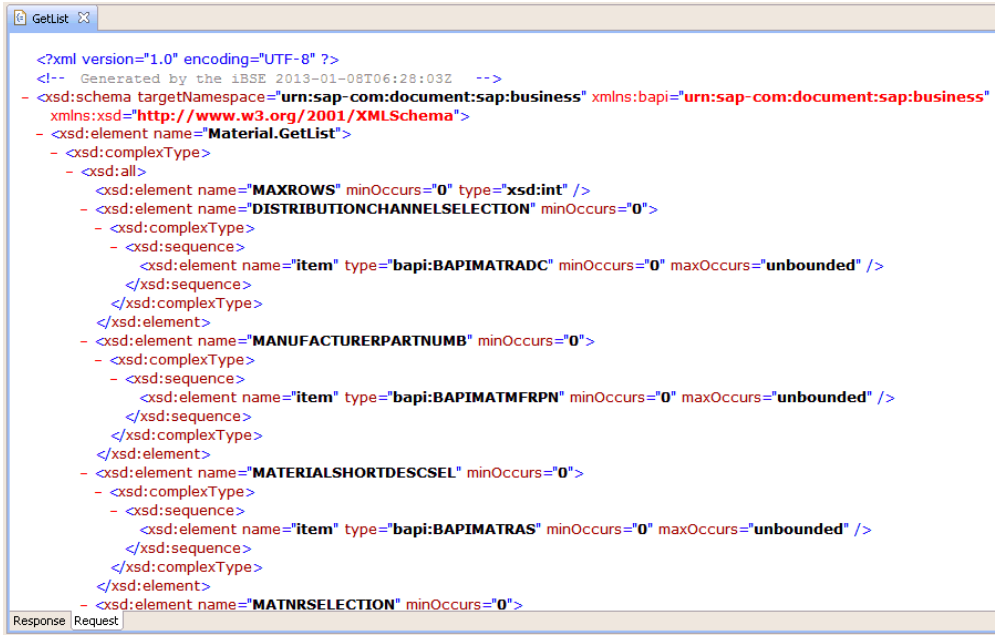
2. Right-click *GetList*, and click *Open Schemas* from the menu, as shown in the following image.



iWay Explorer generates XML request and response schemas for the selected command. By default, the Response tab in the right pane is selected (active), and iWay Explorer displays the XML response schema in that pane.

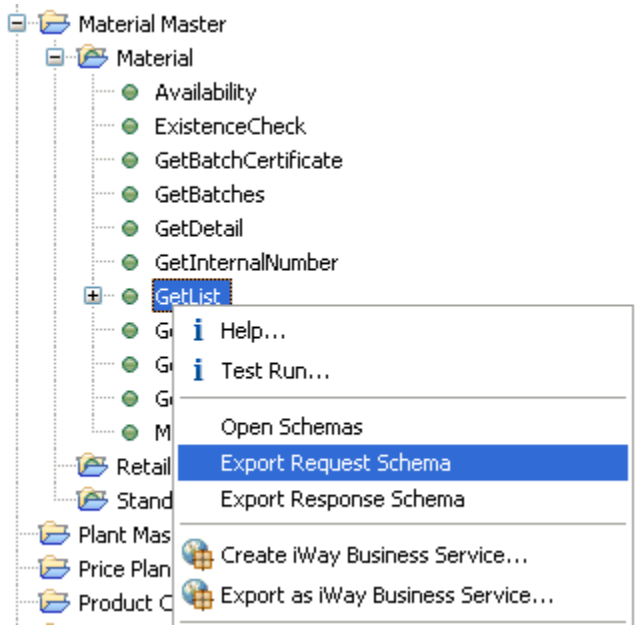


3. In the right pane, click the *Request* tab to display the XML request schema.



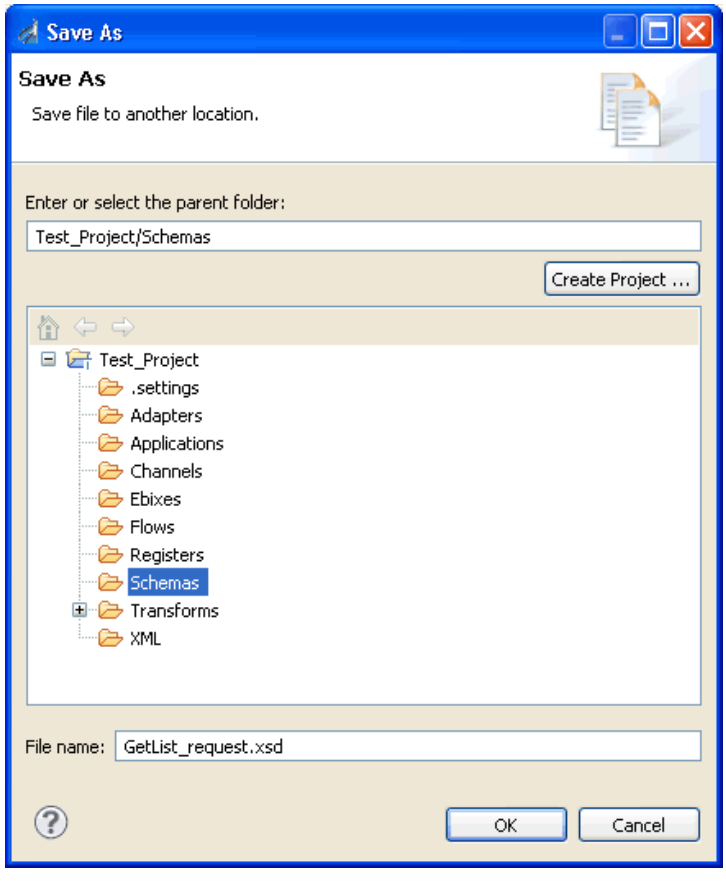
Procedure: How to Export an XML Schema

1. Right-click the SAP ERP method whose schemas you want to export, for example, *GetList*.



2. From the menu, click either *Export Request Schema* or *Export Response Schema*.

The Save As dialog box opens, as shown in the following image.



3. Select the folder on your file system in which to store the exported schema. By default, iWay Explorer stores the file in your workspace folder, followed by the path that you specify on the Save As dialog box.
4. Type a name for the exported schema. By default, the file name extension is .xsd.
5. Click *OK* when you are done.

   iWay Explorer stores the exported schema in the folder that you selected, using the name that you supplied.

   After you browse the list of business objects on your SAP ERP system, you can create iWay Business Services. For more information, see *Creating and Publishing iWay Business Services* on page 107.

After the schemas are created, you also can create events. For more information, see *Configuring SAP ERP Event Handling* on page 137.

Chapter 7

Creating and Publishing iWay Business Services

This section describes how to create and publish iWay Business Services using iWay Explorer for the iWay Application Adapter for SAP ERP.

In this chapter:

Understanding iWay Business Services

iWay Explorer provides web developers with a simple, consistent mechanism for extending the capabilities of the iWay Application Adapter for SAP ERP. The iWay Business Services Provider (iBSP) exposes functionality as web services. It serves as a gateway to heterogeneous back-end applications and databases.

A web service is a self-contained, modularized function that you can publish and access across a network using open standards. It is the implementation of an interface by a component and is an executable entity. For the caller or sender, a web service can be considered as a *black box* that may require input and delivers a result. Web services integrate within an enterprise as well as across enterprises on any communication technology stack, whether asynchronous or synchronous, in any format.

After you browse the SAP ERP business object repository and create an XML schema for the object, you can generate an iWay Business Service for the object you wish to use with your adapter.

Important: The application target you use to create the web service will be the settings used to run the web service. This is particularly important in the case of settings for connection pooling and other usage parameters. If you are creating a production service, calculate the amount of users and the time each service execution takes when configuring connection pool parameters.

Creating iWay Business Services

After you browse the business object repository for an application system, and generate XML schemas for an object that you want to use with an iWay adapter, you can create an iWay Business Service for that object.

The Web Service Description Language (WSDL) file is an XML file that describes the web service documents and provides access to the service. It specifies the location of the service and the operations (or methods) that the service exposes.

You can delete an iWay Business Service that you no longer need.

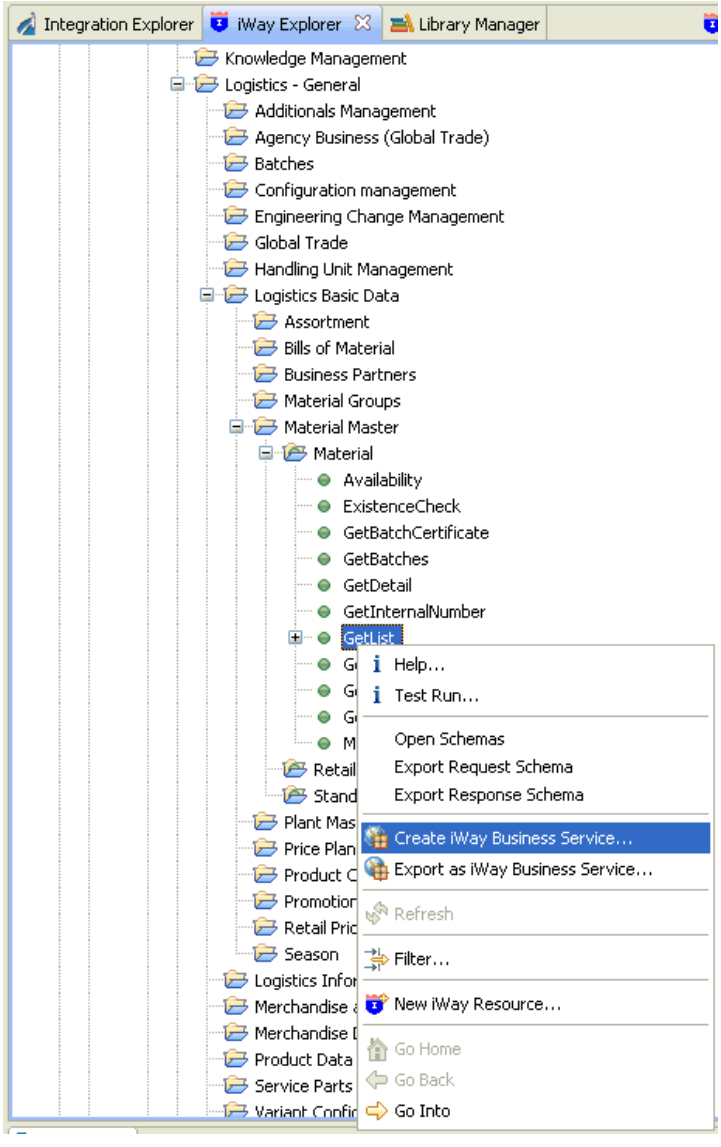
Creating Business Services With iWay Explorer

The following procedure describes how to create iWay Business Services using iWay Explorer. The procedure uses the SAP ERP BAPI method called BAPI_MATERIAL_GETLIST as an example and returns a list of materials.

Note: If you want your web service to use connection pooling, you must specify connection pooling information when connecting or reconnecting to your SAP ERP target.

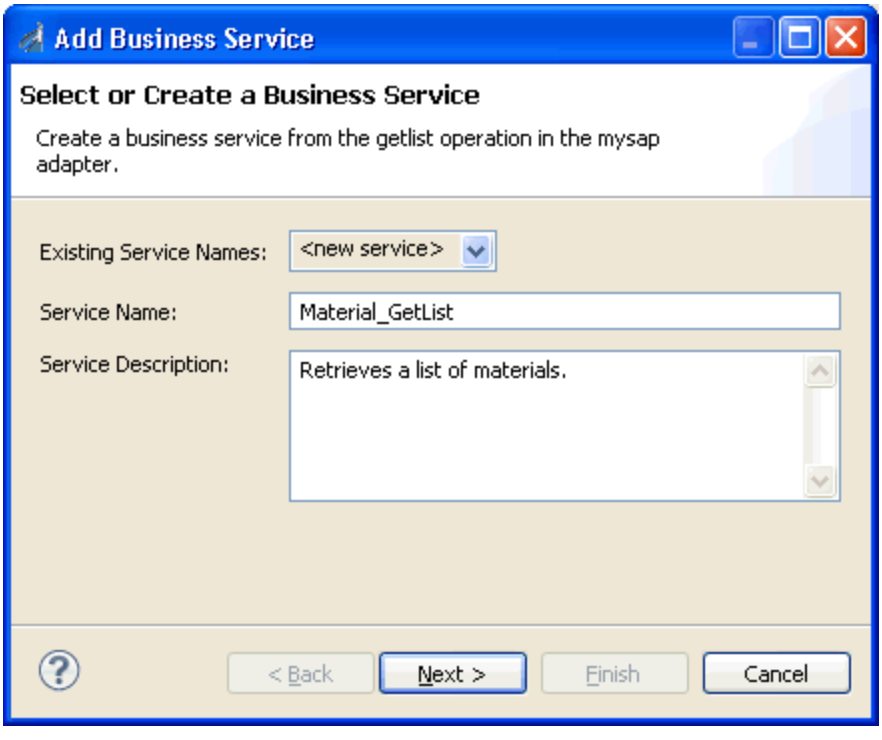
Procedure: How to Create an iWay Business Service

1. In the iWay Explorer tree, expand the target node to which you are connected and locate the method for which you want to create an iWay Business Service. For example:



2. Right-click the command, for example, *GetList*, and click *Create iWay Business Service* from the menu.

The Add Business Service dialog box opens, prompting you for information about the new service.



3. Supply the values for the fields on the dialog box as follows.

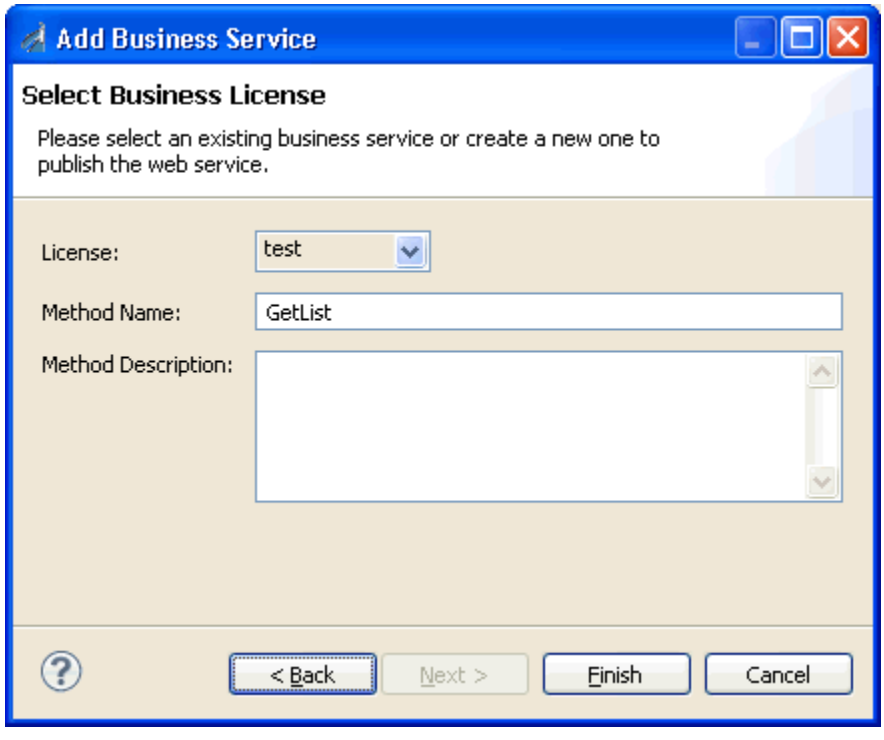
   a. From the Existing Service Names drop-down list, click *<new service>* if you want to create a new service name or select an existing service name.

   b. If you are creating a new service name, type the name in the Service Name field, for example, *Material_GetList*.

   c. In the Service Description field, optionally type a brief description of the new business service.

4. Click *Next*.

The Select Business License pane opens, as shown in the following image.



5. Supply the values for the fields on the dialog box as follows.

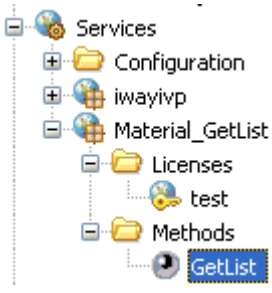
   a. From the License drop-down list, select the license definition that you want to use with this business service.

   b. In the Method Name field, accept the default value or type a descriptive name for the method that the service exposes (for example, GetList).

   c. In the Method Description field, optionally type a brief description of the method.

6. Click *Finish*.

Business Service Explorer adds the new iWay Business Service beneath the Business Service Explorer node in the tree.



The right pane displays the available licenses.

7. To test the new iWay Business Service, click the *test* link in the right pane.

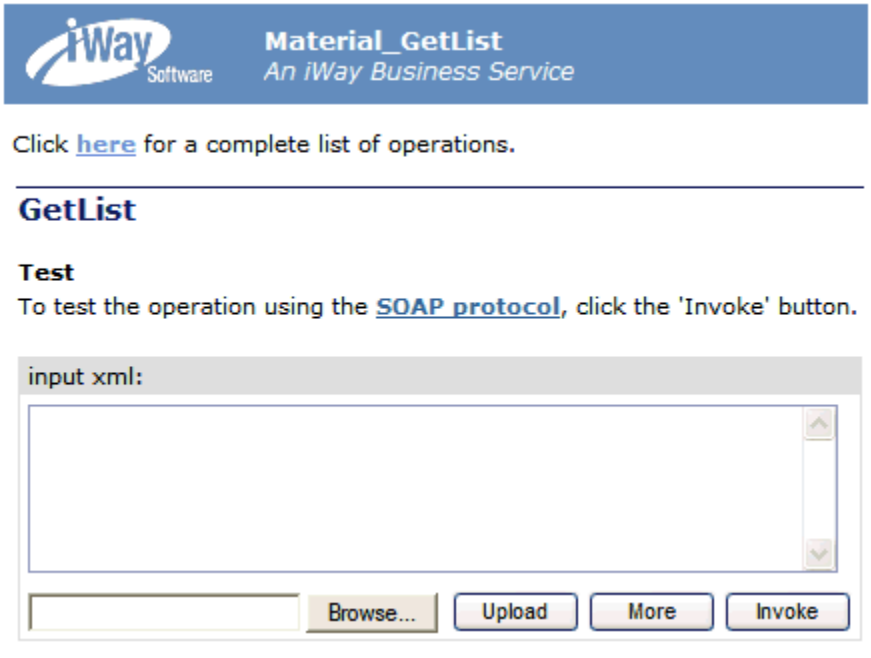
   The iWay Business Services that are licensed under test are displayed.

8. Click the *Material_GetList* link.

   The operations (methods) that are supported are displayed.

9. Click the *GetList* link.

   The test pane for the GetList method opens.

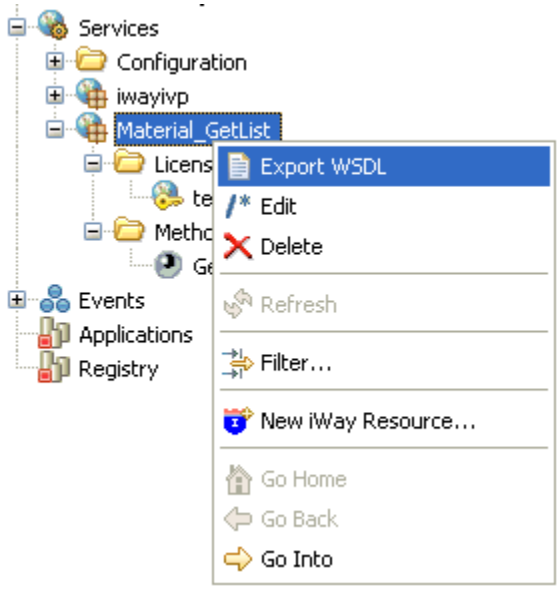


10. In the input xml field, enter an XML request document that queries the iWay Business Service named Material_GetList.
11. Click *Invoke*.

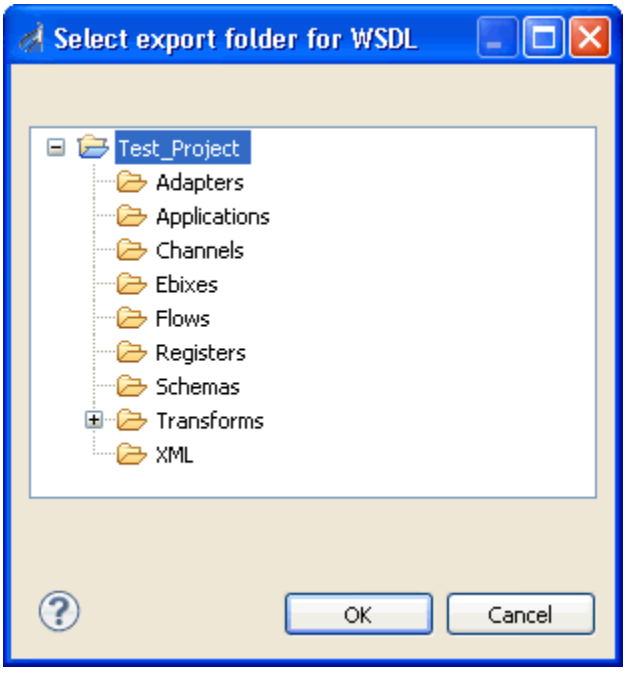
    The result of the test is displayed in the right pane.

Procedure: How to Export a WSDL File

1. Connect to the Business Service Explorer and expand the tree to locate the name of the iWay Business Service whose WSDL file you want to export.
2. Right-click the name of the iWay Business Service, for example, *Material_GetList*, and click *Export WSDL* from the menu.

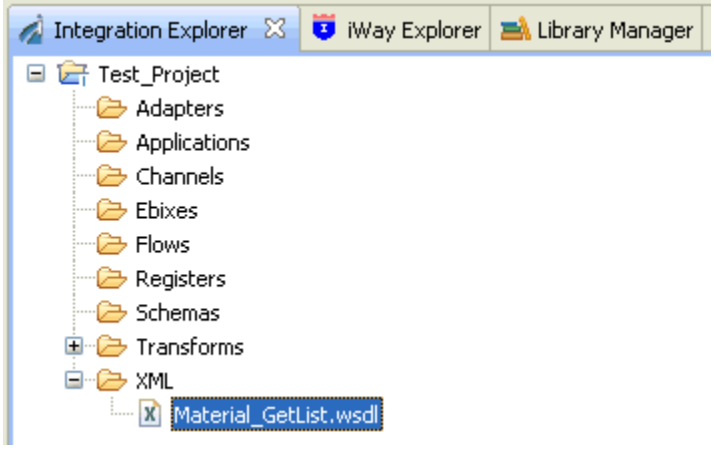


3. In the Select export folder for WSDL dialog box that opens, select the folder in which to store the exported WSDL file.



4. Click *OK* when you are done.

   Integration Explorer stores the exported WSDL file in the folder that you selected.



Procedure: How to Delete an iWay Business Service

1. Connect to the Business Service Explorer, and expand the tree to locate the name of the iWay Business Service that you want to delete.
2. Right-click the name of the iWay Business Service, for example, *Material_GetList*, and click *Delete* from the menu.
3. Business Service Explorer displays a prompt, asking you to confirm the deletion of the selected iWay Business Service.
4. Click *OK* to proceed with the deletion.

Sample iWay Business Services Input XML

The following input XML retrieves a list of materials using the SAP ERP BAPI_MATERIAL_GETLIST method.

```
  <?xml version="1.0" encoding="UTF-8" ?>
- <!-- Sample XML file generated by XMLSPY v5 rel. 3 U
(http://www.xmlspy.com)
  -->
- <Material.GETLIST xmlns="urn:sap-com:document:sap:business"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:sap-com:document:sap:business
C:\temp\service_BAPI_MATERIAL_GETLIST.xsd">
  <MAXROWS>1000</MAXROWS>
- <DISTRIBUTIONCHANNELSELECTION>
- <item>
  <SIGN />
  <OPTION />
  <DISTR_CHAN_LOW />
  <DISTR_CHAN_HIGH />
  </item>
  </DISTRIBUTIONCHANNELSELECTION>
- <MANUFACTURERPARTNUMB>
- <item>
  <MANU_MAT />
  <MFR_NO />
  </item>
  </MANUFACTURERPARTNUMB>
- <MATERIALSHORTDESCSEL>
- <item>
  <SIGN />
  <OPTION />
  <DESCR_LOW />
  <DESCR_HIGH />
  </item>
  </MATERIALSHORTDESCSEL>
- <MATNRLIST>
- <item>
  <MATERIAL />
  <MATL_DESC />
  <MATERIAL_EXTERNAL />
  <MATERIAL_GUID />
  <MATERIAL_VERSION />
  </item>
  </MATNRLIST>
- <MATNRSELECTION>
- <item>
  <SIGN>E</SIGN>
```

```
  <OPTION>BT</OPTION>
  <MATNR_LOW>1000</MATNR_LOW>
  <MATNR_HIGH>1010</MATNR_HIGH>
  </item>
  </MATNRSELECTION>
- <PLANTSELECTION>
- <item>
  <SIGN />
  <OPTION />
  <PLANT_LOW />
  <PLANT_HIGH />
  </item>
  </PLANTSELECTION>
- <RETURN>
- <item>
  <TYPE />
  <ID />
  <NUMBER />
  <MESSAGE />
  <LOG_NO />
  <LOG_MSG_NO />
  <MESSAGE_V1 />
  <MESSAGE_V2 />
  <MESSAGE_V3 />
  <MESSAGE_V4 />
  <PARAMETER />
  <ROW>0</ROW>
  <FIELD />
  <SYSTEM />
  </item>
  </RETURN>
- <SALESORGANISATIONSELECTION>
- <item>
  <SIGN />
  <OPTION />
  <SALESORG_LOW />
  <SALESORG_HIGH />
  </item>
  </SALESORGANISATIONSELECTION>
- <STORAGELOCATIONSELECT>
- <item>
  <SIGN />
  <OPTION />
  <STLOC_LOW />
  <STLOC_HIGH />
  </item>
  </STORAGELOCATIONSELECT>
  </Material.GETLIST>
```

Identity Propagation

If you test or execute a web service using a third-party XML editor (for example, XMLSpy), then the user name and password values that you specify in the SOAP header must be valid. These credentials are used to connect to your SAP ERP system. If you supply a different user name and password, then these values will override the values that you defined during the configuration of the adapter target in iWay Explorer. Otherwise, the user credentials that were defined during the configuration of the adapter target in iWay Explorer will be used to test or execute the web service request.

The following is a sample SOAP header that is included in the WSDL file for a web service:

```
<SOAP-ENV:Header>
    <m:ibsinfo xmlns:m="urn:schemas-iwaysoftware-com:iwse">
        <m:service>String</m:service>
        <m:method>String</m:method>
        <m:license>String</m:license>
        <m:disposition>String</m:disposition>
        <m:Username>String</m:Username>
        <m:Password>String</m:Password>
        <m:language>String</m:language>
    </m:ibsinfo>
</SOAP-ENV:Header>
```

Note: You can remove the following tags from the SOAP header, since they are not required:

```
<m:disposition>String</m:disposition>

<m:language>String</m:language>
```

Chapter 8

Understanding SAP ERP Events

The following topics provide an overview of event functionality in SAP ERP and describe how to configure and test your SAP ERP system for event processing.

In this chapter:

SAP ERP Events Overview

An event in SAP ERP is defined as an occurrence of a status change in an object. The event is created when the relevant status change occurs. You or SAP ERP must implement event creation.

An event is created from a specific application program (the event creator) and then published system-wide. An unlimited number of receivers can respond to the event with their own response mechanisms. An event is usually defined as a component of an object type.

SAP ERP pseudo events are events that are not processed by the SAP ERP Event manager, but are called from an ABAP program or Remote Function call (using the Destination parameter).

Task: In this section, you will learn about the components that are required to configure the SAP system to send IDocs to the adapter. Most configuration work for receiving IDocs is done on the SAP system. This section provides an overview of the components and a step by step walk through to enable you to send or receive IDocs immediately.

Related SAP ERP Concepts and Terminology

The following topics list and define specific terminology related to SAP ERP and SAP ERP event handling.

Client and Server Programs

RFC (Remote Function Call) programs for non-SAP ERP systems can function as either the caller or the called program in an RFC communication. The two types of RFC programs are:

- RFC Client
- RFC Server

The RFC client is the instance that calls the RFC library to execute the function that is provided by an RFC server. The functions that can be executed remotely are called RFC functions, and the functions provided by the RFC API are called RFC calls.

SAP ERP Gateway

The SAP ERP Gateway is a secure application server. No connections are accepted unless they were pre-registered previously from the SAP ERP presentation Client. A server connection presents itself to the Gateway and exposes a Program Identifier. If the Program Identifier is found in the list of registered Program IDs, the Gateway server then offers a connection to the server, which accepts a connection.

The Program ID then is linked with an RFC Destination within SAP ERP, which enables SAP ERP Function Modules and ALE documents (IDocs or BAPI IDocs) to be routed to the destination. The RFC Destination functions as a tag to mask the Program ID to SAP ERP users.

An RFC server program can be registered with the SAP ERP Gateway and wait for incoming RFC call requests. An RFC server program registers itself under a Program ID at an SAP ERP Gateway and not for a specific SAP ERP system.

In SAP GUI, the destination must be defined with transaction SM59, using connection type T and Register Mode. Moreover, this entry must contain information on the SAP ERP Gateway where the RFC server program is registered.

Program IDs and Load Balancing

If the Gateway Server has a connection to a particular server instance and another server instance presents itself to the Gateway, the Gateway offers the connection and then begins functioning in Load Balancing mode. Using a proprietary algorithm, the Gateway sends different messages to each server depending on demand and total processing time. This could cause unpredictable results in a scenario where messages are validated by schema and application.

When configuring multiple events using a single SAP ERP program ID, SAP ERP load balances the event data. For example, if multiple remote function calls or BAPIs use the same program ID (for example, IWAYID) and multiple SAP ERP listeners are configured with this program ID, then SAP ERP sends one request to one listener and the next to another listener, and so on.

The SAP ERP Gateway Server includes a load balancing algorithm. This mechanism is proprietary to SAP ERP application development and may work by comparing total throughput of the connection, the number of times in wait state, and so on. This means connection 1 may receive nine messages and connection 2 may receive one message. If five of nine messages are rejected for schema validation and the message on the other ID is rejected for schema validation, the customer can very easily make a case of missing messages.

Registering Your Program ID in SAP GUI

To enable your SAP ERP system to issue the following calls or interfaces to the SAP ERP event adapter, you must register your program ID under an RFC destination.

- Remote Function Calls (RFC)
- Business Application Programming Interfaces (BAPI)
- Intermediate Documents (IDoc)

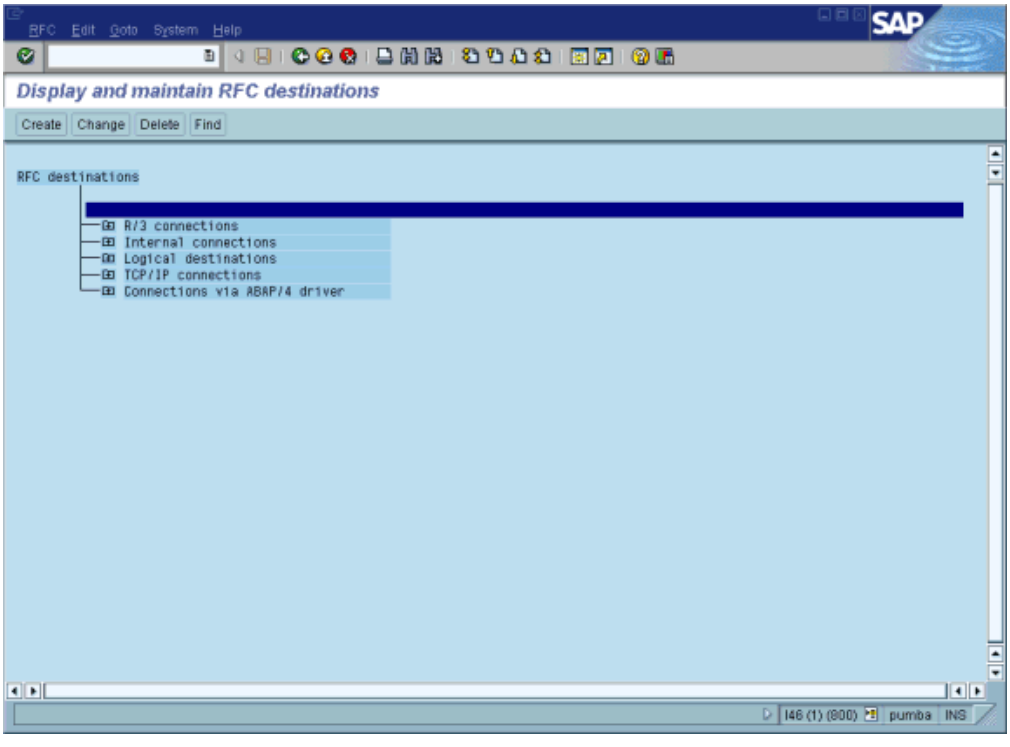
The RFC destination is a symbolic name (for example, IWAYDEST) that is used to direct events to a target system, masking the program ID. The Program ID is configured in both SAP GUI and the event adapter.

Procedure: How to Register Your Program ID

To register your program ID:

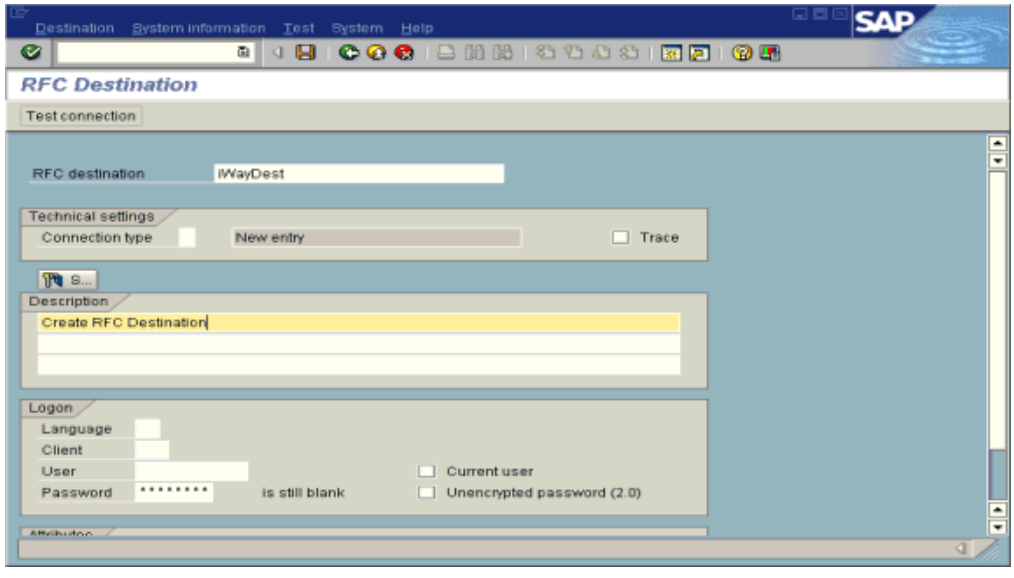
1. Launch the SAP ERP Workbench and logon to the SAP ERP system.
2. Select *Tools*, *Administration*, *Network*, and then *RFC destination*.
3. Execute the *SM59* transaction.

The Display and maintain RFC destinations window opens and displays a list of connections and drivers you can manage as shown in the following image.



4. Select *TCP/IP connections*.
5. Click *Create*.

The RFC Destination window opens and displays fields where you provide information about the RFC destination as shown in the following image.



a. In the RFC destination field, type a name, for example, IWAYDEST.

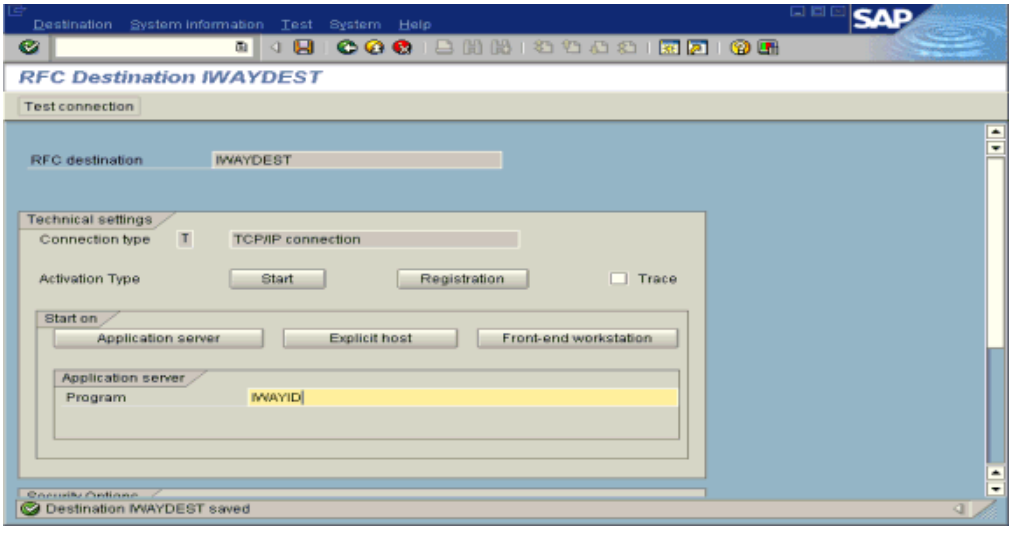
   The value you type in this field is case-sensitive.

b. In the Connection type field, type *T* (for destination type, TCP/IP).

c. In the Description field, type a brief description.

6. Click *Save* from the tool bar or select *Save* from the Destination menu.

The RFC Destination IWAYDEST window opens as shown in the following image.



a. For the Activation Type, click the *Registration* button.

b. In the Program field, type *IWAYID*.

7. Click *Save* from the tool bar or select *Save* from the Destination menu.
8. Ensure your event adapter is running.
9. To verify that the SAP ERP system and the iWay Application Adapter for SAP ERP are communicating, click *Test connection*.

Testing the SAP ERP Event Adapter

In the SAP ERP Server, the SE37 transaction enables you to send RFCs (Remote Function Calls) or BAPIs (Business Application Programming Interfaces) to any RFC destination. For more information on RFC destinations, see *Registering Your Program ID in SAP GUI* on page 121.

Notes:

- Depending on the release or service pack installed, certain RFCs may not exist in your particular SAP ERP system. Therefore, the examples included in this documentation may not be relevant to your system. If this is the case, you should use the examples as a general reference for adapter functionality and choose an RFC that exists within your SAP ERP application environment.

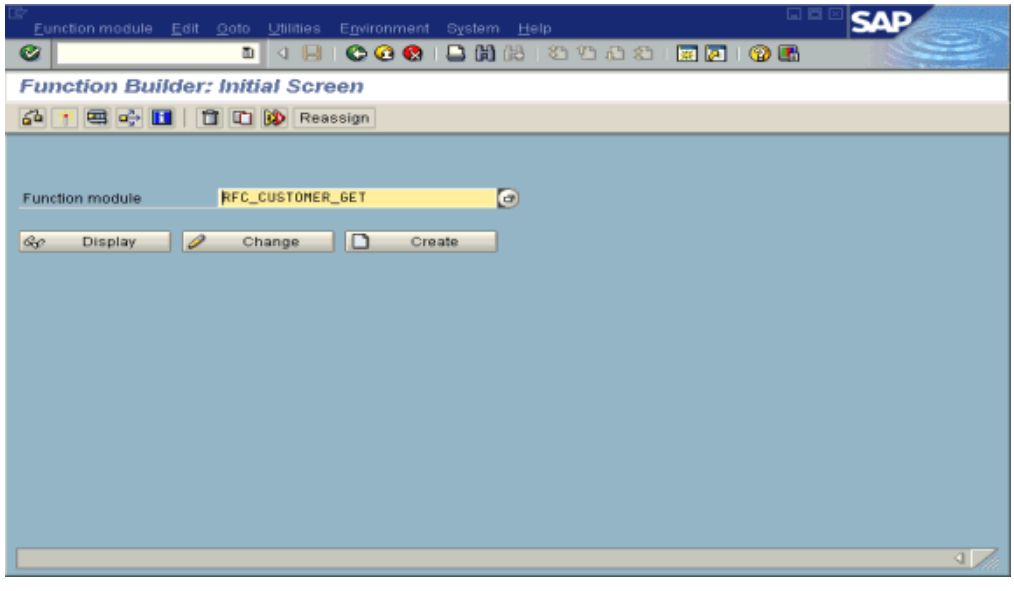
- ❑ iWay Service Manager (iSM) must be running and the iWay Application Adapter for SAP ERP enabled with the configured SAP Program ID before testing can be performed successfully.

Procedure: How to Test the SAP ERP Event Adapter by Sending RFCs or BAPIs Manually

To test the SAP ERP event adapter:

1. In the Function Builder: Initial Screen, select a function module (for example, RFC_CUSTOMER_GET).

   The following image shows the Function Builder: Initial Screen where you can select to display, change, or create a function module. RFC_CUSTOMER_GET is selected.



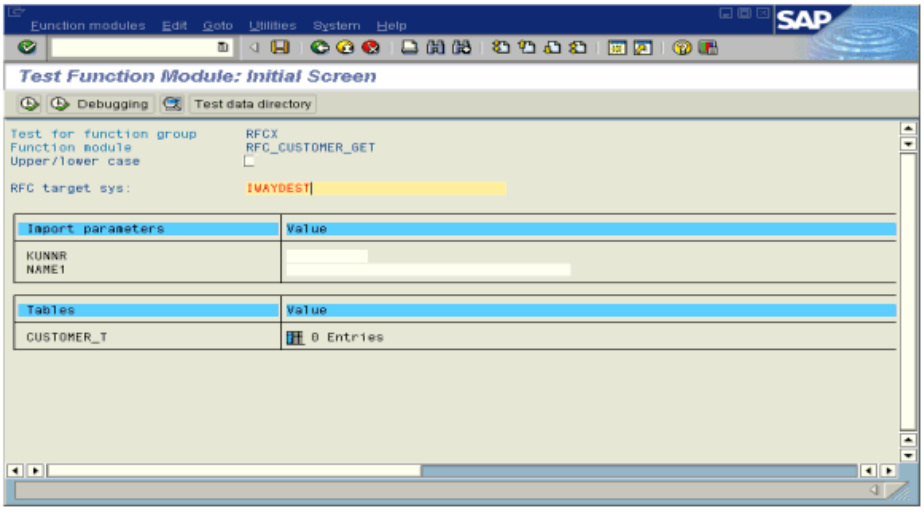
   a. To choose single test, press *F8* and click the *Single Test* icon or select *Function module*, *Test,* and then *Single Test*.

   b. Enter an RFC target system, for example, IWAYDEST.

   c. Enter input data for the particular RFC module, for example, AB*.

2. To execute, press *F8*.

The Test Function Module: Initial Screen opens as shown in the following image. It includes information about the test, the function module, and the target system. You can select the check box for Upper/lower case. The upper left pane lists the import parameters, and the upper right pane contains fields for the values. The lower left pane lists tables, and the lower right pane lists the number of entries.



3. Enter data into the SAP GUI and click the *Execute* button.

   The function name and input data are transferred by RFC to create an XML document on the application server with the parameters input in SAP GUI.

Application Link Enabling Configuration for the Event Adapter

The SAP ERP event adapter receives IDocs (Intermediate Documents) from SAP ERP.

Document Processing

The iWay Application Adapter for SAP ERP accepts IDocs in either SAP ERP standard format or XML format. If you are using flat IDocs, no encoding is required and the EDI_DC40 control header must be the first entry in the IDoc.

Collected Inbound Configuration

When sending collected IDocs to SAP ERP, if the DOCNUM field does not have a unique document number for each IDoc, the system creates an IDoc for each header record in the collected IDoc file. The system also duplicates the data for each IDoc.

You must ensure that the DOCNUM field is included in the EDI_DC40 structure and that each IDoc has a unique sequence number within the collected IDoc file.

To configure an SAP ERP system to send IDocs to the SAP ERP event adapter, you use the ALE (Application Link Enabling) configuration to:

1. Register your program ID in SAP GUI. For more information, see *Registering Your Program ID in SAP GUI* on page 121.
2. Define a port.

   A port identifies where to send messages. The port can be used only if an RFC destination was previously created.

   For more information on creating an RFC destination, see *SAP ERP Events Overview* on page 119. For more information on defining a port, see *How to Define a Port* on page 127.
3. Create a logical system.

   One type of partner is a logical system. A logical system manages one or more RFC destinations. For more information, see *How to Create a Logical System* on page 128.
4. Create a partner profile.

   A partner profile is a definition of parameters for the electronic interchange of data with a trading partner using the IDoc interface. To communicate with a partner using the IDoc interface, you must create a partner profile. For more information, see *How to Create a Partner Profile* on page 130.
5. Create a distribution model for the partner and message type.

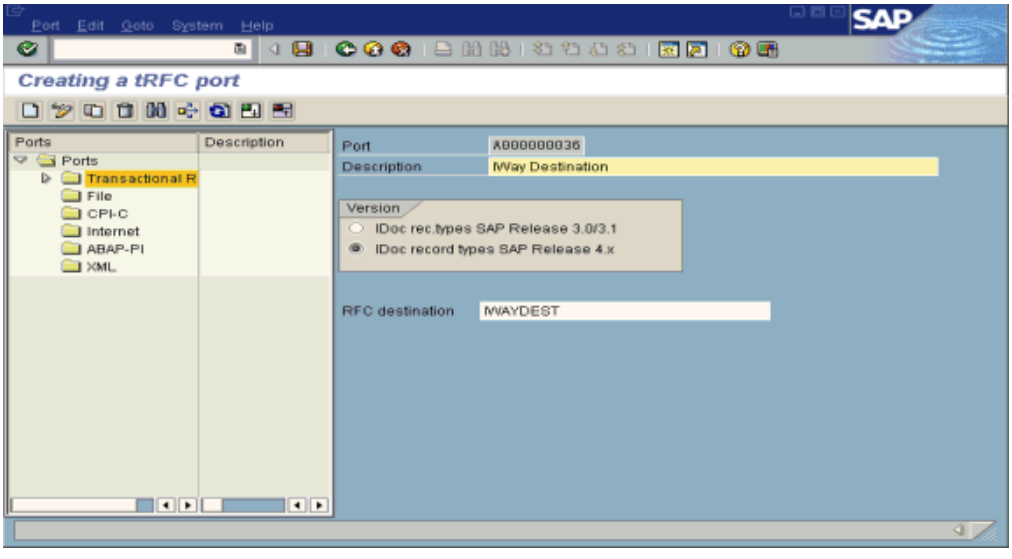
   You create a distribution model for the partner and message type you designated. For more information, see *How to Create a Distribution Model for the Partner and Message Type* on page 132.
6. Test the SAP ERP event adapter. For more information, see *Testing the SAP ALE Configuration* on page 134.

Procedure: How to Define a Port

To define a port:

1. In the ALE configuration, choose *Tools, Business Communications, IDocs Basis, IDoc,* and then *Port Definition* or execute the *WE21* transaction.

The Creating a tRFC port window opens as shown in the following image. On the left, the window is divided into a Ports pane and a Description pane. A pane for displaying information about the port is on the right.



a. In the left pane under Ports, select *Transactional RFC* and click *Create*.

b. Select *Generate port name*.

   The system generates the port name.

c. In the right pane, select the IDoc version you want to send through this port.

d. Click the destination you created, for example, IWAYDEST.

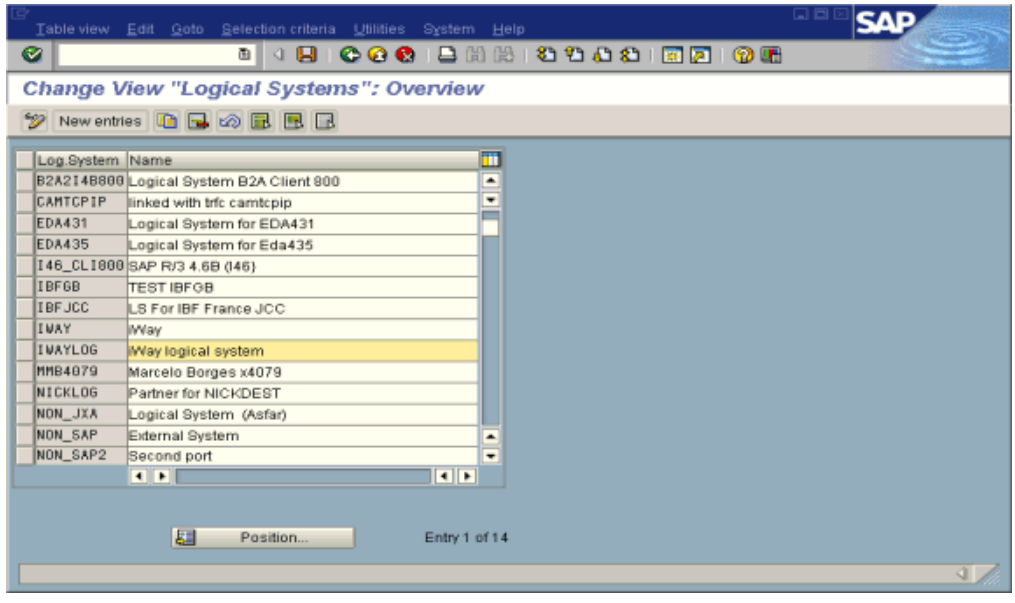
2. Save the session, making note of the system-generated RFC port.

Procedure: How to Create a Logical System

To create a logical system called IWAYLOG:

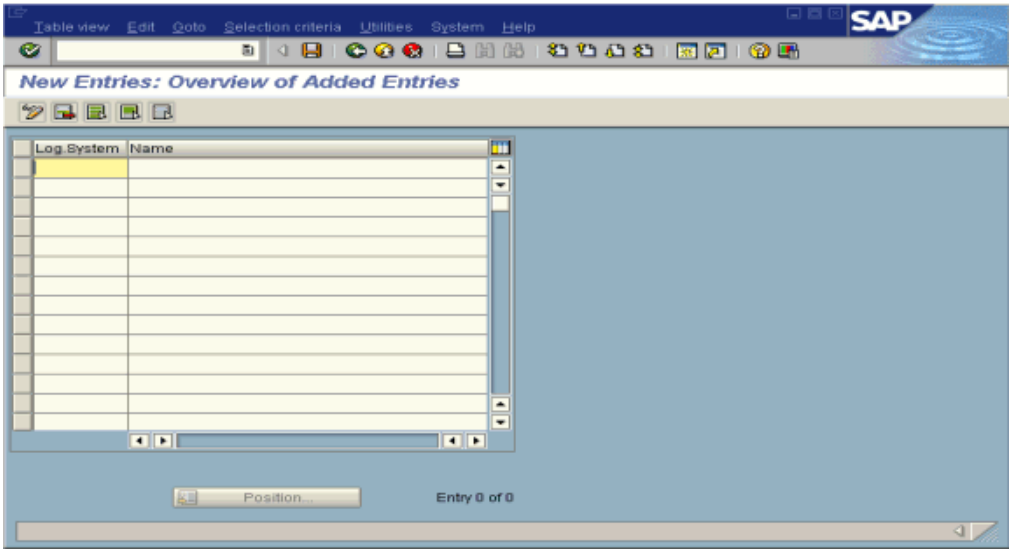
1. In the ALE Configuration, enter the area menu selection *SALE* transaction.
2. Select *SAP Reference IMG*.
3. Expand the following nodes: *Basis Components, Application Link Enabling (ALE), Sending and Receiving Systems, Logical Systems*, and *Define Logical System*.
4. Click the green check mark beside *Define Logical System*.

The Change View "Logical Systems": Overview window opens and displays a list of logical systems and their names, as shown in the following image.



5. Click *New entries*.

The New Entries: Overview of Added Entries window opens, as shown in the following image, with columns labeled Log.System and Name for adding new log systems.



a. Type an entry for Log System, for example, IWAYLOG.

b. In the Name column, type a name (description) for the partner profile.

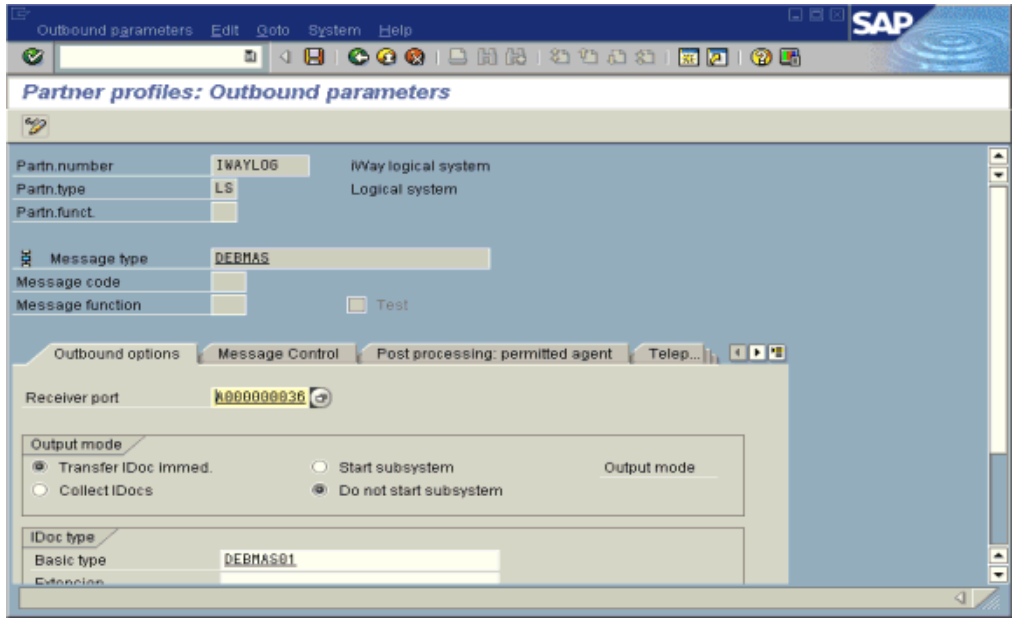
6. Save the session.

Procedure: How to Create a Partner Profile

To create a partner profile:

1. In the SAP ERP Workbench, choose *Tools, Business Communication, IDoc Basis, IDoc,* and then *Partner profile* or execute the *WE20* transaction.

The Partner profiles: Outbound parameters window opens and displays fields for specifying details for the partner profile, as shown in the following image.



a. Select Partner type *LS* (Logical system).

b. Press *F5* (Create).

2. For Type, enter *USER*.
3. For Agent, enter the current user ID, or you may select another agent type.
4. Under the outbound parameter table control, select *Create outbound parameter*.

   Partn.type is LS.

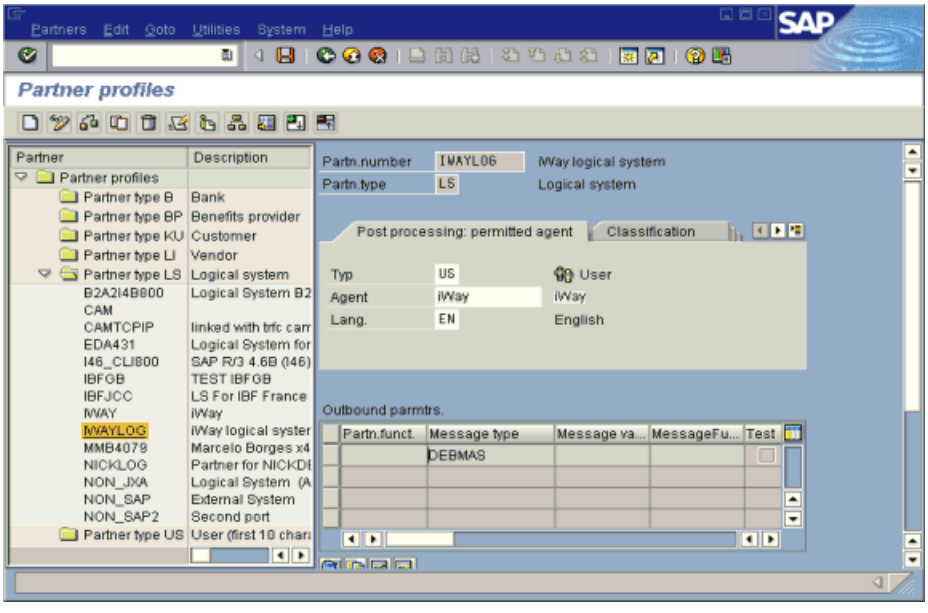
   Message type is DEBMAS (the IDoc document type).
5. Leave *Partn.funct* blank.
6. Click the *Outbound options* tab.

   a. Depending on your performance requirements, click *Transfer IDoc Immed* or *Collect IDocs*.

   b. For the IDoc, type a message type, for example, DEBMAS.

   c. Type a receiver port, for example, A000000036.
7. Save the session and exit.

The Partner profiles summary window opens and displays information for the logical system that you created, as shown in the following image. In the left pane are partners and descriptions. The right pane displays information depending on which tab is active.



Procedure: How to Create a Distribution Model for the Partner and Message Type

To create a distribution model called IWAYMOD:

1. In the SAP ERP Workbench, choose *Tools, AcceleratedSAP, Customizing,* and then *Project Management* or execute the *BD64* transaction.

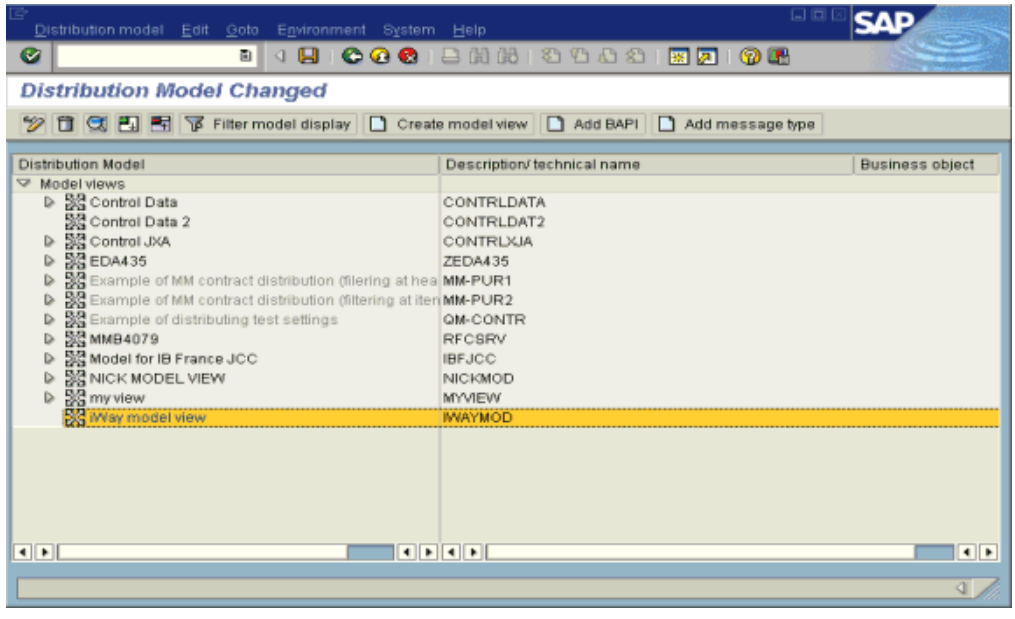
   The Display Distribution Model window opens.

2. Select *Create model view*. (If required, switch processing mode to edit within Distribution Model/Switch Processing Mode.)

3. Type a short text string and a technical name for your new model view.

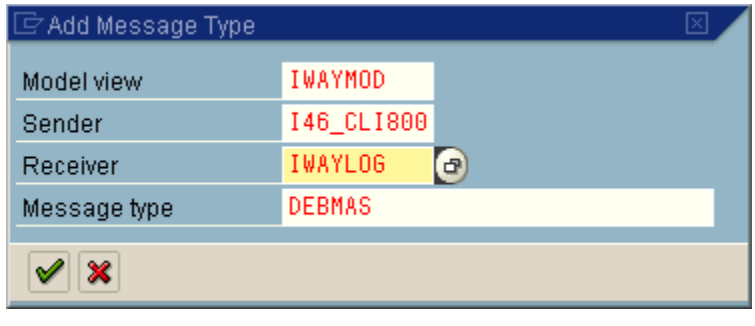
4. Click the *Save* button.

The Distribution Model Changed window opens with a tree structure of the distribution model in the left pane and the descriptions or technical names in the right pane, as shown in the following image.



5. In the Distribution Model tree, select a new model view.
6. At the right, in the button bar, select *Add message type*.

   The Add Message Type pane opens and displays the name of the model view. It includes fields for specifying the sender and receiver of the message, as well as the message type, as shown in the following image.



   a. In the Sender field, provide the sender that points to the SAP ERP system that sends the IDoc, for example, I46_CLI800.

      In this case, the sender is an SAP ERP 4.6B system.

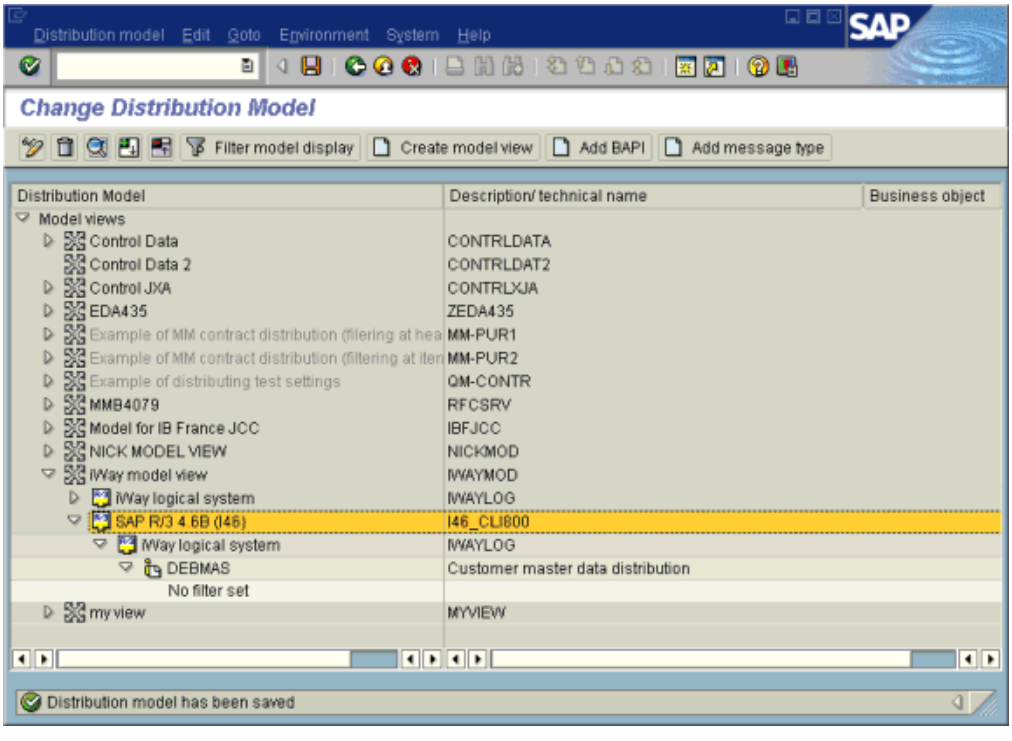
b. In the Receiver field, provide the logical system, for example, IWAYLOG.

c. In the Message type field, provide the type of IDoc, for example, DEBMAS.

7. Click the check mark icon.

8. Click the *Save* button.

   The Change Distribution Model window opens and displays the new model view to use to send message type, DEBMAS, from the I46_CLI800 SAP ERP system to the IWAYLOG logical system, as shown in the following image.



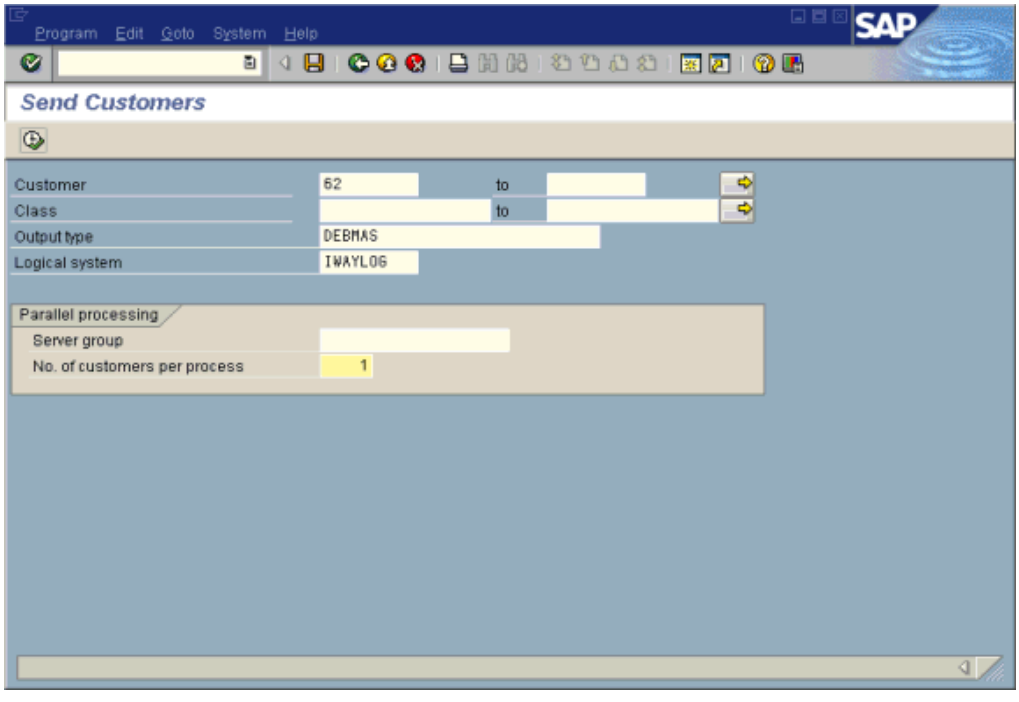
You are now ready to test the connection to the logical system.

Testing the SAP ALE Configuration

In the SAP ERP Server, the BD12 transaction enables you to send IDocs to any logical system, for example, to an event adapter.

Procedure: How to Test the SAP ALE Configuration

The following image shows the Send Customers window where you test the message type. It includes fields for Customer, Class, Output type, and Logical system. The Parallel processing pane includes a field for Server group and a field for the number of customers per process.

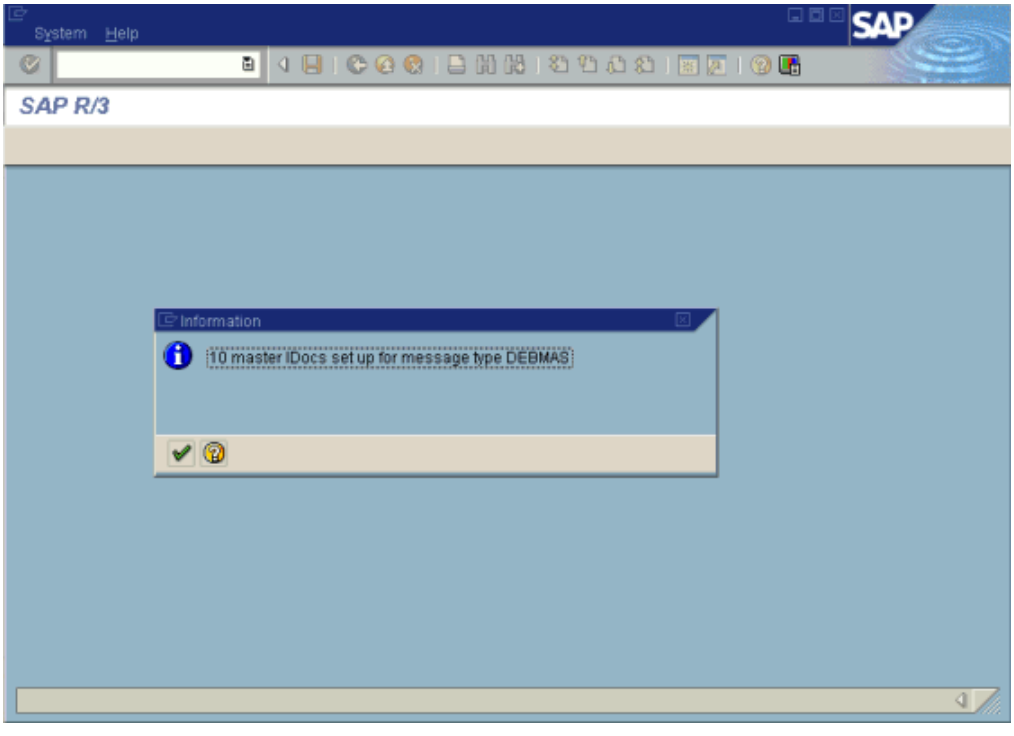


To test the SAP Application Link Enabling (ALE) configuration:

1. In the Send Customers window, type the IDoc message type *DEBMAS* in the Output type field.
2. In the Logical system field, type the logical system, for example, IWAYLOG.
3. To transfer data, click the *Run* button.

   The SAP ERP event adapter receives the IDoc in XML format. No response is expected from the event adapter.

A window opens and confirms the message entered in previous screens, as shown in the following image.



Chapter 9

Configuring SAP ERP Event Handling

This section describes how to create ports and channels using iWay Explorer for the iWay Application Adapter for SAP ERP to listen for SAP ERP events.

In this chapter:

Understanding iWay Event Functionality

Events are generated as a result of activity on an application system. You can use events to trigger an action in your application.

Applications or functions within SAP ERP may broadcast processing information at predefined execution points, or events. You must configure the SAP event receive process and create an adapter event listener if you are to receive events from SAP ERP. For example, the SAP ERP business object, *Material*, may raise the event *Material.Created*, when a new instance of *Material* is created. If you wish to consume this event, you must configure an SAP event handler and an event listener to capture this event within SAP ERP and transmit the event parameters to the adapter system.

After you create a connection to SAP ERP, you can add events using the Events node in iWay Explorer. To add an event, you must create a port and a channel.

The following is a description of how ports and channels work using iWay Explorer.

iWay Software offers an expanded toolset in the iWay Registry and process flows that allow for distributed, coordinated processing. It is recommended that you upgrade to those technologies at your earliest convenience. Ports and channels are documented here for testing purposes or for legacy applications. Note that iWay Registry servers, ports, and channel servers may block one another or intercept messages. Do not use both technologies at once. For more information on the iWay Registry and process flows, see *Configuring the SAP ERP Adapter in an iWay Environment* on page 173 or the *iWay Integration Tools User Guide* for your specific release.

If you are planning to use the iWay Registry or process flows for your integration purposes, then you can skip this chapter.

- **Port.** A port associates a particular business object exposed by an adapter with a particular disposition. A disposition defines the protocol and location of the event data. The port defines the end point of the event consumption. For more information, see *Creating a Port* on page 138.

  Note: The ports that are described in this chapter and configured using iWay Explorer are different from the ports within an SAP ERP system.

- **Channel.** A channel represents configured connections to particular instances of back-end or other types of systems. A channel binds one or more event ports to a particular listener managed by an adapter. For more information, see *Creating a Channel* on page 149.

Creating a Port

The procedures in this topic describe how to create, edit, or delete a port using the Events node in iWay Explorer.

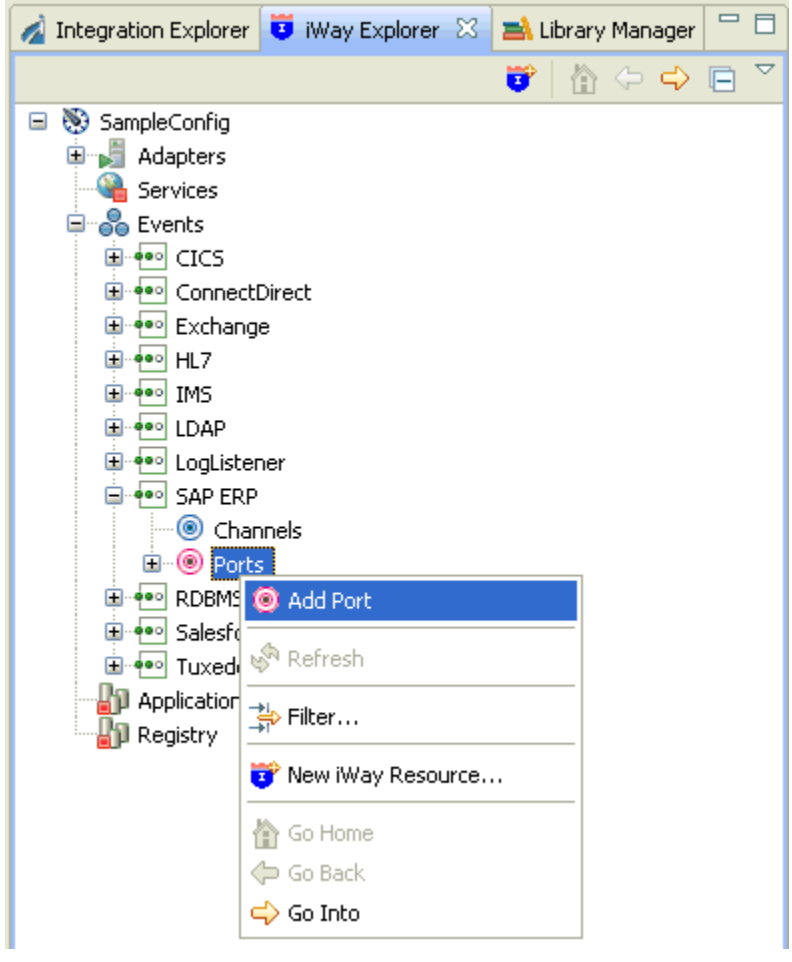
When you the Events node in iWay Explorer with an iWay Business Services Provider (iBSP) implementation, the following port dispositions are available.

- **File.** The File disposition uses a file URL to specify the destination file name or directory in which the event document will be written. During run time, the destination file name may require indexing to avoid overwriting.
- **iBSE.** The iBSE disposition enables an event to launch a business service method.
- **MSMQ.** The Microsoft Message Queuing (MSMQ) disposition supports public and private queues.
- **JMSQ.** The JMSQ disposition allows an event to be added to a JMS queue.
- **SOAP.** The SOAP disposition allows an event to launch a business service specified by a WSDL file. A SOAP action is optional. A double quote ("") is the default value.

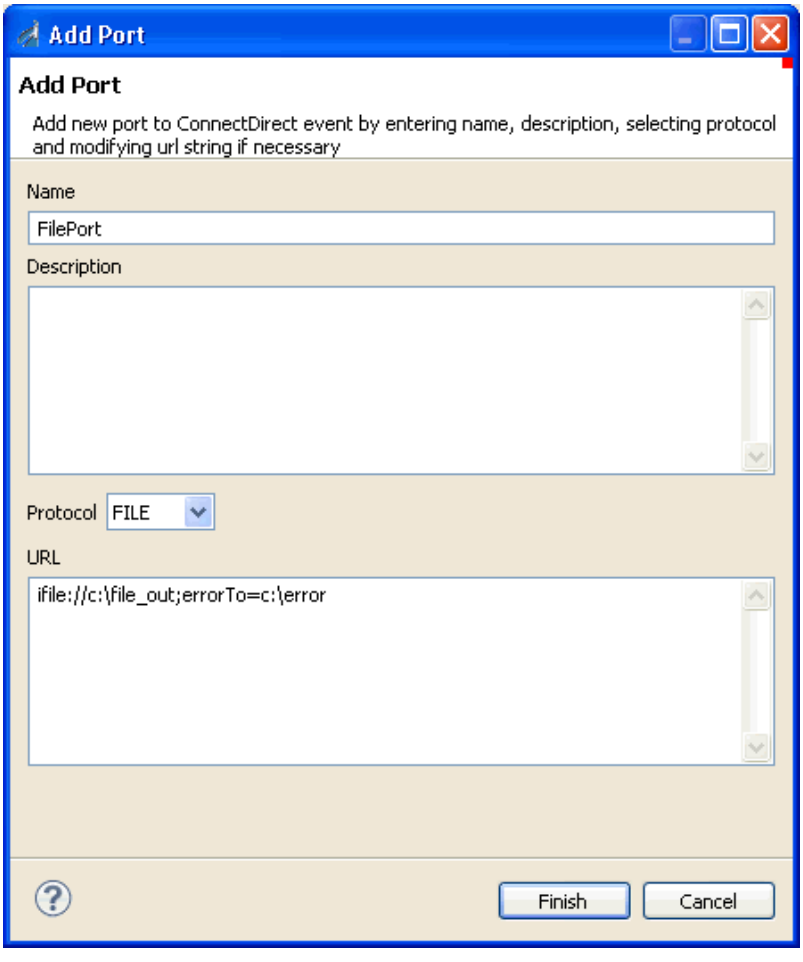
- **HTTP.** The HTTP disposition uses an HTTP URL to specify an HTTP endpoint to which an event document is posted.

Procedure: How to Create a Port for the File Disposition

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.



The following image shows the Add Port dialog box where you can supply information about the port.



a. In the Name field, type a name for the port.

b. In the Description field, optionally type a brief description.

c. From the Protocol drop-down list, select *FILE*.

d. In the URL field, type a File destination to which event data is written.

   When pointing the Events node in iWay Explorer to an iBSP deployment, specify the File destination using the following format:

```
ifile://[location];errorTo=[pre-defined port name or another
disposition url]
```

The following table describes the parameters for the File disposition.

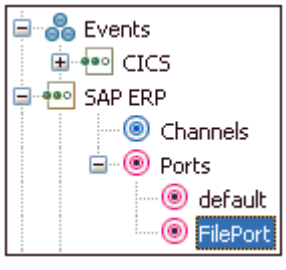
Parameter	Description
location	Destination and file name of the document where event data is written.
errorTo	Predefined port name or another disposition URL where error logs are sent. Optional.

For example:

```
ifile://D:\in\x.txt;errorTo=ifile://D:\error
```

3. Click *Finish* when you have supplied the values on the Add Port dialog box.

   The following image shows the port that you added, which appears beneath the Ports node in the Events area of iWay Explorer. In this example, the port is named FilePort.



Procedure: How to Create a Port for the IBSE Disposition

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.

   The Add Port dialog box opens.
3. Supply the values for the fields on the dialog box as follows.
   a. In the Name field, type a name for the port.
   b. In the Description field, optionally type a brief description.
   c. From the Protocol drop-down list, select *IBSE*.
   d. In the URL field, type an iBSE destination using the following format:

```
ibse:[svcName].[mthName];responseTo=[pre-defined port name or
another disposition url];errorTo=[pre-defined port name or another
disposition url]
```

The following table describes the parameters for the IBSE disposition.

Parameter	Description
svcName	Name of the business service created with iBSE.
mthName	Name of the method created for the business service.
responseTo	Location where responses to the business service are posted. Predefined port name or another full URL. Optional.
errorTo	Location where error documents are sent. Predefined port name or another full URL. Optional.

4. Click *Finish* when you have supplied the values on the Add Port dialog box.

   The port that you added is displayed beneath the Ports node.

Procedure: How to Create a Port for the MSMQ Disposition

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.

   The Add Port dialog box opens.
3. Supply the values for the fields on the dialog box as follows.
   a. In the Name field, type a name for the port.
   b. In the Description field, optionally type a brief description.
   c. From the Protocol drop-down list, select *MSMQ*.
   d. In the URL field, type an MSMQ destination in the following format:

```
msmq://[machineName]/private$/[qName];errorTo=[pre-defined port
name or another disposition url]
```

   The following table describes the parameters for the MSMQ disposition.

Parameter	Description
machineName	Name of the machine on which the Microsoft Message Queuing system is running.

Parameter	Description
queue type	For private queues, type *Private$*. Private queues are queues that are not published in the Active Directory. They appear only on the local computer that contains them. Private queues are accessible only by Microsoft Message Queuing applications that recognize the full path name or format name of the queue.
qName	Name of the private queue where messages are placed.
errorTo	Location where error documents are sent. Predefined port name or another full URL. Optional.

4. Click *Finish* when you have supplied the values on the Add Port dialog box.

   The port that you added is displayed beneath the Ports node.

Procedure: How to Create a Port for the JMSQ Disposition

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.

   The Add Port dialog box opens.
3. Supply the values for the fields on the dialog box as follows.
   a. In the Name field, type a name for the port.
   b. In the Description field, optionally type a brief description.
   c. From the Protocol drop-down list, select *JMSQ*.
   d. In the URL field, type a Java Message Service (JMS) destination.

      When pointing the Events node in iWay Explorer to an iBSP deployment, use the following format:

```
jmsq:[myQueueName]@[myQueueFac];jndiurl=[myurl];jndifactory=
[myfactory];user=[user];password=[xxx];errorTo=[pre-defined port
name or another disposition url]
```

      The following table describes the parameters for the JMSQ disposition.

Parameter	Description
myQueueName or jmsqueue	Name of a queue to which events are emitted.

Parameter	Description
myQueueFac or jmsfactory	A resource that contains information about the JMS Server.
jndiurl	The URL used to contact the JNDI provider. The syntax of this URL depends on the JNDI provider that is used. This value corresponds to the following standard JNDI property: `java.naming.provider.url`
jndifactory	Is JNDI context.INITIAL_CONTEXT_FACTORY, which is provided by the JNDI service provider.
user	User ID associated with this queue.
password	Password for the user ID.
errorTo	Location where error logs are sent. Optional. Predefined port name or another disposition URL. The URL must be complete, including the protocol.

4. Click *Finish* when you have supplied the values on the Add Port dialog box.

   The port that you added is displayed beneath the Ports node.

Procedure: How to Create a Port for the SOAP Disposition

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.

   The Add Port dialog box opens.
3. Supply the values for the fields on the dialog box as follows.
   a. In the Name field, type a name for the port.
   b. In the Description field, optionally type a brief description.
   c. From the Protocol drop-down list, select *SOAP*.
   d. In the URL field, type a SOAP destination, using the following format:

```
soap:[wsdl-url];soapaction=[myaction];method=[web service
method];namespace=[namespace];responseTo=[pre-defined port name or
another disposition url];errorTo=[pre-defined port name or another
disposition url]
```

The following table describes the parameters for the SOAP disposition.

Parameter	Description
wsdl-url	The URL to the WSDL file that is required to create the SOAP message, for example, `http://localhost:7001/ibsp/IBSPServlet/test/webservice.ibs?wsdl` where: *webservice* Is the name of the web service that you created using Business Service Explorer. To find this value, navigate to the Business Service Explorer node and open the *Service Description* hyperlink in a new window. The WSDL URL appears in the Address field. You can also open the WSDL file in a third-party XML editor (for example, Altova XMLSpy®) and view the SOAP request settings to find this value.
soapaction	The method called by the SOAP disposition, for example, *webservice.method@test@@* where: *webservice* Is the name of the web service that you created using Business Service Explorer. *method* Is the method being used. *test* Is the license that is being used by the web service. To find this value, navigate to the Business Service Explorer node and open the *Service Description* hyperlink in a new window. Perform a search for *soapAction*.

Parameter	Description
method	The web service method that you are using. You can find this value in the WSDL file.
namespace	The XML namespace that you are using. You can find this value in the WSDL file.
responseTo	The location to which responses are posted, which can be a predefined port name or another URL. Optional.
errorTo	The location to which error logs are posted, which can be a predefined port name or another URL. Optional.

4. Click *Finish* when you have supplied the values on the Add Port dialog box.

   The port that you added is displayed beneath the Ports node.

Procedure: How to Create a Port for the HTTP Disposition With an IBSP Deployment

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.
2. Right-click the *Ports* node, and click *Add Port* from the menu.

   The Add Port dialog box opens.
3. Supply the values for the fields on the dialog box as follows.
   a. In the Name field, type a name for the port.
   b. In the Description field, optionally type a brief description.
   c. From the Protocol drop-down list, select *HTTP*.
   d. In the URL field, type an HTTP destination, using the following format

```
http://[myurl];responseTo=[pre-defined port name or another
disposition url]
```

   where:

   `myurl`

   Is the URL target for the post operation, for example,

```
http://myhost:1234/docroot
```

   `responseTo`

   Is the location to which responses are posted, if desired.

4. Click *Finish* when you have supplied the values on the Add Port dialog box.

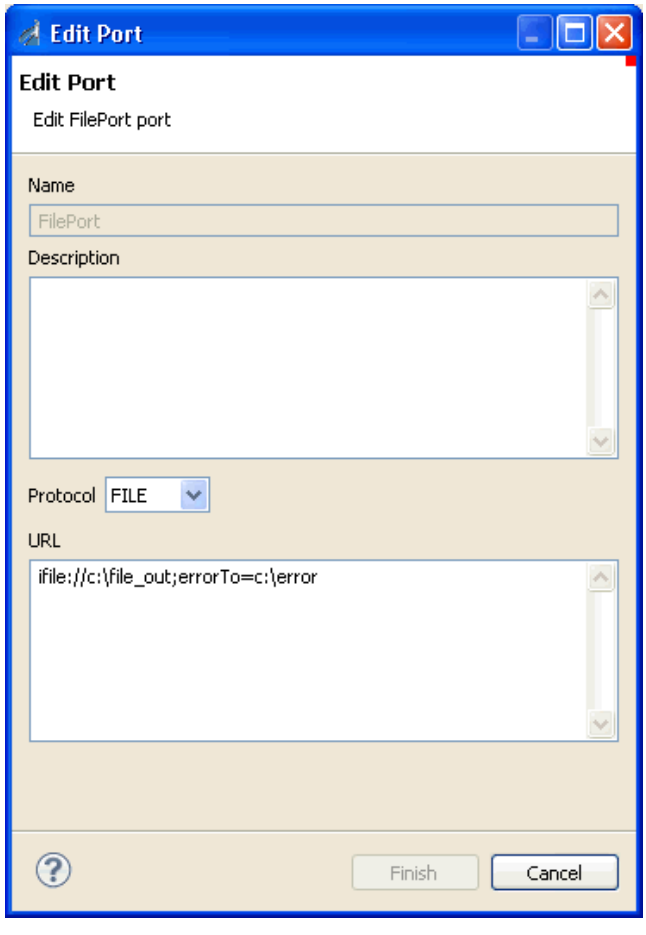
   The port that you added is displayed beneath the Ports node.

Procedure: How to Edit a Port

After you create a port, you can edit the information that you provided during the creation procedure.

1. Expand the *Ports* node in the Events area of iWay Explorer to locate the name of the port that you want to edit, for example, *FilePort*.
2. Right-click the port, and click *Edit* from the menu.

   The Edit Port dialog box opens. It displays the values that you supplied when you created the port.



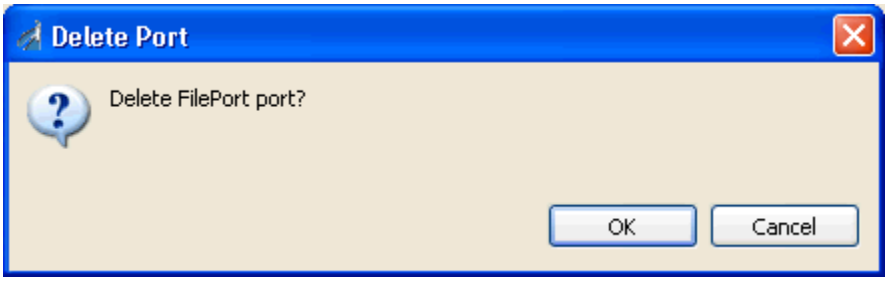
3. Use the fields on the dialog box to modify the properties as desired. You cannot change the name of the port.
4. Click *Finish* when you have completed your edits.

   The modified properties are applied to the port.

Procedure: How to Delete a Port

1. Expand the *Ports* node in the Events area of iWay Explorer to locate the name of the port that you want to delete, for example, *FilePort*.
2. Right-click the port, and click *Delete* from the menu.

   iWay Explorer displays a prompt, asking you to confirm the deletion of the selected port, as shown in the following image.



3. Click *OK* to proceed with the deletion.

Using the Default Port

When using iWay Explorer to connect to an application system and listen for events, a default port is available.

You can use the default port for testing purposes or when you do not want to route event data to a specific port that you have configured. The default port is enabled when you start a channel that does not have a specific port assigned to it.

The default event data is a file disposition that writes to an out.xml file in the following output directory:

```
ifile://./eventOut/out.xml
```

Procedure: How to Modify the Default Port Output Directory

1. In the ibse\WEB-INF\lib directory, open the ibse.jar file, and locate the dispositioninfo.xml file.

2. Using a text editor, locate the following lines in the dispositioninfo.xml file:

```
<?xml version="1.0" encoding="UTF-8"?>
<dispositioninfo pref="built-in" defaultPortURL="ifile://./eventOut/
out.xml">
```

3. Change the default output directory to a new location of your choice.

   You can also change the name and type of the default output file.

4. Save your changes, and redeploy iBSP.

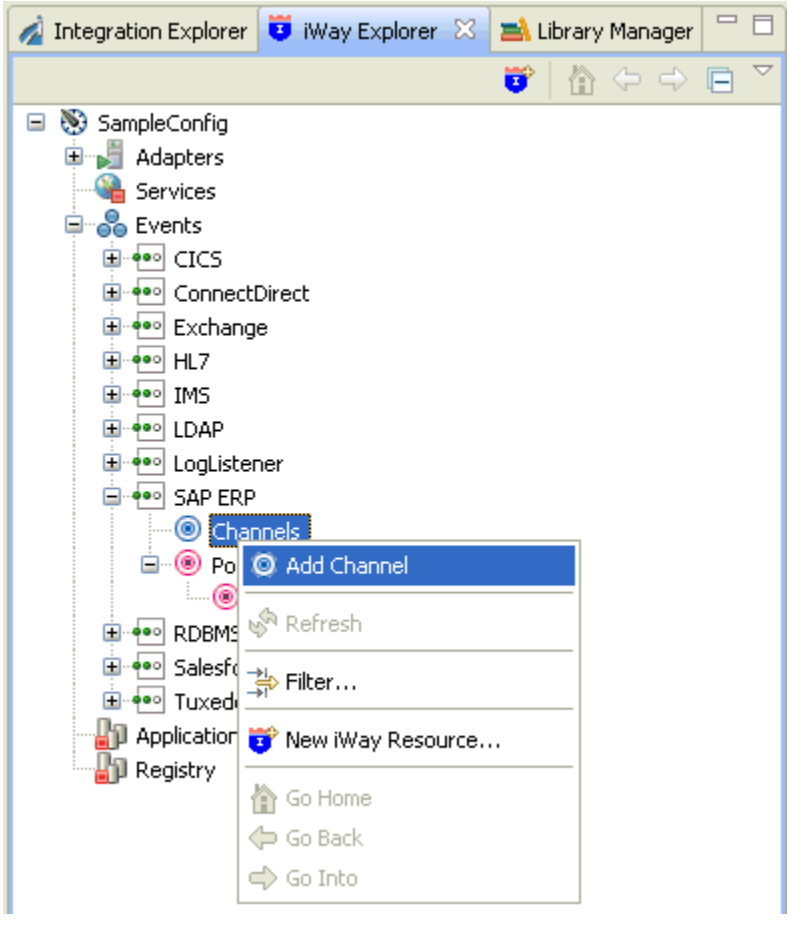
Creating a Channel

A channel binds a port to a listener managed by iWay Application Adapter for SAP ERP. A defined port must be associated with a channel in order for you to listen for events that take place in SAP ERP.

The procedures in this topic describe how to create, edit, or delete a channel using the Events node in iWay Explorer.

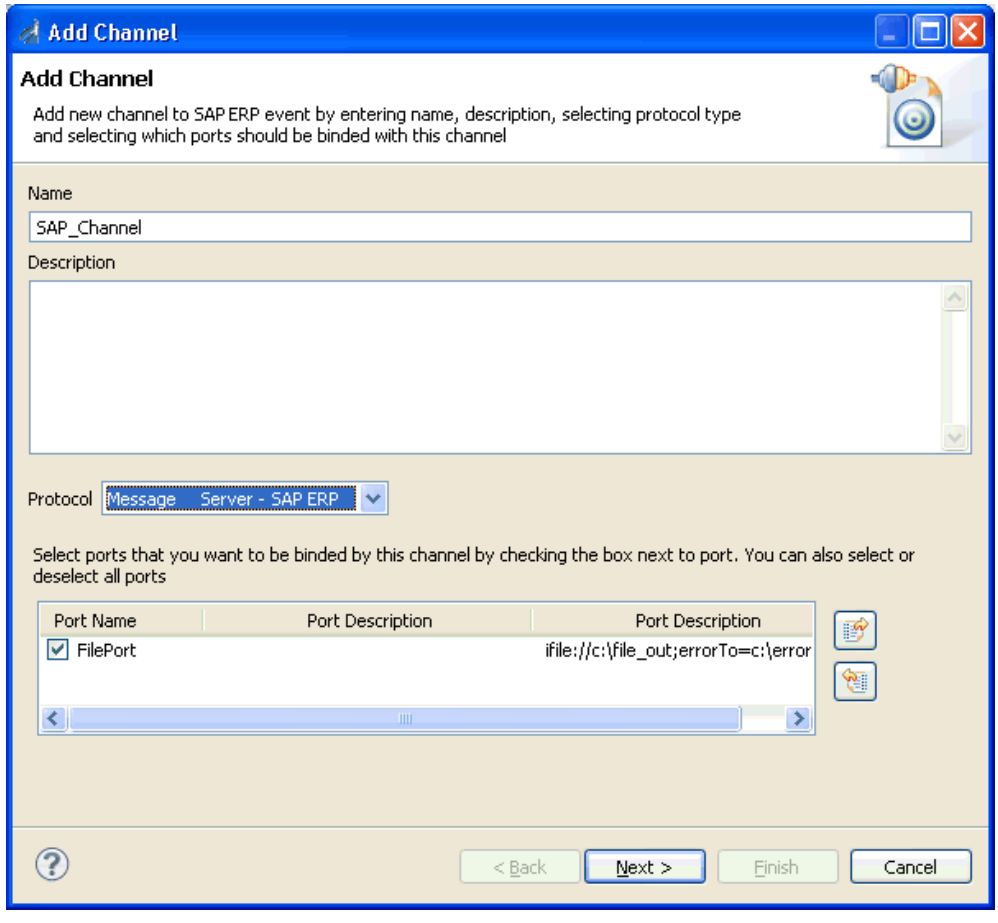
Procedure: How to Create a Channel

1. Connect to the Events node in iWay Explorer and expand the *SAP ERP* node.



2. Right-click the *Channels* node, and click *Add Channel* from the menu.

The following image shows the Add Channel dialog box that opens, where you supply information about the channel.



a. In the Name field, type a name for the channel, for example, SAP_Channel.

b. In the Description field, optionally type a brief description (optional).

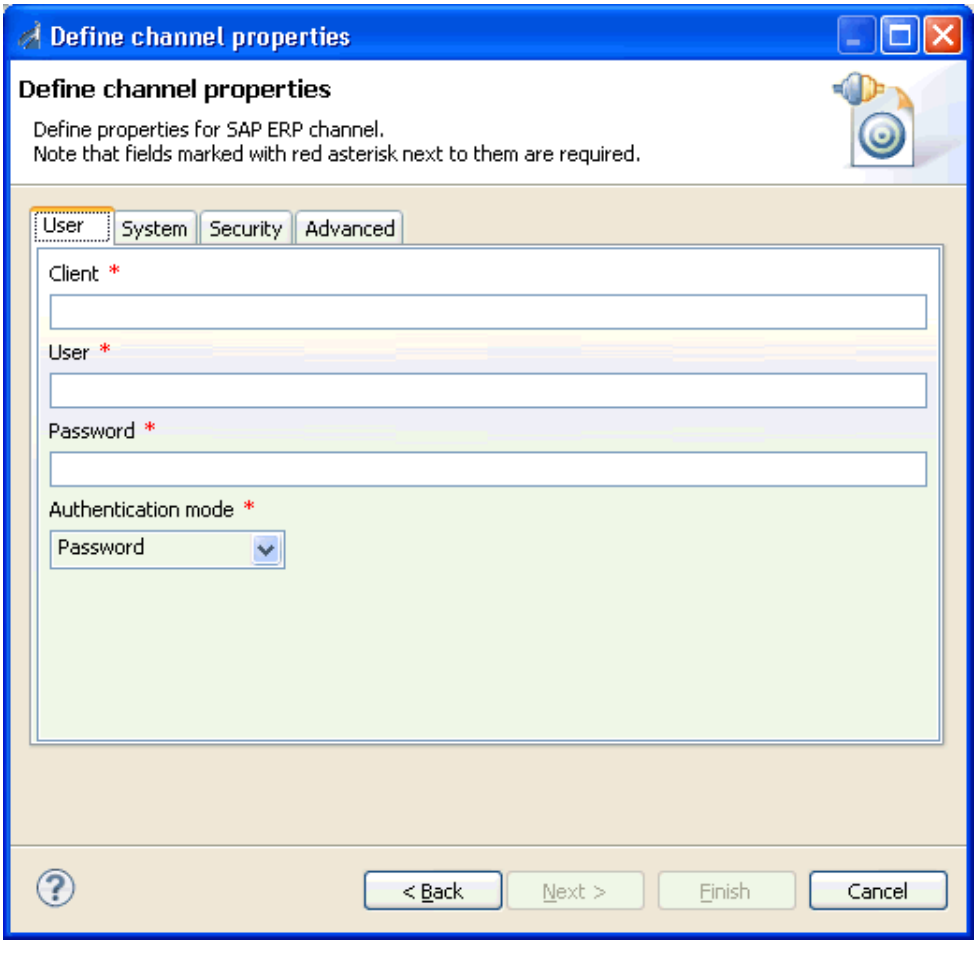
c. From the Protocol drop-down list, select one of the following options:

- **Application Server.** Select this option if you have a single SAP Application Server.
- **Message Server.** Select this option if you use multiple SAP servers with logon load balancing.

d. Under Port Name, select the check box for each port that this channel will bind to a listener.

3. Click *Next*.

   The Define Channel Properties dialog box opens, as shown in the following image.



The following tabs are available:

- **User tab**

  For more information, see *Configuring the User Tab* on page 156.

- **System tab**

  For more information, see *Configuring the System Tab* on page 157.

- **Security tab**

  For more information, see *Configuring the Security Tab* on page 163.

- **Advanced tab**

  For more information, see *Configuring the Advanced Tab* on page 165.

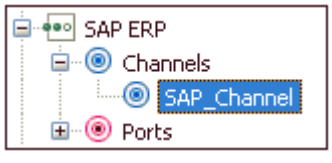
4. Click *Finish* when you are done.

   The following image shows the channel that you added, which appears beneath the Channels node in the Events area of iWay Explorer. In this example, the channel is named SAP_Channel.

   You are ready to start the channel to listen for events.

5. Right-click the channel, for example, *SAP_Channel*, and click *Start* from the menu.

   The channel is now active and will poll the SAP ERP system with the configured commands to generate events.



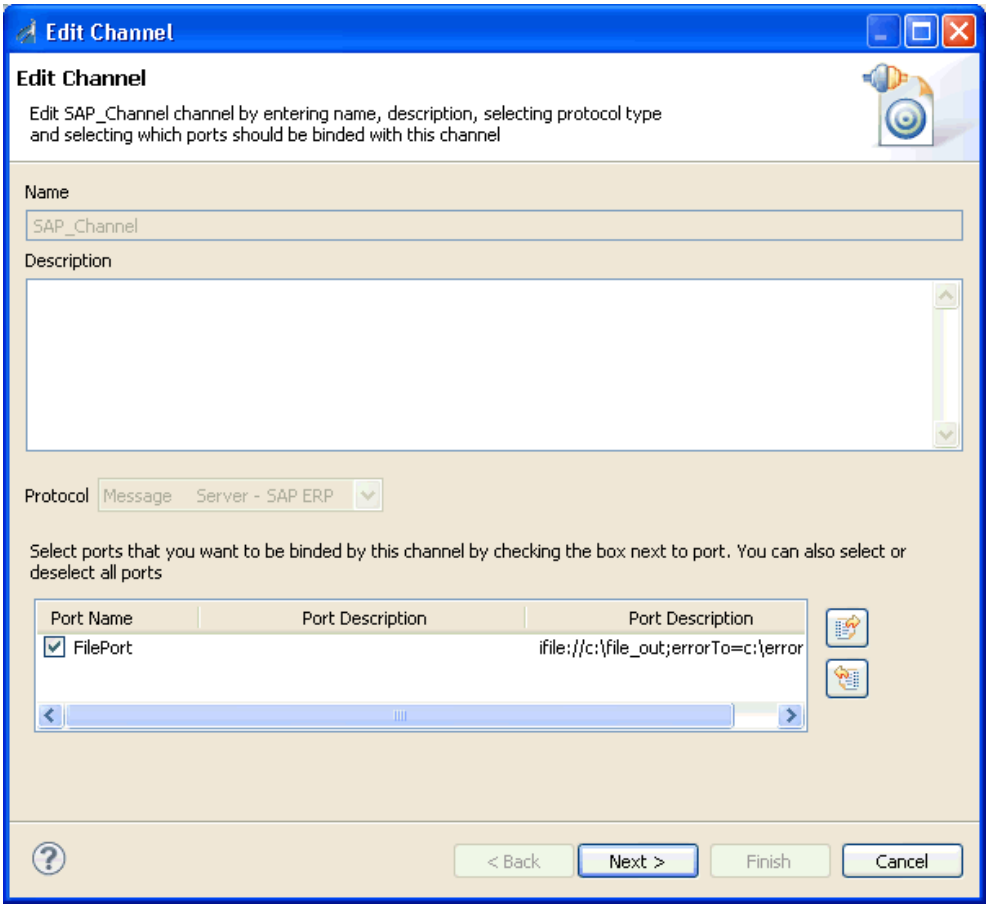
6. To stop the channel at any time, right-click the channel, and click *Stop* from the menu.

Procedure: How to Edit a Channel

After you create a channel, you can edit the information that you provided during the creation procedure.

1. In the Events node of iWay Explorer, locate the name of the channel that you want to edit, for example, *SAP_Channel*.
2. Right-click the channel, and click *Edit* from the menu.

The Edit Channel dialog box opens. It displays the values that you supplied when you created the channel.



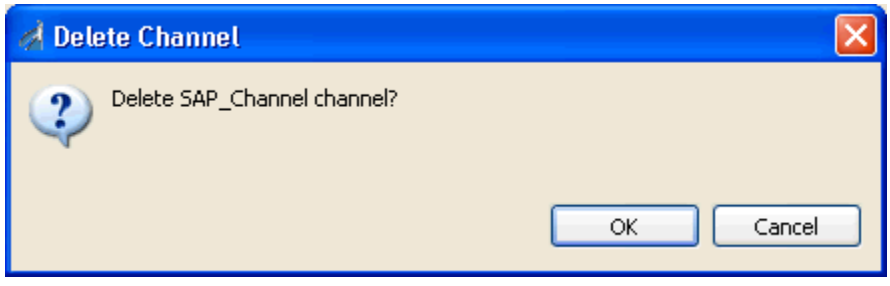
3. Use the fields on the dialog box to modify the properties as desired. You cannot change the name of the channel or its protocol.
4. Click *Next* on the Edit Channel dialog box to open the Define Channel Properties dialog box.
5. Use the tabs and fields on this dialog box to modify the properties as desired.
6. Click *Finish* on the Define Channel Properties dialog box when you have made your edits.

   The modified properties are applied to the channel.

Procedure: How to Delete a Channel

1. Expand the *Channels* node in the Events area of iWay Explorer to locate the name of the channel that you want to delete, for example, *SAP_Channel*.
2. Right-click the channel, and click *Delete* from the menu.

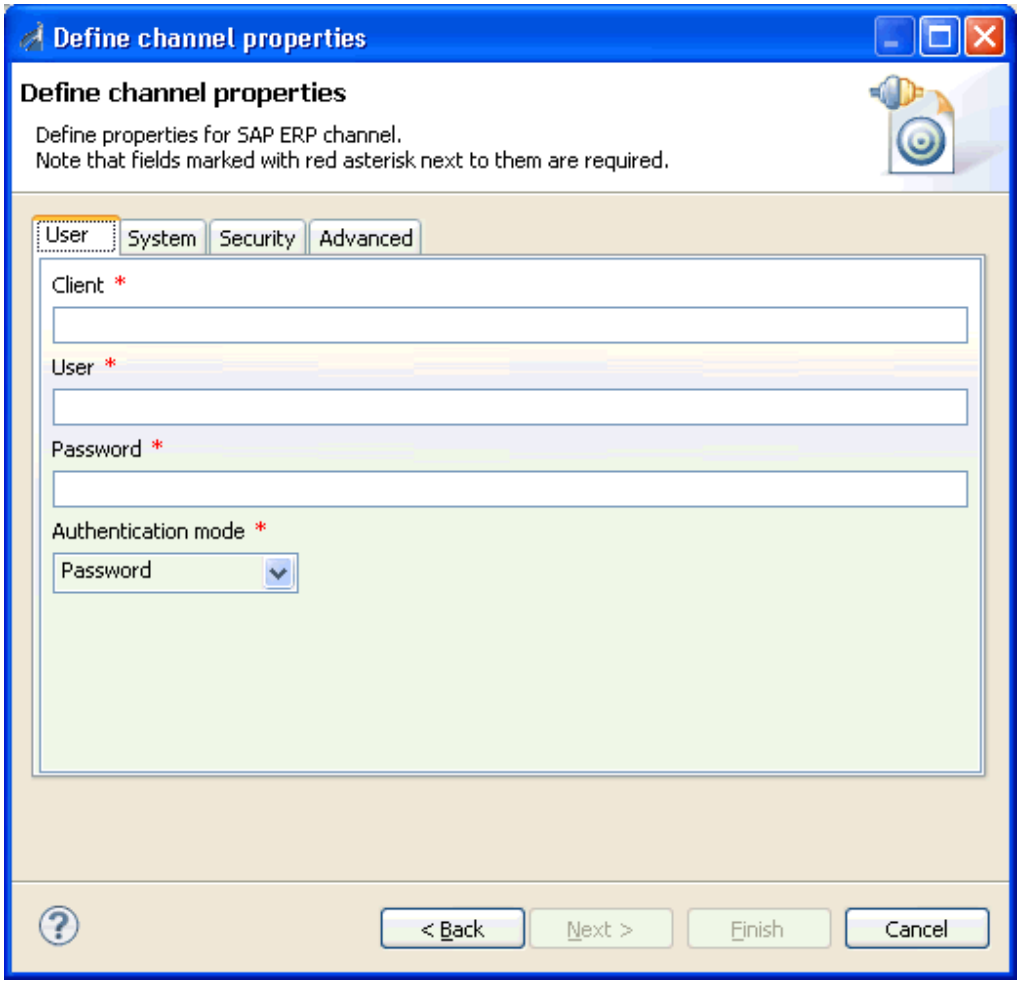
   iWay Explorer displays a prompt, asking you to confirm the deletion of the selected channel, as shown in the following image.



3. Click *OK* to proceed with the deletion.

Configuring the User Tab

This section describes how to configure the User tab during the channel configuration process, which is shown in the following image.



The parameters available in the User tab are listed and described in the following table:

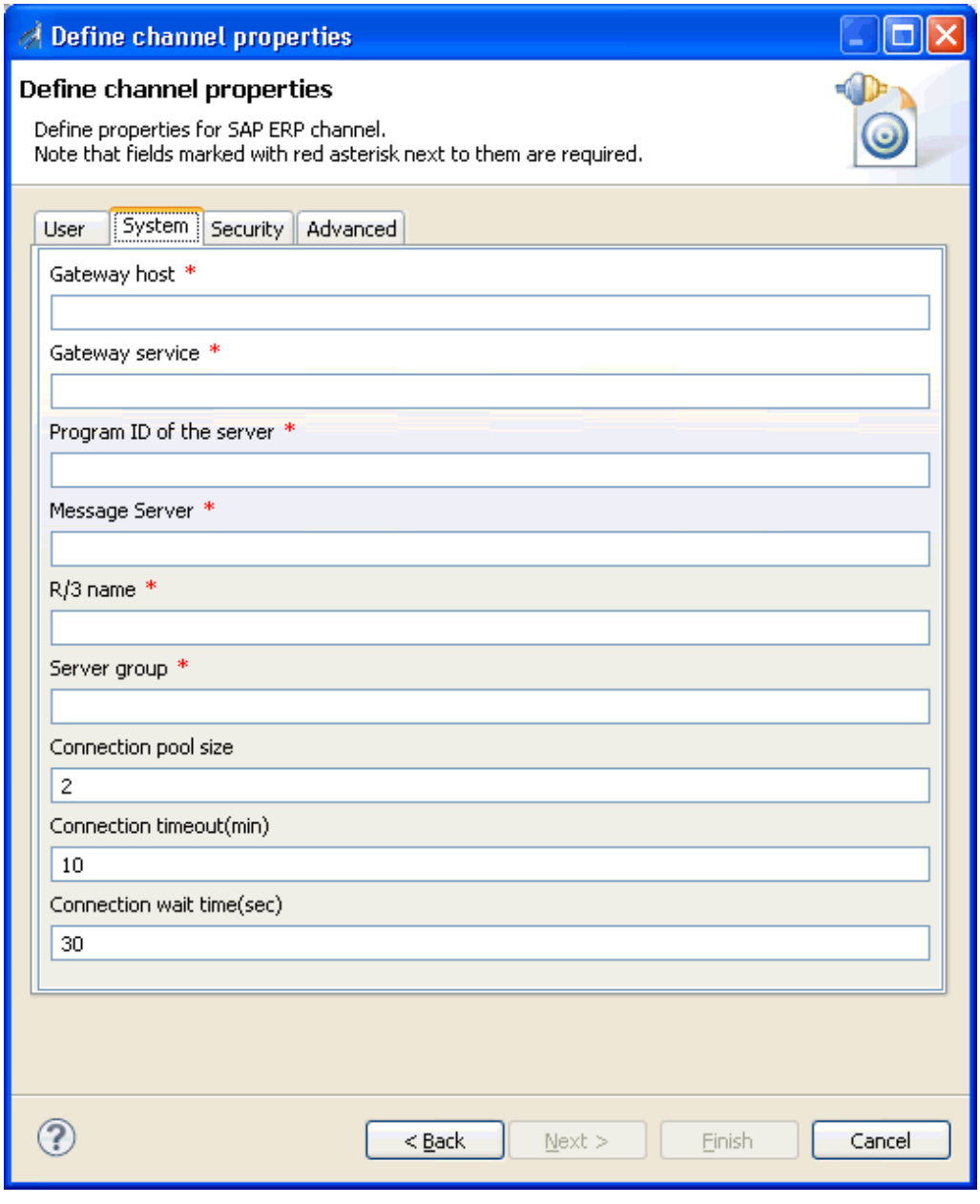
Parameter	Description
Client	Client number defined for the SAP ERP system for client communications.

Parameter	Description
User	Valid user ID for the SAP ERP system.
Password	Valid password for the SAP ERP system.
Authentication mode	From the Authentication mode drop-down list, select one of the following options. ❏ **Password.** Use the value in the supplied field. ❏ **Logon ticket (SSO2).** Specify the user to be `$SAPSSO2$` and pass the base64 encoded ticket as the password parameter. ❏ **Logon ticket (X509).** Specify the user to be `$X509CERT$` and pass the base64 encoded certificate as the password parameter. **Note:** The user and password parameters that are mentioned here refer to the User and Password parameter fields in iWay Explorer.

Configuring the System Tab

This section describes how to configure the System tab during the channel configuration process

During the configuration of a channel, if you select **Message Server** in the Add Channel dialog box, then the System tab contains parameters as shown in the following image.

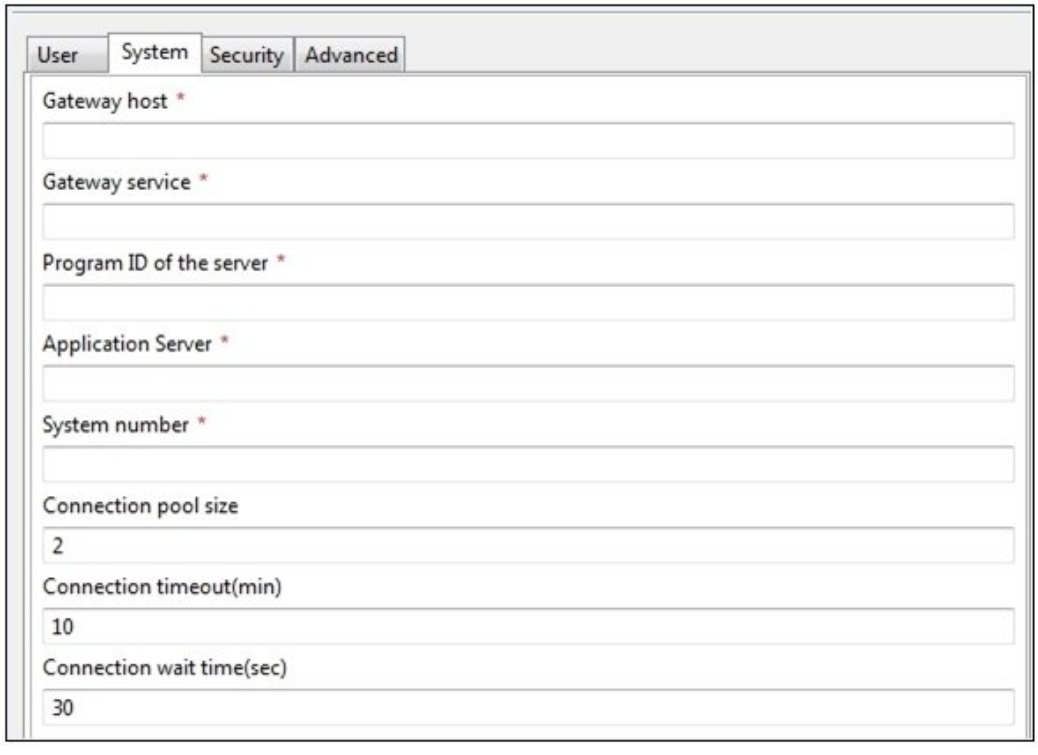


The parameters available in the System tab for **Message Server** configuration are listed and described in the following table:

Parameter	Description
Gateway host	Enter the name of a SAP ERP Gateway server. The SAP ERP Gateway carries out CPI-C services within the SAP ERP world, which are based on TCP/IP. These services enable SAP ERP systems and external programs to communicate with one another.
Gateway service	Enter the service name (usually a compound of the service name and system number). This is the service name on the gateway host.
Program ID of the server	A program identifier that has been specified on the SAP ERP Gateway server (case sensitive). This is a unique identifier for your communication session specified by your system administrator. The value entered in this field must match the one exposed on the gateway.
Message Server	Connects to an ABAP message server. For load balancing purposes, application servers from one SAP ERP system are usually configured in logon groups, where each group serves a particular kind of user. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to choose an appropriate server when a user logs onto the system.
R/3 name	Identifies a unique instance on the application server. This value is a symbolic SAP ERP system name used to identify the system.
Server group	Identifies the logon group. This is the logon group that the user ID belongs with.

Parameter	Description
Connection pool size	Maximum number of connections for the pool. This sets the maximum number of connections that can be allocated from the pool.
Connection timeout(min)	Maximum time to keep open a free connection (in minutes). Connections that have not been used for at least the connection timeout interval are closed.
Connection wait time(sec)	Maximum wait for a free connection. This sets the maximum time to wait in a connection request for a free connection. If the pool is exhausted, and there is still no connection available after the specified time, then a JCO exception with the key JCO_ERROR_RESOURCE is generated. The default value is 30 seconds.

During the configuration of a channel, if you select **Application Server** in the Add Channel dialog box, then the System tab contains parameters as shown in the following image.



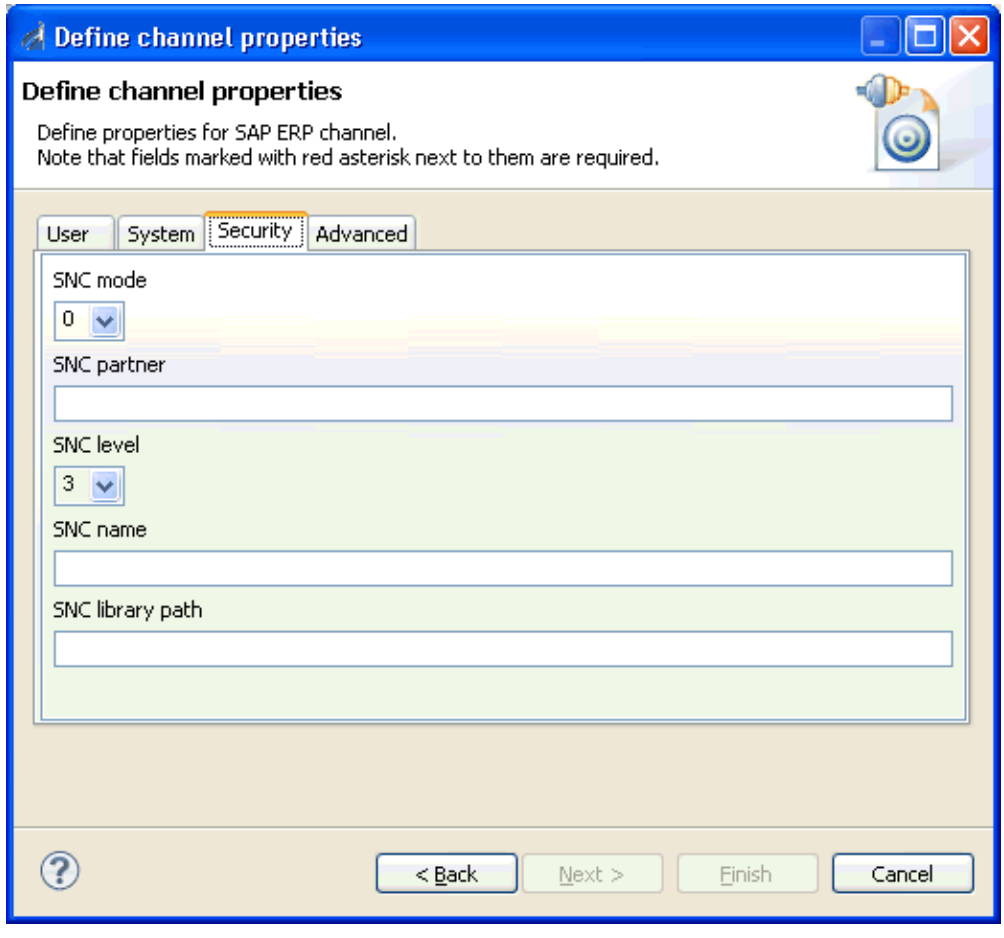
The parameters available in the System tab for **Application Server** configuration are listed and described in the following table:

Parameter	Description
Gateway host	Enter the name of a SAP ERP Gateway server. The SAP ERP Gateway carries out CPI-C services within the SAP ERP world, which are based on TCP/IP. These services enable SAP ERP systems and external programs to communicate with one another.
Gateway service	Enter the service name (usually a compound of the service name and system number). This is the service name on the gateway host.

Parameter	Description
Program ID of the server	A program identifier that has been specified on the SAP ERP Gateway server (case sensitive). This is a unique identifier for your communication session specified by your system administrator. The value entered in this field must match the one exposed on the gateway.
Application Server	Connects to an ABAP application server. Application programs in an R/3 system are run on application servers. To obtain metadata information, a connection to an application server is required.
System number	Identifies a unique instance on the application server. An application server may have different system numbers. Use the one provided by your administrator.
Connection pool size	Maximum number of connections for the pool. This sets the maximum number of connections that can be allocated from the pool.
Connection timeout(min)	Maximum time to keep open a free connection (in minutes). Connections that have not been used for at least the connection timeout interval are closed.
Connection wait time(sec)	Maximum wait for a free connection. This sets the maximum time to wait in a connection request for a free connection. If the pool is exhausted, and there is still no connection available after the specified time, then a JCO exception with the key JCO_ERROR_RESOURCE is generated. The default value is 30 seconds.

Configuring the Security Tab

This section describes how to configure the Security tab during the channel configuration process, which is shown in the following image.



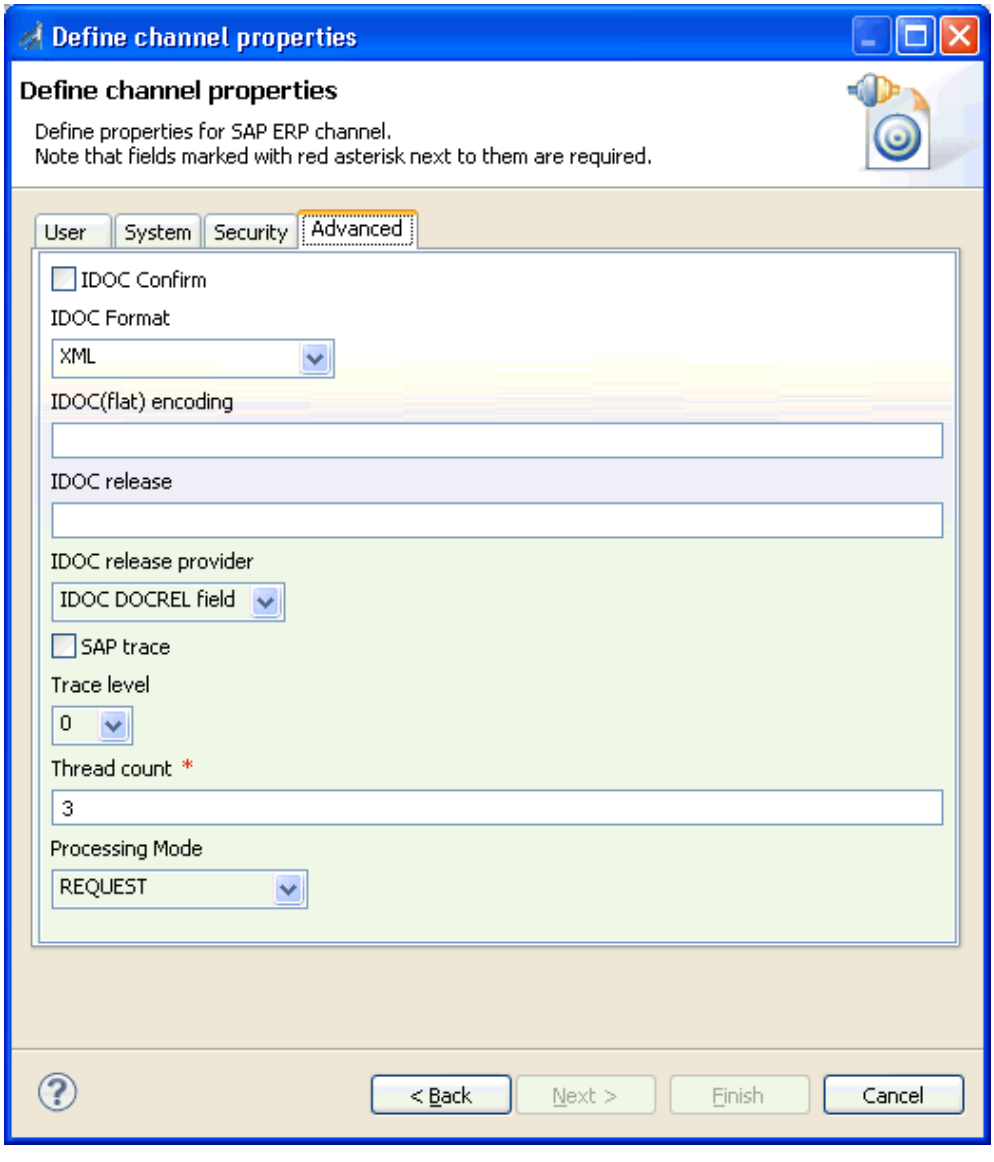
The parameters available in the Security tab are listed and described in the following table:

Parameter	Description
SNC mode	Flag for activating SNC. Select 0 to disable SNC mode and 1 to enable SNC mode.

Parameter	Description
SNC partner	Specifies the SNC name of the application server. You can find the SNC name of the application server in the profile parameter snc/identity/as.
SNC level	Specifies the level of protection to use for the connection. ❑ **1.** Authentication only (default). ❑ **2.** Integrity protection ❑ **3.** Privacy protection. ❑ **8.** Use the value from snc/data_protection/use on the application server. ❑ **9.** Use the value from snc/data_protection/max on the application server.
SNC name	Specifies SNC name. Although this parameter is optional, it is not recommended for use to ensure that the correct SNC name is used for the connection.
SNC library path	Specifies the path and file name of the external library. The default is the system-defined library as defined in the SNC_LIB environment variable.

Configuring the Advanced Tab

This section describes how to configure the Advanced tab during the channel configuration process, which is shown in the following image.



The parameters available in the Advanced tab are listed and described in the following table:

Parameter	Description
IDOC Confirm	If this option is selected, a STATUS IDOC is returned to SAP ERP confirming receipt for every IDOC that is received. When a standard IDOC is sent, the usual last status available through the SAP IDOC monitor is *Data Sent to Port OK - 03*, in the WE02 transaction IDOC list. If you want to use the WE02 transaction to ensure that the IDOC was received at the target destination, then enable this option. When an IDOC is received, the adapter returns a STATUS IDOC to SAP ERP and in the WE02 transaction IDOC list, the status of the IDOC is changed to *12*, *Dispatch OK*. Note that if a large number of IDOCs are sent in bursts, enabling this option may impact performance. If performance is an issue, then it is recommended to disable this option.
IDOC Format	Select an IDOC type from the drop-down list: ❑ XML (default) ❑ XML-CDATA-ENVELOPED ❑ NATIVE IDOC
IDOC(flat) encoding	The type of encoding for IDOC processing.
IDOC release	Specifies the version in which the IDOC definition was released. You can assign segment definitions from previous releases to an IDoc type in the current release. This may be necessary if, for example, the partner is using an older release which supports your current IDoc type, but not your current segment definitions.

Parameter	Description
IDOC release provider	Specifies where the adapter will retrieve the release information. ❏ **IDOC DOREL field.** Uses the information in the IDOC header. ❏ **SAP release.** Retrieves the information from the user account logon. ❏ **user input.** Uses the IDOC release field to retrieve the information. For more information, see *Understanding the User Input Option for the IDOC Release Provider Parameter* on page 45.
SAP trace	Enables the SAP ERP Java connectors trace behavior. ❏ **Off** (default). Only hard errors are written to the trace file (dev_rfc.trc) in append mode. ❏ **ON.** Individual rfc*.trc and JCO*.trc are written for each request. This is useful in finding errors, but not recommended in a production environment.
Trace level	Indicates the level of detail in the SAP ERP traces. Select a value that ranges from 0 through 10 from the drop-down list.
Thread count	The number of open threads. By default, three threads are specified. For more information on this parameter, see... You must also configure iWay Service Manager for increased listener threads to take advantage of increased worker threads, and configure other parameters, such as Process In Parallel.

Parameter	Description
Processing Mode	Select the type of synchronous processing from the drop-down list. Possible values include REQUEST and REQUEST_RESPONSE. If a channel is created with a processing mode set to REQUEST_RESPONSE, then this channel is listed during the WSDL creation process only if the object has a reply schema. Otherwise, the channel will not be listed.

Understanding the Thread Count Parameter

The Thread count parameter is used to adjust the number of server working threads. By default, three server working threads are designated.

The SAP ABAP server outbound queue has, by default, a single DIALOG work process per non ABAP destination. iWay has found that the ratio of 3:1 results in maximum throughput through the JCO Server, where:

- One thread is used to receive.
- One thread is used to process.
- One thread is used to commit/cleanup.

Thus, the default iWay thread count is 3.

This parameter was not exposed in JCO Server Version 2 because the API did not permit thread count, and the solution to increased load was to create an additional server and provide it the same *Program ID*.

JCO Server Version 3 has a restriction that the same *Program ID* cannot be registered more than once for the same JCO installation. As a result, the solution is to increase the thread count when the throughput (via a single JCO server) is less than optimal.

The thread count increases the threading or maximum times the same server is registered at the gateway to receive requests. An SAP RFC destination is registered automatically in the QOUT Scheduler (SAP transaction SMQS) if it is one of the following:

- A destination for an external program (type T in SM59) default 1 DIALOG sending thread.
- A destination for another SAP system (type 3 in SM59) default 10. Note that this is not applicable to the iWay Application Adapter for SAP ERP.

The threading model can be adjusted in SAP to allow output threading to process in parallel by increasing the QOUT count. If doing so, keeping the iWay 3:1 ratio is a good practice to achieve balanced performance. If the QOUT scheduler has, for example, a count of 3, then the SAP server would emit on 3 threads, and using nine (9) iWay server gateway threads would be a good practice based on the 3:1 ratio.

Each channel must have a metadata repository to contain the relevant information about SAP functions and IDocs. This information is retrieved at run time with the channel SAP Repository Destination connection parameters. As the adapter completes a metadata retrieval, it adds the metadata information to a runtime cache, so the Repository connection is used less often the more repeatedly the function or IDocs are run. The metadata Repository Destination is a separate connection from regular inbound SAP Destination connections, which is why it is configured separately. Usually, the default size of 2 connections is sufficient for repository processing. The name of the Repository is internally generated and cannot be altered.

Relationship Between a Channel Thread and a Channel Connection Pool

If the channel connection count is set to a high number (there is an SAP maximum of 99), then the channel connection pool must be increased to service the larger number of initial requests. However, as each metadata request is fulfilled, it is cached, and not re-sent to the SAP server.

For example, if the channel is set to receive ORDERS05 IDocs, then there would be a single request of metadata functions for the repository destination even if 500 IDocs were received, because the metadata is the same for nearly all IDocs. If the first request does not reference all the segments, then any segments that are not present in the repository will be retrieved on demand from the SAP system and cached for later usage.

The SAP Repository Destination channel is deleted when the channel is undeployed and then added to each function call after deployment.

There is an iWay security limitation where the repository connection must be set to the same server as the event channel configuration.

At this time, iWay supports SAP outbound transactional Remote Function Call (tRFc) and tRfc with send queue. Queued RFC is similar to a collected IDoc, but all transactions in the queue either execute or are rolled back. This is opposed to traditional trfc, where the rollback of one item does not affect the other transaction items.

Synchronous Event Processing

You can configure synchronous event processing using iWay Explorer to trigger a web service after an event occurs in the SAP ERP system. The event response that is received can then be routed to another disposition for further processing.

Procedure: How to Configure Synchronous Event Processing Using iWay Explorer

To configure synchronous event processing:

1. Create a web service for an SAP ERP Remote Function Module, for example, BAPI_MATERIAL_GETLIST.
2. View the WSDL file.
3. In the Create New Port pane, create a port using the SOAP disposition.
   a. In the Name field, type a name.
   b. In the Description field, type a brief description (optional).
   c. From the Disposition Protocol drop-down list, select *SOAP*.
   d. In the Disposition field, enter a SOAP destination, using the following format:

```
soap:[wsdl-url];soapaction=[myaction];
method=[web service method];namespace=[namespace];
responseTo=[pre-defined port name or another disposition URL];
errorTo=[pre-defined port name or another disposition url]
```

   The following table lists and describes the parameters for the disposition.

Parameter	Description
wsdl-url	The URL to the WSDL file that is required to create the SOAP message, for example: `http://localhost:7001/ibse/IBSEServlet/test/`*`webservice`*`.ibs?wsdl` where: *`webservice`* Is the name of the web service you created using iWay Explorer. To find this value, you can navigate to the iWay Business Services tab and open the Service Description link in a new window. The WSDL URL appears in the Address field. Alternatively, you can open the WSDL file in a third-party XML editor (for example, XMLSPY) and view the SOAP request settings.

Parameter	Description

soapaction	Method that is called by the SOAP disposition, for example:
	`webservice.method@test@@`
	where:
	`webservice`
	Is the name of the web service you created using iWay Explorer.
	`method`
	Is the method being used.
	`test`
	Is the license that is used by the web service.
	To find this value, you can navigate to the iWay Business Services tab, open the Service Description link in a new window, and perform a search for soapAction.
	Alternatively, you can open the WSDL file in a third-party XML editor (for example, XMLSPY) and view the SOAP request settings.

method	Web service method you are using. This value is in the WSDL file.
namespace	The XML namespace you are using. This value is in the WSDL file.
responseTo	Location to which responses are posted. Can be a predefined port name or another URL. Optional. The URL must be complete, including the protocol.
errorTo	Location where error documents are sent. This can be a predefined port name or another full URL. Optional.

Note: To use the SOAP disposition with a synchronous event, use Remote Function Modules to generate the schema and WSDL file instead of using the Business Object Repository for any RFC or BAPI.

The following is an example of a completed SOAP disposition:

```
soap:http://localhost:7001/ibse/IBSEServlet/test/soapWS.ibs?wsdl;
soapaction=soapWS.GETLISTRequest@test@@;method=GETLIST;
namespace=urn:iwaysoftware:ibse:jul2005:GETLIST;
responseTo=ifile://c:\output\sap\soapOut.xml
```

4. Using the Edit channels pane, create a channel.
   a. Provide the required information to connect to SAP ERP in the System and User tabs.
   b. In the Advanced tab, from the Processing Mode drop-down list, select *REQUEST_RESPONSE*.
5. Associate the port you created earlier with the new channel.
6. Start the channel.

   A web service for an SAP ERP Remote Function Module, for example, BAPI_MATERIAL_GETLIST, is triggered after an event occurs in the SAP ERP system. The response document is returned and routed to a file location.

Chapter 10 Configuring the SAP ERP Adapter in an iWay Environment

After you successfully configure the adapter to represent a particular adapter target, the adapter can be assigned to an iWay Service Manager channel.

In this chapter:

Configuring the SAP ERP Adapter in iWay Service Manager

Before configuring the adapter in iWay Service Manager (iSM), you must first create a target, which represents a connection to a backend system, using iWay Explorer. For more information on configuring targets and connections using iWay Explorer, see *Configuring SAP ERP Adapter Targets and Creating XML Schemas* on page 73 or the *iWay Explorer User's Guide*.

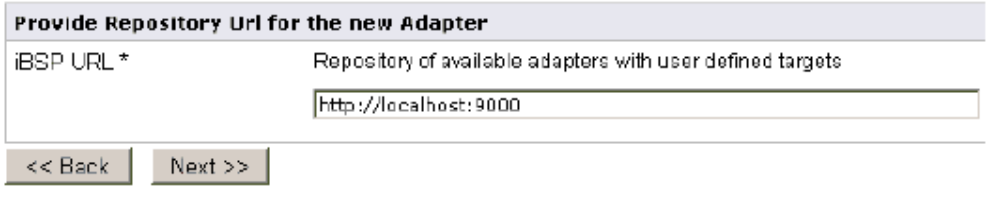
You configure the adapter in the iSM Administration Console. The configuration process creates run-time connection and persistent data files within iSM. The configuration process interrogates the iSM repository entries that were built when the target and connection were created using iWay Explorer. The define adapter process creates the run-time repository based on the design-time repository.

Procedure: How to Define the Adapter

To define the adapter:

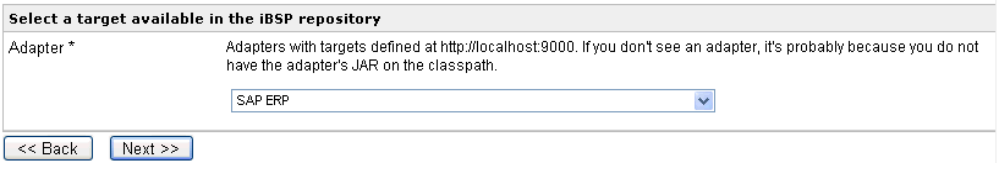
1. In the iSM Administration Console, select *Registry*, then *Adapters*.
2. Click *Add*.

   The iBSP URL pane opens, as shown in the following image.



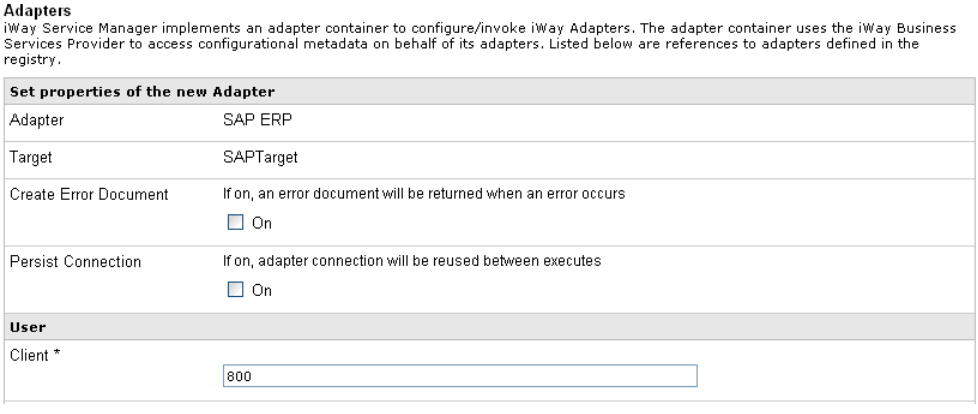
3. Enter your iBSP URL, which is the location of the Service Manager repository, for example, `http://localhost:9000`. This field is required.
4. Click *Next*.

An adapter selection pane opens, as shown in the following image.



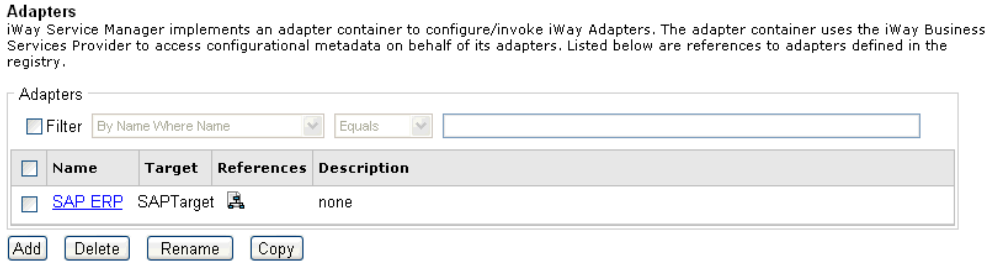
5. From the Adapter drop-down list, select the Adapter, then click *Next*.
6. From the Target drop-down list, select a target you configured for the adapter in iWay Explorer, then click *Next*.

   The connection information associated with the target selected is displayed.



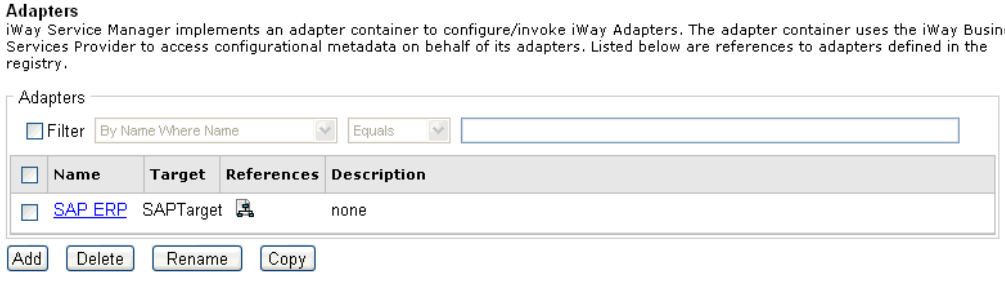
   a. Select whether to return an error document when an error occurs.
   b. Select whether an adapter connection will be reused between executes.
   c. Review the connection information you specified in iWay Explorer. You can change or update any information.
7. Click *Next*.
8. Provide a name and, optionally, a description, for the adapter, and click *Finish*.

The adapter appears in the adapters list, as shown in the following image.



Procedure: How to Modify or Update an Adapter Connection

The following image shows the Adapter Defines pane which displays the name of the adapter and the description (optional).



To modify or update an adapter connection:

1. From the Adapters list, click the adapter reference you defined, in this example, SAP ERP.

   The pane that displays the target connection information opens. You cannot change the name of the adapter or the target, but you can edit the connection information.

2. After you modify the connection information, click *Update Connection Properties*.
3. After you make changes or additions to the adapter target in iWay Explorer, click *Update Adapter Data*.
4. Click *Finish*.

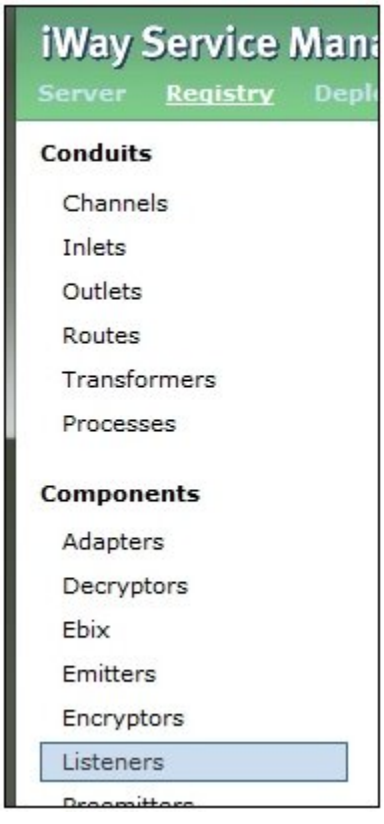
   After you have defined the SAP ERP adapter in iSM, you can now use the adapter target in iSM channels or import the adapter into the iWay Integration Tools (iIT) Designer for use in process flows and applications.

Procedure: How to Define an SAP Listener in the iSM Administration Console

To define an SAP listener in the iSM Administration Console:

1. In the iSM Administration Console, select *Registry*, as shown in the following image.

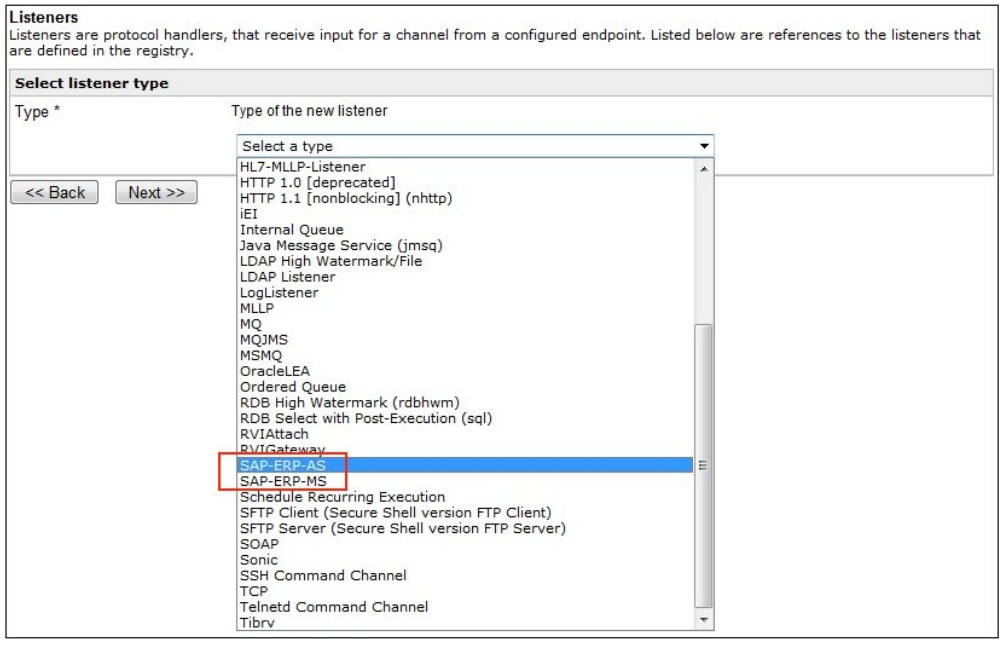
2. Click *Listeners* in the left pane (under Components), as shown in the following image.



The Listeners pane opens.

3. Click *Add*.

The Select listener type pane opens, as shown in the following image.



4. Select *SAP-ERP-AS* (Application Server) or *SAP-ERP-MS* (Message Server) from the Type drop-down list and click *Next*.

   A configuration page for the selected listener (SAP-ERP-AS or SAP-ERP-MS) is displayed. You can refer to *Configuring the System Tab* on page 157 for more information on the configuration parameters that are required for the selected listener.

5. After you have provided values for all of the required SAP listener configuration parameters, click *Next*.

6. Provide a name and a description for your SAP listener and then click *Finish*.

   The configured SAP listener is added to the Listeners pane. The SAP listener can now be used in iSM channels or imported into iWay Integration Tools (iIT) Designer for use in process flows and applications.

   For more information, see the *iWay Service Manager User's Guide* and *iWay Service Manager Programmer's Guide*.

Chapter 11

SAP ERP Troubleshooting Guidelines

This section provides useful troubleshooting guidelines for the iWay Application Adapter for SAP ERP.

In this chapter:

Identifying the Issue

Take a moment to categorize the issue you are experiencing. This will help you identify the specific area of concern, find the cause, and ultimately determine a solution or a workaround. Take some time to verify each step of the procedure to eliminate all possible extraneous causes of the issue and determine the correct cause.

Design Time

This section lists potential issues that you may encounter during the design-time phase of the development process and provides solutions.

Connectivity

Connectivity problems may occur when defining or connecting to a SAP ERP target using iWay Explorer. Check with your system administrator and verify that all SAP ERP server and logon information is correct. For more information on how to create and connect to a target, see *Configuring SAP ERP Adapter Targets and Creating XML Schemas* on page 73.

Metadata

If you experience missing data or application errors when trying to browse and create metadata, verify:

- For BAPI/RFC, that the function is RFC callable and is in an activated state.
- For IDoc, that the IDoc has been released and that the IDoc segments are released. In addition, verify that you are using a correct version of the IDoc for the system target.
- For all objects, verify that the user ID for metadata has the correct authorizations in the target system.

For more information, see *Viewing Application System Objects* on page 93.

RFC / BAPI

Remote Function Call (RFC) is the standard SAP ERP interface for communication between SAP ERP systems. The RFC subsystem calls a remote enabled function to be executed in a target system.

BAPIs (Business Application Programming Interfaces) play an important role in the technical integration and in the exchange of business data between SAP ERP components, and between SAP ERP and non-SAP ERP components. BAPIs have a release and versioning system, and you must be sure that the BAPI you are attempting to use is in a valid release state before proceeding.

For customer created Remote Functions or BAPIs, verify that the functions are in correct release state and that standard ABAP programming conventions have been followed. If you experience a problem with a custom RFC/BAPI/IDoc, you must be prepared to send the source code for examination and duplication of the problem.

IDoc

In SAP ERP systems, the IDoc interface is used to exchange business data between two different Systems in an asynchronous manner.

The IDoc interface consists of the definition of a data structure and the processing logic for this data structure. The systems involved must both recognize the data format used to exchange the data, this is done through segments and versioning.

The IDoc must be in a released state for the SAP ERP version you are using, and all segments must be released for the IDoc and release. The IDoc type must be assigned to a valid Message Type. At run time, determine whether you are integrating with collected IDocs or single IDocs, and adjust the SAP ALE profile parameters accordingly.

Run Time

This section lists potential issues that you may encounter during the run time phase of the development process and provides solutions.

Connectivity

The design process target is used for run time connectivity. Verify that when you created the target, you specified the correct connection pool and IDoc parameters. For security reasons, target parameters can be overridden for a single session, but the base information can never be changed. You must delete and recreate the target for permanent changes.

Processing Guidelines

In a structural issue, information about the function or its parameters are faulty. This can be connectivity issues, release issues, authorizations or even incorrect document.

What can you do?

If you created your instance document in an external editor or program, verify the document against the iWay created schema for the document. If this is correct, verify the schema against the SAP ERP function parameters to make sure there were no errors or omissions in creating the schema. If all of these pass, note the error message, a reproduction scenario, traces of the error, and contact iWay support.

In a data issue, it is the values you are passing to the function that are incorrect.

What can you do?

Verify that you are sending the data for the release dependent version of the function or IDoc you wish to call. Make sure you are passing data that is valid for the SAP ERP parameter for the function. Check with the functional area specialist for the application to make sure you meet the application requirements.

Service Scenario

Service processing occurs when the iWay Application Adapter for SAP ERP calls an SAP ERP system and waits for a response. In this scenario, you typically create a Target, browse to the meta data of the function or IDoc you with to work with, and create a schema and / or a web service. You then create a channel with all valid processing parameters. You then create an XML instance with the data you want to pass to the function, and submit it to the iWay adapter via any standard protocol. The response is delivered to the destination channel you configured when setting up the service.

Event Processing

Event processing occurs when an SAP ERP system calls the iWay Application Adapter for SAP ERP. Verify correct Event registration in SAP ERP using the correct event modality: change pointers / table update / BAPI Event, custom function.

The following event-driven scenarios are possible:

- An SAP ERP system calls the iWay Application Adapter for SAP ERP and the adapter is configured for asynchronos processing.
  - **BAPI/RFC interface.** In this case, SAP ERP passes the function name and any input parameters to the function. iWay creates an XML document with these parameters and the function name as the root node at the defined destination.
  - **IDoc interface.** The IDocs are created by the adapter at the defined destination.
- An SAP ERP system calls the iWay Application Adapter for SAP ERP and the adapter is configured for synchronous processing.
  - **BAPI/RFC interface.** You must define a service that will process the function parameters and return valid data in SAP ERP format back to SAP ERP. Any iWay service or a custom service you program can be used for this type.
  - **IDoc interface.** The IDoc interface is asynchronous by design. Any attempt to make synchronous events from IDocs can seriously impair the TRFC service on the SAP ERP application server. Do not attempt to define this scenario.

Performance Issues

Examine your entire system landscape configuration. Determine if the number of documents received or sent matches processing times and memory requirements. SAP ERP maintains an online optimization help file for you to review all of these parameters. Increase hardware of total number of iWay adapter instances can optimize performance.

Here are some quick tips and suggestions:

- Use transaction ST06 to review the CPU, memory, swap, disk, and LAN response times.
- Use transaction ST02 to review the memory buffers. If any field has a indication (red color), investigate each field's dependant parameters and make the necessary adjustments.
- Determine whether the server has any external processes and/or programs running. In addition, review the shared pool buffers, redo log buffers, and how much is allocated for the SAP ERP buffers.

- Determine whether you will use dialog or communication users and how many work processes have been allocated and make sure there is a sufficient amount available.

  For example, there can be some users who are running inefficient programs that are delaying the dialog work processes. Use transaction SM50 to check all dialog work processes that have a waiting status.

- Use transaction ST04 to review the database response times. Examine the physical reads ratio, logical reads ratio, wait times, and number of user calls.

- Use transaction SE30 to perform an ABAP runtime analysis. Every long running program can be optimized, whether on the ABAP layer or on the selection layer. In general, more attention should be focused toward custom programs. Since these are usually created quickly, performance considerations are often neglected.

Debugging Error Messages

This section provides information that allows you to interpret various error message that can be generated when connecting to SAP ERP. The adapter-specific errors that are also described in this section can also arise if you are using the adapter with an iBSP configuration.

The following locations include log file information that is relevant for debugging purposes.

- iBSP trace information can be found under the following directory:

  ```
  C:\Program Files\iWay7\ibsp\ibsplogs
  ```

- The log file for iWay Explorer can be found under the following directory:

  ```
  C:\Program File\iWay7\tools\iwae\bin
  ```

Error Messages in iWay Explorer

The following table lists errors and solutions when using iWay Explorer with the adapter.

Error	Solution
Cannot connect to the adapter from iWay Explorer.	Ensure that: SAP ERP is running. The Server name, System Number, and Client Number are correct. The SAP ERP user ID and password are correct.
Cannot connect to the SAP ERP target through iWay Explorer. The following error message appears: `Error getting target [SAP] - java.lang.Exception: Error Logon to SAP System`	Ensure that you enter the correct connection parameters when connecting to the SAP ERP target.
SAP ERP does not appear in the iWay Explorer adapter node list.	Ensure that you added the sapjco.jar and sapjcorfc.dll files to the lib directory. Ensure that you added the librfc32.dll file to the Windows system32 folder.

Error	Solution
Cannot connect to your SAP ERP system through iWay Explorer. The following error message appears: `Problem activating adapter. (com.ibi.sapr3.SapAdapterException : com.sap.mw.jco.JCO$Exception: (102) RFC_ERROR_COMMUNICATION: Connect to SAP gateway failed Connect_PM GWHOST=isdsrv8, GWSERV=sapgw00, ASHOST=isdsrv8, SYSNR=00 LOCATION CPIC (TCP/IP) on local host ERROR partner not reached (host isdsrv8, service 3300) TIME Fri Aug 27 11:49:14 2004 RELEASE 620 COMPONENT NI (network interface) VERSION 36 RC -10 MODULE ninti.c LINE 979 DETAIL NiPConnect2 SYSTEM CALL SO_ERROR ERRNO 10061 ERRNO TEXT WSAECONNREFUSED: Connection refused COUNTER 1). Check logs for more information.`	Ensure that SAP ERP is running and that the parameter values for connecting to your server are correct.

Cannot connect to your SAP ERP system through iWay Explorer even though SAP ERP is running. The following error message appears:
`Problem activating adapter. (com.ibi.sapr3.SapAdapterException : java.lang.ExceptionInInitializerError: JCO.classInitialize(): Could not load middleware layer 'com.sap.mw.jco.rfc.MiddlewareRFC'`
 	
`JCO.nativeInit(): Could not initialize dynamic link library sapjcorfc [no sapjcorfc in java.library.path]. java.library.path`
	Ensure that you added the sapjcorfc.dll file to the lib directory and the librfc32.dll file to the Windows system32 folder.

Error	Solution

The DLL is loaded in another class loader (iBSP is installed on the same server). The following error message appears:
`com.ibi.sapr3.SapAdapterException:`
`java.lang.ExceptionInInitializerError: JCO.classInitialize(): Could not load middleware layer 'com.sap.mw.jco.rfc.MiddlewareRFC'`
`JCO.nativeInit(): Could not initialize dynamic link library sapjcorfc [Native Library F:\iWay60.008.0628\lib\sapjcorfc.dll already loaded in another classloader]. java.library.path`
	Ensure that you added the sapjco.jar file to the server class path.

Error Messages in SAP ERP

The following table lists errors and solutions when using the adapter.

Error	Solution
When executing a request, the following error message appears: `AdapterException: java.lang.Exception: Function module CUSTOMER_GETDETAIL2 does NOT exist.`	Check the syntax of your input XML document and ensure the name of the Remote Function module is correct and is available in SAP ERP.
When executing a request, the following error message appears: `AdapterException: java.lang.Exception: Object type unknown for business object: CUST`	Check the syntax of your input XML document and ensure the Object type is correct.

Error	Solution
When executing a request, the following error message appears: `AdapterException: java.lang.Exception: Unable to retrieve BAPI name for: CUSTOMER.DETAIL2`	Check the syntax of your input XML document and ensure the name of the BAPI is correct and is available in SAP ERP.
When executing a request, the following error message appears: `java.lang.RuntimeException: com.sap.mw.jco.JCO$AbapException: (126) OBJECT_UNKNOWN: Basic type or extension does not exist.`	Check the syntax of your input XML document and ensure the IDoc extension is correct and is available in SAP ERP.
When executing a request, the following error message appears: `AdapterException: java.lang.Exception: BapiError/BapiAbort: You are not authorized to display customers.`	Make sure your user ID has the correct permissions configured in SAP ERP. For more information, consult your SAP ERP administrator.

Error Messages in iBSP

The following topics discuss the different types of errors that can occur when processing web services through the iWay Business Services Engine (iBSP).

The iWay Business Services Engine (iBSP) serves as both a SOAP gateway into the adapter framework and as the engine for some of the adapters. At design time and run time, various conditions can cause errors in iBSP when web services that use adapters are running. Some conditions and resulting errors are exposed the same way, regardless of the specific adapter; others are exposed differently, based on the adapter being used. This topic explains what to expect when you encounter the more common error conditions on an adapter-specific basis.

Usually, the SOAP gateway (*agent*) inside iBSP passes a SOAP request message to the adapter required for the web service. If an error occurs, the way it is exposed depends on the adapter and the API or interfaces that the adapter uses. A few scenarios cause the SOAP gateway to generate a SOAP fault. In general, when the SOAP agent inside iBSP receives an invalid SOAP request, a SOAP fault element is generated in the SOAP response. The SOAP fault element contains fault string and fault code elements. The fault code contains a description of the SOAP agent error.

The following SOAP response document results when iBSP receives an invalid SOAP request:

```
<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
      <SOAP-ENV:Fault>
         <faultcode>SOAP-ENV:Client</faultcode>
         <faultstring>Parameter node is missing</faultstring>
      </SOAP-ENV:Fault>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

In the previous example, iBSP did not receive an element in the SOAP request message that is mandatory for the WSDL for this web service.

Adapter-Specific Error Handling

When an adapter raises an exception during run time, the SOAP agent in iBSP produces a SOAP fault element in the generated SOAP response. The SOAP fault element contains fault code and fault string elements. The fault string contains the native error description from the adapter target system. Because adapters use the target system interfaces and APIs, whether an exception is raised depends on how the target systems interface or API treats the error condition. If a SOAP request message is passed to an adapter by the SOAP agent in iBSP and that request is invalid based on the WSDL for that service, the adapter may raise an exception yielding a SOAP fault.

Although it is almost impossible to anticipate every error condition that an adapter may encounter, the following examples show how adapters handle common error conditions and how error conditions are then exposed to the web services consumer application.

Example: iWay Application Adapter for SAP ERP Invalid SOAP Request

When the iWay Application Adapter for SAP ERP receives a SOAP request message that does not conform to the WSDL for the web service being executed, the following SOAP response is generated:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/
 soap/envelope/">
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode>SOAP-ENV:Server</faultcode>
      <faultstring>Error processing agent [XDSapIfrAgent] - XD[FAIL]
       SapIFRException: java.sql.SQLException:
       com.ibi.sapjco.SapCallableStatement: execute() j
       java.util.NoSuchElementException</faultstring>
    </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Example: Empty Result From SOAP Request

When the iWay Application Adapter for SAP ERP executes an SAP ERP object as a web service using input parameters passed in the SOAP request message that do not match records in SAP ERP, the following SOAP response is generated:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/
 soap/envelope/">
  <SOAP-ENV:Body>
   <SOAP-ENV:Fault>
    <faultcode>SOAP-ENV:Server</faultcode>
    <faultstring>Error processing agent [XDSapIfrAgent] - XD[FAIL]
     SapIFRException: java.sql.SQLException:
     com.ibi.sapjco.SapCallableStatement: execute()
     java.sql.SQLException: JCO Error Key: NO_RECORD_FOUND Short
     Description: com.sap.mw.jco.JCO$AbapException: (126)
     NO_RECORD_FOUND: NO_RECORD_FOUND</faultstring>
   </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Example: Failure to Connect to SAP ERP

When the iWay Application Adapter for SAP ERP cannot connect to SAP ERP when executing a web service, the following SOAP response is generated:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/
 soap/envelope/">
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode>SOAP-ENV:Server</faultcode>
      <faultstring>Error processing agent [XDSapIfrAgent] - XD[RETRY]
       Connect to SAP gateway failed Connect_PM GWHOST=ESDSUN,
       GWSERV=sapgw00, ASHOST=ESDSUN, SYSNR=00 LOCATION CPIC (TCP/IP) on
       local host ERROR partner not reached (host ESDSUN, service 3300)
       TIME Mon Jun 30 16:01:02 2003 RELEASE 620 COMPONENT NI (network
       interface) VERSION 36 RC -10 MODULE ninti.c LINE 976 DETAIL
       NiPConnect2 SYSTEM CALL SO_ERROR ERRNO 10061 ERRNO TEXT
       WSAECONNREFUSED: Connection refused COUNTER 1</faultstring>
    </SOAP-ENV:Fault>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Example: Invalid SOAP Request

When the iWay Application Adapter for SAP ERP receives a SOAP request message that does not conform to the WSDL for the web services being executed, the following SOAP response is generated:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/
 soap/envelope/">
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode>SOAP-ENV:Server</faultcode>
      <faultstring>RPC server connection failed: Connection refused:
       connect
      </faultstring>
    </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Example: Empty Result From an iWay Application Adapter for SAP ERP SOAP Request

Note: The condition for this adapter does not yield a SOAP fault.

When the iWay Application Adapter for SAP ERP executes a SOAP request using input parameters passed that do not match records in the target system, the following SOAP response is generated:

```
<SOAP-ENV:Envelope xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance"
 xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
 xmlns:xsd="http://www.w3.org/1999/XMLSchema">
   <SOAP-ENV:Body>
      <m:RunDBQueryResponse xmlns:m="urn:schemas-iwaysoftware-com:iwse"
        xmlns="urn:schemas-iwaysoftware-com:iwse"
        cid="2A3CB42703EB20203F91951B89F3C5AF">
        <RunDBQueryResult run="1" />
     </m:RunDBQueryResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Gathering Information Before Calling Customer Support

Gathering specific information about a problem before calling Customer Support helps familiarize you with the troubleshooting process and saves you time. This section outlines necessary information you should obtain for your iWay Application Adapter for SAP ERP.

In the SAP ERP system, you find a set of tools for displaying detailed information on user sessions, work processes, and on the servers in your SAP ERP system.

If you want to work with these tools, choose the path *Administration*, *System Administration* on the initial SAP ERP screen, or run transaction S002. The initial screen for system administration appears. The tools are available under *Administration* and *Monitor*.

There are also programs that you can use at the operating system level to monitor the message server or the gateway.

Display an Overview of SAP ERP Application Servers

The Application Server Overview (transaction SM51) shows the application servers logged on at the SAP ERP message server. Only these application servers are active in an SAP ERP system. You can also administer the application servers, and manage and display the status of the users and work processes in all application servers belonging to the SAP ERP system.

Monitoring and Administration of the SAP ERP Message Server

If the messages server stops working, it must be restarted as quickly as possible, to ensure system continues to operate trouble-free.

Display and Control Work Processes

The Process Overview (transaction SM50) displays the current status of the work processes on the application server where you are logged on.

The process overview is intended primarily for information-gathering. For example, you can monitor processes to determine if the number of work processes in your system is adequate, to assess if the instance is working to full capacity, to gather information for trouble-shooting, or for tuning.

Display and Manage User Sessions

In the User Overview (transaction SM04), you can display, log off, and monitor all the users active in the system who are logged on to this application server.

Call Trace Facilities

You can use the trace functions to follow the process of various operations in your SAP ERP system. This allows you to monitor the system and to isolate problems that occur.

You can use the trace functions to trace SQL database accesses, ABAP programs, internal operations in the SAP ERP system, and authorization checks using flow traces (developer traces) generated by SAP ERP processes.

Use the SAP ERP Gateway Monitor in the SAP ERP System

The Gateway Monitor is used for analyzing and administrating the SAP ERP Gateway in the SAP ERP system. The initial screen of the gateway monitor shows all the active gateway connections on this instance.

Monitor RFC Resources on the Application Server

You can monitor the RFC resources on all application servers and thus find out the load incurred by parallel RFCs on a server.

You can also dynamically change the various quotas on all servers.

Analyze Errors in the System with the System Log

You can use the log to pinpoint and correct errors occurring in your system and its environment.

Recording HTTP Requests and Evaluating the Log

If you are using your SAP ERP system as an HTTP client or server, you can record the HTTP requests and evaluate the log file created. The Internet Communication Manager (ICM) and the SAP ERP message server support HTTP logging.

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