TIBCO iProcess® Connector for ActiveMatrix BusinessWorks™

User's Guide

Software Release 11.6
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Two-Second Advantage®

Important Information

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Preface

This manual describes TIBCO iProcess® Connector for ActiveMatrix BusinessWorks™. iProcess Connector for ActiveMatrix BusinessWorks enables TIBCO iProcess® Engine to interact with TIBCO ActiveMatrix BusinessWorks™ and vice versa. For example, ActiveMatrix BusinessWorks processes can be invoked from iProcess Engine procedures and iProcess Engine cases can be started from ActiveMatrix BusinessWorks.

This manual is not intended to be a complete reference for developing process definitions using TIBCO ActiveMatrix BusinessWorks and TIBCO iProcess Engine. Understanding the content of the ActiveMatrix BusinessWorks and iProcess Engine documentation is a pre-requisite to using iProcess Connector for ActiveMatrix BusinessWorks.

Topics

Related Documentation

This section lists documentation resources you may find useful.

TIBCO iProcess Connector for ActiveMatrix BusinessWorks Documentation

In addition to this manual, you can find out more about TIBCO iProcess Connector for ActiveMatrix BusinessWorks in the following documentations:

- *TIBCO iProcess® Technology Plug-ins Installation* Read this manual for information on installing the iProcess Technology plug-ins, which includes TIBCO iProcess Server Plug-in for ActiveMatrix BusinessWorks and TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess (components of TIBCO iProcess Connector for ActiveMatrix BusinessWorks).
- *TIBCO iProcess® Workspace Plug-ins Installation* Read this manual for information on installing the iProcess Workspace plug-ins, which includes the TIBCO iProcess Client Plug-in for ActiveMatrix BusinessWorks (a component of the TIBCO iProcess Connector for ActiveMatrix BusinessWorks).
- *TIBCO iProcess® Connector for ActiveMatrix BusinessWorks™ Connector Release Notes* Read the release notes for a list of new and changed features. This document also contains lists of known issues and closed issues for this release.

TIBCO ActiveMatrix BusinessWorks Documentation

The following documents are part of the TIBCO ActiveMatrix BusinessWorks documentation set:

- *TIBCO ActiveMatrix BusinessWorks Concepts* Read this manual before reading any other manual in the documentation set. This manual describes terminology and concepts of TIBCO ActiveMatrix BusinessWorks, and the other manuals in the documentation set assume you are familiar with the information in this manual.
- *TIBCO ActiveMatrix BusinessWorks Quick Start* This manual steps you through a very simple example of designing, deploying, and monitoring a TIBCO ActiveMatrix BusinessWorks process.
- *TIBCO ActiveMatrix BusinessWorks Process Design Guide* This manual describes how to create, edit, and test business processes using TIBCO ActiveMatrix BusinessWorks.
- *TIBCO ActiveMatrix BusinessWorks Installation* Read this manual for information on installing one or more components of TIBCO ActiveMatrix BusinessWorks and setting up a TIBCO ActiveMatrix BusinessWorks domain.

- *TIBCO ActiveMatrix BusinessWorks Error Codes* This manual describes errors returned by TIBCO ActiveMatrix BusinessWorks.
- *TIBCO ActiveMatrix BusinessWorks Release Notes* Read the release notes for a list of new and changed features. This document also contains lists of known issues and closes issues for this release.

TIBCO iProcess Engine Documentation

You can find more information related to integrating iProcess Engine procedures with other applications from the following sources:

- *TIBCO iProcess Engine Architecture Guide* provides information about the architecture, processes and messaging system for TIBCO iProcess Engine.
- The iProcess Modeler set of guides explains how to use the iProcess Modeler and Step Definer to create procedures.

Other TIBCO Product Documentation

You may find it useful to read the documentation for the following TIBCO products, which may be used or integrated with TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess:

- TIBCO Runtime Agent™: This software suite is a prerequisite for other TIBCO software products. In addition to TIBCO Runtime Agent components, the software suite includes the third-party libraries used by other TIBCO products, TIBCO Designer, Java Runtime Environment (JRE), TIBCO Hawk Agent, and TIBCO Rendezvous.
- TIBCO Administrator™: This software is available in two editions, Repository Edition and Enterprise Edition. The software allows you to manage users, machines and applications defined in a TIBCO Administration Domain. The TIBCO Administrator graphical user interface enables users to deploy, monitor, and start and stop TIBCO applications.
- TIBCO Designer™: This graphical user interface is used for designing and creating integration project configurations and building an Enterprise Archive (EAR) for the project. The EAR can then be used by TIBCO Administrator for deploying and running the application.
- TIBCO Hawk®: This is a tool for monitoring and managing distributed applications and operating systems.
- TIBCO Rendezvous®: This software enables programs running on many different kinds of computers on a network to communicate seamlessly. It includes two main components: the Rendezvous programming language interface (API) in several languages, and the Rendezvous daemon.

- TIBCO Enterprise Message Service™: This software lets application programs send and receive messages using the Java Message Service (JMS) protocol. It also integrates with TIBCO Rendezvous and TIBCO SmartSockets™ messaging products.
- TIBCO SmartSockets™: This message-oriented middleware product enables programs to communicate quickly, reliably, and securely across local area networks (LANs), wide area networks (WANs), and the Internet.

Typographical Conventions

The following typographical conventions are used in this manual.

Table 1 General Typographical Conventions

Convention	Use
ENV_NAME *TIBCO_HOME*	TIBCO products are installed into an installation environment. A product installed into an installation environment does not access components in other installation environments. Incompatible products and multiple instances of the same product must be installed into different installation environments. An installation environment consists of the following properties: • **Name** Identifies the installation environment. This name is referenced in documentation as *ENV_NAME*. On Microsoft Windows, the name is appended to the name of Windows services created by the installer and is a component of the path to the product shortcut in the Windows Start > All Programs menu. • **Path** The folder into which the product is installed. This folder is referenced in documentation as *TIBCO_HOME*.
SWDIR	TIBCO iProcess Engine installs into a directory. This directory is referenced in documentation as *SWDIR*. For example, if *SWDIR* is set to `C:\swerver\staffw_nod1` on a Windows server (on the `C:` drive), then the full path to the `swutil` command is `C:\swerver\staffw_nod1\bin\swutil`.
`code font`	Code font identifies commands, code examples, filenames, pathnames, and output displayed in a command window. For example: Use `MyCommand` to start the foo process.
`bold code font`	Bold code font is used in the following ways: • In procedures, to indicate what a user types. For example: Type **`admin`**. • In large code samples, to indicate the parts of the sample that are of particular interest. • In command syntax, to indicate the default parameter for a command. For example, if no parameter is specified, `MyCommand` is enabled: `MyCommand [enable | disable]`

Table 1 General Typographical Conventions (Cont'd)

Convention	Use
italic font	Italic font is used in the following ways: • To indicate a document title. For example: See *TIBCO ActiveMatrix BusinessWorks Concepts*. • To introduce new terms For example: A portal page may contain several portlets. *Portlets* are mini-applications that run in a portal. • To indicate a variable in a command or code syntax that you must replace. For example: `MyCommand` *PathName*
Key combinations	Key name separated by a plus sign indicate keys pressed simultaneously. For example: Ctrl+C. Key names separated by a comma and space indicate keys pressed one after the other. For example: Esc, Ctrl+Q.
	The note icon indicates information that is of special interest or importance, for example, an additional action required only in certain circumstances.
	The tip icon indicates an idea that could be useful, for example, a way to apply the information provided in the current section to achieve a specific result.
	The warning icon indicates the potential for a damaging situation, for example, data loss or corruption if certain steps are taken or not taken.

Table 2 Syntax Typographical Conventions

Convention	Use
`[ ]`	An optional item in a command or code syntax. For example: `MyCommand [optional_parameter] required_parameter`
`|`	A logical `OR` that separates multiple items of which only one may be chosen. For example, you can select only one of the following parameters: `MyCommand para1 | param2 | param3`

Table 2 Syntax Typographical Conventions

Convention	Use

`{ }`	A logical group of items in a command. Other syntax notations may appear within each logical group.
	
	For example, the following command requires two parameters, which can be either the pair `param1` and `param2`, or the pair `param3` and `param4`.
	
	`MyCommand {param1 param2} | {param3 param4}`
	
	In the next example, the command requires two parameters. The first parameter can be either `param1` or `param2` and the second can be either `param3` or `param4`:
	
	`MyCommand {param1 | param2} {param3 | param4}`
	
	In the next example, the command can accept either two or three parameters. The first parameter must be `param1`. You can optionally include `param2` as the second parameter. And the last parameter is either `param3` or `param4`.
	
	`MyCommand param1 [param2] {param3 | param4}`

Connecting with TIBCO Resources

How to Join TIBCOmmunity

TIBCOmmunity is an online destination for TIBCO customers, partners, and resident experts. It is a place to share and access the collective experience of the TIBCO community. TIBCOmmunity offers forums, blogs, and access to a variety of resources. To register, go to http://www.tibcommunity.com.

How to Access TIBCO Documentation

Documentation for this and other TIBCO products is available on the TIBCO Documentation site:

https://docs.tibco.com

Documentation on the TIBCO Documentation site is updated more frequently than any documentation that might be included with the product. To ensure that you are accessing the latest available help topics, please visit us at https://docs.tibco.com.

How to Contact TIBCO Support

For comments or problems with this manual or the software it addresses, contact TIBCO Support as follows:

- For an overview of TIBCO Support, and information about getting started with TIBCO Support, visit this site:

  http://www.tibco.com/services/support

- If you already have a valid maintenance or support contract, visit this site:

  https://support.tibco.com

  Entry to this site requires a user name and password. If you do not have a user name, you can request one.

Chapter 1 Product Introduction

This chapter provides an introduction to TIBCO iProcess Connector for ActiveMatrix BusinessWorks and provides an overview of how it works.

Topics

About iProcess Connector for ActiveMatrix BusinessWorks

The TIBCO iProcess® Suite of products provide comprehensive business process management (BPM) features for modeling and automating user-centric business processes such as customer relations management (CRM). TIBCO ActiveMatrix BusinessWorks provides a set of tools for modeling and automating system-centric business processes such as interaction between two mission critical applications like a billing system and a shipping system. iProcess Connector for ActiveMatrix BusinessWorks allows applications designed using either TIBCO ActiveMatrix BusinessWorks or the TIBCO iProcess suite of products to communicate easily.

The main function of iProcess Connector for ActiveMatrix BusinessWorks is to provide an efficient and easy to use interface between BusinessWorks and iProcess Engine. iProcess Connector for ActiveMatrix BusinessWorks can be used in the following ways:

- A TIBCO ActiveMatrix BusinessWorks process definition can invoke a TIBCO iProcess Engine procedure. For example, a BusinessWorks process starts or suspends a case of an iProcess Engine procedure.
- A TIBCO iProcess Engine procedure can invoke a TIBCO ActiveMatrix BusinessWorks process definition. For example, a step in a TIBCO iProcess Engine procedure calls a BusinessWorks process and waits for a reply.

About the Components of iProcess Connector for ActiveMatrix BusinessWorks

iProcess Connector for ActiveMatrix BusinessWorks consists of three components:

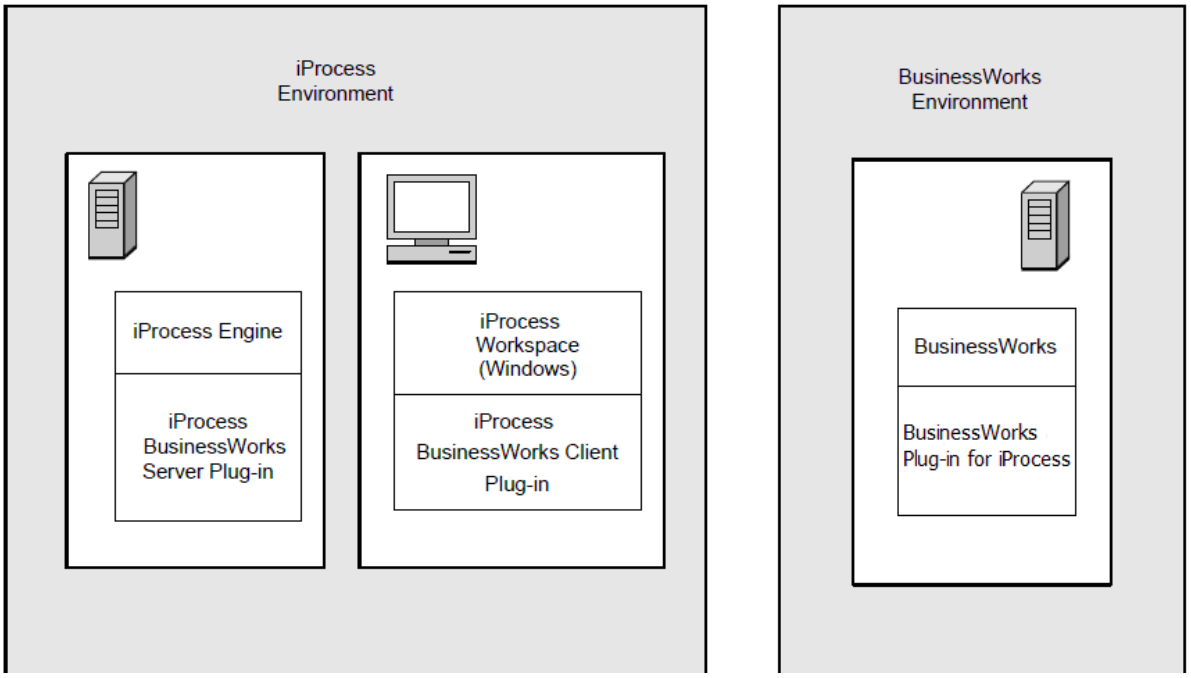
- TIBCO ActiveMatrix BusinessWorks™ Plug-in for iProcess— this component is installed on the same machine as TIBCO ActiveMatrix BusinessWorks and provides a set of resources that allow a TIBCO ActiveMatrix BusinessWorks process definition to communicate with TIBCO iProcess Engine.
- TIBCO iProcess Server Plug-in for ActiveMatrix BusinessWorks — this component is installed on the same machine as TIBCO iProcess Engine and provides the communication mechanism that allows the engine to make calls to TIBCO ActiveMatrix BusinessWorks.

You can install all or some of these components when you install iProcess Connector for ActiveMatrix BusinessWorks. See *TIBCO iProcess Technology Plug-ins Installation* for more information.

- TIBCO iProcess Client Plug-in for ActiveMatrix BusinessWorks — this component is installed as part of TIBCO iProcess Workspace Plug-ins. It must be installed on the same machine as TIBCO iProcess Workspace (Windows) and TIBCO iProcess Modeler. It provides a set of steps that allow an iProcess Engine procedure to invoke a TIBCO ActiveMatrix BusinessWorks process definition. See *TIBCO iProcess Workspace Plug-ins Installation* for more information.

Figure 1 illustrates the location of the components.

Figure 1 The TIBCO iProcess Connector for ActiveMatrix BusinessWorks Components



JMS

The iProcess Connector for ActiveMatrix BusinessWorks components use JMS (Java Message Service) to communicate with each other. This release of iProcess Connector for ActiveMatrix BusinessWorks supports one JMS provider, TIBCO EMS (Enterprise Message Service™). Communications between iProcess Connector for ActiveMatrix BusinessWorks and EMS can be set up to use secure SSL connections.

See Chapter 5, Managing Your JMS Provider, on page 51 for details of setting up JMS connections, and see *TIBCO Enterprise Message Service™ User's Guide* for more information on EMS and SSL.

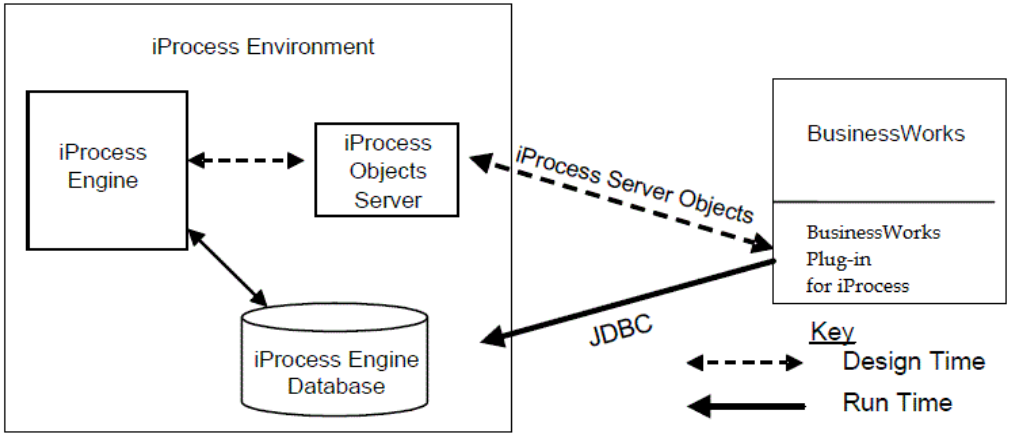
Understanding the iProcess Connector for ActiveMatrix BusinessWorks Architecture

The following section describes how iProcess Connector for ActiveMatrix BusinessWorks provides communication between TIBCO ActiveMatrix BusinessWorks and TIBCO iProcess Engine. It describes:

Invoking iProcess Engine From TIBCO ActiveMatrix BusinessWorks

Figure 2 illustrates how BusinessWorks invokes iProcess Engine.

Figure 2 BusinessWorks Invoking an iProcess Engine Procedure



The following steps outline how the different components communicate with each other.

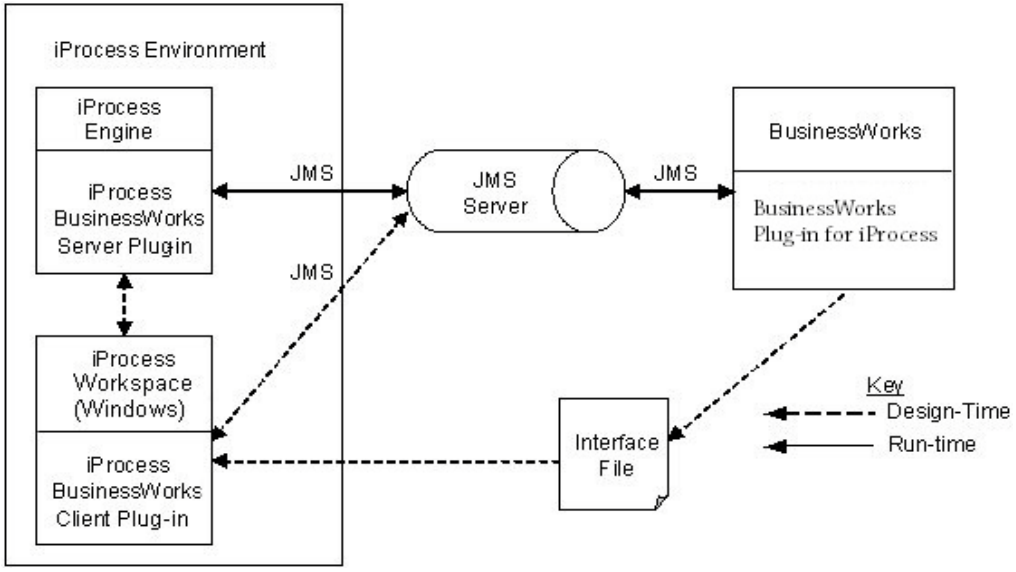
1. The iProcess Connection resource must be created and configured in BusinessWorks. This provides the connection information for BusinessWorks to communicate with the iProcess Environment.

2. The BusinessWorks process definitions must be created to define the iProcess Environment activities that you want to invoke from BusinessWorks. When working in the design environment, the iProcess Objects Server provides BusinessWorks with the procedure information that is available from the iProcess Environment. The connectivity between BusinessWorks and iProcess is facilitated by iProcess Server Objects.
3. When the BusinessWorks process definition executes, BusinessWorks communicates directly with the iProcess Engine database. The protocol that is used is JDBC (Java Database Connectivity).

Invoking BusinessWorks From iProcess Engine

Figure 3 illustrates how iProcess Engine invokes BusinessWorks.

Figure 3 iProcess Engine Invoking a BusinessWorks Process Definition



The following steps outline how the different components communicate with each other.

1. A BusinessWorks process definition is created or already exists in a project. The process definition describes the automated process you want to invoke from iProcess Engine.
2. The iProcess Service Agent must be created and configured in BusinessWorks. The iProcess Service Agent invokes BusinessWorks process definitions. The protocol used for this is JMS (Java Message Service), and the connection must

use the JNDI connection factory. See Creating an iProcess Service Agent Resource on page 30 for more information.

3. You must choose which introspection method you want to use. See Understanding the Introspection Methods on page 26. Depending on the introspection method you have chosen, you must either:
   - create an interface file. The interface file contains the connection information that iProcess Engine needs to integrate with BusinessWorks. See Using an Interface File on page 26 for more information.
   - make sure the iProcess Service Agent is running if you want to use the live link to BusinessWorks. See Using a Live Link to BusinessWorks on page 27.
4. An iProcess Engine procedure is created that defines an iProcess BusinessWorks step that invokes a BusinessWorks process. The protocol used for this is JMS (Java Message Service). The step uses the interface file to communicate with BusinessWorks. The interface file is generated from BusinessWorks and it contains the BusinessWorks process name, input and output data so that you can define the data that needs to be mapped between the iProcess Engine procedure and the BusinessWorks process definition.

Chapter 2

Design Guidelines for Process Definitions and Procedures

This chapter provides some design guidelines for TIBCO ActiveMatrix BusinessWorks process definitions and iProcess Engine procedures.

Topics

Understanding Transactions in TIBCO iProcess Connector for ActiveMatrix BusinessWorks

This section describes the transactional scope of TIBCO iProcess Connector for ActiveMatrix BusinessWorks. It describes:

- XA transactions and TIBCO iProcess Connector for ActiveMatrix BusinessWorks. See XA Transactions and TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess on page 10.
- the transactional scope of the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess step. See Transactional Scope of the iProcess BusinessWorks Step on page 11.

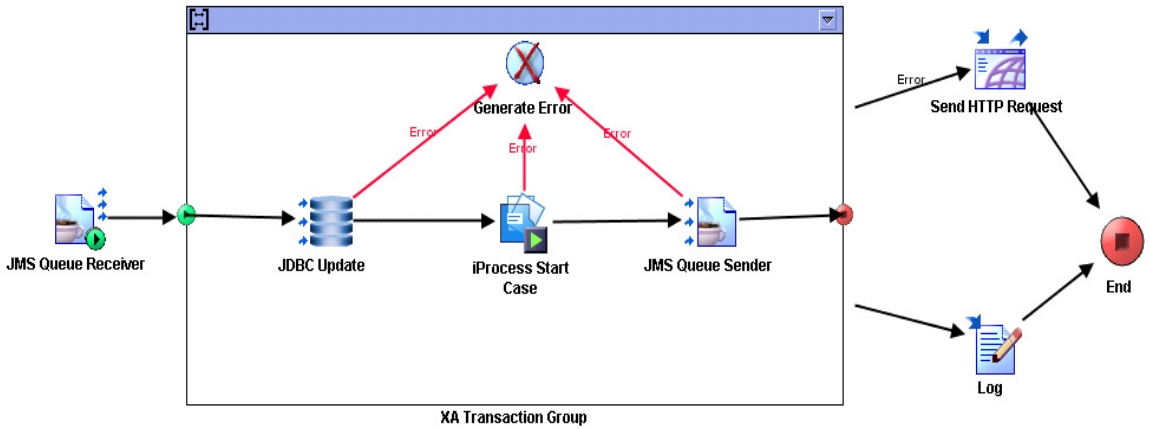
The transaction behavior of the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activities is different from the iProcess BusinessWorks step. The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activities can participate in an XA transaction whereas the iProcess BusinessWorks step cannot.

XA Transactions and TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess

BusinessWorks provides XA and JDBC transaction groups that allow activities to be grouped together into a transaction. The operations performed by all the transaction-aware activities in a BusinessWorks transaction group will complete successfully or are rolled back. See "Transactions" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for more information about using transactions in BusinessWorks.

The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activities are transaction-aware and they can participate in the BusinessWorks XA and JDBC transaction group. For example in a BusinessWorks XA transaction group, you can have JDBC, JMS and iProcess Plug-in activities. This will ensure that either all operations performed by JDBC, JMS and iProcess plug-in activities are completed, or none are performed. See the following illustration.

Figure 4 Illustration of a BusinessWorks XA Transaction Group



If the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activities are part of a BusinessWorks transaction group and the transaction was aborted then the output values generated by these activities are not valid. For example, if an activity is part of a transaction group and there is a problem which causes the transaction to be rolled back, then any data returned by the activity is not valid and cannot be used for further processing.

Transactional Scope of the iProcess BusinessWorks Step

When designing a procedure containing iProcess BusinessWorks steps, you must consider the transaction implications in your system design. This is because TIBCO does not support propagating a transaction context into a Java Virtual Machine through the Java Native Interface.

For example, suppose that an iProcess BusinessWorks step is linked to an EAI Oracle step. If there is a failure inside the EAI Oracle step, the transaction is aborted and the transaction is rolled back to the point just before the execution of the iProcess BusinessWorks step. When the transaction is retried, the iProcess BusinessWorks step is re-processed. In this scenario, it is necessary to design your iProcess BusinessWorks object so that it can handle being called repeatedly without causing a problem.

Another consideration is that it is possible to inadvertently design a deadlock into the procedure. For example, where there is an iProcess BusinessWorks step following an EAI Oracle step, if the iProcess BusinessWorks step uses JDBC to attempt to access a resource that the EAI Oracle step has used then a deadlock will occur. The EAI Oracle step does not relinquish its lock on the resource it has used until the transaction is complete, but the transaction will not complete until the iProcess BusinessWorks step has accessed the resource that the EAI Oracle step has locked.

TIBCO recommends that you do not use an EAI step as the first step in your procedure. There are two reasons for this:

- if an EAI step is the first step in a procedure and it succeeds, nothing is recorded in the audit trail to say this.
- if an EAI step is the first step in a procedure and it fails, the case is not started and nothing is recorded in the audit trail to say this. The iProcess Engine continues to retry the step and the only way to stop this is to de-register and re-register the EAI plug-in.

See "Using Enterprise Application Integration (EAI) Steps" in *TIBCO iProcess Modeler Integration Techniques* for more information about EAI steps and transactions.

Error Handling in TIBCO iProcess Connector for ActiveMatrix BusinessWorks

This section describes:

Error Handling in TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess

If a BusinessWorks process definition tries to invoke an iProcess Engine activity and for some reason the iProcess Engine database is not available, an error is thrown. See "Error Handling" in *TIBCO ActiveMatrix BusinessWorks Design Guide* for information on how to handle errors in your BusinessWorks process definitions.

If a BusinessWorks process definition tries to invoke an iProcess Engine activity and the iProcess Engine is not available, an error is reported in the *SWDIR*`\logs\sw_error` or `sw_warn` files. See *TIBCO iProcess System Messages Guide* for more information about iProcess environment error messages.

Error Handling in iProcess BusinessWorks Server and Client Plug-ins

If an iProcess Engine procedure tries to invoke a BusinessWorks process definition and for some reason BusinessWorks or the BusinessWorks process definition is not available, an error is thrown. For example, you may have an iProcess Engine procedure that invokes a BusinessWorks process but, for some reason, BusinessWorks is not available. This means that the iProcess Engine could be blocked while waiting for a response from BusinessWorks. Eventually, the operation will time out. To work around this, you should build in some error handling in your iProcess Engine procedure to handle this.

Timeout Handling in TIBCO iProcess Connector for ActiveMatrix

BusinessWorks

TIBCO iProcess Connector for ActiveMatrix BusinessWorks employs a timeout system to prevent failed communications between iProcess Engine and BusinessWorks from corrupting the integrity of the system. This is a two-phase timeout system with a further backup timeout setting designed to reinforce the primary timeout system in the event of a failure of the iProcess Engine BG (background) process (and hence of the BusinessWorks plug-in).

Default values for these timeouts are specified in a Java properties file located in *SWDIR*`\eaijava\properties\bw`. You can specify the values used by each iProcess BusinessWorks step when you design the step, overriding the default values.

The timeout system works as follows:

1. iProcess Engine sends a JMS message to BusinessWorks. If a response is received from BusinessWorks, all continues as normal.
2. If no response is received from BusinessWorks by the end of first timeout period (**Response Timeout**), it is assumed that communication has failed. Depending on how the step has been configured, it can:
   - If no response is received, a warning is written to the log and then the iProcess Server Plug-in for ActiveMatrix BusinessWorks attempts to re-consume the message.
   - Report a success and continue (immediately, in the case of immediate release).
   - Report a success and set an iProcess Engine field, which the user can select, to a defined value.
3. iProcess Engine waits for the period specified by the **Consume Timeout** for the re-consumption of the JMS message to succeed. If the message is re-consumed, iProcess Engine generates an error and re-tries the step.
4. If the attempt to re-consume the message fails, the system waits for the length of the **Deadlock Timeout**. If a response is received before the end of this period, processing continues as normal. If no response has been received by the end of the period, it aborts the step and sends an error message to iProcess Engine. The background process re-tries the step.
5. This system avoids duplication of JMS messages where possible, and means that iProcess Engine can manage the behavior of the step without user intervention. Duplication can however still occur if the second timeout occurs or if the iProcess Engine shuts down, so you should be aware of this and exercise caution when designing applications. Therefore an **Expiration Timeout** is provided. If the JMS message is not consumed within this period, the JMS server deletes the message.

See step 21 for how to specify these values when designing an iProcess BusinessWorks step.

When using timeout values other than zero, you must ensure that the clocks on the iProcess Engine server and the BusinessWorks server are synchronized. Synchronize clocks to a tolerance that is a very small fraction of the smallest message expiration time. If this is not done, it would be possible for processes to time out unexpectedly.

Specifying the Default JMS Timeout Values

You specify the default JMS timeout values in the Java properties file located in *SWDIR*`\eaijava\properties\bw`. This file contains a series of key and value pairs.

Key	Value (in milliseconds)	Description
jms.responseTimeout	A value greater than or equal to zero. Defaults to `20000` (20 seconds).	The time to wait for a response from BusinessWorks before attempting to re-consume the JMS message.
jms.consumeTimeout	A value greater than or equal to zero. Defaults to `5000` (five seconds).	The time to wait for the re-consumption of a JMS message to succeed, before aborting the step and reporting an error to iProcess Engine.
jms.deadlockTimeout	A value greater than or equal to zero. Defaults to `240000` (four minutes).	If the JMS message could not be re-consumed, the time to wait before aborting the step and reporting an error to iProcess Engine.
jms.expirationTimeout	A value greater than or equal to zero. Defaults to `30000` (30 seconds).	Time to set on the JMS message for the JMS server to delete the message in the event the message fails to be consumed. This should be set to at least one second (1000 milliseconds) more than the `jms.responseTimeout` value.

Chapter 3 Invoking iProcess Engine from BusinessWorks

This chapter describes the steps you need to perform to invoke iProcess Engine procedures from BusinessWorks. It starts with an overview that outlines the steps you need to perform from both BusinessWorks and iProcess Engine. The later sections describe some of these steps in more detail.

Topics

Overview

The following section is an overview of the steps you need to perform, both in BusinessWorks and iProcess Engine, to invoke iProcess Engine procedures from BusinessWorks.

Overview of the Invocation Process

This section describes an overview of the steps you need to perform if you want BusinessWorks to invoke an iProcess Engine procedure.

1. Create a BusinessWorks project. See "Managing Projects and Resources" in *TIBCO ActiveMatrix BusinessWorks Design Guide* for more information.
2. Create and configure an iProcess Connection resource. The iProcess Connection resource provides the connection information for the iProcess Environment. See Defining the iProcess Connection Resource on page 19.
3. Create the BusinessWorks processes that define the iProcess Engine operations that you want the BusinessWorks process to initiate at runtime. The iProcess Engine operations are performed from BusinessWorks using the activities contained in the ActiveMatrix BusinessWorks Plug-in for iProcess Palette. See Creating the BusinessWorks Process Definitions on page 21.
4. For BusinessWorks to invoke an iProcess Engine procedure, you need to create the iProcess Engine procedures that you want BusinessWorks to invoke.

Configuring the BusinessWorks Components

This section describes how to configure the BusinessWorks components so that a BusinessWorks process definition can invoke an iProcess Engine procedure. It describes:

Defining the iProcess Connection Resource

Define the iProcess Connection resource as follows:

1. In your TIBCO ActiveMatrix BusinessWorks project, drag and drop an **iProcess Connection** resource from the iProcess Palette to the design panel.
2. Enter the information in the Configuration tab that enables you to connect to the TIBCO iProcess Objects Server. See iProcess Connection on page 74 for more information on how to do this.

Make sure you have enabled Database Connection Information Access for your TIBCO iProcess Objects Server, using the TIBCO iProcess Objects Server Configuration Utility. See "Using the TIBCO iProcess Objects Server Configuration Utility" in *TIBCO iProcess Objects Server Administrator's Guide* for more information.

3. From the Database Connection tab, select the type of database connection type you want the iProcess Connection to use. You have two choices:
   - **JDBC**. For more information about JDBC transactions, see "Transactions" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide*.
   - **XA**. For more information about XA transactions, see "Transactions" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide*.
4. Click **Test Connection**. Once you have clicked **Test Connection**, BusinessWorks does the following:
   a. tries to establish a connection to the iProcess Objects Server.

b. once BusinessWorks has established the connection, it tries to obtain the connection information to the iProcess database automatically and populates the fields in the Database Connection tab with the iProcess Engine database connection information.

c. tries to establish a connection to the iProcess Engine database.

If, at some point, one of these should fail, an error message is reported to you.

The iProcess Engine database connection information should be automatically populated in the remaining fields. If you want to amend any of the database connection information, uncheck the **Auto Config** checkbox. The database connection fields become active and you can amend them.

In some database environments, you may have to uncheck the **Auto Config** checkbox and modify the values for the Database User Name and Database Password fields, for example if your iProcess Engine is using a SQL Server that uses Windows authentication. See *TIBCO iProcess BusinessWorks Technology Plug-ins Installation* for more information.

Defining an iProcess Case Start Activity

Define the iProcess Case Start activity as follows:

1. From your iProcess Palette, drag and drop an **iProcess Start Case** activity to your BusinessWorks process definition.
2. Click the **Configuration** tab.
3. From the iProcess Connection field, select the iProcess Connection resource that you want to use.
4. Click the **Fetch/Refresh** button to retrieve a list of the iProcess Engine procedures that are available.
5. From the Procedure Name field, select the procedure that you want to start a case of.
6. From the Step Type field, select the step type of the step that you want the case of the iProcess Engine procedure to start at.
7. From the Step Name field, select the step that you want the case of the iProcess Engine procedure to start at.
8. Configure the Advanced tab, according to your requirements.
9. In the Input tab, set a value for the case priority based on your requirements in the Priority field of the Activity Input panel.

Defining an iProcess Procedure Case Management Activity

Define the iProcess Procedure Case Management activity as follows:

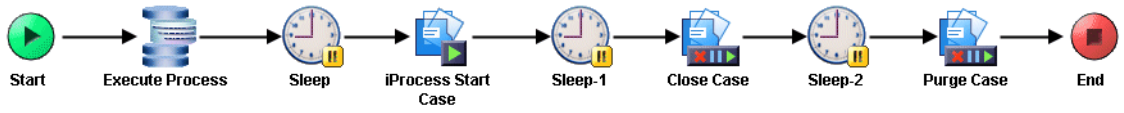
1. From your iProcess Palette, drag and drop an **iProcess Procedure Case Management** activity to your BusinessWorks process definition.
2. Click the **Configuration** tab.
3. From the iProcess Connection field, select the iProcess Connection resource that you want to use.
4. From the Case Operation drop-down list, select the case operation you want to invoke. If the Trigger Event operation is selected in the Case Operation drop-down list, the following checkboxes are displayed. You can check them according to your requirements.
   - Resurrect Case
   - Update Pack Data
   - Recalculate Deadlines (Main Case)
   - Recalculate Deadlines (Main Case and Sub-cases)

   For more information about how to use the checkboxes, see Trigger Event on page 98.
5. Click the **Fetch/Refresh** button to retrieve a list of the iProcess Engine procedures that are available. These populate the Procedure Type and Procedure Name fields.
6. From the Event Step Name field, select the event step in the iProcess Engine procedure that you want to perform the case operation on.
7. Configure the Advanced tab, according to your requirements.
8. Click the **Apply** button to save the configuration.
9. In the Input tab, set a value for the case priority based on your requirements in the Priority field of the Activity Input panel.

Creating the BusinessWorks Process Definitions

The aim of the examples below is to demonstrate how you might define some BusinessWorks process definitions using the activities in the iProcess Palette.

Example 1 Closing a Case of an iProcess Engine Procedure



In this example, the activities are processed as follows:

1. The first activity executes a business process.
2. There is a sleep activity between the Execute Process activity and the iProcess Start case activity to give the process time to execute.
3. As a result of the business process, a case of an iProcess Engine procedure is started in the third activity.
4. The sleep-1 activity gives the iProcess Engine time to start the case of the iProcess Engine procedure.
5. Once the case has completed, the fifth activity closes the case.
6. The sleep-2 activity gives the iProcess Engine time to close the case.
7. Once the case has closed, it can be purged so the final activity purges the case. Purging a case removes the case and any case data from the iProcess Engine. See "Purging Cases" in *TIBCO iProcess Workspace (Windows) Manager's Guide*.

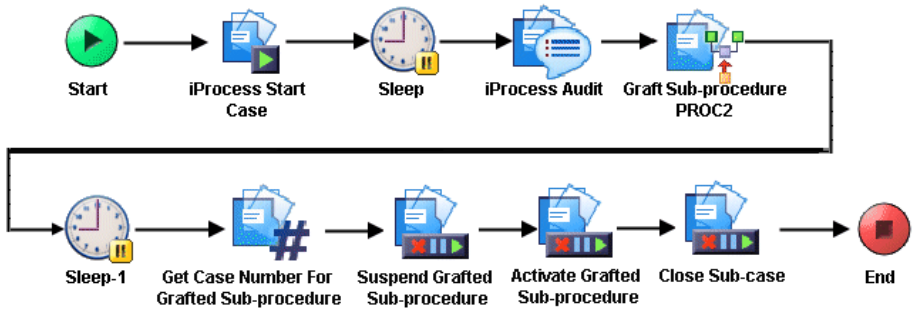
Example 2 Using iProcess Engine Case Management Activities

In this example, the activities are processed as follows:

1. The first activity receives a JMS message from a JMS queue.
2. The second activity starts a case of an iProcess Engine procedure as a result of the JMS message.
3. The sleep activity gives the iProcess Engine time to start the case so that it is started by the time the next activity needs to take place.
4. The fourth activity triggers an event in the iProcess Engine procedure. For example, some information may need to be published to an external process.

5. The sleep-1 activity gives the iProcess Engine time to trigger the event.
6. The sixth activity gets the status of the case. This is to make sure that the event has been triggered.

Example 3 Using the Graft and Audit Activities



In this example:

1. The iProcess Start Case Activity starts a case of an iProcess Engine procedure GRAFT.
2. As in the previous example, the sleep activity gives the iProcess Engine time to start the case.
3. The iProcess Audit Entry Activity adds audit information for the GRAFT procedure.
4. The iProcess Graft Management Activity is used to graft sub-procedure SUB2 to step GRAFT1 in procedure GRAFT. The graft count is set automatically within the activity.
5. The second sleep activity gives the iProcess Engine time to trigger the event.
6. The iProcess Get Case Number activity takes a procedure (in this example, a sub-procedure), step name, sub-procedure name and case number as input, and returns the case number for the grafted sub-procedure.
7. The iProcess Procedure Case Management activity is used, specifying Suspend as the operation to be carried out. It takes a sub-procedure as a configuration parameter. The sub-case number output by the iProcess Get Case Number activity is supplied as the case number to the Input tab.
8. The iProcess Procedure Case Management activity is used again, specifying Activate as the operation to be carried out. It re-activates the suspended sub-procedure.
9. Finally, the iProcess Procedure Case Management activity is used yet again, this time to close the sub-case. It could instead perform any case management

task available, including Status, Activate, Suspend, Close, Purge, Trigger Event, and Jump To.

Chapter 4 Invoking BusinessWorks from iProcess Engine

This chapter describes the steps you need to perform to invoke BusinessWorks processes from iProcess Engine. It contains an overview that aims to outline the steps you need to perform from both BusinessWorks and iProcess Engine. The later sections describe some of these steps in more detail.

Topics

Understanding the Introspection Methods

Introspection methods define how the iProcess Engine communicates with TIBCO ActiveMatrix BusinessWorks. There are two introspection methods you can use when configuring iProcess Engine to integrate with BusinessWorks:

- Using an Interface File on page 26
- Using a Live Link to BusinessWorks on page 27

Whichever method you decide to use, you must create a JMS destination queue for the TIBCO Enterprise Message Service that handles messages from TIBCO ActiveMatrix BusinessWorks and TIBCO iProcess Engine and vice versa.

You must use JMS queues as JMS topics are not supported. For JMS queues, see Chapter 5, Managing Your JMS Provider, on page 51.

Using an Interface File

If you want to use this introspection method, you must generate an interface file (`.wsdl` file) from the iProcess Service Agent. See Creating an iProcess Service Agent Resource on page 30 for more information.

The interface file contains:

- the transport information for your JMS provider
- the BusinessWorks process definitions that iProcess Engine can integrate with.

Once you have created an interface file from the iProcess Service Agent, you need to reference this file when defining your iProcess BusinessWorks step. This is so that the iProcess Engine can obtain the connection information for BusinessWorks. See Defining an iProcess BusinessWorks Step on page 32 for more information.

If you use this introspection method then the iProcess Service Agent does not need to be running when defining an iProcess BusinessWorks step. This is because all of the connection information is contained in the interface file.

Using a Live Link to BusinessWorks

If you want to use this introspection method, your iProcess Workspace (Windows) must be able to connect directly to the iProcess Service Agent and the iProcess Service Agent must be running. See "Creating an Archive for Deployment" in *TIBCO Designer User's Guide* for more information. The same information that would be contained in the interface file is available over the live link, so any changes can be reflected dynamically.

To use this method, you must configure your JMS Provider transport information before defining your iProcess BusinessWorks step. See Chapter 5, Managing Your JMS Provider, on page 51 for more information.

Overview of the Invocation Process

The following section is an overview of the steps you need to perform, both in BusinessWorks and iProcess Engine, to invoke BusinessWorks processes from iProcess Engine. It describes:

- Overview of the Invocation Process From BusinessWorks on page 28
- Overview of the Invocation Process From the iProcess Environment on page 29

Overview of the Invocation Process From BusinessWorks

You must perform the following steps in BusinessWorks if you want the iProcess Engine to invoke BusinessWorks processes.

1. Create a JMS destination queue for the TIBCO Enterprise Message Service that handles messages from TIBCO ActiveMatrix BusinessWorks and TIBCO iProcess Engine. See "Working with Destinations" in *TIBCO Enterprise Message Service User's Guide* for more information.

You must use JMS queues as JMS topics are not supported. For JMS queues, see Chapter 5, Managing Your JMS Provider, on page 51.

2. Create an external schema for the BusinessWorks subprocess that you want to invoke from iProcess Engine. The schema describes the vocabulary and structure of the data that can be passed between iProcess Engine and BusinessWorks. If the process is to be subject to delayed release, the JMS message schema will include the Delayed Release ID.
3. Create the BusinessWorks project. See "Managing Projects and Resources" in *TIBCO ActiveMatrix BusinessWorks Design Guide* for more information.
4. Create the BusinessWorks processes that define the iProcess Engine activities/operations that you want the iProcess Engine procedure to initiate at runtime. See Creating the BusinessWorks Process Definitions on page 21.
5. Create and configure a **JMS Connection** resource in your BusinessWorks project for the JMS destination queue you created in step 1. The JMS Connection resource is contained in the JMS Palette. See "JMS Connection" in *TIBCO ActiveMatrix BusinessWorks Palette Reference Guide* for more information.
6. Create and configure an **iProcess Service Agent** resource. The iProcess Service Agent resource is contained in the BusinessWorks iProcess Palette and it

provides the mechanism for the iProcess Engine to interact with the BusinessWorks. See Creating an iProcess Service Agent Resource on page 30.

7. Depending on the introspection method you are using either:
   - If you are using an interface file as your introspection method, generate an interface file from the **iProcess Service Agent** resource. The interface file contains the JMS connection information, the BusinessWorks process name and the input and output schema that the iProcess Engine needs to interact with BusinessWorks. See Creating an iProcess Service Agent Resource on page 30.
   - If you are using a live link to BusinessWorks, make sure that:
     —the iProcess Service Agent is running. See "Creating an Archive for Deployment" in *TIBCO Designer User's Guide* for more information.
     —you have configured your JMS Provider transport information. See Managing Your JMS Provider on page 51.

   See Understanding the Introspection Methods on page 26 for more information.

Overview of the Invocation Process From the iProcess Environment

You must perform the following steps from iProcess Modeler if you want to invoke BusinessWorks processes from iProcess Engine:

1. Create the iProcess Engine procedure.
2. Create the iProcess BusinessWorks step. See Defining an iProcess BusinessWorks Step on page 32.
   - If you are using an interface file as your introspection method, import the interface file from step 7 in Overview of the Invocation Process From BusinessWorks on page 28. See Defining an iProcess BusinessWorks Step on page 32.
   - If you are using a live link to BusinessWorks, configure your JMS provider and JMS destinations. See Chapter 5, Managing Your JMS Provider, on page 51.

Configuring the BusinessWorks Components

To configure the BusinessWorks components so that an iProcess Engine procedure can invoke a BusinessWorks process definition you must create an iProcess Service Agent resource.

Creating an iProcess Service Agent Resource

Define the iProcess Service Agent resource as follows:

1. In your BusinessWorks project, drag and drop an **iProcess Service Agent** resource from the iProcess Palette to the design panel.
2. From the JMS Connection field in the Configuration tab, select the JMS Connection resource that you created in step 5 in Overview of the Invocation Process From BusinessWorks on page 28.
3. From the JMS Destination Queue field, enter the name of the JMS destination queue that you created in the TIBCO Enterprise Message Service in step 1 in Overview of the Invocation Process From BusinessWorks on page 28.

The iProcess Service Agent does not support JMS topics, so you must enter a JMS queue name here.

4. Click **Select Processes**. The Select Processes for iProcess Service Agent dialog is displayed. Do the following:
   a. Select the BusinessWorks process definitions that you want to use for this iProcess Service Agent resource.

You can only select a BusinessWorks subprocess here. You can only use BusinessWorks sub-processes that are configured to use external schema for input and output. For more information:

— See step 2 in Overview of the Invocation Process From BusinessWorks on page 28.

— See "Subprocesses" in *TIBCO ActiveMatrix BusinessWorks Design Guide* for more information about subprocesses.

b. If you are using an interface file for your introspection method, check the **Generate Interface file** checkbox. Type in the path where you want to save the interface file directly or click  to browse to the location. The interface file contains the connection information and BusinessWorks process definitions that the iProcess Engine needs to integrate with BusinessWorks. You can save the interface file anywhere you like as long as the iProcess Engine and iProcess Workspace (Windows) can access it.

c. Click **OK** to exit the Select Processes for iProcess Service Agent dialog. The Processes tab displays the BusinessWorks process definitions you have selected for the iProcess Service Agent resource.

Configuring the iProcess Engine Components

This section describes how to configure the iProcess Engine components. It describes:

- Defining an iProcess BusinessWorks Step
- Editing an iProcess BusinessWorks Step

Defining an iProcess BusinessWorks Step

To create an iProcess BusinessWorks step in your procedure, you must perform the following steps:

1. Define Basic iProcess BusinessWorks Step Information (step name, description, type, deadline and audit trail information.)
2. Define the Call to BusinessWorks. Use the BusinessWorks Step Definition wizard to define the necessary information required for the invocation of the BusinessWorks process definition.

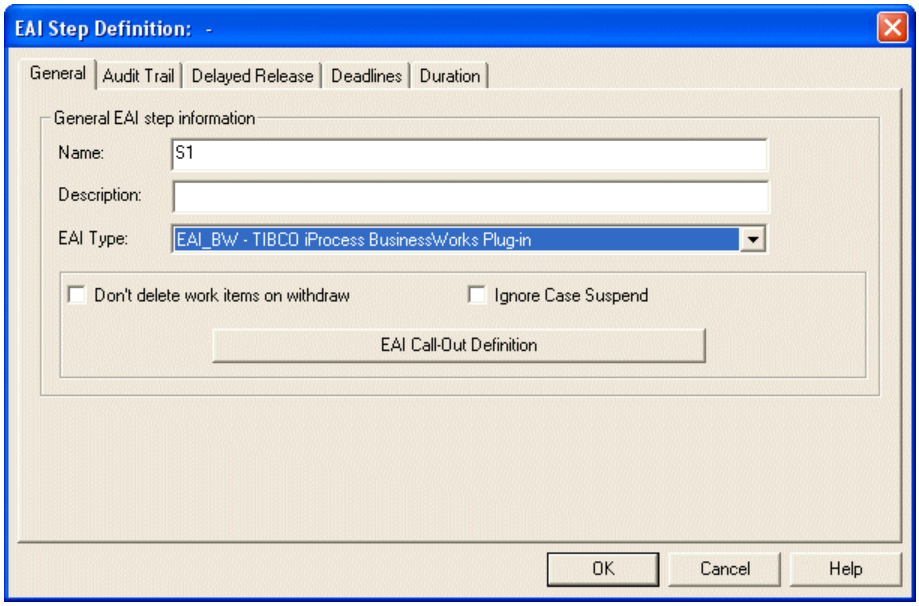
When you have completed these steps, the step type is defined as an iProcess BusinessWorks step and the following icon is displayed:

Define Basic iProcess BusinessWorks Step Information

The first stage in defining your iProcess BusinessWorks step is to define the basic iProcess BusinessWorks step information, for example, step name, description, type, deadline and audit trail information. To define the basic iProcess BusinessWorks step information, do the following:

1. Start TIBCO iProcess Modeler, click the EAI Step tool  and click in the window where you want to place the EAI Step.
2. In the EAI Step Definition dialog, enter the name and description for the step.

3. In the EAI Type drop-down list, select **EAI_BW - TIBCO iProcess BusinessWorks plug-in**.



   You must enter this when you first create the step; it cannot be changed later. The list box displays EAI step types that have been installed as client EAI plug-ins.

4. If the iProcess BusinessWorks step does not appear in the drop-down list, you need to make sure the plug-in is located in the following path:

   swclient\eai_plugins\EAI_BW

   where *swclient* is the location of your TIBCO iProcess Workspace (Windows). See *TIBCO iProcess Workspace Plug-ins Installation* for more information about installing the iProcess Client Plug-in for ActiveMatrix BusinessWorks.

5. (*Optional*) Select the **Don't delete work items on withdraw** option. If this option is selected, and the deadline on an outstanding step expires or it is withdrawn as an action (release or deadline expire) of another step:

   — the deadline actions are processed.

   — the step remains outstanding (the step remains in the work queue or the sub-procedure case is not purged).

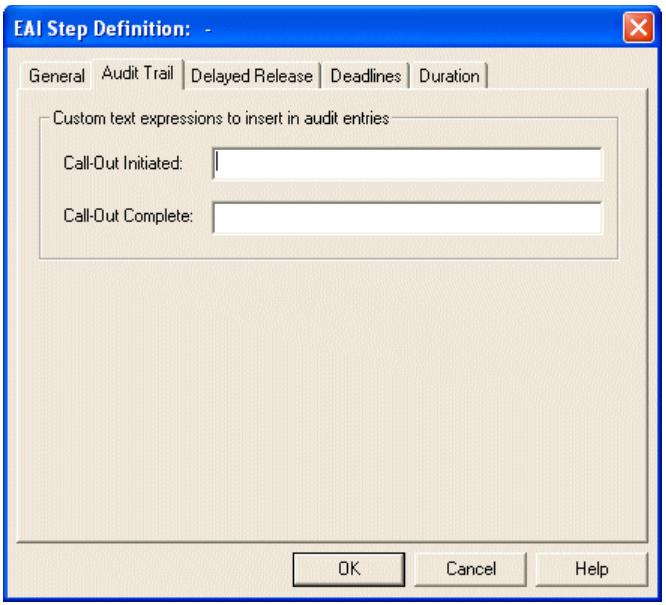
When the step is released (or the sub-procedure case completes) the normal release actions are not processed but the case field data associated with the release step (for example, the field values set in a normal step whilst in a work queue or the output parameters of a sub-case) is applied to the main case data.

6. (*Optional*) Check the **Ignore Case Suspend** checkbox if you want the step to still be processed as normal while a case is suspended.

   If **Ignore Case Suspend** is not checked (the default option), the step is *not processed* while the case is suspended.

7. The **EAI Call-Out Definition** button invokes the iProcess BusinessWorks step wizard. See Define the Call to BusinessWorks on page 37 for more information.

8. Click the **Audit Trail** tab to define custom audit trail entry expressions. This enables you to define text expressions that are evaluated when the step is processed and inserted as the %USER value in the audit trail entries.



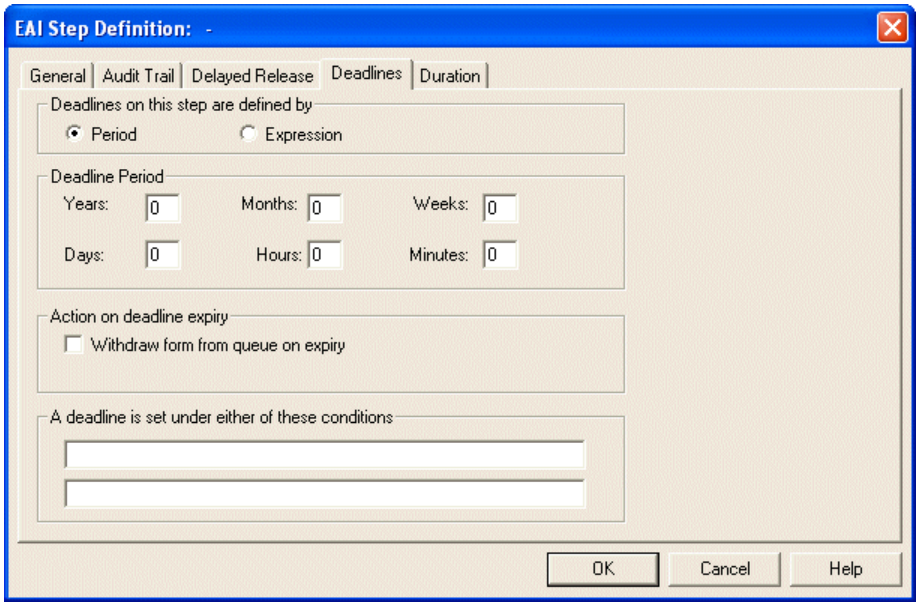
   You must enter a value in both fields or leave them both empty:

   — In the Call-out Initiated field, enter a valid text expression that will replace the %USER value in the audit trail when the call out is initiated.

   — In the Call-out Complete field, enter a valid text expression that will replace the %USER value in the audit trail when the call out is complete.

The Delayed Release tab is not used. Specify delayed release using the Delayed Release option in the BusinessWorks Step Definition dialog (see step 14).

9. Click the **Deadlines** tab if you want to enter deadline information for this step. See "Using Deadlines" in *TIBCO iProcess Modeler Basic Design* for an explanation of defining deadlines.



You can enter a deadline either as a period (defined in years, months, weeks, days, hours or minutes) or as an expression. If you select Expression you can:

— Specify a deadline by defining a date expression. For example, the following expression:

ap_date + @0/2/0/0@

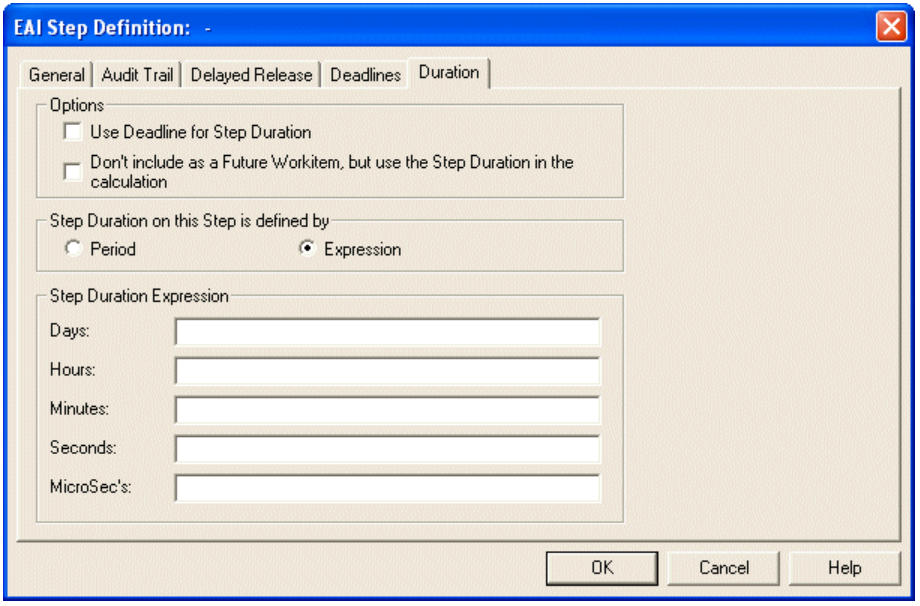
is a date expression that is the date of application plus two weeks using the formula of @days/weeks/months/years@. The expression is evaluated at the time the step is sent out. For more information on expressions, see *TIBCO iProcess Expressions and Functions Reference Guide.*

— Specify a deadline by defining a time expression. For more information on expressions, see *TIBCO iProcess Expressions and Functions Reference Guide.*

- Do not select the **Withdraw form from queue on expiry** check box. Withdraw is not supported for an EAI BusinessWorks step.

If you select **A deadline set under either of these conditions**, you can enter any deadline conditions required. You can set a deadline to only take effect if a certain condition is true. For example, a deadline could be set if the anticipated completion date for the property purchase is less than 4 weeks after the application date. This condition is evaluated when the step is sent out.

10. Click the **Duration** tab if you want to enter the step duration if you are using case prediction. See "Using Case Prediction to Forecast Outstanding Work items" in *TIBCO iProcess Modeler Advanced Design* for an explanation of using case prediction.



— Select **Use Deadline for Step Duration** if you want to set the step duration to be the same as the deadline. This means you do not have to manually set the duration to be the same as the deadline.

— Select **Don't include as a future WorkItem, but use the Step Duration in the calculation** if you want to exclude the step from prediction. For example, you may want to exclude broker and EAI steps because these steps are processed automatically. This means that although these steps are taken into account as part of the case prediction, they do not appear in the outstanding step list.

— Specify whether the duration should be defined as a **Period** or an **Expression**, and then enter the period or expression in the remaining fields. For more information on expressions, see *TIBCO iProcess Expressions and Functions Reference Guide.*

11. Click the **General** tab, then click **EAI Call-Out Definition**. The **BusinessWorks Step Definition** wizard is displayed.

Define the Call to BusinessWorks

The **BusinessWorks Step Definition** wizard enables you to:

- define the calls to BusinessWorks. There are two ways you can call BusinessWorks:
  - **Import Process Definition**. To use this method, you must have an interface file that you have already generated from an iProcess Service Agent resource that provides the JMS transport information. This enables you to define your iProcess BusinessWorks step without TIBCO ActiveMatrix BusinessWorks running. See Creating an iProcess Service Agent Resource on page 30 for more information about creating the interface file.

    The interface file does not contain authorization information for the JMS connection. Therefore, if your TIBCO ActiveMatrix BusinessWorks installation uses SSL, when you import the process definition you must enter the authorization data manually.

  - **Live Link to BusinessWorks**. To use this method, you do not need an interface file but your iProcess Workspace (Windows) must be able to connect directly to the iProcess Service Agent. This means that the iProcess Service Agent must be running if you want to use this introspection method. You must also have configured your JMS Provider transport information. See Managing Your JMS Provider on page 51 for more information.

  See Understanding the Introspection Methods on page 26 for more information.

- (*Optional*) specify the case data that is passed to BusinessWorks and the data that is passed back to the iProcess Engine case.

To define the call to BusinessWorks:

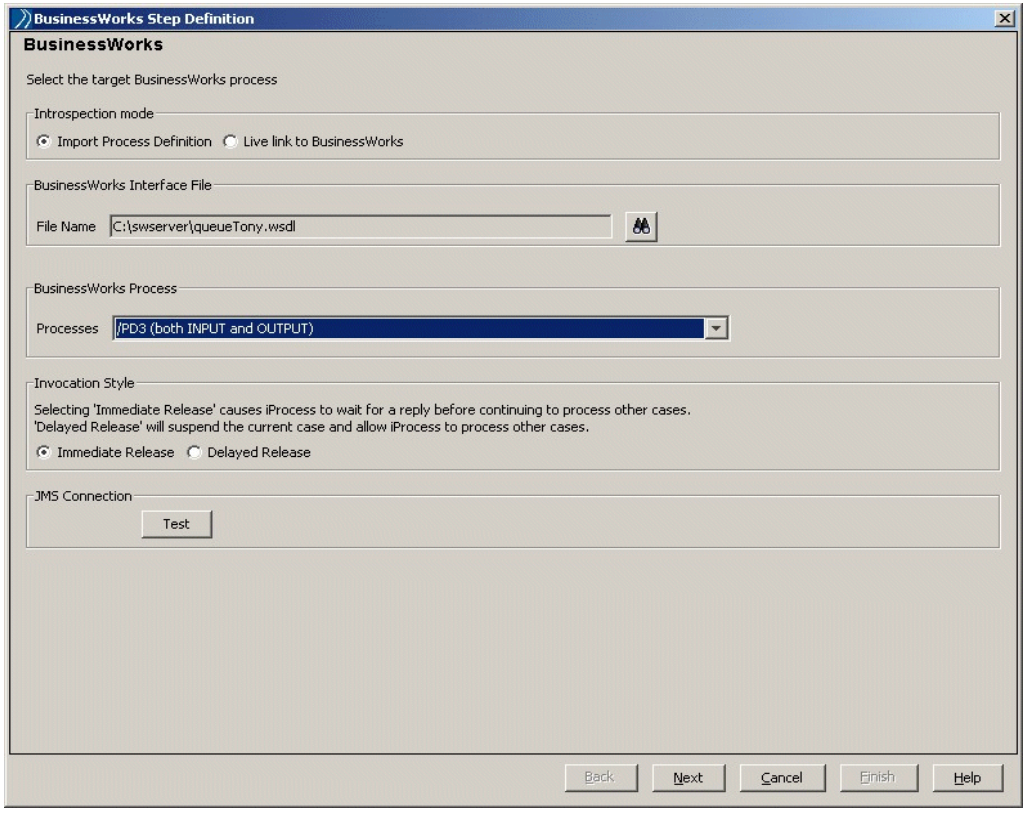
12. The **BusinessWorks Step Definition** dialog is displayed. In the **Introspection Mode** area, select the introspection method you want to use. See Understanding the Introspection Methods on page 26 for more information about introspection methods.

    Select either:

    - **Import Process Definition**. Select this if you wish to use the interface file introspection method. If you select this method then, from the **BusinessWorks Interface File** box, click  to browse to the location of

your interface file. The interface file contains the connection information and BusinessWorks process definitions that the iProcess Engine needs to communicate with BusinessWorks. It is created using the iProcess Service Agent resource in BusinessWorks. See Creating an iProcess Service Agent Resource on page 30 for information on how to create a BusinessWorks interface file.

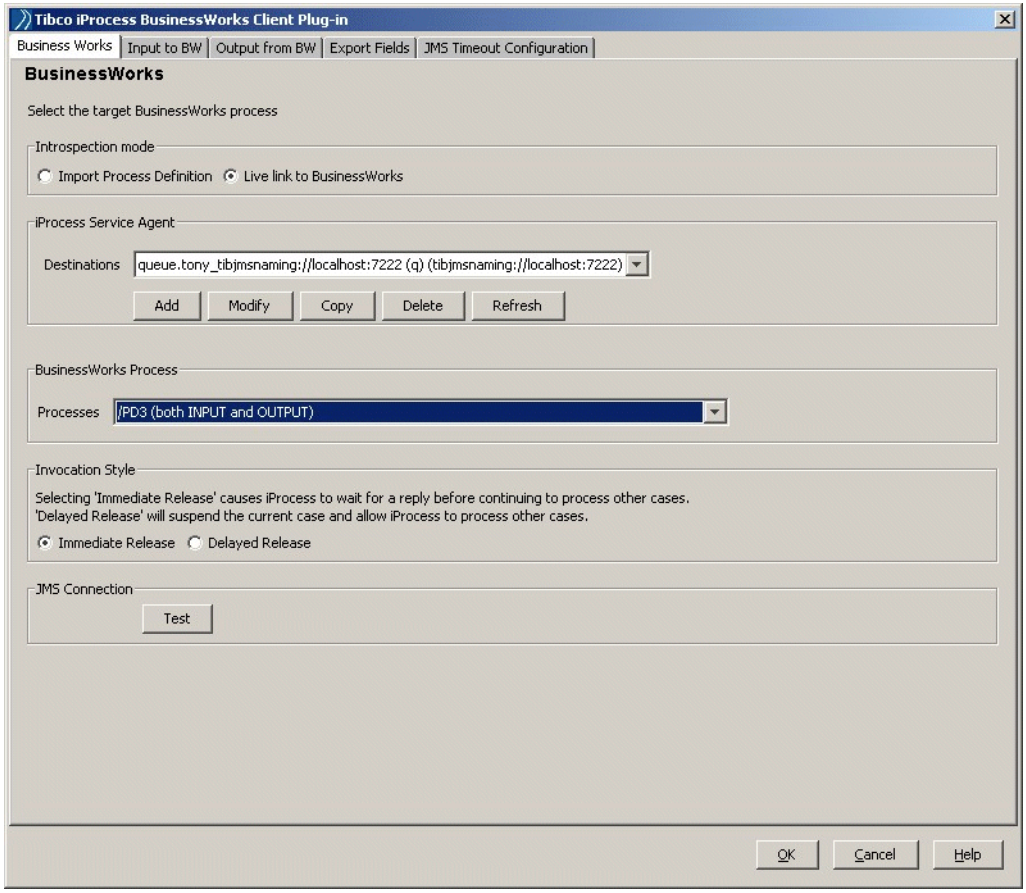
If the interface file contains a JMS queue and/or JMS provider that has not



been configured in the iProcess BusinessWorks step, then the BusinessWorks Step Definition wizard displays the Add a new JMS Provider dialog so that you can configure the new JMS queue and/or JMS provider detailed in the interface file. See Adding a New JMS Provider on page 60 for details of this dialog.

Click the **Test** button in the BusinessWorks Step Definition dialog. This will test the connection to the JMS provider.

— **Live link to BusinessWorks**. If you selected this method then from the JMS Destinations box, select the JMS queue you want to send JMS messages to.



Depending on your requirements you can add new JMS queues, or modify, copy and delete existing JMS queues by using the Add, Modify, Copy and Delete buttons from the iProcess Service Agent area of the BusinessWorks

Step Definition dialog. See Administering JMS Providers and Destinations on page 54 for more information.

You can also add new JMS providers or modify, copy and delete existing JMS providers. See Managing JMS Providers on page 59 for more information.

If the Destination information in the iProcess Service Agent area has changed, you must now click **Refresh** to display an updated list of processes in the Process field. Until you do this neither the process list nor the Test button is available.

Click the **Test** button in the JMS Connection box of the BusinessWorks Step Definition dialog. This will test the connection to the JMS provider. If there is any problem, this will help you determine whether the fault is with the JMS connection or with BusinessWorks.

13. From the Processes drop-down list, select the BusinessWorks process that you want to invoke. See Invoking iProcess Engine from BusinessWorks on page 17 for more information about defining BusinessWorks processes.
14. Specify the Invocation Style. This determines how the iProcess Engine should handle the BusinessWorks step. It can be one of:
    - **Immediate Release** The iProcess Engine will wait for a reply before continuing to process other cases. This is the default.
    - **Delayed Release** The iProcess Engine does not wait for a reply and continues to process other cases. This means the BG process continues to work without being slowed down if the BusinessWorks system is busy. If an error occurs, an error code, error message, and BG action flag will be sent back to iProcess Engine and logged to the audit trace.

      If you select Delayed Release, the Manual field is also selected; automatic delayed release is not supported in this version.

      Existing BusinessWorks processes, developed with previous versions of the iProcess Connector for ActiveMatrix BusinessWorks, are assumed to be immediate release, since delayed release was not supported in previous versions of the iProcess BusinessWorks Connector. If you want the existing

BusinessWorks processes to use delayed release, these processes need to be modified

Note that:

— The **Delayed Release** option is disabled if the schema for the process has no input parameters. In that case, the Delayed Release ID could not be mapped to a suitable field (see Overview of the Invocation Process From BusinessWorks on page 28).

— If the schema has both input *and* output parameters, and you select **Delayed Release**, the Output tab is disabled. A warning message is displayed suggesting that you carry out the output mapping in BusinessWorks rather than in the iProcess Engine.

— If the step is subject to delayed release, the BusinessWorks process that is to be instantiated by the step must use the iProcess Complete Delayed Release activity to complete the delayed release. See iProcess Complete Delayed Release on page 111 for details of the activity.

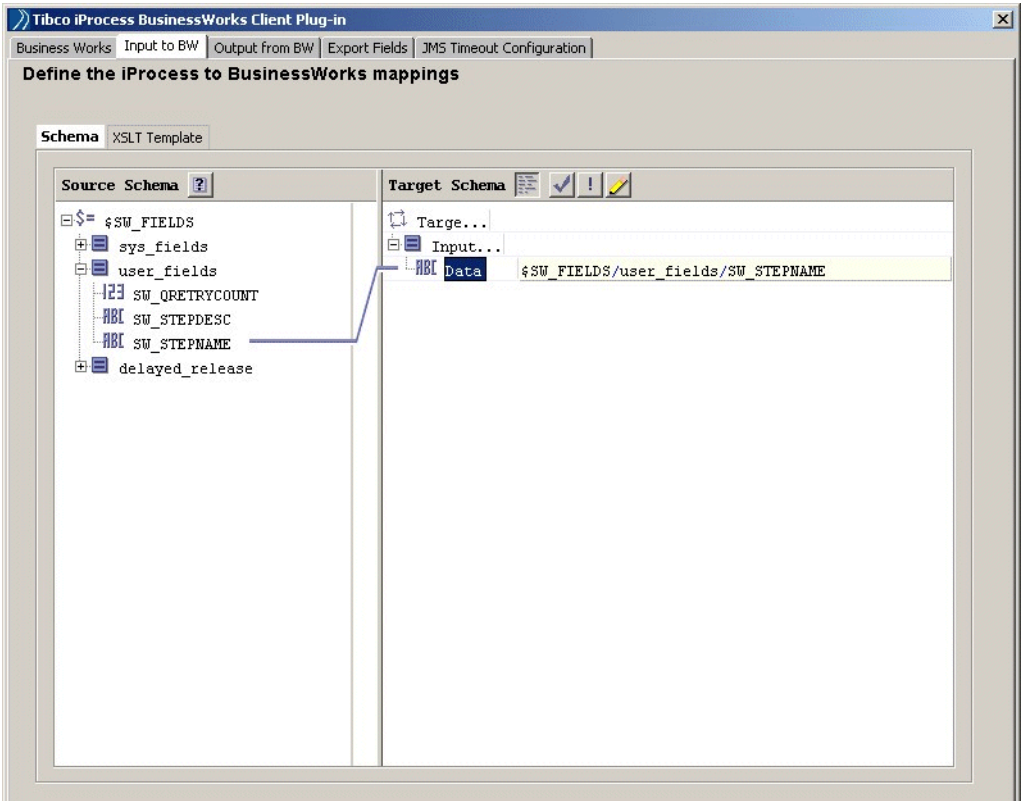
— The Delayed Release tab in the Edit Step Definition dialog is not used. Delayed Release is specified only by selecting the **Delayed Release** option in this dialog.

— If you try to purge a case that is subject to delayed release but has not yet been released, the purge may fail. Prevent this by setting the `CHECK_EAIWITHDRAW_ONPURGE` process attribute to **0**. See the section "Administering Process Attributes" in *TIBCO iProcess Engine Administrator's Guide* for details of this attribute.

15. Click **Next** to continue. The Define iProcess to BusinessWorks Mappings dialog is displayed.
16. (*Optional*) The Define iProcess to BusinessWorks Mappings dialog enables you to define the input mappings so that data is sent from the iProcess Engine procedure to the BusinessWorks process definition.

    Click the **Schema** tab to use the XML Mapper to define the field mappings between the iProcess Engine procedure and the BusinessWorks process definition. This means that you can specify which BusinessWorks fields are populated with data from the iProcess Engine fields at runtime. To map fields,

simply drag the iProcess Engine field to the BusinessWorks field to create the mapping, as shown below.



Note that:

— The elements in iProcess Engine array fields start at 0. However, XML arrays start at 1. If you map an iProcess Engine array to a BusinessWorks array, the 0 array field element from the iProcess Engine array field is automatically mapped to the 1 array field element in the BusinessWorks field, the iProcess 1 field to the BusinessWorks 2 field, and so on. Similarly, if you map an individual iProcess array field to a BusinessWorks field, the iProcess 1 field will map automatically to the BusinessWorks 2 field, and so on. The only exception is that the XML Mapper does not allow you to enter an index of 0, so you cannot map the 0 field in an iProcess array directly to a BusinessWorks field.

— If you want to pass iProcess fields that contain null values to BusinessWorks fields, your BusinessWorks schema must also be defined to

allow a null value. If you do not, the iProcess procedure and BusinessWorks process definition will fail.

— Some of the fields in the target schema are required. If you leave them empty, the field names will turn red. You can click  to check which field values are invalid.

The BG process might crash if the process contains invalid field values.

— If the BusinessWorks process definition you want to map iProcess Engine data to has an invalid schema, then blank mapping screens are displayed or no mapping screen is displayed at all. In this situation, you need to go back to your BusinessWorks process definition and check the schema definition.

— Although the XML Mapper used in the iProcess Client Plug-in for ActiveMatrix BusinessWorks is the same as the XML Mapper used in TIBCO ActiveMatrix BusinessWorks, some XPath functions are not supported. See Unsupported XPath Functions on page 178 for more information.

—For more information about the XML Mapper see:

—"Mapping and Transforming Data" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for a complete explanation of the XML Mapper.

—"Buttons, Menus and Icons**"** in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for an explanation of toolbar buttons, popup menus, and icons.

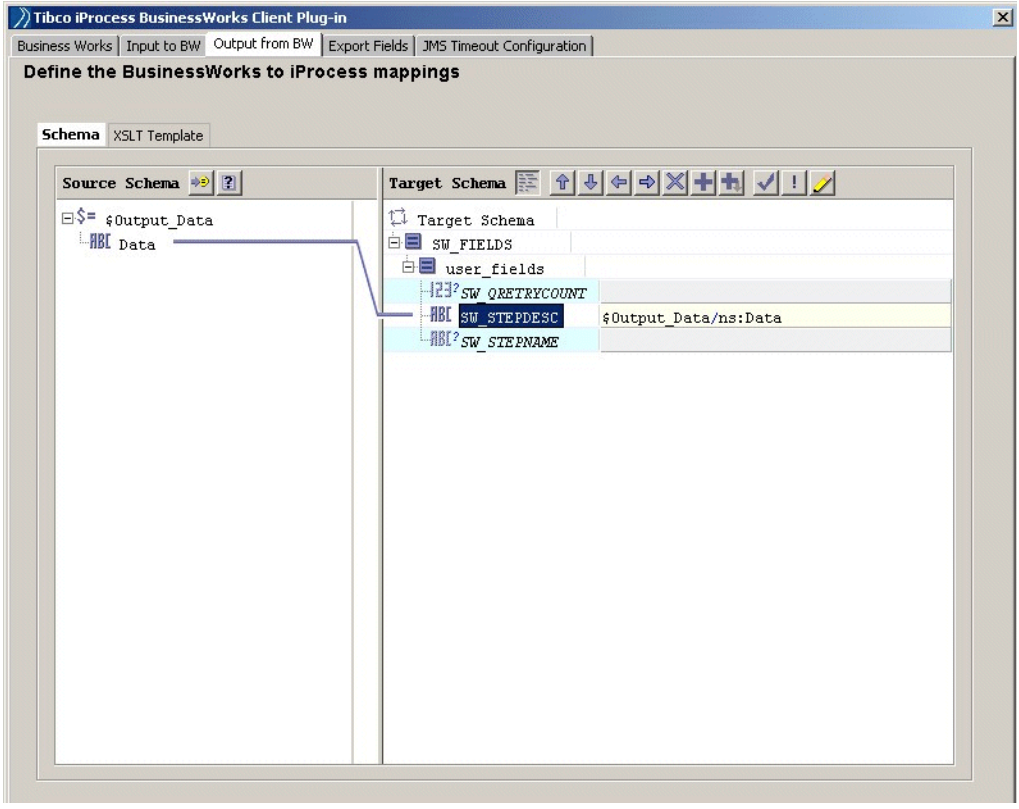
—"Icons for Schema Element Datatypes**"** in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for an explanation of the schema elements and their associated icons.

Click the **XSLT Template** tab to view the XSLT you have created as a result of the field mappings you have set in the Schema tab.

17. Click **Next** to continue. If the BusinessWorks process definition has any outputs defined, the Define the Business Works to iProcess Mappings dialog is displayed.

18. (*Optional*) The Define the BusinessWorks to iProcess Mappings dialog enables you to define the output mappings so that data is returned from BusinessWorks to the iProcess Engine case. Click the **Schema** tab to use the XML Mapper to define the field mappings between the BusinessWorks process definition and the iProcess Engine procedure. This means that you can specify which iProcess Engine fields are populated with the return data from

the BusinessWorks fields at runtime. To map fields, simply drag the BusinessWorks field to the iProcess Engine field to create the mapping, as shown below.



Note that:

— The elements in iProcess Engine array fields start at 0. However, XML arrays start at 1. If you map an iProcess Engine array to a BusinessWorks array, the 0 array field element from the iProcess Engine array field is automatically mapped to the 1array field element in the BusinessWorks field, the iProcess 1 field to the BusinessWorks 2 field, and so on. Similarly, if you map an individual iProcess array field to a BusinessWorks field, the the iProcess 1 field will map automatically to the BusinessWorks 2 field, and so on. The only exception is that the XML Mapper does not allow you to enter an index of 0, so you cannot map the 0 field in an iProcess array directly to a BusinessWorks field.

— If you attempt to write to any read-only SW_*name* iProcess fields, an error will result. These fields are listed in the section "Using Delimiters and Key Words" in *TIBCO iProcess™ Modeler - Basic Design*.

— Some of the fields in the target schema are required. If you leave them empty, the field names will turn red. You can click  to check which field values are invalid.

The BG process might crash if the process contains invalid field values.

— If the BusinessWorks process definition you want to map iProcess Engine data to has an invalid schema, then blank mapping screens are displayed or no mapping screen is displayed at all. In this situation, you need to go back to your BusinessWorks process definition and check the schema definition.

— Although the XML Mapper used in the iProcess Client Plug-in for ActiveMatrix BusinessWorks is the same as the XML Mapper used in TIBCO ActiveMatrix BusinessWorks, some XPath functions are not

supported. See Unsupported XPath Functions on page 178 for more information.

—For more information about the XML Mapper see:

—"Mapping and Transforming Data" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for a complete explanation of the XML Mapper.

—"Buttons, Menus and Icons" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for an explanation of toolbar buttons, popup menus, and icons.

—"Icons for Schema Element Datatypes" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for an explanation of the schema elements and their associated icons.

Click the **XSLT Template** tab to view the XSLT you have created as a result of the field mappings you have set in the Schema tab.

19. Click **Next**. The Export iProcess Fields dialog is displayed.
20. The Export iProcess Fields dialog indicates which fields should be exported at runtime. The list may contain pre-selected fields, depending on the mappings that you created in the previous dialogs.

Any mappings of iProcess fields involving XPath formulas that contain arithmetic expressions or functions can result in the list of pre-selected fields in the Export iProcess Fields dialog being incomplete. You should therefore carefully check the list against your mappings, and manually check the **Input to BW** checkbox for any missing fields that you need to export.

If any iProcess field contains a colon in its name, that colon will be converted to a hyphen for export.

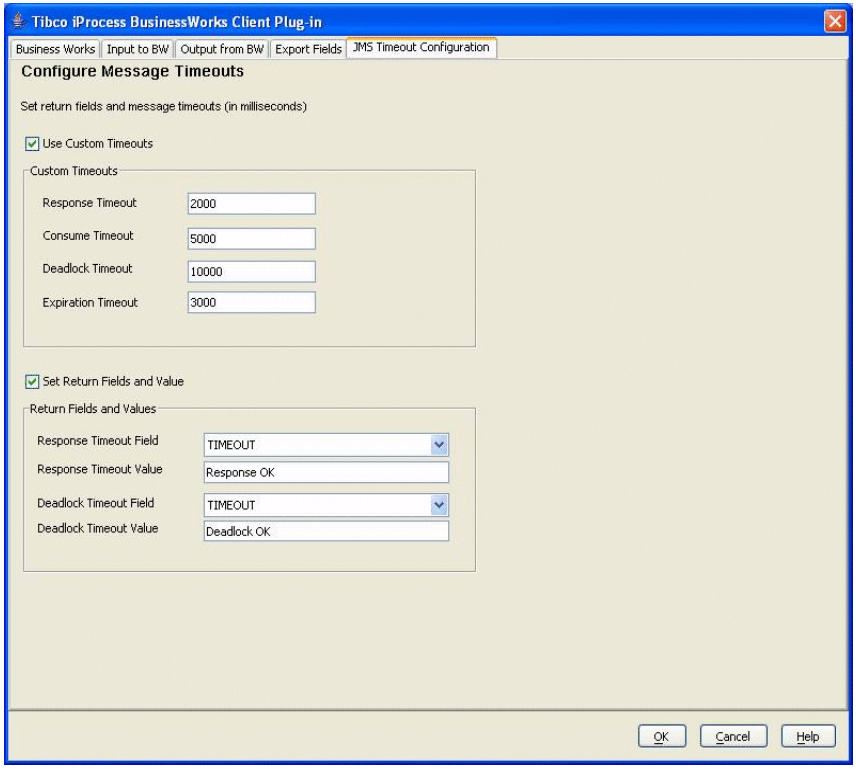
You must verify that all iProcess Engine fields involved in mappings are appropriately selected as either **Input** or **Output**.

— To select a field, check the checkbox.

— To de-select a field, check the checkbox again.

— Click **Reset** to de-select all manually selected fields. Fields involved in defined mappings remain selected.

21. Click the **JMS Timeout Configuration** tab to set the timeout values and the desired behavior for the step, as described in Timeout Handling in TIBCO iProcess Connector for ActiveMatrix BusinessWorks on page 13.



— Check the **Use Custom Timeout** checkbox to enable the Timeout fields so that you can enter custom timeout values for this step.

— In the Response Timeout field, enter the length of the response timeout (in milliseconds).

— In the Consume Timeout field, enter the length of the consume timeout (in milliseconds).

— In the Deadlock Timeout field, enter the length of the deadlock timeout (in milliseconds).

— In the Expiration Timeout field, enter the time (in milliseconds) that the JMS server should wait before deleting the JMS message, in the event the message fails to be consumed. You are recommended to set this to at least

one second (that is, a value of **1000** milliseconds) more than the Response Timeout value.

Note that specifying 0 for any of the timeout values means an indefinite wait (effectively no timeout), not an immediate timeout.

— Check the **Set Return Field and Values** checkbox to enable the Return Fields and Values fields so that you can specify behavior for this step in the case of a timeout period being reached.

— In the Response Timeout Field drop-down list, select the iProcess field that should be populated when a response is received. You can only select fields of type Text or Numeric. In the Response Timeout Value field, specify the value to which the selected field should be set.

— In the Deadlock Timeout Field drop-down list, select the iProcess field that should be populated if a failed JMS message could not be re-consumed but the deadlock timeout has reported success. You can only select fields of type Text or Numeric. In the Deadlock Timeout Value field, specify the value to which the selected field should be set.

22. Click **Finish** to save your changes and exit the wizard.

Editing an iProcess BusinessWorks Step

To edit an iProcess BusinessWorks step, do the following:

1. Double-click the iProcess BusinessWorks step in your procedure.
2. The EAI Step Definition dialog is displayed.
3. Click **EAI Call-Out Definition**. The BusinessWorks Step Definition dialog is displayed. The BusinessWorks Step Definition dialog is in the form of a tabbed interface that consists of the same screens as the BusinessWorks Step Definition Wizard:

   — For information on the BusinessWorks tab, see step 12.

   — For information on the Define iProcess to BusinessWorks Mappings tab, see step 4.

If the step data contains mappings which involve iProcess Engine fields that have been deleted or modified, then the XML Mapper displays errors. You must resolve these errors before saving the step.

— For information on the Define the BusinessWorks to iProcess Mappings tab, see step 6.

— For information on the Export iProcess Fields tab, see step 20.

4. Click the tabs to modify any of the settings as required.
5. Click **OK** to save your new settings.

Chapter 5 Managing Your JMS Provider

This chapter describes how to administer the JMS provider and JMS destinations in iProcess Engine.

Topics

The JMS Provider in TIBCO iProcess Connector for ActiveMatrix BusinessWorks

This version of TIBCO iProcess Connector for ActiveMatrix BusinessWorks supports only TIBCO EMS (Enterprise Message Service) as a JMS provider.

All TIBCO iProcess Engine customers are provided with EMS licenses enabling them to connect iProcess to other TIBCO software. However, TIBCO EMS must be purchased separately if you want to use it to communicate with non-TIBCO products.

To use a JMS destination in communications between iProcess Engine and BusinessWorks, you need to do the following:

1. Add the JMS provider in TIBCO iProcess Connector for ActiveMatrix BusinessWorks.
2. Add a JMS endpoint, using the added JMS provider, in TIBCO iProcess Connector for ActiveMatrix BusinessWorks. See Managing JMS Destinations on page 55.

TIBCO EMS and SSL

Communications between TIBCO iProcess Connector for ActiveMatrix BusinessWorks and EMS can be set up to use secure SSL authentication, including Certificate Based Mutual Authentication (CBMA) with User Name Certificate Extraction. Secure connections require you to specify more SSL information than ordinary connections. You can continue to use an existing non-SSL EMS configuration if you wish.

You can set up SSL authentication using the **JMS Administration Utility**. See Administering JMS Providers and Destinations on page 54 for information on this utility.

Setting Up an IP Address and a Port Number

You need to configure the IP address and the port number before using JMS to communicate between iProcess Engine and BusinessWorks.

To set up the IP address and the port number, perform the following steps:

1. Open the `jmsdb.properties` file, which is located in the *SWDIR*`\jmsadmin` directory.

2. Set the IP address that is used for communication to the `jms_host` variable.
   - If an IPv4 address is used, then set the IP address of iProcess Engine or the loopback IP address to the `jms_host` variable. For example, set the variable as the loopback address: `jms_host=127.0.0.1`.
   - If an IPv6 (Internet Protocol version 6) address is used, then set the IP address to `jms_host=::1`.
3. Set a port number that is used for communication to the `jmx_port` variable.

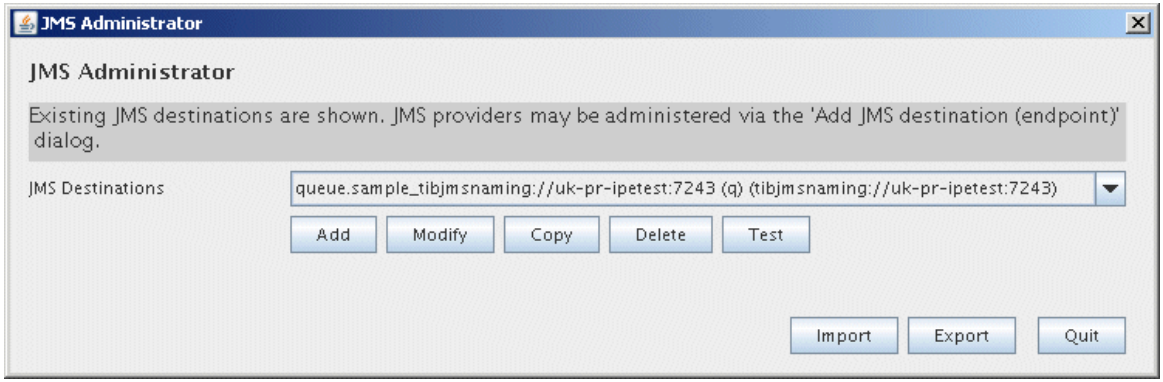
Make sure the port number is available.

Administering JMS Providers and Destinations

There are two ways that you can add or amend JMS providers and queues in the iProcess Engine database:

- Using the **JMS Administration Utility**. To access the **JMS Administration Utility**:
  - From UNIX, navigate to the *$SWDIR*`/jmsadmin` directory and enter the following command:

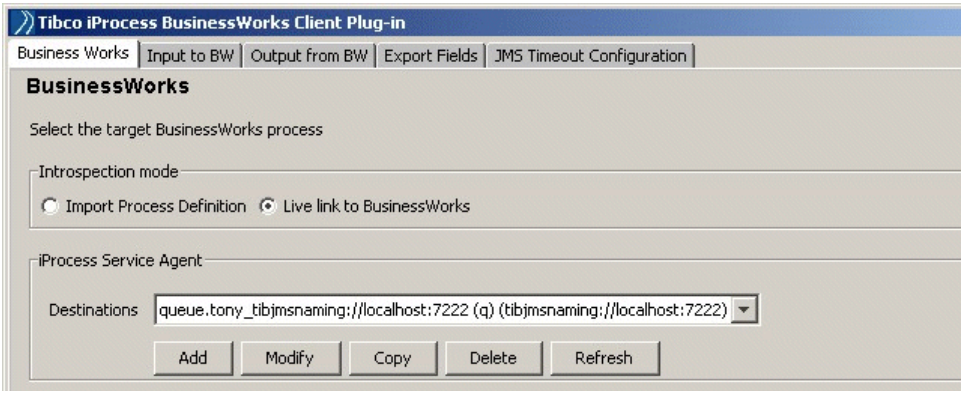
    `jmsadmin.sh`
  - From Windows, click **Start** > **TIBCO iProcess Server (Windows)** > **JMS Administration Utility**.



You can choose the appearance of the JMS Administrator dialog, so that it is compatible with other dialogs used on your system. Not all appearances are available on all platforms. To specify the appearance of the **JMS Administrator**, use the `look_and_feel` property in the `jmsdb.properties` file. This gives you the following options:

- Metal (this is the default value)
- Windows (only available on Windows)
- Windows Classic (only available on Windows)
- CDE/Motif

- Using the BusinessWorks Step Definition dialog. You can use the **Add**, **Modify**, **Copy** or **Delete** buttons from the iProcess Service Agent area of the BusinessWorks Step Definition dialog when you are defining an iProcess BusinessWorks step in an iProcess Engine procedure.



Whether you choose to configure the JMS provider information using the JMS Administration Tool or from the BusinessWorks Step Definition wizard, the dialogs are the same. The following section describes how to configure these dialogs in more detail. See Managing JMS Destinations on page 55 and Managing JMS Providers on page 59 for more information.

You can also export and import your JMS provider configuration information from one iProcess Engine database to another using the JMS Administration Tool. This is useful, for example, if you want to migrate your iProcess Engine environment from a Development environment to a Production environment. See Importing and Exporting JMS Configuration Information from the iProcess Engine Database on page 67.

Managing JMS Destinations

JMS destinations (also referred to as *endpoints*) must be queues, as JMS topics are not supported. Depending on your requirements you can add new JMS queues, or copy, modify, and delete existing JMS queues. This section describes:

- Adding a New JMS Queue
- Copying an Existing JMS Queue
- Modifying an Existing JMS Queue
- Deleting an Existing JMS Queue

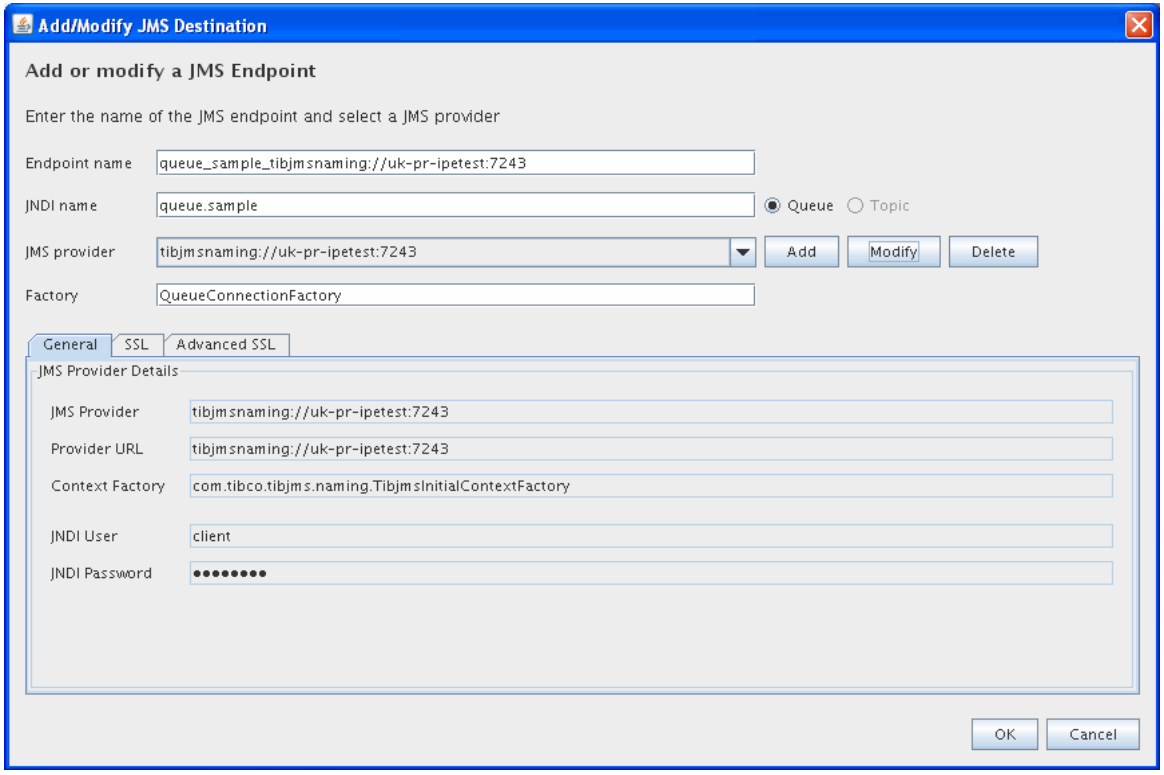
These procedures assume that you have defined the JMS provider associated with the destinations. If you have not, see Managing JMS Providers on page 59.

Adding a New JMS Queue

To add a JMS queue, do the following:

1. Click **Add** from either:
   - the iProcess Service Agent area of the BusinessWorks Step Definition dialog, or
   - the JMS Administration Tool.

   The Add/Modify JMS Destination dialog is displayed.



2. Enter the following information in the dialog:

Table 3 The General tab in the Add/Modify JMS Destination Dialog

Field	Description
Endpoint Name	A unique ID that you want to associate with the JMS provider.
JNDI Name	Select the JNDI name for this destination. **Note**: You must also manually create this JNDI object in your JMS server. If you do not, the procedure fails at runtime.
JMS Provider	Select the JMS provider associated with this destination. If no JMS provider has yet been defined, you need to define one before you can proceed further with creating a JMS destination. See Managing JMS Providers on page 59 for details of creating a JMS provider. **Note**: The Add, Modify and Delete buttons on the upper pane of this dialog affect the JMS Provider associated with the current endpoint, not the endpoint itself. You should bear in mind that a JMS Provider will typically provide more than one JMS endpoint, so modifying or deleting a JMS Provider here may affect several other endpoints as well as the selected one. Deleting a JMS Provider will delete all other endpoints with which that Provider is associated.
Factory	The factory associated with this destination. This defaults to `QueueConnectionFactory`, but if your JMS Provider is configured to use a different factory name you can amend this field to the correct value. The factory must have been made available via the JNDI lookup interface using the EMS Administration Tool. See *TIBCO Enterprise Message Service™ Application Integration Guid*e for details of this utility.

If you are using SSL authentication to provide a secure link with TIBCO EMS, the SSL information is displayed in the **SSL** and **Advanced SSL** tabs, in a read-only format. To modify any SSL settings, you must change them for the JMS provider. See Managing JMS Providers on page 59 for details of modifying SSL Authentication settings.

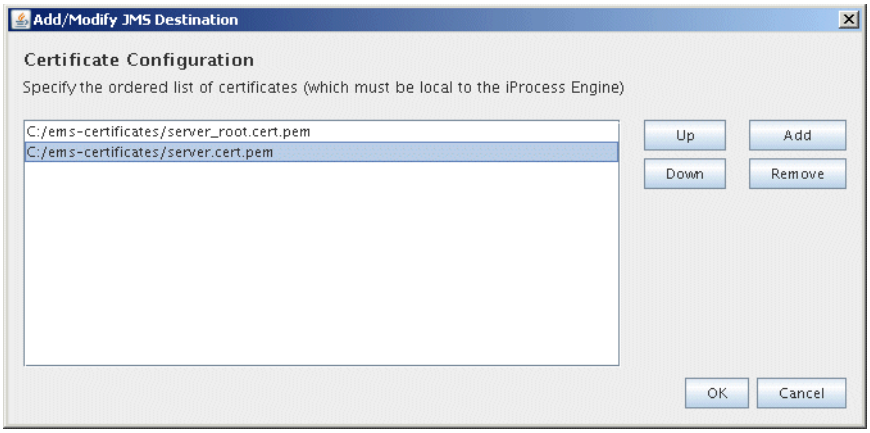
Choosing Certificates

In the Trusted Certificates and Issuer Certificates fields, you must enter a list of certificate files listed in the order in which the client should read them.

To choose a list of certificates:

1. Click the **Edit** button next to the appropriate field.

2. The Certificate Configuration dialog is displayed.



3. To add a certificate file to the list, click **Add**. A file chooser dialog is displayed. Browse for and select the certificate files that you need.
4. In the Certificate Configuration dialog, select a certificate and use the Up and Down buttons to move it within the list, until you have the certificates in the order that you want the client to read them.
5. When you have finished, click **OK**.

Copying an Existing JMS Queue

To copy an existing JMS queue, do the following:

1. From the JMS Destinations area in either:
   - the iProcess Service Agent box of the BusinessWorks Step Definition dialog
   - the JMS Administration Tool,

   select the JMS queue you want to copy.
2. Click **Copy**. The Add or Modify JMS Endpoint dialog is displayed.
3. Amend the information in the Add/Modify JMS Destination dialog, depending on your requirements. See Table 3 for more information.

Modifying an Existing JMS Queue

To modify an existing JMS queue, do the following:

1. From the JMS Destinations area in either:
   - the iProcess Service Agent box of the BusinessWorks Step Definition dialog
   - the JMS Administration Tool,

   select the JMS queue you want to modify.
2. Click **Modify**. The Add or Modify a JMS Destination dialog is displayed.
3. Amend the information in the Add or Modify a JMS Destination dialog, depending on your requirements. See Table 3 for more information.

Deleting an Existing JMS Queue

To delete a JMS queue, do the following:

1. From the JMS Destinations box in either:
   - the iProcess Service Agent area of the BusinessWorks Step Definition dialog
   - the JMS Administration Tool,

   select the JMS queue you want to delete.
2. Click **Delete**. The JMS queue is deleted. Note that the JMS Provider associated with the queue and any other queues associated with the same Provider are also deleted.

Managing JMS Providers

Depending on your requirements you can add new JMS providers, or copy, modify and delete existing JMS providers. This section describes:

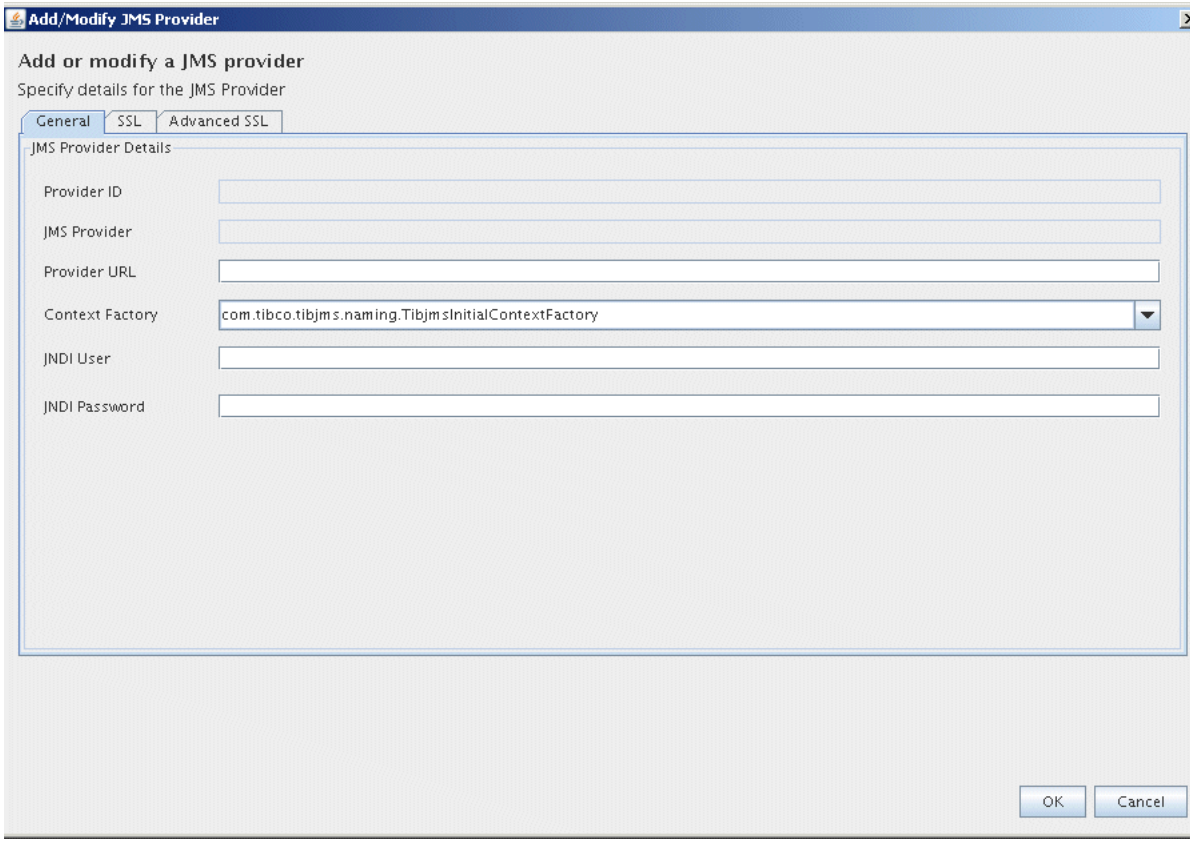
- Adding a New JMS Provider
- Modifying an Existing JMS Provider
- Deleting an Existing JMS Provider

Adding a New JMS Provider

To add TIBCO EMS as a new JMS provider, do the following:

1. Click **Add** from either:
   - — the iProcess Service Agent area of the BusinessWorks Step Definition dialog.
   - — the JMS Administration Tool.

   The Add/Modify JMS Destination dialog is displayed.
2. From next to the JMS Provider field, click **Add**. The Add or Modify a JMS Provider dialog is displayed.



3. Enter the following information in the dialog:

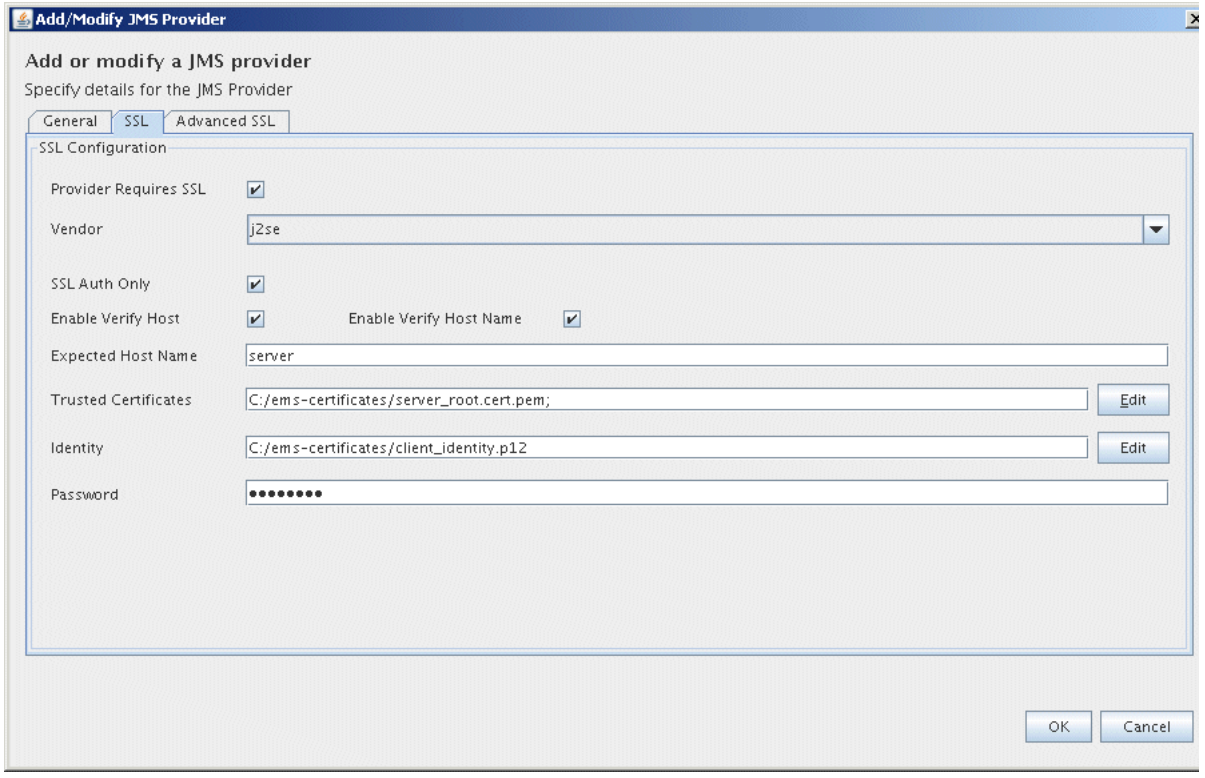
Table 4 The General tab in the Add or Modify a JMS Provider Dialog

Field	Description
Provider ID	A unique ID for the JMS provider. This is supplied automatically.
JMS Provider	The name of the JMS provider. This name does not need to be unique. BusinessWorks steps do not permit duplicate JMS provider names. However you can create a duplicate JMS provider here so that, for example, you can use two different sets of credentials for the same JMS endpoint. The second and subsequent duplicate provider names are automatically suffixed with a unique identifier. When you create a new provider, the product checks to ensure that the overall record (name and suffix taken together) is unique so that BusinessWorks will accept it.
Provider URL	The URL to use to connect to the JMS server.
Context Factory	The initial context factory class for accessing JNDI.
JNDI Username	(Optional) Username for logging into the JNDI server.
JNDI Password	(Optional) Password for logging into the JNDI server. This can be up to 1 KByte in length.

SSL Authentication

If you are using SSL authentication to provide a secure link with TIBCO EMS:

1. Select the **SSL** tab.

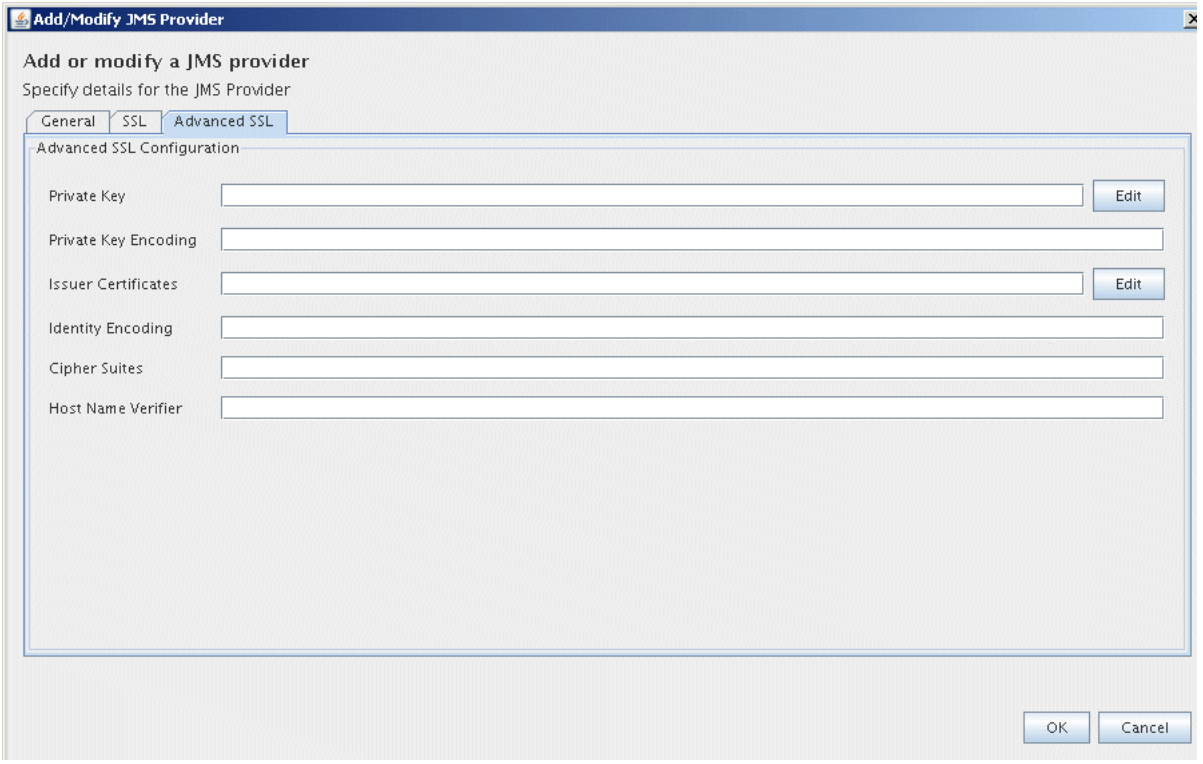

Add/Modify JMS Provider
Add or modify a JMS provider
Specify details for the JMS Provider
General
SSL
Advanced SSL
SSL Configuration
Provider Requires SSL
Vendor
j2se
SSL Auth Only
Enable Verify Host
Enable Verify Host Name
Expected Host Name
server
Trusted Certificates
C:/ems-certificates/server_root.cert.pem;
Edit
Identity
C:/ems-certificates/client_identity.p12
Edit
Password
OK
Cancel

2. Enter the following information in the dialog:

Table 5 The SSL Tab in the Add/Modify JMS Provider Dialog

Field	Description
Provider Requires SSL	Check this checkbox if the server only accepts SSL connections from clients that have digital certificates. If so, connections from clients without certificates are denied.
Vendor	Select the name of the provider of your SSL implementation. This must be one of the implementations supported by EMS: either `JSSE` or `Entrust`.
SSL Auth Only	Check this checkbox if you require SSL authentication only. Leave it unchecked if you require SSL both for authentication and for message content.
Enable Verify Host	Check this checkbox to verify that the server host certificate is authentic.
Enable Verify Host Name	Check this checkbox to verify the server host name against either the name specified in its certificate, or the name specified in the Expected Host Name field.
Expected Host Name	Enter the server host name. This value is used to override the host name given in the certificate, in case it is different to the real host name.
Trusted Certificates	Click the Edit button to select and sort a list of root certificates to be used for validating client/server certificates. See Modifying an Existing JMS Provider on page 65 for details of how to do this. Note that the certificate locations specified must be with respect to the iProcess server, and if the certificates are not present in those locations the JMS connection will fail.
Identity	Click the Edit button to browse for and select the filename of the server certificate.
Password	Type the password for the server SSL certificate.

3. Select the Advanced SSL tab.


Add/Modify JMS Provider
Add or modify a JMS provider
Specify details for the JMS Provider
General
SSL
Advanced SSL
Advanced SSL Configuration
Private Key
Edit
Private Key Encoding
Issuer Certificates
Edit
Identity Encoding
Cipher Suites
Host Name Verifier
OK
Cancel

4. Enter the following information in the dialog:

Table 6 The Advanced SSL Tab in the Add/Modify JMS Provider Dialog

Field	Description
Private Key	Click the **Edit** button to browse for and select the file holding the private key to the client's certificate. If this is included in the certificate referred to in the Identity field, you do not need to specify it here.
Private Key Encoding	The format of the private key. May be one of `PEM`, `DER`, or `PKCS#12`.
Issuer Certificates	Click the **Edit** button to select and sort a list of certificates that comprise the issuer's certificate chain for the server's certificate. The server reads the certificates in the chain in the order in which they are presented in this parameter. See Choosing Certificates on page 57 for details of how to do this. Note that the certificate locations specified must be with respect to the iProcess server, and if the certificates are not present in those locations the JMS connection will fail.
Identity Encoding	The file format of the certificate referred to in the Identity field.
Cipher Suites	A list of acceptable cipher suites for the encrypted communication channel. Type a list of names, separated by colons (:). You can use either the OpenSSL name for cipher suites, or the longer descriptive names. For information about available cipher suites and their names, see "Specifying Cipher Suites" in *TIBCO Enterprise Message Service™ User's Guide*.
Host Name Verifier	Enter the name of the custom class used for validating the server host name.

For more details on these values, see *TIBCO Enterprise Message Service™ User's Guide*.

Modifying an Existing JMS Provider

To modify an existing JMS provider, do the following:

1. From the JMS Destinations box in either:
   - the iProcess Service Agent area of the BusinessWorks Step Definition dialog
   - the JMS Administration Tool,

   select a (or the) JMS queue belonging to the JMS provider that you want to modify.

2. Click **Modify**. The Add or Modify JMS Destination dialog is displayed.
3. From the JMS Provider box, click **Modify**. The Add or Modify a JMS Provider dialog is displayed.
4. Amend the information in the Add or Modify a JMS Provider dialog, depending on your requirements. See Table 4 for more information.

Deleting an Existing JMS Provider

If you delete the JMS provider then all the JMS queues that are available for this JMS provider are also automatically deleted.

To delete a JMS provider, do the following:

1. From the JMS Destinations box in either:
   - the iProcess Service Agent area of the BusinessWorks Step Definition dialog
   - the JMS Administration Tool,

   select a (or the) JMS queue belonging to the JMS provider that you want to delete.
2. Click **Modify**. The Add or Modify a JMS Destination dialog is displayed. From the JMS Provider box, click **Delete**.
3. Click **OK** to delete the JMS provider or **Cancel** to return to the Add/Modify JMS Destination dialog.

Importing and Exporting JMS Configuration Information from the iProcess Engine Database

You can export and import your JMS provider configuration information from one iProcess Engine database to another using JMS Administration Tool. You may wish to do this:

- If you want to migrate your iProcess Engine environment, for example, from a development environment to a production environment
- As a way of backing up your data, for example when upgrading TIBCO iProcess Connector for ActiveMatrix BusinessWorks, or if for instance you want to perform some maintenance to your iProcess Engine database that may result in data being overwritten.

If you import new JMS provider information to your iProcess Engine database, then you are overwriting the existing JMS provider information that is stored there. If your JMS destination information does not match what is defined in your current iProcess BusinessWorks steps, it will cause those iProcess BusinessWorks steps to fail. You should either:

- Check that the JMS provider information you are importing matches the JMS provider information defined in your iProcess BusinessWorks steps, or
- Re-define your iProcess BusinessWorks steps to use the new JMS provider information you are importing.

The following section describes:

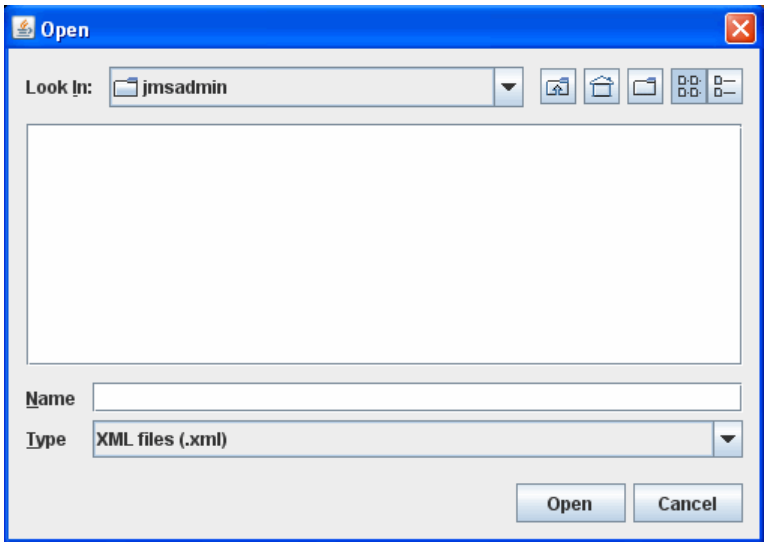
- Exporting JMS Provider Configuration Information
- Importing JMS Provider Configuration Information

Exporting JMS Provider Configuration Information

This section describes how to export your JMS provider configuration information using JMS Administration Tool:

1. Start JMS Administration Tool.

2. Click **Export**. The Open dialog is displayed.



3. In the Name field, type the name of the file where you want to save the JMS provider configuration information. The file can be saved in any location.
4. Click **Save**. The JMS provider configuration information is exported.

The **JNDI Password** (see Table 4, The General tab in the Add or Modify a JMS Provider Dialog, on page 61) is encrypted in the exported file. It will appear as a line similar to the following:

```
<jndi_password
encryptmode="1">sfhsdjfhskdjfhsjkdsdjkfh</jndi_password>
```

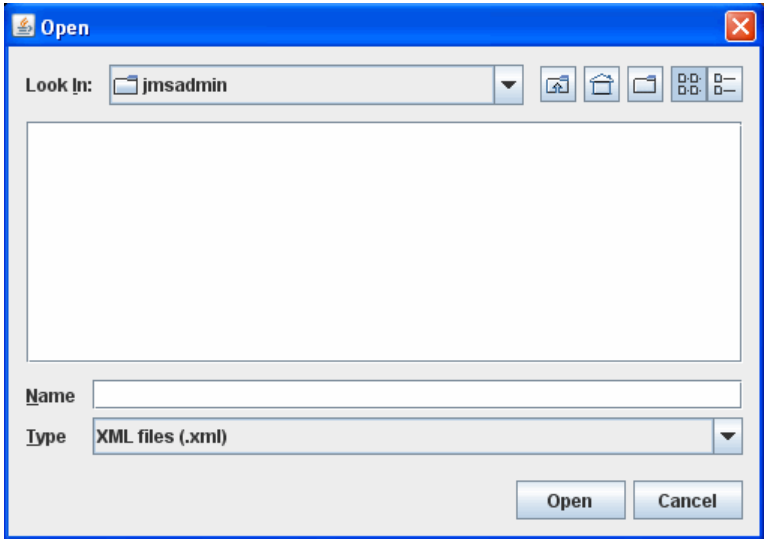
Importing JMS Provider Configuration Information

This section describes how to import your JMS provider configuration information using JMS Administration Tool:

1. Start JMS Administration Tool.

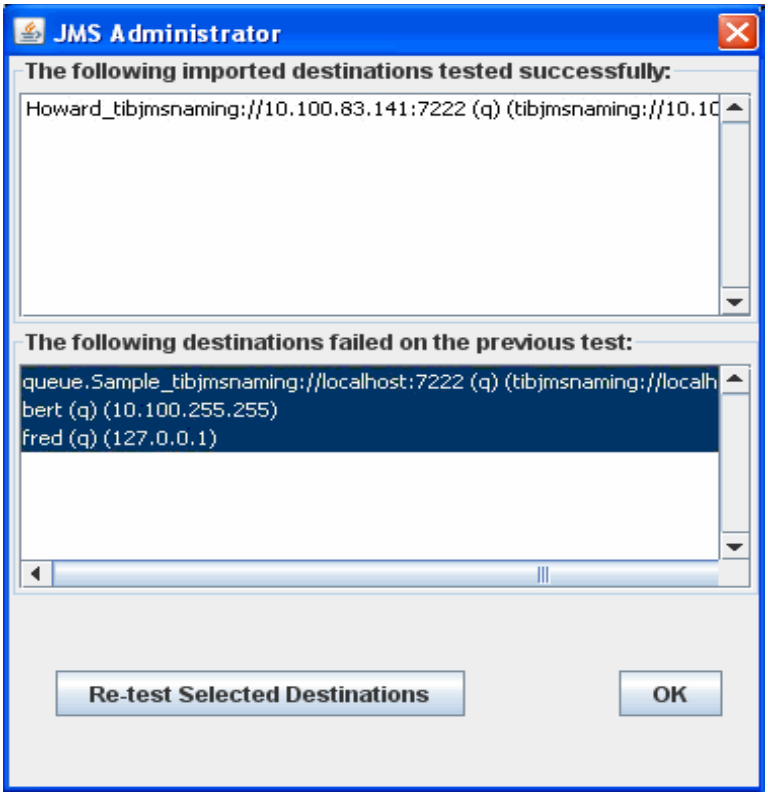
2. Click **Import**. The following warning is displayed:

3. Click **OK** to continue importing the new JMS provider information or **Cancel** to return to the Open dialog.
4. If you clicked **OK**, the Open dialog is displayed.



5. In the Name field, select the file that contains your JMS provider configuration information and click **Open**.

6. The Report for JMS Destination Import dialog is displayed.



This dialog shows which connections have tested successfully and which have failed. You can:

— Click **Re-test Selected Destinations** to re-test one or more connections.

7. Click **OK**. The new JMS provider information is imported.

Testing JMS Providers

When you have added or changed JMS provider information, click **Test** in the JMS Administration Utility dialog (see Administering JMS Providers and Destinations). This will display a message that will inform you whether or not the JMS connection is working and, if it is not, will inform you of the likely cause for the failure.

Operating the JMS Administration Utility in Console Mode

Commands are available for operating the JMS Administration Utility in console mode.

Overview of the Commands

The commands and the descriptions of each command are listed in the following table.

Command	Syntax	Description
`jmsadmin password` *password*	Where *password* is a new password you want to use to log into TIBCO Enterprise Message Service.	Generates a new password for logging into TIBCO Enterprise Message Service.
`jmsadmin show destinations | providers | ssl`	N/A	Displays the information of all the destinations, JMS providers, or SSL.
`jmsadmin import` *XMLFileName*	Where *XMLFileName* is the name of the XML file, which you want to import into the iProcess Engine database.	Imports a specific XML file, which contains the configuration information of a JMS provider, to the iProcess Engine database.
`jmsadmin export` *XMLFileName*	Where *XMLFileName* is the name of the XML file, which you want to export the configuration information of a JMS provider from the iProcess Engine database.	Exports the configuration information of a JMS provider from the iProcess Engine database to a specific XML file.
`jmsadmin test destination` *id* | *name*	Where: • *id* indicates the id of a specific destionation. • *name* indicates the name of a specific destination.	Tests whether the JMS provider information has been imported into the corresponding destination successfully.

Command	Syntax	Description
`jmsadmin upgrade`	N/A	Create a corresponding sql script file for the current iProcess Engine database. The sql script is used for executing update operations on the database.

Usage of the Commands

To use the commands, complete the following steps:

1. The commands are under the *SWDIR*`/jmsadmin` directory, you should first navigate to the `jmsadmin` directory.
2. Under the `jmsadmin` directory, type the commands you want to use.

Chapter 6

TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess Palette

The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resources are contained in the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess Palette. The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess Palette enables you to create BusinessWorks process definitions that invoke operations in the iProcess Engine. The palette gives you access to a wide range of iProcess operations, for example, starting a case, suspending or closing a case.

This chapter describes the resources contained in the iProcess Palette.

Topics

iProcess Connection

Resource

The iProcess Connection is a shared configuration resource that contains the connection information for the iProcess environment.

At this release of TIBCO iProcess Connector for ActiveMatrix BusinessWorks, if the version of BusinessWorks being used does not have the Data Direct JDBC drivers included it is necessary to enter the information in the Database Connection tab manually. The information entered must be based on the JDBC driver installed when TIBCO ActiveMatrix BusinessWorks was installed. See the documentation supplied with your JDBC driver for further information.

Configuration

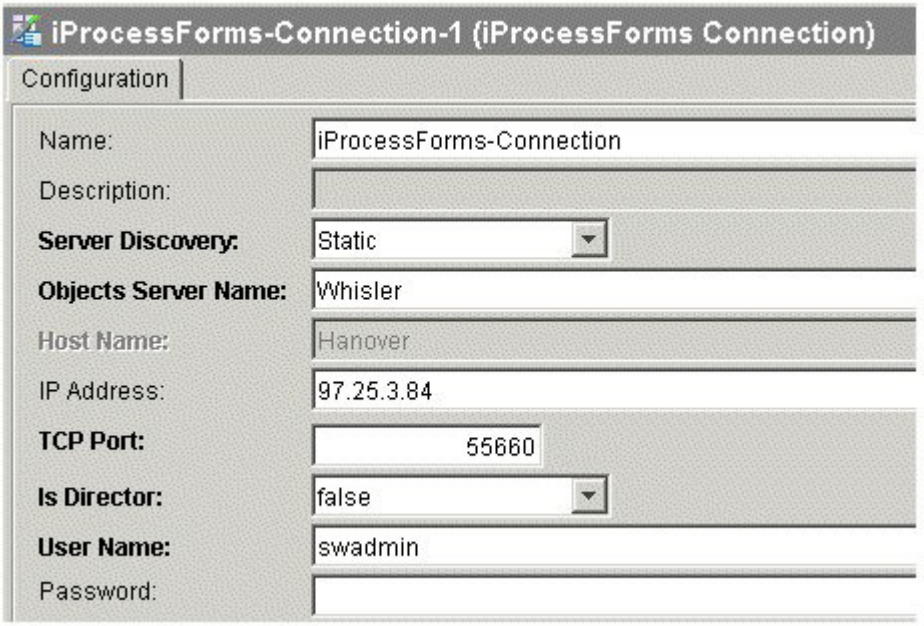
The Configuration tab has the following fields.

Field	Global Var?	Description
Name	No	The name to appear as the label for the iProcess Connection in the BusinessWorks project.
Description	No	Short description of the resource.
Server Discovery	No	The methods of discovery of the TIBCO iProcess Objects Server that you want to connect to. There are two options: • Static - select this if your iProcess Objects Server is configured to use a static (fixed) TCP port. • Directed UDP - select this if your iProcess Objects Server is configured to use a dynamic TCP port — the server's TCP port changes each time the server is restarted. A directed UDP message is issued to a specific iProcess Objects Server to determine the TCP port to use. For more information about configuring iProcess Objects Servers to use static or dynamic TCP ports, see *TIBCO iProcess Server Objects Programmer's Guide*.

Field	Global Var?	Description
Static Configuration Options		
Objects Server Name	Yes	The name of the TIBCO iProcess Objects Server you want to connect to.
Host Name	Yes	This is the name of the machine where the TIBCO iProcess Objects Server is installed. This field is disabled when the IP Address field contains a value. The IP Address field takes precedence over the Host Name field.
IP Address	Yes	The IP Address of the machine where the TIBCO iProcess Objects Server is installed.
TCP Port	Yes	The TCP port number where the TIBCO iProcess Objects Server is listening to requests.
Is Director	No	Specify whether or not a Director is used to locate the TIBCO iProcess Objects Server.
User Name	Yes	The User name to use when logging into the TIBCO iProcess Objects Server.
Password	Yes	The Password for the User name when logging into a TIBCO iProcess Objects Server.

Field	Global Var?	Description

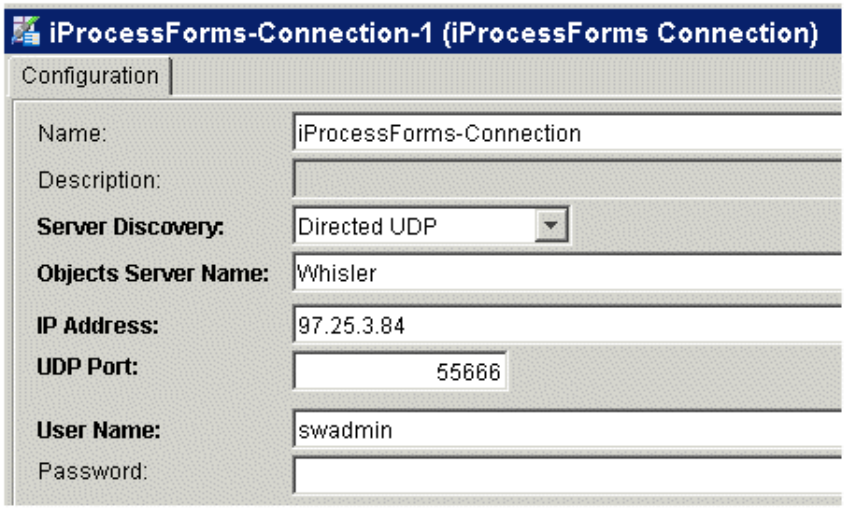
For example:



Directed UDP Configuration Options		
Objects Server Name	Yes	The name of the TIBCO iProcess Objects Server you want to connect to.
IP Address	Yes	The IP Address of the machine where the TIBCO iProcess Objects Server is installed.
UDP Port	Yes	This field is only displayed if you selected Directed UDP from the Server Discovery drop-down list. The UDP port number where the TIBCO iProcess Objects Server is listening to requests.
User Name	Yes	The User name to use when logging into the TIBCO iProcess Objects Server.
Password	Yes	The Password for the User name when logging into the TIBCO iProcess Objects Server.

Field	Global Var?	Description

For example:



Test Connection Button

When the Test Connection button is clicked, TIBCO ActiveMatrix BusinessWorks attempts to connect to the specified iProcess Objects Server using the information provided in the Configuration tab fields. You can use this button to determine if the connection will succeed. If the connection does succeed, then the fields of the Database Connection tab are automatically updated with the information. The information contained in the Configuration tab is only used at design-time to interact with the iProcess environment. At runtime, the information contained in the Database Connection tab is used.

Advanced

The Advanced tab has the following fields.

Field	Global Var?	Description
Auto Config Date Format	No	If this checkbox is checked (which is the default), then at runtime the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess retrieves information on what date format to use from the iProcess Engine via the iProcess Objects Server. If this checkbox is unchecked, the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess does not connect to the iProcess Objects Server at runtime. Unchecking this checkbox enables the date format fields, which can be used to select the date format manually.
Date Format	Yes	**Note**: This field and the following two fields are only enabled if the Auto Config Date Format checkbox is unchecked. Enter either an abbreviation for the required date format, or the associated numeric value: • **DMY** or **0** • **DYM** or **1** • **MDY** or **2** • **MYD** or **3** • **YDM** or **4** • **YMD** or **5**
Date Separator	Yes	Enter the character used to separate elements of the date.
Time Separator	Yes	Enter the character used to separate elements of the time.
Decimal Symbol	Yes	Enter the character used to separate elements of numerical value.

Database Connection

The Database Connection tab has the following fields.

Field	Global Var?	Description
Connection Type	No	The type of database connection you wish to have. You can select: • JDBC. Select JDBC if you wish to use a JDBC transaction group. JDBC connections cannot be used if you intend to place iProcess Palette resources within an XA transaction group. • XA. The XA connection type should be selected if you plan to use the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activities that refer to this shared resource in a BusinessWorks XA transaction group. See "Transactions" in *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for more information about XA transactions.
Max Connections	Yes	The maximum number of database connections to allocate. The default maximum is 10. The minimum value that can be specified is 1. See "Connection Pooling" in *TIBCO ActiveMatrix BusinessWorks Palette Reference Guide* for more information about this field.
Login Timeout (sec)	Yes	Time (in seconds) to wait for a successful database connection. Only JDBC drivers that support connection timeouts can use this configuration field. If the JDBC driver does not support connection timeouts, the value of this field is ignored. Most JDBC drivers should support connection timeouts.
Operation Timeout (sec)	Yes	Time (in seconds) to wait for a connection to the iProcess database.

Field	Global Var?	Description
Auto Config	No	This field specifies whether to configure the database connection automatically or manually: • If this checkbox is checked, the database connection will be configured automatically. However, you need to configure the JDBC driver for database connection in the `BWPlugin.properties` file. See Configuring JDBC Drivers on page 182 for more information. **Note**: If the JDBC driver for database connection is not set in the `BWPlugin.properties` file, the TIBCO JDBC driver will be used for database connection. The JDBC driver you set up in the `BWPlugin.properties` file will be used: — By the Test Connection button. — At runtime if the database connection details are changed. **Warning**: — The iProcess memos are not compatible with the JDBC Oracle database driver `(tibcosoftwareinc.jdbc.oracle.OracleDriver)` that is supplied with the TIBCO ActiveMatrix BusinessWorks installation. If you want to use iProcess memos and you are using Oracle as your database type, you must obtain the JDBC driver from Oracle (`oracle.jdbc.driver.OracleDriver (oci)`), and save the driver in the *TIBCO_HOME*`\bw\plugins\lib` directory. See "Database Drivers" in *TIBCO ActiveMatrix BusinessWorks Palette Reference Guide* for more information.

Field	Global Var?	Description
Auto Config (continuation)	No	— The TIBCO JDBC driver version 2.x is not supported for setting up a connection for Oracle database. Starting a case in TIBCO ActiveMatrix BusinessWorks will be failed if you use the TIBCO JDBC driver version 2.x to set up the connection for Oracle database. To avoid this problem, you can use the TIBCO JDBC driver version 1.x as a substitution or use the JDBC driver supplied by Oracle. • If this checkbox is unchecked, the database connection will be configured manually. You need to specify details of the database connection in the Database Connection tab.
The following fields are available if the Auto Config checkbox is unchecked.		
Database Type	Yes	The database used by iProcess Engine. You can specify the name of the database either by entering a database name in this field or by referencing a pre-defined global variable. Three types of database are supported in this field: • DB2 • Oracle • SQL Server **Note**: The spelling of the database name can be either upper case or lower case. If the database name you entered is invalid, an error dialog is displayed to remind you to correct it.

Field	Global Var?	Description
JDBC Driver	Yes	This field is only displayed if you select **JDBC** from the Connection Type drop-down list. The name of your JDBC Driver. **Warning**: — If you want to use iProcess memos and you are using Oracle as your database type, you must use the JDBC driver supplied by Oracle (`oracle.jdbc.driver.OracleDriver` (`oci`)) rather than the JDBC driver that is supplied with the TIBCO ActiveMatrix BusinessWorks installation. You must obtain this from Oracle. This is because iProcess memos are not compatible with the JDBC Oracle database driver that is supplied with the TIBCO ActiveMatrix BusinessWorks installation. See "Database Drivers" in *TIBCO ActiveMatrix BusinessWorks Palette Reference Guide* for more information. — When you use the JDBC driver version 2.x (`tibcosoftwareinc.jdbc.oracle.OracleDriver`) to set up a connection for Oracle database, starting a case in TIBCO ActiveMatrix BusinessWorks will be failed. This problem will not occur when you use TIBCO JDBC driver version 2.x to set up connections for DB2 and SQL Server database. To avoid this problem, you can use TIBCO JDBC driver version 1.x as a substitution or just use the JDBC driver supplied by Oracle.

Field	Global Var?	Description
JDBC Driver (continuation)	No	The Oracle JDBC driver will be used: • When you select **JDBC** from the **Connection Type** list, check the **Auto Config** check box, and set up the Oracle JDBC driver ((`oracle.jdbc.driver.OracleDriver` (`oci`)) as the JDBC driver in the `BWPlugin.properties` file. • When you select **JDBC** from the **Connection Type** list, uncheck the **Auto Config** check box, and type the name of the JDBC driver supplied by Oracle in the **JDBC Driver** field manually in the **DatabaseConnection** tab of the iProcess Connection shared resource. The TIBCO JDBC driver will be used: • When you select **JDBC** from the **Connection Type** list, check the **Auto Config** check box in the **DatabaseConnection** tab of the iProcess Connection shared resource, and haven't specified the JDBC driver in the `BWPlugin.properties` file. • When you select **JDBC** from the **Connection Type** list, uncheck the **Auto Config** check box, and type the name of the JDBC driver supplied by TIBCO in the **JDBC Driver** field manually in the **DatabaseConnection** tab of the iProcess Connection shared resource. If you have installed TIBCO JDBC driver version 2.x and you want to use TIBCO JDBC driver to set up a connection for Oracle database, you need to uninstall the JDBC driver version 2.x first and then reinstall the JDBC driver version 1.x. For more information about the installation and uninstall of TIBCO JDBC driver, see *TIBCO Database Drivers Supplement Installation*.

Field	Global Var?	Description
XA Data Source	Yes	The XA DataSource class. **Note**: This field is only displayed if you select **XA** from the Connection Type field. TIBCO ActiveMatrix BusinessWorks attempts to find the class. However, you may need to add the location of the class to the CLASSPATH environment variable.
Database URL	Yes	The URL to use to connect to the database. This field is completed automatically when you press the Test Connection button. If you need to amend it manually, uncheck the Auto Config checkbox so the Database URL field is enabled.
Database Username	Yes	Username to use when connecting to the database. **Note**: If you are using SQL Server and your usernames authenticate using Windows authentication, you should enter the username of the user you have created that uses SQL Server authentication. See "Pre-requisites for the TIBCO iProcess Server Plug-in for ActiveMatrix BusinessWorks When Using SQL Server" in *TIBCO iProcess Technology Plug-ins Installation* for more information.
Database Password	Yes	Password to use when connecting to the database. **Note**: If you are using SQL Server and your usernames authenticate using Windows authentication, you should enter the password of the user you have created that uses SQL Server authentication. See "Pre-requisites for the TIBCO iProcess Server Plug-in for ActiveMatrix BusinessWorks When Using SQL Server" in *TIBCO iProcess Technology Plug-ins Installation* for more information.

Field	Global Var?	Description
Database Schema Owner	Yes	The username of the Schema Owner for the database. **Note**: If you are using SQL Server and your usernames authenticate using Windows authentication, enter the username of the iProcess Table Owner. See "Pre-requisites for the TIBCO iProcess Server Plug-in for ActiveMatrix BusinessWorks When Using SQL Server" in *TIBCO iProcess Technology Plug-ins Installation* for more information.

Test Connection Button

When the Test Connection button is clicked, TIBCO ActiveMatrix BusinessWorks attempts to connect to the database using the specified usernames and passwords. You can use this button to determine if the connection will succeed.

iProcess Service Agent

Resource

The iProcess Service Agent has two functions:

- At runtime, the iProcess Service Agent accepts requests from the iProcess Engine to invoke a BusinessWorks sub-process.
- At development time, the iProcess Service Agent accepts requests from the iProcess Engine to obtain a schema for the BusinessWorks sub-processes that can be invoked from the iProcess Engine at runtime.

When used at runtime, the iProcess Service Agent responds to requests by sending a JMS message to the BusinessWorks step running on the iProcess Engine:

- When the iProcess EAI step is running in Immediate Release mode, this message is sent on completion of the BusinessWorks process;
- When the iProcess EAI step is running in Delayed Release mode, this message is sent when the BusinessWorks process has been successfully started. To complete delayed release, use the iProcess Complete Delayed Release activity described on page 111.

  If a delayed release error occurs, an error code, error message, and BG action flag will be sent back to iProcess Engine. BG process takes actions according to the BG action flag. See the `SW_DELAYED_RELEASE_ERR` procedure in *TIBCO iProcess Engine (Oracle, DB2, SQL) Administrator's Guide* for more information about the BG action flags.

Configuration

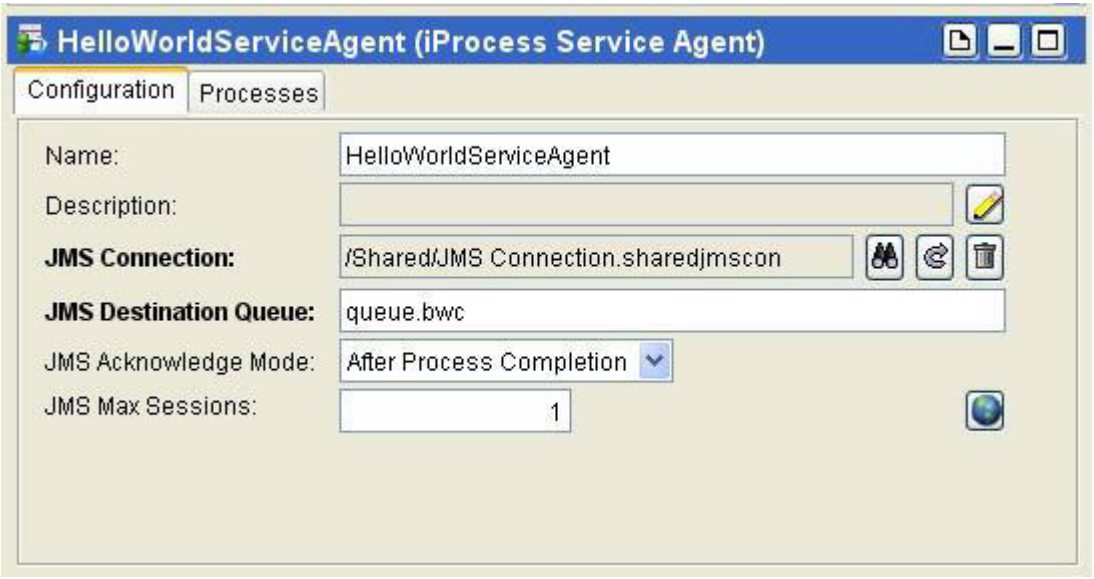
The Configuration tab has the following fields.

Field	Global Var?	Description
Name	No	The name to appear as the label for the resource in the BusinessWorks Project.
Description	No	Short description of the resource.

Field	Global Var?	Description
JMS Connection	No	Select the previously defined JMS Connection resource you want to use with this iProcess Service Agent. The JMS Connection must have **Use JNDI for Connection Factory** checked; the TIBCO iProcess Connector for ActiveMatrix BusinessWorks supports only JNDI connections. The JMS Connection resource is in the JMS Palette. See "JMS Connection" in *TIBCO ActiveMatrix BusinessWorks Palette Reference Guide* for more information.
JMS Destination Queue	Yes	Name of the queue from which to retrieve the message. The syntax of the queue name is specific to the JMS provider you are using. See your JMS provider documentation for more information about queue names.
JMS Acknowledge Mode	No	The acknowledge mode for incoming messages. Can be one of the following: • Auto — the JMS message is automatically acknowledged by the iProcess Service Agent as soon as it receives a request to start a BusinessWorks process. • After Process Completion — the iProcess Service Agent acknowledges the JMS message after the invoked BusinessWorks process has started.
JMS Max Sessions	Yes	When the Acknowledge Mode field is set to "After Process Completion", this field appears for specifying the maximum number of JMS sessions to create for incoming messages. When a JMS queue message is received, the session is blocked until the message is acknowledged. Because the acknowledgement can come at a later time depending on the BusinessWorks process, this field allows you to specify a maximum number of new sessions to create to handle incoming messages. Once the maximum number of sessions is reached, no new incoming messages can be processed. Once an incoming message is confirmed, the total number of active sessions is decreased and another incoming message can be processed.

Field	Global Var?	Description

For example:



Select Processes Button

When the Select Processes button is clicked, the Select Processes for iProcess Service Agent dialog is displayed. This dialog provides a list of BusinessWorks processes that can be invoked by the iProcess Service Agent.

Only BusinessWorks process definitions that are configured to use external schema for input and output are permitted. Processes that do not have any input or output data are also permitted. However, BusinessWorks processes that contain process starter or in-line schema for input or output are not permitted.

Check the **Generate Interface File** checkbox and enter the path to the location of the interface file if you want the iProcess Service Agent to export the schema for the BusinessWorks sub-processes that you have selected.

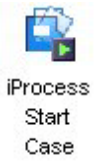
Processes

The Processes tab displays a list of the BusinessWorks sub-processes that you want the iProcess Service Agent to invoke at runtime.

The Select Processes button is also available from this tab. See Select Processes Button on page 88 for more information.

iProcess Start Case

Activity



This activity starts a case of a procedure in the iProcess Engine environment. At design-time, it enables you to specify which iProcess Connection resource you want to use. You must then select a procedure/step to be started in the iProcess Engine environment. At runtime, it starts a case of an iProcess procedure.

Configuration

The Configuration tab has the following fields.

Field	Global Var?	Description
Name	No	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	No	Short description of the activity.
iProcess Connection	No	The iProcess Connection resource you want to use.
Procedure Name	No	The name of the iProcess Engine procedure. Select from a drop-down list of all the procedures available in the iProcess Engine environment.
Fetch/Refresh Button	No	Click the Fetch/Refresh button to populate the Procedure Name field with a list of all the procedures available in the iProcess Engine environment.
Step Type	No	The type of step to display in the Step Name field. You can select: • All Steps - displays all the available steps in the procedure you have selected. • Public Steps - displays all the public steps in the procedure you have selected. • Start Step - displays the start step in the procedure you have selected.

Field	Global Var?	Description
Step Name	No	The stepname you want the case of the procedure to start at. Select from a drop-down list of all the steps available for the procedure you have selected from the Procedure Name drop-down list.

Advanced

The Advanced tab has the following fields.

Field	Global Var?	Description
Procedure Status	No	A particular version of a procedure always has an associated release status that determines how that version can be used. This field enables you to select the release status that you want to use for the iProcess Engine procedure. You can select: • Released - A procedure that can be used to process live work. • Unreleased - A procedure that is complete and can be run. However, cases are run in the test queue of the user that starts them. • Model - A Released procedure. However, any cases are run in the test queue of the user that starts them. Model status allows a new version to be imported without overwriting the existing Released or Unreleased version that allows you to test a new version on a target system before adopting it. **Note:** The iProcess Start Case activity does not support the procedures that are in the Model status. If the procedure status changes then the Procedure Name field is cleared. You must click Fetch/Refresh to populate the Procedure Name field with a new list of available procedures.

Field	Global Var?	Description
Use Case Precedence Rule	No	Sets how the major and minor versions of the procedure are specified. If checked, then the major/minor versions of the procedure are set so that the most recent version is used. Note that this is different from the meaning of this flag in other iProcess Engine procedures (described in "Defining which version of a sub-procedure is called" in *TIBCO iProcess Modeler Procedure Management*).
Include Procedure System Fields in Input	No	Enables you to display the iProcess Engine procedure system fields in the Input tab. See "System Values" in *TIBCO iProcess Expressions and Functions Reference Guide* for more information about the iProcess Engine system fields.

Field	Global Var?	Description
Validate Field Value Length in Input	No	Fields in the iProcess Engine have set limits on their length. (See *TIBCO iProcess Modeler Basic Design* for more information.) This means that any data that is output from BusinessWorks that is longer than the field length limit set in the iProcess Engine is ignored by the iProcess Engine. (The iProcess Engine procedure is invoked successfully but the data that is too long is ignored and a warning is written to the *SWDIR*`\logs\sw_warn` file). Select this option if you want BusinessWorks to validate the field length that you have specified in the schema that defines the output data from BusinessWorks. If the field value length in the output is too long, an error is returned to BusinessWorks and you must go back to your schema and correct it. TIBCO recommends that you select this option while you are defining your iProcess Start Case activity. However, once you are satisfied that the field value lengths in your output match the field value lengths set for fields in the iProcess Engine, you should de-select this option. This is because, at runtime, having this option selected has an impact on performance.
Override Transaction Behavior	No	Enables you to override transaction behavior for this particular procedure. If this is selected then this activity will not participate in transactions when inside a BusinessWorks transaction group.

Input

The input fields for the activity is the following.

Input Item	Datatype	Description
Case Description	String	The iProcess Engine case description.

Input Item	Datatype	Description
Username	String	The username to use when performing the case operation on the case. The default is the username supplied in the iProcess Connection resource.
Priority	Numeric	The value of the case priority. The value of the priority can be set between `1` and `999`, where `1` is the highest priority. The default value of this field is `50`. **Note**: The priority of each message in a case is the same as the priority of the case. The case priority can be set either in the `SW_CP_VALUE` system field or in this Priority field. The rules determining which case priority setting should be used for processing messages are as follows. • If the value of the `SW_CP_VALUE` field is set, the messages will be processed in the order of `SW_CP_VALUE` regardless of the message queue priority that is set in the Priority field. • If the value of the `SW_CP_VALUE` field is not set, the messages will be processed in the order of the message queue priority that is set in the Priority field. • If neither the `SW_CP_VALUE` field nor the Priority field are set, the messages priority will be set to the default value of the `SW_CP_VALUE` field, `50`. For more information about the `SW_CP_VALUE` field, see *TIBCO iProcess Modeler Advanced Design*.

Input Item	Datatype	Description
iProcess Engine procedure fields	Depends on the fields defined in the iProcess Engine.	The iProcess Engine procedure fields that require data when a case of the iProcess Engine procedure is started.
Step Fields	Depends on the fields that are referenced from the iProcess Engine steps.	The iProcess Engine fields that are referenced from the steps.

See *TIBCO ActiveMatrix BusinessWorks Process Design Guide* for more information about mapping and transforming input data.

Output

The output field for the activity is the following.

Output Item	Datatype	Description
Case Number	Numeric	The number of the case returned by the iProcess Engine procedure.

Error Output

The Error Output tab lists the possible exceptions thrown by this activity. See Error Codes on page 124 for more information about the error codes and corrective action to take.

Exception	Thrown When...
iProcessStartCase Exception	An error occurred while executing this activity.

iProcess Procedure Case Management

Activity

The iProcess Procedure Case Management activity performs case management operations. At this release, it can manage both iProcess Engine main procedures and sub-procedures. See "Defining and Using Sub-Procedures" in *TIBCO iProcess Modeler Advanced Design* for more information about sub-procedures.

At design time, it enables you to select which case management operation you want to perform. Different inputs and outputs are required for each activity. You can perform the following case management operations in an iProcess Engine main procedure or sub-procedure:

- Activate a case. See "Using Public Steps & Events" in *TIBCO iProcess Modeler Integration Techniques* for more information.
- Close a case. See "Closing Cases" in *TIBCO iProcess Workspace (Windows) Manager's Guide* for more information.
- Purge a case. See "Purging Cases" in *TIBCO iProcess Workspace (Windows) Manager's Guide* for more information.
- Get the status of a case. See "Release Status" in *TIBCO iProcess Modeler Procedure Management* for more information.
- Suspend a case. See "Using Public Steps & Events" in *TIBCO iProcess Modeler Integration Techniques* for more information.
- Trigger an event in a case. See "Using Public Steps & Events" in *TIBCO iProcess Modeler Integration Techniques* for more information.
- Jump to a particular step or steps in a case. You can specify dynamically at runtime the step, or steps, to be jumped to. See "Changing the Process Flow in a Case" in *TIBCO iProcess Workspace (Browser) User's Guide* for more information.
- Modify case data. You can use this operation to change the data in a case of an iProcess procedure. For example, you can use it to modify case data for a sub-procedure grafted using the iProcess Graft activity. See iProcess Graft on page 107 for more details of that activity.

  Note that any changes you make to a case are only written to the iProcess Engine server when the affected step is released. Until then, the data displayed does not correspond to the situation on the server. After release, any subsequent steps in the case will show the modified data.

Configuration

The Configuration tab has the following fields.

Field	Global Var?	Description
Name	No	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	No	Short description of the activity.
iProcess Connection	No	The iProcess Connection resource you want to use.
Case Operation	No	Select the case operation you want to perform in the iProcess Engine environment: • Activate - re-activates a case of a procedure that has been suspended. • Close - closes a case of an iProcess Engine procedure. • Purge - purges a case an iProcess Engine procedure. • Status - obtains the status of a case of an iProcess Engine procedure for a specific case number. • Suspend - suspends a case of a procedure. • Trigger Event - triggers an event in a case of an iProcess Engine procedure. • Jump To - jumps to a particular step or steps in a case of a procedure • Modify Case Data - modify data in a case of an iProcess procedure
Fetch/Refresh Button	No	Click the Fetch/Refresh button to populate the Procedure Name field with a list of all the procedures available in the iProcess Engine environment.

Field	Global Var?	Description
Procedure Type	No	The type of procedure to display in the Procedure Name field. Select one of Main (which is the default) or Sub.
Procedure Name	No	The name of the iProcess Engine procedure that you want to perform a case management operation in. Select from a drop-down list of all the procedures available in the iProcess Engine environment. This field will be disabled for the Status case operation.
Trigger Event		
Step Name	No	The name of the event step that you want to perform a case management operation on.
Resurrect Case	No	Checking this checkbox enables you to resurrect the case if the case is closed.
Update Pack Data	No	Checking this checkbox enables you to update the work item data for the outstanding work items after processing the triggered event. For more information about how to propagate the case data changes into sub-cases, see “Propagation of New Field Values” in *TIBCO iProcess Modeler Integration Techniques*. For more information about the pack data, see "pack_data" in the appropriate *TIBCO iProcess Engine (Database) Administrator's Guide*.

Field	Global Var?	Description
Recalculate Deadlines (Main Case)	No	Checking this checkbox enables you to recalculate deadlines for the cases that belong to the main procedure. If this checkbox is checked, the Recalculate Deadlines (Main Case and Sub-cases) checkbox will be grayed out. **Note**: Both checkboxes cannot be checked at the same time. For more information about recalculating deadlines dynamically, see "Dynamically Recalculating Deadlines" in *TIBCO iProcess Modeler Basic Design*.
Recalculate Deadlines (Main Case and Sub-cases)	No	Checking this checkbox enables you to recalculate deadlines of cases that belong to both the main procedure and sub-procedures. If this checkbox is checked, the Recalculate Deadlines (Main Case) checkbox will be grayed out. **Note**: Both chekboxes cannot be checked at the same time. For more information about recalculating deadlines dynamically, see "Dynamically Recalculating Deadlines" in *TIBCO iProcess Modeler Basic Design*.
Jump To		
Step Name	No	The name of the step, in the procedure identified in the Procedure Name field, that you wish to jump to. Select from a drop-down list of steps in the procedure. This can be overridden at run time by a Step Name specified in the Input tab.

Advanced

The Advanced tab has the following fields:

Field	Global Var?	Description
Procedure Status	No	A particular version of a procedure always has an associated release status that determines how that version can be used. This field enables you to select the release status that you want to use for the iProcess Engine procedure. You can select: • Released - A procedure that can be used to process live work. • Unreleased - A procedure that is complete and can be run. However, cases are run in the test queue of the user that starts them. • Model - A Released procedure. However, any cases are run in the test queue of the user that starts them. Model status allows a new version to be imported without overwriting the existing Released or Unreleased version that allows you to test a new version on a target system before adopting it. If the Procedure Type field in the Configuration tab is set to `Sub`, this field is disabled, since sub-procedures are retrieved differently from main procedures. The current version of the sub-procedure requested is returned. The current version is that with the highest status in the following hierarchy: Released, Unreleased, Model, Withdrawn
Use Case Precedence Rule	No	Sets how the major and minor versions of the procedure are specified. If checked, then the major/minor versions of the procedure are set so that the most recent version is used. Note that this is different from the meaning of this flag in other iProcess Engine procedures (described in "Defining which version of a sub-procedure is called" in *TIBCO iProcess Modeler Procedure Management*).

Field	Global Var?	Description
Include Procedure System Fields in Input	No	Enables you to display the iProcess Engine procedure system fields in the Input tab. See "System Values" in *TIBCO iProcess Expressions and Functions Reference Guide* for more information about the iProcess Engine system fields.
Validate Field Value Length in Input	No	Fields in the iProcess Engine have set limits. (See *TIBCO iProcess Modeler Basic Design* for more information). This means that any data that is output from BusinessWorks that is longer than the field length limit set in the iProcess Engine is ignored by the iProcess Engine. (The iProcess Engine procedure is invoked successfully but the data that is too long is ignored and a warning is written to the *SWDIR*`\logs\sw_warn` file). Select this option if you want BusinessWorks to validate the field length that you have specified in the schema that defines the output data from BusinessWorks. If the field value length in the output is too long, an error is returned to BusinessWorks and you must go back to your schema and correct it. TIBCO recommends that you select this option while you are defining your iProcess Start Case activity. However, once you are satisfied that the field value lengths in your output match the field value lengths set for fields in the iProcess Engine, you should de-select this option. This is because, at runtime, having this option selected impacts on performance.
Override Transaction Behavior	No	Enables you to override transaction behavior for this particular procedure.

Input

The fields in the Input tab depend on the case operation you have selected in the Case Operation field in the Configuration tab. The following table describes the fields that are displayed in the Input tab for each of the case operations.

Field	Datatype	Description
Priority	Numeric	The value of the case priority. The value of the priority can be set between `1` and `999`, where `1` is the highest priority. The default value of this field is `50`. **Note**: The priority of each message in a case is the same as the priority of the case. The case priority can be set either in the `SW_CP_VALUE` system field or in this Priority field. The rules determining which case priority setting should be used for processing messages are as follows. • If the value of the `SW_CP_VALUE` field is set, the messages will be processed in the order of `SW_CP_VALUE` regardless of the message queue priority that is set in the Priority field. • If the value of the `SW_CP_VALUE` field is not set, the messages will be processed in the order of the message queue priority that is set in the Priority field. • If neither the `SW_CP_VALUE` field nor the Priority field are set, the messages priority will be set to the default value of the `SW_CP_VALUE` field, `50`. For more information about the `SW_CP_VALUE` field, see *TIBCO iProcess Modeler Advanced Design*.
If the Activate, Suspend, Close, or Purge case operation is selected, the following fields will be displayed.		
Case Number	Numeric	The number of the case that you want to perform the case operation on.

Field	Datatype	Description
Procedure Name	String	The procedure on which the operation is to be carried out.
Procedure MajorVersion	Numeric	These fields enable you to overwrite the procedure name and the procedure major & minor version at runtime. The default is the value specified in the Configuration tab.
Procedure MinorVersion	Numeric	
Username	String	The username to use when performing the case operation on the case. The default is the username supplied in the iProcess Connection resource. This field is only available when the Activate, Suspend, or Close case operation is selected.
If the Status case operation is selected, the following fields will be displayed.		
Case Number	Numeric	The number of the case that you want to perform the case operation on.
If the Trigger Event case operation is selected, the following fields will be displayed.		
Case Number	Numeric	The number of the case that you want to perform the case operation on.
Username	String	The username to use when performing the case operation on the case. The default is the username supplied in the iProcess Connection resource.
If the Jump To case operation is selected, the following fields will be displayed.		
Case Number	Numeric	The number of the case that you want to perform the Jump To operation on.
Reason	String	Enter a reason for the Jump To operation. This is available in the audit trail.

Field	Datatype	Description
Withdraw Step Name	String	The name of the step to be withdrawn. If this field is left blank, all previous steps are withdrawn.
Username	String	The username to use when performing the Jump To operation on the case. The default is the username supplied in the iProcess Connection resource.
Step Name	String	Enter the name of the step or steps, in the procedure identified in the Procedure Name field, that you wish to jump to. Select from a drop-down list of steps in the procedure. This overrides any Step Name specified in the Configuration tab. If you wish to jump to more than one step, you can enter a list of steps here, specified using the For Each SPath notation.
Field Names and Types	String	Names and types of fields in the step that require values when the case is started. Date and time fields can be re-initialized by setting the content to **Explicit Nil** in the Content tab of the Edit Statement dialog in BusinessWorks. See *TIBCO ActiveMatrix BusinessWorks™ Process Design Guide* for further details. Note that composite fields are not supported, and so even if the step contains a composite field it will not be shown in this tab.
If the Modify Case Data case operation is selected, the following fields will be displayed.		
Case Number	Numeric	The number of the case that you want to perform the case operation on.
Username	String	The username to use when performing the case operation on the case. The default is the username supplied in the iProcess Connection resource.

Field	Datatype	Description
Reason	String	Enter a reason for the Modify operation. This is available in the audit trail.
Field Names and Types	String	Names and types of fields in the step that require values when the case is started. Enter here the values that this operation is modifying. Date and time fields can be re-initialized by setting the content to **Explicit Nil** in the Content tab of the Edit Statement dialog in BusinessWorks. See *TIBCO ActiveMatrix BusinessWorks™ Process Design Guide* for further details. Note that composite fields are not supported, and so even if the step contains a composite field it will not be shown in this tab.

Output

The fields in the Output tab depend on the case operation you have selected in the Case Operation field in the Configuration tab, as shown in the following table:

Output Item	Datatype	Description
Activate, Close, Purge, Suspend, Trigger Event		
Case Number	Numeric	The number of the case that you performed the case operation on.
Case Status		
Case Number	Numeric	The number of the case that you performed the case operation on.
CaseStartTime	Time	The time that the case was started.
CaseStatus	String	The current status of the case.
ProcedureType	String	The procedure type of the procedure, for example, Main procedure or Sub-procedure.

Error Output

The Error Output tab lists the possible exceptions thrown by this activity. See Error Codes on page 124 for more information about the error codes and corrective action to take.

Exception	Thrown When...
`iProcessProcedureCaseManagementException`	An exception occurred when executing this activity.

iProcess Graft

Activity

This activity enables you to graft one or more sub-procedures to a specific graft step in an instance of an iProcess Engine procedure or sub-procedure. The sub-procedures to be grafted are defined at runtime and could be supplied as input to the BusinessWorks process.

The graft count is defined internally by the activity, based on the number of sub-procedures to be grafted.

Configuration

The Configuration tab has the following fields.

Field	Description
Name	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	Short description of the activity.
iProcess Connection	The iProcess Connection resource you want to use. Select from a drop-down list of the available iProcess Connection resources.
Procedure Type	The type of procedure to display in the Procedure Name field. Select one of Main (which is the default) or Sub.
Procedure Name	The name of the iProcess Engine procedure. Select from a drop-down list of all the procedures available in the iProcess Engine environment.
Graft Step Name	The graft step name in the iProcess Engine procedure. Select from a drop-down list of all the graft steps available in the iProcess Engine procedure you selected from the Procedure Name field.

Advanced

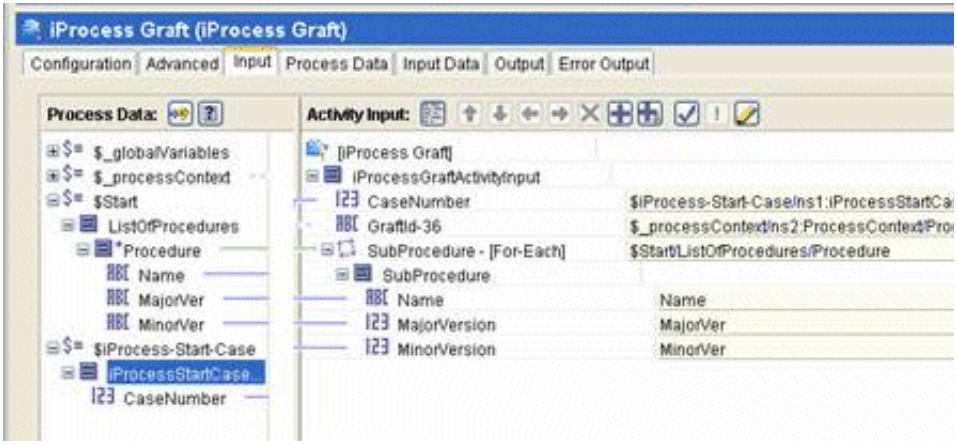
The Advanced tab has the following fields.

Field	Description
Procedure Status	Select one of Model, UnReleased, or Released from the drop-down list. Defaults to Released. If the Procedure Type field in the Configuration tab is set to Sub, this field is disabled, since sub-procedures are retrieved differently from main procedure.
Use Case Precedence Rule	Sets how the major and minor versions of the procedure are specified. If checked, then the major/minor versions of the procedure are set so that the most recent version is used. Note that this is different from the meaning of this flag in other iProcess Engine procedures (described in "Defining which version of a sub-procedure is called" in *TIBCO iProcess Modeler Procedure Management*).
Validate Field Value Length on Input	Fields in the iProcess Engine have set limits. (See *TIBCO iProcess Modeler Basic Design* for more information). This means that any data that is output from BusinessWorks that is longer than the field length limit set in the iProcess Engine is ignored by the iProcess Engine. (The iProcess Engine procedure is invoked successfully but the data that is too long is ignored and a warning is written to the *SWDIR*`\logs\sw_warn` file). Select this option if you want BusinessWorks to validate the field length that you have specified in the schema that defines the output data from BusinessWorks. If the field value length in the output is too long, an error is returned to BusinessWorks and you must go back to your schema and correct it. TIBCO recommends that you select this option while you are defining your iProcess activity. However, once you are satisfied that the field value lengths in your output match the field value lengths set for fields in the iProcess Engine, you should de-select this option. This is because, at runtime, having this option selected impacts on performance.

Field	Description
Override Transaction Behavior	Enables you to override transaction behavior for this particular procedure. If this is selected then this activity will not participate in transactions when inside a BusinessWorks transaction group.

Input

The Input tab has the following fields.

Field	Datatype	Description
Case Number	Numeric	The case number of the iProcess case instance.
Graft ID	Numeric	The unique ID for this graft step in this case.
Sub Procedures	String	The sub-procedures to be grafted. These are defined at runtime using XPath notation, and can be supplied as input to the BusinessWorks process. For example:
		
		The graft count is set automatically to correspond to the number of sub-procedures supplied.

Field	Datatype	Description
Procedure Name	String	These fields enable you to overwrite the procedure name and the procedure major and minor version at runtime. The default is the value specified in the Configuration tab.
Procedure MajorVersion	Numeric	
Procedure MinorVersion	Numeric	

Error Output

The Error Output tab lists the exceptions thrown by the iProcess Graft activity. Because an iProcess Activity can return any Java exception, the potential exceptions cannot be listed here. While all potential errors cannot be known, the error schema for all errors is the same.

Error Schema Element	Datatype	Description
msg	String	The error description.
msgCode	String	The error code.

iProcess Complete Delayed Release

Activity

This activity enables you to complete the delayed release for an iProcess EAI step. This is typically used in conjunction with an EAI BusinessWorks Step; but it can also be used to complete delayed release for any EAI step which has delayed release defined.

Configuration

The Configuration tab has the following fields.

Field	Description
Name	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	Short description of the activity.
iProcess Connection	The iProcess Connection resource you want to use. Select from a drop-down list of the available iProcess Connection resources.
Procedure Name	The name of the iProcess Engine procedure. This is optional. Select from a drop-down list of all the procedures available in the iProcess Engine environment.

Advanced

The Advanced tab has the following fields.

Field	Description
Procedure Status	Select one of Model, UnReleased, or Release from the drop-down list. Defaults to Release. If the Procedure Type field in the Configuration tab is set to Sub, this field is disabled, since sub-procedures are retrieved differently from main procedures.

Field	Description
Include Procedure System Fields in Input	Enables you to display the iProcess Engine procedure system fields in the Input tab. See "System Values" in *TIBCO iProcess Expressions and Functions Reference Guide* for more information about the iProcess Engine system fields.
Validate Field Value Length on Input	Fields in the iProcess Engine have set limits. (See *TIBCO iProcess Modeler Basic Design* for more information). This means that any data that is output from BusinessWorks that is longer than the field length limit set in the iProcess Engine is ignored by the iProcess Engine. (The iProcess Engine procedure is invoked successfully but the data that is too long is ignored and a warning is written to the *SWDIR*`\logs\sw_warn` file). Select this option if you want BusinessWorks to validate the field length that you have specified in the schema that defines the output data from BusinessWorks. If the field value length in the output is too long, an error is returned to BusinessWorks and you must go back to your schema and correct it. TIBCO recommends that you select this option while you are defining your iProcess activity. However, once you are satisfied that the field value lengths in your output match the field value lengths set for fields in the iProcess Engine, you should de-select this option. This is because, at runtime, having this option selected impacts on performance.
Override Transaction Behavior	Enables you to override transaction behavior for this particular procedure. If this is selected then this activity will not participate in transactions when inside a BusinessWorks transaction group.

Input

The **Input** tab has the following fields.

Field	Datatype	Description
DelayedReleaseid	Numeric	The Delayed Release ID which is generated by the iProcess Engine.
Audit Message	String	The delayed release audit description.

Field	Datatype	Description
User Name	String	The user name to be used for performing the task. This defaults to the name specified in the iProcess Connection resource selected in the Configuration tab.
Priority	Numeric	The value of the case priority. The value of the priority can be set between `1` and `999`, where `1` is the highest priority. The default value of this field is `50`. **Note**: The priority of each message in a case is the same as the priority of the case. The case priority can be set either in the `SW_CP_VALUE` system field or in this Priority field. The rules determining which case priority setting should be used for processing messages are as follows. • If the value of the `SW_CP_VALUE` field is set, the messages will be processed in the order of `SW_CP_VALUE` regardless of the message queue priority that is set in the Priority field. • If the value of the `SW_CP_VALUE` field is not set, the messages will be processed in the order of the message queue priority that is set in the Priority field. • If neither the `SW_CP_VALUE` field nor the Priority field are set, the messages priority will be set to the default value of the `SW_CP_VALUE` field, `50`. For more information about the `SW_CP_VALUE` field, see *TIBCO iProcess Modeler Advanced Design*.

Field	Datatype	Description
Field Names and Types	String	The names and types of the fields in the selected procedure. This is only displayed when a procedure name has been specified in the Configuration tab. Date and time fields can be re-initialized by setting the content to **Explicit Nil** in the Content tab of the Edit Statement dialog in BusinessWorks. See *TIBCO ActiveMatrix BusinessWorks™ Process Design Guide* for further details. Note that composite fields are not supported, and so even if the step contains a composite field it will not be shown in this tab.

Error Output

The Error Output tab lists the exceptions thrown by the iProcess Complete Delayed Release activity. Because an iProcess Activity can return any Java exception, the potential exceptions cannot be listed here. While all potential errors cannot be known, the error schema for all errors is the same.

Error Schema Element	Datatype	Description
msg	String	The error description.
msgCode	String	The error code.

iProcess Audit Entry

Activity

This activity enables you to add audit information for a case of a procedure in the iProcess environment.

Configuration

The Configuration tab has the following fields.

Field	Description
Name	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	Short description of the activity. This is optional.
iProcess Connection	The iProcess Connection resource you want to use. Select from a drop-down list of the available iProcess Connection resources.
Procedure Type	The type of procedure to display in the Procedure Name field. Select one of Main (which is the default) or Sub.
Procedure Name	The name of the iProcess Engine procedure. Select from a drop-down list of all the procedures available in the iProcess Engine environment.

Advanced

The Advanced tab has the following fields.

Field	Description
Procedure Status	Select one of Model, UnReleased, or Released from the drop-down list. Defaults to Released. If the Procedure Type field in the Configuration tab is set to Sub, this field is disabled, since sub-procedures are retrieved differently from main procedures.

Field	Description
Use Case Precedence Rule	Sets how the major and minor versions of the procedure are specified. If checked, then the major/minor versions of the procedure are set so that the most recent version is used. Note that this is different from the meaning of this flag in other iProcess Engine procedures (described in "Defining which version of a sub-procedure is called" in *TIBCO iProcess Modeler Procedure Management*).
Validate Field Value Length on Input	Fields in the iProcess Engine have set limits. (See *TIBCO iProcess Modeler Basic Design* for more information). This means that any data that is output from BusinessWorks that is longer than the field length limit set in the iProcess Engine is ignored by the iProcess Engine. (The iProcess Engine procedure is invoked successfully but the data that is too long is ignored and a warning is written to the *SWDIR*`\logs\sw_warn` file). Select this option if you want BusinessWorks to validate the field length that you have specified in the schema that defines the output data from BusinessWorks. If the field value length in the output is too long, an error is returned to BusinessWorks and you must go back to your schema and correct it. TIBCO recommends that you select this option while you are defining your iProcess activity. However, once you are satisfied that the field value lengths in your output match the field value lengths set for fields in the iProcess Engine, you should de-select this option. This is because, at runtime, having this option selected impacts on performance.
Override Transaction Behavior	Enables you to override transaction behavior for this particular procedure. If this is selected then this activity will not participate in transactions when inside a BusinessWorks transaction group.
Use Custom Audit	If you check this checkbox, the Input tab will contain two extra fields, Audit Name and Audit ID. If this is unchecked, Audit ID defaults to 131 (which references audit message 131 in the `audit.mes` file, which reads: `BusinessWorks Activity Audit "%DESC" processed by "%USER")`

Input

The Input tab has the following fields.

Field	Datatype	Description
Case Number	Numeric	The case number of the iProcess case instance.
User Name	String	The user name to be used for the audit entry. This defaults to the name specified in the iProcess Connection resource selected in the Configuration tab.
Audit Name	String	Name of the audit step. This field is only displayed if the Use Custom Audit checkbox in the Advanced tab is checked. Note that the Audit Name is not validated. Therefore, if you specify an invalid Audit Name, the audit message is written but iProcess Activity Publication (IAP) does not send it to the required queue.
Audit Description	String	Description of the audit.
Audit ID	Numeric	The ID of the audit type for this audit entry. The possible audit types are defined in the iProcess Audit Trail Entries system files *SWDIR*`\etc\`*language*`.lng\audit.mes` (for system-defined audit types) and `auditusr.mes` in the same folder (for any user-defined audit types). This field is only displayed if the Use Custom Audit checkbox in the Advanced tab is checked.

Field	Datatype	Description
Procedure Name	String	These fields enable you to overwrite the procedure name and the procedure major & minor version at runtime. The default is the value specified in the Configuration tab.
Procedure MajorVersion	Numeric	
Procedure MinorVersion	Numeric	

Output

The Output tab has the following fields.

Field	Datatype	Description
Case Number	Numeric	The case number of the iProcess case instance.

Error Output

The Error Output tab lists the exceptions thrown by the iProcess Audit Entry activity. Because an iProcess Activity can return any Java exception, the potential exceptions cannot be listed here. While all potential errors cannot be known, the error schema for all errors is the same.

Error Schema Element	Datatype	Description
msg	String	The error description.
msgCode	String	The error code.

iProcess Get Case Number

Activity

This activity retrieves a sub-case number for the procedure or sub-procedure case instance. The sub-case number is used together with the iProcess Procedure Case Management activity to manage sub-procedures; see iProcess Procedure Case Management on page 96.

Configuration

The Configuration tab has the following fields.

Field	Description
Name	The name to appear as the label for the activity in the BusinessWorks process definition.
Description	Short description of the activity. This is optional.
iProcess Connection	The iProcess Connection resource you want to use. Select from a drop-down list of the available iProcess Connection resources.
Procedure Type	The type of procedure to display in the Procedure Name field. Select one of Main (which is the default) or Sub.
Procedure Name	The name of the iProcess Engine procedure. Select from a drop-down list of all the procedures available in the iProcess Engine environment.
Step Name	Name of the step. You can select from a drop-down list of steps of types Sub Proc, Dynamic Sub Proc, or Graft.
Sub-Procedure Name	Name of the iProcess sub-procedure. This can be overridden at run time by a Sub-Procedure Name specified in the Input tab.

Advanced

The Advanced tab has the following fields.

Field	Description
Procedure Status	Select one of Model, UnReleased, or Released from the drop-down list. Defaults to Released. If the Procedure Type field in the Configuration tab is set to Sub, this field is disabled, since sub-procedures are retrieved differently from main procedures.
Override Transaction Behavior	Enables you to override transaction behavior for this particular procedure. If this is selected then this activity will not participate in transactions when inside a BusinessWorks transaction group.

Input

The Input tab has the following fields.

Field	Datatype	Description
Case Number	Numeric	The case number of the iProcess case instance.
Procedure Name	String	The procedure on which the operation is to be carried out.
Step Name	String	Name of the step; this can be of type Sub Proc, Dynamic Sub Proc, or Graft. This field is optional. It defaults to the value specified in the Step Name field of the Configuration tab.
Sub-Procedure Name	String	Name of the iProcess sub-procedure. This field is optional. It defaults to the value specified in the Sub-Procedure Name field of the Configuration tab.

Output

The Output tab has the following fields.

Field	Datatype	Description
Case Number	Numeric	The sub-case number of the iProcess case instance. If the step has multiple sub-procedures of the same name associated with it, a sequence of case numbers will be generated. If the case number input is invalid (because it does not exist, or for any other reason cannot be processed) a value of **0** is returned. You can then use BusinessWorks facilities to repeat iterations of this activity until a result other than **0** is produced.

Error Output

The Error Output tab lists the exceptions thrown by the iProcess Get Case Number activity. Because an iProcess Activity can return any Java exception, the potential exceptions cannot be listed here. While all potential errors cannot be known, the error schema for all errors is the same.

Error Schema Element	Datatype	Description
msg	String	The error description.
msgCode	String	The error code.

Appendix A TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess Error Codes

This appendix describes error codes that are returned from TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess.

Topics

Error Codes

BW-iPROCESS-000001: BusinessWorks iProcess Service Agent is unable to generate the interface definition file. The BusinessWorks iProcess Service Agent is not configured to start or service any BusinessWorks process.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to generate the interface definition file. The TIBCO ActiveMatrix BusinessWorks process name must be selected before generating a interface file.

Resolution: Please verify that the BusinessWorks iProcess Service Agent is correctly configured to invoke BusinessWorks process.

BW-iPROCESS-000002: BusinessWorks iProcess Service Agent is unable to generate the interface definition. The BusinessWorks iProcess Service Agent is not configured to start or service any BusinessWorks process.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to generate the interface definition. The TIBCO ActiveMatrix BusinessWorks process name must be selected before generating a interface file.

Resolution: Please verify that the BusinessWorks iProcess Service Agent is correctly configured to invoke BusinessWorks process.

BW-iPROCESS-000003: BusinessWorks iProcess Service Agent is unable to generate the interface definition file. %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to generate the interface definition file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000004: BusinessWorks iProcess Service Agent is unable to generate interface definition. %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to generate the interface definition.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000005: BusinessWorks iProcess Service Agent is unable to create the interface definition file. Exception [%1] occurred while creating the interface file [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to create the interface definition file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000006: BusinessWorks iProcess Service Agent is unable to write to the interface definition file. Exception [%1] occurred while performing write operation to the interface file. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to write to the interface definition file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000007: BusinessWorks iProcess Service Agent is unable to create a new interface definition file. Exception [%1] occurred while deleting the existing interface file [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to delete the existing interface definition file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000008: BusinessWorks iProcess Service Agent is unable to create a new interface definition file. Error occurred while deleting the existing interface file [%1].

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to delete the existing interface definition file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000009: BusinessWorks iProcess Service Agent is unable to create a new interface definition file. The existing interface file [%1] can not be modified by the application.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to modify or delete the existing interface file.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-100009: BusinessWorks iProcess Service Agent is unable to create the interface definition file. The interface definition file name was not specified by the user.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to create the interface definition file. The user did not specify the file name.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000010: BusinessWorks iProcess Service Agent is unable to start the BusinessWorks process [%1]. The BusinessWorks engine raised exception [%2] when starting the process. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable start the specified TIBCO ActiveMatrix BusinessWorks process. Exception occurred while starting the process.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000011: BusinessWorks iProcess Service Agent is unable to start the BusinessWorks process [%1]. The process may not exist in the BusinessWorks engine. The BusinessWorks engine raised exception [%2] when starting the process. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable start the specified TIBCO ActiveMatrix BusinessWorks process. Exception occurred while starting the process.

Resolution: Please verify that the process exists in the BusinessWorks engine.

BW-iPROCESS-000012: BusinessWorks iProcess Service Agent is unable to start the BusinessWorks process [%1]. Process input data may be invalid. The BusinessWorks engine returned errorcode [%2] and exception [%3] when starting the process. %4

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable start the specified TIBCO ActiveMatrix BusinessWorks process. Error occurred while starting the process.

Resolution: Please verify that correct input data is provided when invoking the specified BusinessWorks process

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BW-iPROCESS-000013: BusinessWorks iProcess Service Agent is unable to start the BusinessWorks process [%1]. The BusinessWorks iProcess Service Agent is not configured to start the specified process.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is not configured to service or invoke the specified TIBCO ActiveMatrix BusinessWorks process.

Resolution: Please verify that the BusinessWorks iProcess Service Agent is correctly configured to invoke the specified BusinessWorks process.

BW-iPROCESS-000014: Abstract WSDL creation error. The BusinessWorks process [%1] contains incorrect input schema. %2

Role: errorRole

Category: BW_Plugin

Description: The start activity of the specified TIBCO ActiveMatrix BusinessWorks process contains incorrect schema.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000015: Abstract WSDL creation error. The BusinessWorks process [%1] contains incorrect output schema. %2

Role: errorRole

Category: BW_Plugin

Description: The end activity of the specified TIBCO ActiveMatrix BusinessWorks process contains incorrect schema.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000016: Abstract WSDL creation error. The BusinessWorks process [%1] contains incorrect error schema. %2

Role: errorRole

Category: BW_Plugin

Description: Generate error activity of the specified TIBCO ActiveMatrix BusinessWorks process contains incorrect schema.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000017: Abstract WSDL creation error. Exception [%1] occurred while creating abstract wsdl. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to create the abstract WSDL.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000018: Concrete WSDL creation error. Abstract WSDL contains no port type.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to create Concrete WSDL due to an error in the abstract WSDL.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000019: Concrete WSDL creation error. Exception [%1] occurred while creating concrete wsdl. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to create the Concrete WSDL.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000020: Unable to create ServiceAgentException schema. Exception: %1

Role: errorRole

Category: BW_Plugin

Description: Unable to create schema for the ServiceAgentException that can be raised by the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent'.

Resolution: This error may be caused by missing "ServiceAgentException.xsd" file. Please contact TIBCO Support.

BW-iPROCESS-000021: Unable to build ServiceAgentException node. Exception: %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable build a ServiceAgentException reply node for a request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000022: Unable to build ServiceAgentInterfaceDefinition node. Exception: %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable build a ServiceAgentInterfaceDefinition reply node for a request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000023: Request message format error. Message received= %1

Role: errorRole

Category: BW_Plugin

Description: Request message received by the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is incorrect.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000024: Request message format error. Missing valid JMS Property in the request message.

Role: errorRole

Category: BW_Plugin

Description: Request message received by the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is missing JMS Property 'SOAPAction' or no value is specified for this property.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000025: Request message format error. JMS Destination queue name to which a reply must be sent is missing in the request message.

Role: errorRole

Category: BW_Plugin

Description: JMS destination queue name to which the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' must reply to is missing in the request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000026: BusinessWorks iProcess Service Agent is unable to retrieve JMS request message. Exception occurred while retrieving the JMS request message. %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to retrieve the JMS request message. Exception occurred while retrieving the JMS request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000027: BusinessWorks iProcess Service Agent is unable to build Fault Node. Exception: %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable build a fault message for a request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000028: BusinessWorks iProcess Service Agent is unable to build Reply Node. Exception: %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable build a reply message for a request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000029: BusinessWorks iProcess Service Agent is unable to send reply message. Exception [%1] occurred while sending reply message. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to send reply to the request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000030: BusinessWorks iProcess Service Agent is unable to confirm the received JMS request message. Exception [%1] occurred on the confirm operation. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Service Agent' is unable to confirm the JMS request message.

Resolution: Please contact TIBCO Support.

BW-iPROCESS-000031: The BusinessWorks process [%1] referenced by the iProcess Service Agent has changed since the last configuration of the iProcess Service Agent. The current form of the BusinessWorks process will cause the iProcess Service Agent to generate a runtime exception. The iProcess Service Agent must be reconfigured. To reconfigure press the "Select Processes" button that is in the Configuration tab of the iProcess Service Agent.

Role: errorRole

Category: BW_Plugin

Description: The iProcess Service Agent references invalid BusinessWorks process. The iProcess Service Agent must be reconfigured.

Resolution: Reconfigure the iProcess Service Agent. To reconfigure press the "Select Processes" button that is in the Configuration tab of the iProcess Service Agent.

BW-iPROCESS-000050: Connection Test Failed. %1

Role: errorRole

Category: BW_Plugin

Description: Unable to test connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000051: Connection Test Failed. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Unable to test connection to the TIBCO iProcess Objects Server. Exception occurred

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000052: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. %1

Role: errorRole

Category: BW_Plugin

Description: Error occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000053: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000054: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the iProcess Objects Server is running and the iProcess Connection resource fields "Host Name", "IP Address" and "TCP Port" contain correct values. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000055: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the iProcess Objects Server is running and the iProcess Connection resource field "IP Address" contains correct value. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000056: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the iProcess Objects Server is running and the iProcess Connection resource field "Objects Server Name" contains correct value. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000057: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the iProcess Objects Server is running and the iProcess Connection resource fields "Objects Server Name", "IP Address" and "UDP Port" contain correct values. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000058: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the fields "User Name" and "Password" contain correct values. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000059: Connection Test Failed. Unable to establish connection to the iProcess Objects Server. Verify that the field "Is Director" contains correct value. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000060: Connection Test Failed. Unable to establish connection to the iProcess Engine's Database. %1

Role: errorRole

Category: BW_Plugin

Description: Error occurred while establishing database connection to the TIBCO iProcess Engine's database.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000061: Connection Test Failed. Unable to establish connection to the iProcess Engine's Database. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing database connection to the TIBCO iProcess Engine's database.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000062: Connection Test Failed. Unable to establish connection to the iProcess Engine's Database. SQLException occurred [%1].

Role: errorRole

Category: BW_Plugin

Description: SQLException occurred while establishing database connection to the TIBCO iProcess Engine's database.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000063: Connection Test Failed. Unable to establish connection to the iProcess Engine's database. The database login failed, verify that the fields "Database UserName" and "Database Password" contain correct values. This error also can occur when the database username is not correctly authenticated by the MicroSoft OS. SQLException occurred [%1].

Role: errorRole

Category: BW_Plugin

Description: SQLException occurred while establishing database connection to the TIBCO iProcess Engine's database.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000064: Connection Test Failed. Unable to obtain database information from the iProcess Objects Server. %1

Role: errorRole

Category: BW_Plugin

Description: Error occurred while retrieving database information from the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000065: Connection Test Failed. Unable to obtain database information from the iProcess Objects Server. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while retrieving database information from the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000066: Unable to establish connection to the iProcess Objects Server. %1

Role: errorRole

Category: BW_Plugin

Description: Unable to establish connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000067: Unable to establish connection to the iProcess Objects Server. Exception [%1] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while establishing connection to the TIBCO iProcess Objects Server.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000068: Connection to the iProcess Objects Server server was aborted.

Role: errorRole

Category: BW_Plugin

Description: Connection to the TIBCO iProcess Objects Server was aborted.

Resolution: Try to reconnect it to the server.

BW-iPROCESS-000069: Failed to find or load JDBC Driver [%1]. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while loading JDBC Driver.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000070: The BusinessWorks iProcess Connection shared resource reference [%1] not found.

Role: errorRole

Category: BW_Plugin

Description: Unable to obtain the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection' referenced by the activity.

Resolution: Please correct the error and retry.

BW-iPROCESS-000071: The BusinessWorks iProcess Connection shared resource reference [%1] not found in repository.

Role: errorRole

Category: BW_Plugin

Description: The repository does not contain the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection' referenced by the activity.

Resolution: Please correct the error and retry.

BW-iPROCESS-000072: The BusinessWorks iProcess Connection reference [%1] contains incorrect field values.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection' referenced by the activity contains invalid field values.

Resolution: Please correct the error and retry.

BW-iPROCESS-000073: Exception occurred while trying to obtain the BusinessWorks iProcess Connection reference [%1]: %2

Role: errorRole

Category: BW_Plugin

Description: Unable to obtain the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection' referenced by the activity.

Resolution: Please correct the error and retry.

BW-iPROCESS-000074: Invalid database type. The database type [%1] provided by the iProcess Objects Server is not supported by the BusinessWorks iProcess Plug-in.

Role: errorRole

Category: BW_Plugin

Description: TIBCO iProcess Objects Server returned a database type that is not supported by the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess.

Resolution: Please contact TIBCO Support

BW-iPROCESS-000075: Unable to obtain procedure names from the iProcess Objects Server. %1

Role: errorRole

Category: BW_Plugin

Description: Error occurred while trying to obtain procedure names from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000076: Unable to obtain the start step name for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while trying to obtain start step name for a procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000077: Unable to obtain the public step names for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while trying to obtain public step names for a procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000078: Unable to obtain step names for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while trying to obtain all step names for the procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000079: Unable to obtain the event step names for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while trying to obtain event step names for a procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000080: The iProcess procedure [%1] does not contain a Start step.

Role: errorRole

Category: BW_Plugin

Description: Specified TIBCO iProcess procedure does not contain a start steps.

Resolution: Please correct the error and retry.

BW-iPROCESS-000081: The iProcess procedure [%1] does not contain Public steps.

Role: errorRole

Category: BW_Plugin

Description: Specified iProcess procedure does not contain any public steps.

Resolution: Please correct the error and retry.

BW-iPROCESS-000082: The iProcess procedure [%1] does not contain steps.

Role: errorRole

Category: BW_Plugin

Description: Specified TIBCO iProcess procedure does not contain any steps.

Resolution: Please correct the error and retry.

BW-iPROCESS-000083: The iProcess procedure [%1] does not contain Event steps.

Role: errorRole

Category: BW_Plugin

Description: Specified iProcess procedure does not contain any event steps.

Resolution: Please correct the error and retry.

BW-iPROCESS-000084: The procedure information contained in the local cache does not match the procedure information in the iProcess Server. Please press Fetch/Refresh button and reselect the procedure name.

Role: errorRole

Category: BW_Plugin

Description: There is a mismatch of procedure information between local cache and the TIBCO iProcess Server. User must reselect the procedure name.

Resolution: Please correct the error and retry.

BW-iPROCESS-000085: There are no procedures with the status RELEASED defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO iProcess Engine does not contain any procedures with released status for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-000086: There are no procedures with the status UNRELEASED defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: The iProcess Server does not contain any procedures with unreleased status for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-000087: There are no procedures with the status MODEL defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO iProcess Server does not contain any procedures with model status for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-000088: Unable to obtain inputs required for the procedure [%1] from the iProcess Objects Server. %2

Role: errorRole

Category: BW_Plugin

Description: Error occurred while trying to obtain input fields required for a procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000089: Unable to obtain inputs required for the step [%1] contained the procedure [%2] from the iProcess Objects Server. %3

Role: errorRole

Category: BW_Plugin

Description: Error occurred while trying to obtain input fields required for a step in the procedure from the TIBCO iProcess Objects Server.

Resolution: Please correct the error and retry.

BW-iPROCESS-000090: iProcess Start Case activity configuration Error. Please reconfigure the activity by pressing Fetch/Refresh button and reselecting the procedure name.

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Start Case' was not configured correctly.

Resolution: Please correct the error and retry.

BW-iPROCESS-000091: Configuration error in field [%1] the value must be a valid procedure name.

Role: errorRole

Category: BW_Plugin

Description: The specified field contains incorrect value.

Resolution: Please correct the error and retry.

BW-iPROCESS-000092: Configuration error in field [%1] the value must be a valid step name.

Role: errorRole

Category: BW_Plugin

Description: The specified field contains incorrect value.

Resolution: Please correct the error and retry.

BW-iPROCESS-000093: BusinessWorks iProcess Plug-in activity configuration Error. Procedure name contains incorrect major or minor version number. %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity was not configured correctly. Procedure name contains incorrect version number.

Resolution: Please correct the error and retry.

BW-iPROCESS-000094: BusinessWorks iProcess Plug-in activity input schema creation error. Exception [%1] occurred while trying to create an input schema for the activity [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity was not able create schema for the activity's input tab. Exception occurred.

Resolution: Please correct the error and retry.

BW-iPROCESS-000095: BusinessWorks iProcess Plug-in activity output schema creation error. Exception [%1] occurred while trying to create an output schema for the activity [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity was not able create schema for the activity's output tab. Exception occurred.

Resolution: Please correct the error and retry.

BW-iPROCESS-000096: BusinessWorks iProcess Plug-in activity input data conversion error. Exception [%1] occurred while trying to render the activity input data. %2

Role: errorRole

Category: BW_Plugin

Description: This TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity was not able to convert the input data.

Resolution: Please contact TIBCO Support

BW-iPROCESS-000097: BusinessWorks iProcess Plug-in activity data conversion error. Exception [%1] occurred while trying to create the activity output data. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity was not able to create the output data.

Resolution: Please contact TIBCO Support

BW-iPROCESS-000098: BusinessWorks iProcess Plug-in activity initialization error. %1

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity initialization operation failed.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000099: BusinessWorks iProcess Plug-in activity initialization error. Exception [%1] occurred while creating JDBC Connection pool. %2

Role: errorRole

Category: BW_Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity is not able to create JDBC Connection pool.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000100: BusinessWorks iProcess Plug-in activity can not participate in the transaction group. The database connection type does match the transaction group type. Correct the database 'Connection Type' in the BusinessWorks iProcess Connection resource or enable 'Override Transaction Behavior' in the activity.

Role: errorRole

Category: BW_Plugin

Description: The database connection type in the associated TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection' does not match the transaction group type.

Resolution: Please correct the error and retry.

BW-iPROCESS-000101: No database connection available.

Role: errorRole

Category: BW-Plugin

Description: No database connection available.

Resolution: Try to increase the 'Max Connections' field value in the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess resource 'iProcess Connection'.

BW-iPROCESS-000102: BusinessWorks iProcess Plug-in activity's database or SQL operation timed out.

Role: errorRole

Category: BW-Plugin

Description: The TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess activity's database or SQL operation timed out.

Resolution: Please contact TIBCO Support

BW-iPROCESS-000103: BusinessWorks iProcess Plug-in activity operation Failed. Unable to create instance of StaffwareControlDAO for the database type [%1]. Exception [%2] occurred. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to create an instance of a com.staffware.integration.ssolite.java.library.StaffwareControlDAO. Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000104: iProcess Plug-in activity operation failed. Exception [%1] occurred. %2

Role: errorRole

Category: BW_Plugin

Description: Unable to complete the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess operation. Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000105: iProcess Plug-in activity operation failed. Error occurred. %1

Role: errorRole

Category: BW_Plugin

Description: Unable to complete the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000106: Unable to start case for iProcess procedure [%1]. Exception [%2] occurred. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to create an instance of a TIBCO iProcess procedure. Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000107: Unable to start case for iProcess procedure [%1]. SQLException occurred [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to create an instance of a TIBCO iProcess procedure. SQL Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000108: Unable to configure or execute the BusinessWorks iProcess Plug-in resource. The TIBCO BusinessWorks iProcess Plug-in is not supported by the current version of the TIBCO ActiveMatrix BusinessWorks. Please refer to the TIBCO BusinessWorks iProcess Plug-in documentation for the required TIBCO ActiveMatrix BusinessWorks version or hotfix.

Role: errorRole

Category: BW_Plugin

Description: The current version of the TIBCO ActiveMatrix BusinessWorks engine does not support the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess.

Resolution: Please make sure the TIBCO ActiveMatrix BusinessWorks Plug-in for iProcess is executed under the correct version of the TIBCO ActiveMatrix BusinessWorks.

BW-iPROCESS-000109: iProcess Connection resource configuration error. Value for the field "JDBC Driver" or "XA Data Source" does not match value in the field 'Database Type'. Verify that a correct JDBC driver or XA data source name is entered for the selected database type in the iProcess Connection resource.

Role: errorRole

Category: BW_Plugin

Description: JDBC driver or XA data source name does not match the selected database type.

Resolution: Please correct the error stated in the error message and retry.

BW-iPROCESS-000110: Unable to perform iProcess case operation [%1]. Exception [%2] occurred. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess case operation. Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000111: iProcess procedure case [%1] operation error. SQLException occurred [%2]. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess case operation. SQL Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000112: Activity input validation error. The length of the input value for the field [%1] exceeds the length specified for this field in the iProcess Procedure. The maximum length permitted for this field is [%2]; the length of input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000113: Activity input validation error. The number of digits in the input value for the field [%1] exceeds the number of digits specified for this field in the iProcess Procedure. The maximum number of digits permitted for this field is [%2]; the number of digits in the input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000114: Activity input validation error. The number of digits before decimal in the input value for the field [%1] exceeds the number of digits specified for this field in the iProcess Procedure. The maximum number of digits permitted before the decimal for this field is [%2]; the number of digits before the decimal in the input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000115: Activity input validation error. The number of digits in the input value for the field [%1] exceeds the number of digits specified for a negative number for this field in the iProcess Procedure. The maximum number of digits permitted for a negative number in this field is [%2]; the number of digits in the input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000116: Activity input validation error. The number of digits before decimal in the input value for the field [%1] exceeds the number of digits specified for a negative number for this field in the iProcess Procedure. The maximum number of digits permitted for a negative number before the decimal for this field is [%2]; the number of digits before the decimal in the input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000117: Activity input validation error. The number of digits after decimal in the input value for the field [%1] exceeds the number of digits specified for this field in the iProcess Procedure. The maximum number of digits permitted after the decimal for this field is [%2]; the number of digits after the decimal in the input value of this field is [%3].

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-000119: BusinessWorks iProcess Plug-in configuration error. Invalid priority number.

Role: errorRole

Category: BW_Plugin

Description: The value provided for the Priority field in the Input tab is invalid.

Resolution: Input a valid value for the Priority field. The values of priority ranges from 1 to 999.

BW-iPROCESS-000120: Connection Test Failed. Unable to connect to the iProcess Engine's Database.The wrong type of database has been specified. Valid values are: "ORACLE" or "SQL SERVER" or "DB2".

Role: errorRole

Category: BW_Plugin

Description: Invalid database type.

Resolution: Input a valid database type. Three types of database are supported: Oracle, SQL Server, and DB2. The spelling of the database type can be either upper case or lower case.

BW-iPROCESS-000121: Connection Test Failed. Unable to connect to the iProcess Engine's Database.The global variable for data type is not defined.

Role: errorRole

Category: BW_Plugin

Description: The global variable is not defined.

Resolution: Input a valid global variable that is defined for the database type.

BW-iPROCESS-000122: BusinessWorks iProcess Plug-in configuration error. BWPlugin.properties does not exist.

Role: errorRole

Category: BW_Plugin

Description: Cannot find the `BWPlugin.properties` file when connecting database.

Resolution: Make sure the `BWPlugin.properties` file is put in the *TIBCO_HOME*`\bw\plugins\lib\palettes` directory.

BW-iPROCESS-001000: iProcess %1 case [%2] operation error. Invalid sequence type. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001001: iProcess %1 case [%2] operation error. Unable to create DMO connection, check user is system administrator. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001002: iProcess %1 case [%2] operation error. Unable to set connection type. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001003: iProcess %1 case [%2] operation error. Unable to connect to server. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001004: iProcess %1 case [%2] operation error. Unable to verify connection. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001005: iProcess %1 case [%2] operation error. Failed to execute sequences. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001006: iProcess %1 case [%2] operation error. Failed to retrieve sequence number. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001007: iProcess %1 case [%2] operation error. Node details not found in database. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001008: iProcess %1 case [%2] operation error. MBox Queue Name(s) not found in database. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001009: iProcess %1 case [%2] operation error. Case number not found in database or has been purged. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001010: iProcess %1 case [%2] operation error. Procedure details not found in database for procedure name [%3]. %4.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001011: iProcess %1 case [%2] operation error. Procedure version not found in database for the specified procedure and case number. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001012: iProcess %1 case [%2] operation error. Latest Released or Unreleased Procedure version not found in database for procedure name [%3]. %4.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001013: iProcess %1 case [%2] operation error. Procedure version not found in database for procedure [%3]. %4.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001014: iProcess %1 case [%2] operation error. %3. %4.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001015: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001016: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001017: iProcess %1 case [%2] operation error. Failed to get request ID. %3

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001018: iProcess %1 case [%2] operation error. Sub-Procedure case number not found in database for procedure [%3]. %4.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001019: iProcess %1 case [%2] operation error. Case number not found in database or has been purged. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001020: iProcess %1 case [%2] operation error. Unexpected inconsistency between node name and delayed release id procedure node name. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001021: iProcess %1 case [%2] operation error. Unexpected inconsistency between node name and delayed release id queue node name. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001022: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001023: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001024: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001025: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001026: iProcess %1 case [%2] operation error. Failed to get request ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001027: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001028: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001029: iProcess %1 case [%2] operation error. Failed to get request ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001030: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001031: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001032: iProcess %1 case [%2] operation error. Failed to get request ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001033: iProcess %1 case [%2] operation error. Failed to get node ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001034: iProcess %1 case [%2] operation error. Failed to get procedure ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001035: iProcess %1 case [%2] operation error. Failed to get request ID. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001036: iProcess %1 case [%2] operation error. Case is already in active state. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001037: iProcess %1 case [%2] operation error. Case is in dead state. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001038: iProcess %1 case [%2] operation error. Case is already in suspended state. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001039: iProcess %1 case [%2] operation error. Case is in dead state. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001040: iProcess %1 case [%2] operation error. Case is in dead state. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001041: iProcess %1 case [%2] operation error. Procedure and case information does not match. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001042: iProcess %1 case [%2] operation error. Procedure and case information does not match. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001043: iProcess %1 case [%2] operation error. Procedure and case information does not match. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001044: Unable to complete delayed release [%1]. Exception [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform Complete Delayed Release instruction. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001045: Unable to complete delayed release [%1]. SQLException occurred [%2]. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform Complete Delayed Release instruction. SQL Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001046: Unable to obtain procedure names and fields for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred.

Role: errorRole

Category: BW_Plugin

Description: Unable to obtain procedure names and input fields. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001047: Unable to perform graft operation [%1] for graft step [%2] for iProcess procedure [%3]. Exception [%4] occurred. %5.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform graft operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001048: Unable to perform graft operation [%1] for graft step [%2] for iProcess procedure [%3]. SQLException [%4] occurred. %5.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform graft operation. SQL Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001049: Unable to obtain step names for procedure [%1] from the iProcess Objects Server. Exception [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to obtain step names for the selected procedure. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001050: The iProcess procedure [%1] does not contain graft steps.

Role: errorRole

Category: BW_Plugin

Description: The selected iProcess procedure does not contain graft steps. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001051: iProcess Graft activity configuration error. Please reconfigure the activity by pressing Fetch/Refresh button and reselecting the procedure name.

Role: errorRole

Category: BW_Plugin

Description: iProcess Graft activity configuration error. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001052: Unable to perform iProcess Audit [%1]. Exception [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess Audit. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001053: Unable to perform iProcess Audit [%1]. SQLException [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess Audit. SQL Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001054: Unable to perform iProcess Get Sub Case Number [%1]. Exception [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess Get Sub Case Number. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001055: Unable to perform iProcess Get Sub Case Number [%1]. SQLException [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform iProcess Get Sub Case Number. SQL Exception occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001056: Activity input validation error. The length of the input value for the field [%1] is zero length.

Role: errorRole

Category: BW_Plugin

Description: Value provided for the specified input field contains incorrect length.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001057: Unable to obtain sub-procedure call step names for procedure [%1]. from the iProcess Objects Server. Exception [%2] occurred. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to obtain sub-procedure call type step names. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001058: The iProcess procedure [%1] does not contain any graft, sub-procedure call or dynamic sub-procedure call steps.

Role: errorRole

Category: BW_Plugin

Description: The iProcess procedure does not contain any graft, sub-procedure call or dynamic sub-procedure call steps. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

BW-iPROCESS-001059: Database connection exception occurred.

Role: errorRole

Category: BW_Plugin

Description: Exception occurred while connecting to TIBCO iProcess Engine's database.

Resolution: Check that the database user has the correct permissions.

BW-iPROCESS-001060: Incompatible iProcess Engine Version. To use this activity you must upgrade to iProcess Engine version 10.5 or greater.

Role: errorRole

Category: BW_Plugin

Description: Incompatible iProcess Engine Version. To use this activity you must upgrade to iProcess Engine version 10.5 or greater.

Resolution: Please correct the error and retry.

BW-iPROCESS-001061: Incompatible iProcess Engine Version. To use this activity you must upgrade to iProcess Engine version 10.6 or greater.

Role: errorRole

Category: BW_Plugin

Description: Incompatible iProcess Engine Version. To use this activity you must upgrade to iProcess Engine version 10.6 or greater.

Resolution: Please correct the error and retry.

BW-iPROCESS-001062: Activity input validation error. The length of the input value exceeds the length for this field.

Role: errorRole

Category: BW_Plugin

Description: Activity input validation error. The length of the input value '%1' for the field [%2] exceeds the length specified for this field in the iProcess procedure. The maximum length permitted for this field is [%3]; the length of input value of this field is [%4].

Resolution: Please correct the error and retry.

BW-iPROCESS-001063: There are no sub procedures with the status RELEASED defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: There are no sub procedures with the status RELEASED defined in the iProcess Server for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-001064: There are no sub procedures with the status UNRELEASED defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: There are no sub procedures with the status UNRELEASED defined in the iProcess Server for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-001065: There are no sub procedures with the status MODEL defined in the iProcess Server for the specified user.

Role: errorRole

Category: BW_Plugin

Description: There are no sub procedures with the status MODEL defined in the iProcess Server for the specified user.

Resolution: Please correct the error and retry.

BW-iPROCESS-005000: iProcess %1 case [%2] operation error. %3.

Role: errorRole

Category: BW_Plugin

Description: Unable to perform the specified iProcess case operation. Error occurred.

Resolution: Please correct the error stated in the exception message and retry.

Appendix B Unsupported XPath Functions in iProcess Connector for ActiveMatrix BusinessWorks

Although the XML Mapper used in the iProcess Client Plug-in for ActiveMatrix BusinessWorks is the same as the XML Mapper used in TIBCO ActiveMatrix BusinessWorks, some XPath functions are not supported.

This appendix describes the XPath functions that are not supported.

Topics

Unsupported XPath Functions

Although the XML Mapper used in the iProcess Client Plug-in for ActiveMatrix BusinessWorks is the same as the XML Mapper used in TIBCO ActiveMatrix BusinessWorks, some XPath functions are not supported. Listed below are the unsupported XPath functions.

A

add-to-dateTime
add-to-time
avg

B

base-length
base64-to-hex
base64-to-string

C

compare-date
compare-dateTime
compare-time
concat-sequence
concat-sequence-format
conditionsiteration
create-date
create-dateTime
create-dateTime-timezone
create-time
current-date
current-dateTime
current-dateTime-timezone

D

datetime

E

empty
exists

F

for
format-date
format-dateTime

format-time

G

get-century-from-date
get-century-from-dateTime
get-day-from-date
get-day-from-dateTime
get-hours-from-DateTime
get-hours-from-time
get-minutes-from-dateTime
get-minutes-from-time
get-month-from-date
get-month-from-dateTime
get-seconds-from-dateTime
get-seconds-from-time
get-timezone-from-date
get-timezone-from-dateTime
get-timezone-from-time
get-year-from-date

H

hex-to-base64
hex-length
hex-to-string

I

if-absent
index-of

L

last-index-of
left
lower-case

M

max
min

P

pad
pad-and-limit
pad-front
parse-date
parse-dateTime
parse-time

R
render-xml
right
round-fraction

S
string-round-fraction
string-to-base64
string-to-hex
substring-after-last
substring-before-last

T
timestamp
tokenize
tokenize-allow-empty
translate-timezone
trim

U
upper-case

V
validate-dateTime

X
xor

Appendix C Configuring Database Connections

This appendix describes how to configure the `BWPlugin.properties` file and how to configure your database connections for best performance. Database connections are pooled for calls made to the database as part of processing a TIBCO iProcess Connector for ActiveMatrix BusinessWorks step.

Topics

Configuring JDBC Drivers

This section describes how to configure JDBC drivers for database connections in the `BWPlugin.properties` file. You can also configure JDBC drivers in the DatabaseConnection tab of the iProcess Connection shared resource, see iProcess Connection on page 74.

Perform the following tasks to configure JDBC drivers in the `BWPlugin.properties` file:

- Task A, Set Up a JDBC Driver
- Task B, Add a JDBC Driver

When the Auto Config checkbox in the DatabaseConnection tab of the iProcess Connection activity is checked, the configuration of the JDBC driver is applied after clicking the Test Connection button in the DatabaseConnection tab of the iProcess Connection activity or at runtime if the details of the database connection are changed. See iProcess Connection on page 74 for more information.

Task A Set Up a JDBC Driver

You need to set up JDBC drivers in the `BWPlugin.properties` file, which is located in the *TIBCO_HOME*`\bw\plugins\lib\palettes` directory, before connecting a database.

If the JDBC driver for database connection is not set in the `BWPlugin.properties` file, and the Auto Config checkbox in the DatabaseConnection tab of the iProcess Connection activity is checked, the TIBCO JDBC driver will be used for database connection.

To set up a JDBC driver:

1. Find the type of database that is used for database connection in the `BWPlugin.properties` file. Three types of databases are supported: Oracle, DB2, and SQL Server.
2. Delete all the number signs (#) that begin each command line under the database section. For example, if the Oracle database is used in your database connection, then edit the following command lines:

```
#For Oracle
#iProcessPlugin.DefaultDatabaseType=1
#iProcessPlugin.DefaultJdbcDriver=oracle.jdbc.driver.OracleDriver
#iProcessPlugin.DefaultDatabaseUrl=jdbc:oracle:thin:@<HOST>:<PORT>:<CONNECTIONID>
#iProcessPlugin.DefaultDataSource=oracle.jdbc.xa.client.OracleXADataSource
```

After deleting the number signs (#), the command lines should be:

```
#For Oracle
iProcessPlugin.DefaultDatabaseType=1
iProcessPlugin.DefaultJdbcDriver=oracle.jdbc.driver.OracleDriver
iProcessPlugin.DefaultDatabaseUrl=jdbc:oracle:thin:@<HOST>:<PORT>:<CONNECTIONID>
iProcessPlugin.DefaultDataSource=oracle.jdbc.xa.client.OracleXADataSource
```

Task B Add a JDBC Driver

After setting the JDBC driver in the `BWPlugin.properties` file, you need to add the JDBC driver of the database you required to the *TIBCO_HOME*`\tpcl\`*version_number*`\jdbc` directory or the `TIBCO_HOME\bw\version_number\lib` directory. If the `jdbc` folder does not exist, you need to create a `jdbc` folder under the *TIBCO_HOME*`\tpcl\`*version_number* directory.

Database Connection Pool

This section introduces how to improve the performance of database connections by configuring database connection pool.

Introduction of Database Connection Pool

TIBCO iProcess Connector for ActiveMatrix BusinessWorks enables you to create and manage a pool of database connections. It permits administration of the pool if required, and modifies the default behavior to increase the performance. One pool is created for each iProcess server instance, and is initialized when that server starts up. The pool is created in one of the iProcess background processes. In the event that the background process running the pool fails, the pool is transparently and automatically failed-over to another running background process instance.

You can specify many database pool parameters, so that they can be administered dynamically.

The default values for these parameters will be suitable for most installations. You should only change the default values as part of a performance-tuning exercise if you are entirely familiar with all aspects of the iProcess system and of your database. Otherwise, your system's performance may degrade.

For each database connection in the pool, you can direct messages from the plug-in to use a specific background message queue. This is done using the existing iProcess SSOLite functions `SW_SET_QUEUE()` and `SW_UNSET_QUEUE()`. See the Appendix "SSOLite Stored Procedures" in *iProcess Engine Database Administrator's Guide* for your database for full details of these functions.

Configuration of Database Connection Pool

The TIBCO iProcess Connector for ActiveMatrix BusinessWorks uses a pool of database connections to ensure best performance when handling database updates using the SSOLite stored procedures. It provides facilities that enable you to tailor some of the parameters used for this database connection pooling.

The pool used by TIBCO iProcess Connector for ActiveMatrix BusinessWorks is separate from the database pool used by the iProcess Java Plug-in and described in *TIBCO iProcess Java Plug-in User's Guide*.

The default values for the attributes which control the way each pool behaves are configured in the file *SWDIR*`\java\jmx\config.xml` and these values are used when the iProcess Engine starts up.

As well as being able to define defaults for many parameters associated with the database pooling mechanism used by the TIBCO iProcess Connector for ActiveMatrix BusinessWorks, there are further facilities which enable you to dynamically change the values at run-time. This is not done by changing the `java\jmx\config.xml` file but by configuring `DBPoolMBean` through the Java Monitoring & Management Console. Changes made in this way are not preserved if iProcess Engine is shut down and restarted.

For more information, see the Apache *Commons Pool 1.4 API* documentation. This is supplied on the iProcess Technology Plug-ins installation media in the `\pooling` folder. Click the `index.html` **file** to open the document, and then click the `GenericObjectPool` class.

Changing the following parameters is supported:

MaxActive=**8**
WhenExhaustedAction=**1**
MaxWait=**-1**
MaxIdle=**8**
MinIdle=**0**
TestOnBorrow=**false**
TestOnReturn=**false**
TimeBetweenEvictionRunsMillis=**900000**
NumTestsPerEvictionRun=**3**
MinEvictableIdleTimeMillis=**1800000**
TestWhileIdle=**false**
SoftMinEvictableIdleTimeMillis=**-1**
Lifo=**true**

The values given in the list above are the supplied defaults. For details about each of these parameters, see `GenericObjectPool` in the Apache *Commons Pool 1.4 API* documentation.

Note that changing any of the above values is normally done as part of a tuning exercise to improve performance. It is not possible to recommend alternative values without examining the performance characteristics of a particular system. You must carry out any changes with great care, to avoid affecting the performance of your system adversely.

Note also that the following values are available, but must not be changed:

ConnectionURL
DriverName
HeartBeatSQL

Message Queue Functionality

To use specific message queues in TIBCO iProcess Connector for ActiveMatrix BusinessWorks, you can modify the value of the `SpecificQueue` property in the `config.xml` file, which is located in the *SWDIR*`\java\jmx` directory, in the Java Monitoring & Management Console.

By default, this property is not set. This means that the BusinessWorks Connector makes no effort to determine what message queue is used.

To take advantage of the functionality provided to specify queues, you must set the value of this property to either `true` or `false`.

Setting `eaijava.db_specific_queue` to `true` causes the BusinessWorks Connector to call the SSOLite stored procedure, `SW_SET_QUEUE`. This directs messages to a specific queue. Once a first message has been sent, all messages subsequently posted on the same database connection then use the same background queue established by that first message.

Setting `eaijava.db_specific_queue` to `false` causes the BusinessWorks Connector to call the SSOLite stored procedure `SW_UNSET_QUEUE`. Messages sent over this database connection will not then be allocated to a specific queue but will be distributed over available queues.

See "SSOLite Stored Procedures" in *TIBCO iProcess Engine Database Administrator's Guide* for your database for descriptions of `SW_SET_QUEUE` and `SW_UNSET_QUEUE`.

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