

TIBCO® BusinessWorks IntegrationManager Plug-in

User's Guide

*Software Release 1.0
October 2004*

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Preface

TIBCO BusinessWorks is a standards-based, easy-to-use solution for companies looking to integrate their enterprise computing environment and automate their business processes. TIBCO IntegrationManager also allows you to create automated business processes. You may wish to reuse business logic from legacy TIBCO IntegrationManager projects in new TIBCO BusinessWorks projects. The TIBCO IntegrationManager (IM) palette allows your TIBCO BusinessWorks projects to reuse TIBCO IntegrationManager process diagrams. This manual describes the TIBCO IntegrationManager (IM) palette of TIBCO BusinessWorks.

This manual is not intended to be a complete reference for developing processes using TIBCO BusinessWorks or TIBCO IntegrationManager. Understanding the content of the TIBCO BusinessWorks and TIBCO IntegrationManager documentation is a prerequisite to using the IM palette.

Topics

- *Related Documentation, page vi*
- *How to Contact TIBCO Customer Support, page vii*

Related Documentation

You may find the following documentation resources useful.

TIBCO BusinessWorks Documentation

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

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

Other Documentation

TIBCO BusinessWorks is bundled with other products. You will therefore find the documentation for those products useful:

- TIBCO IntegrationManager documentation. TIBCO IntegrationManager is a process modeling tool that allows you to graphically model and automate business processes.
- TIBCO Designer documentation. TIBCO Designer is an easy to use graphical user interface for design-time configuration of TIBCO applications. TIBCO Designer includes online help for each palette.

- TIBCO Administrator documentation. TIBCO Administrator is the monitoring and managing interface for new-generation TIBCO products such as TIBCO BusinessWorks.

How to Contact TIBCO Customer Support

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

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

<http://www.tibco.com/services/support/default.jsp>

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

<http://support.tibco.com>

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

Chapter 1

Using the TIBCO BusinessWorks IntegrationManager Plug-in

The TIBCO BusinessWorks IntegrationManager Plug-in allows you to reuse process diagrams created in TIBCO IntegrationManager. This chapter provides a conceptual overview and usage notes for the plug-in.

Topics

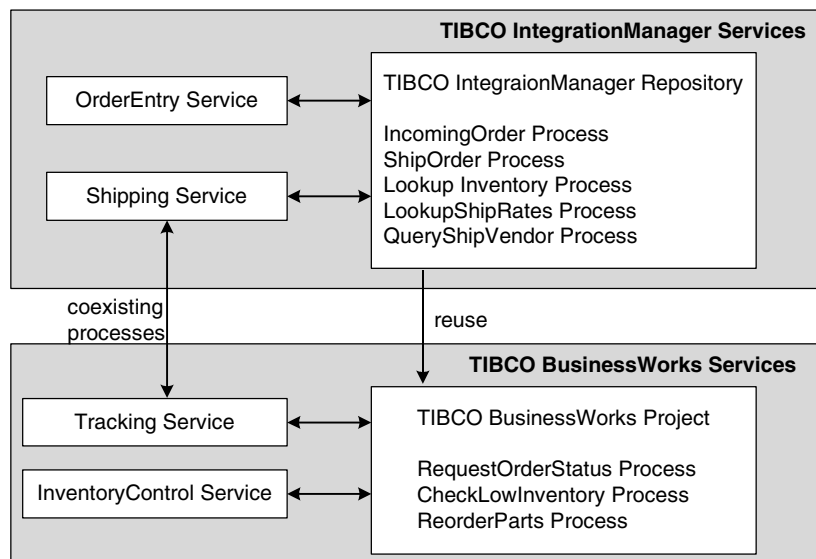
- *Overview, page 2*
- *Using the Plug-in, page 4*
- *Installing the Plug-in, page 7*
- *Example Projects, page 8*
- *Frequently Asked Questions, page 9*

Overview

Many organizations have significant investment in automated business processes implemented in TIBCO IntegrationManager. The TIBCO BusinessWorks IntegrationManager Plug-in allows you to leverage your existing investment while developing new TIBCO BusinessWorks process definitions. TIBCO BusinessWorks and TIBCO IntegrationManager have significantly different design paradigms. Business logic developed in TIBCO IntegrationManager must be re-designed to work in the TIBCO BusinessWorks environment. This plug-in allows you to reuse existing TIBCO IntegrationManager process diagrams within a TIBCO BusinessWorks process definition by loading the repository and invoking the process diagram created in TIBCO IntegrationManager from within a TIBCO BusinessWorks process definition.

If you wish to allow TIBCO IntegrationManager and TIBCO BusinessWorks processes to co-exist, then you can accomplish this by using standard messaging protocols (JMS, HTTP, and so on) to send and receive messages between business processes running in the different types of process engines. This plug-in does not assist or prevent a co-existence strategy, but rather it is designed to aid re-use of existing TIBCO IntegrationManager process diagrams within a TIBCO BusinessWorks process definition. You can choose to run tested and deployed services in TIBCO IntegrationManager while developing new services in TIBCO BusinessWorks. Figure 1 illustrates TIBCO BusinessWorks and TIBCO IntegrationManager co-existence and reuse.

Figure 1 TIBCO IntegrationManager and TIBCO BusinessWorks reuse and co-existence



In Figure 1, the OrderEntry and Shipping services were created in TIBCO IntegrationManager. These services relied on processes to handle incoming orders, lookup inventory quantities, and determine shipping rates from vendors. These services will continue to run within a TIBCO IntegrationManager engine, but TIBCO BusinessWorks will be used to implement the new Tracking and InventoryControl services. These services will rely on newly-developed processes in TIBCO BusinessWorks, and they will also use existing processes in TIBCO IntegrationManager, such as the LookupInventory process. Also, the Tracking and Shipping service will communicate with each other by way of HTTP.

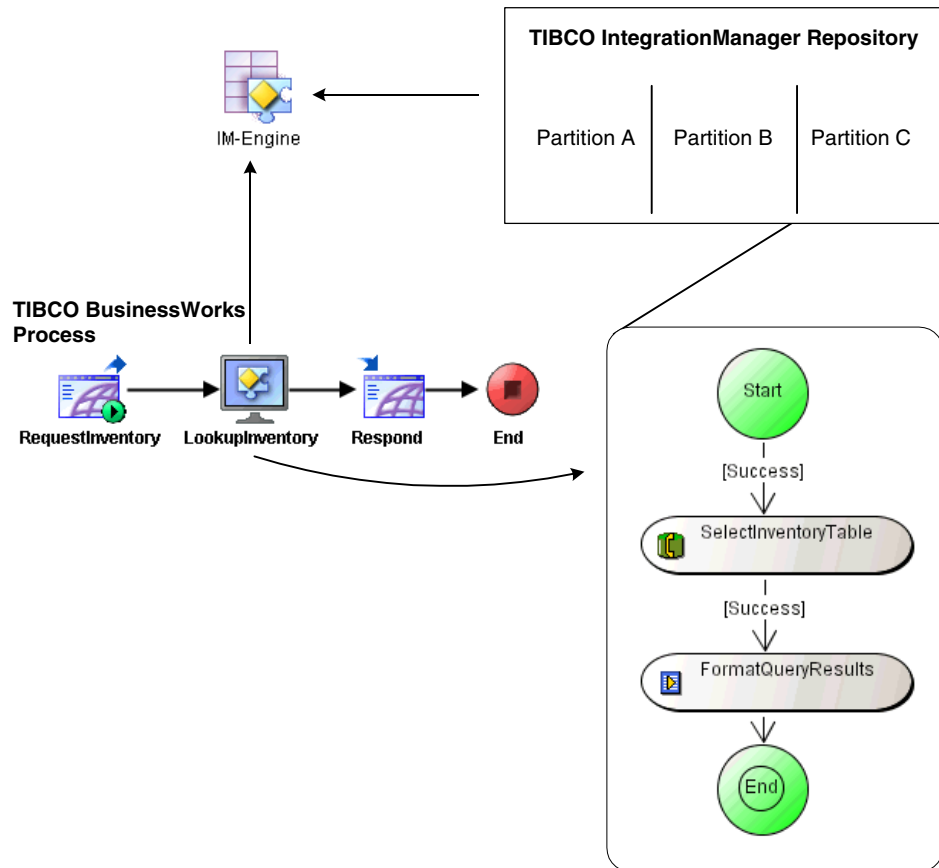
Working with both TIBCO IntegrationManager and TIBCO BusinessWorks will require significant analysis to determine which processes can be reused, which should continue to run unchanged, and which should be redeveloped. This manual describes how to use this plug-in to reuse TIBCO IntegrationManager processes, but it is beyond the scope of this manual to describe all of the possible issues you will encounter when analyzing the interoperability of TIBCO IntegrationManager and TIBCO BusinessWorks. Also, you should be familiar with both TIBCO BusinessWorks and TIBCO IntegrationManager before beginning your analysis. See the TIBCO BusinessWorks and TIBCO IntegrationManager documentation for more information.

Using the Plug-in

The TIBCO BusinessWorks IntegrationManager Plug-in runs a TIBCO IntegrationManager engine within the same Java VM as the TIBCO BusinessWorks process engine. This engine is used to run TIBCO IntegrationManager process diagrams that you wish to call from TIBCO BusinessWorks process definitions.

Figure 2 illustrates a project using the TIBCO BusinessWorks IntegrationManager plug-in.

Figure 2 Using the plug-in



The IM Engine shared configuration resource specifies a TIBCO IntegrationManager repository to load into the project. The IM Engine resource allows you to pass command-line arguments to the engine so that configuration properties can be specified. In Figure 2, the IM Engine loads only Partition C because the remainder of the repository is not used by the TIBCO BusinessWorks process.

The IM Job Creator activity allows you to call a TIBCO IntegrationManager process diagram within the repository loaded by the IM Engine resource. In Figure 2, the TIBCO BusinessWorks process definition calls the LookupInventory process diagram and returns the results to the requestor.

Changes in TIBCO IntegrationManager Behavior

The engine run by the TIBCO BusinessWorks IntegrationManager plug-in behaves the same as a TIBCO IntegrationManager engine, with the following exceptions:

- Regardless of the setting of the TIBCO IntegrationManager property `Config.Distributed`, the IntegrationManager engine is run in non-distributed mode. All engine status notifications and fault-tolerant related features are disabled.
- Certain TIBCO Hawk commands (for example, `moveJob`, `moveJC`, `shutdown`, and so on) cannot be used on the TIBCO IntegrationManager engine. An error is returned if these commands are attempted.
- TIBCO IntegrationManager can be configured as an ActiveEnterprise operation server. The engine sets the appropriate job slots to the response for the operation, but it will not automatically send the response to the requestor. The TIBCO BusinessWorks process must send the response (which can be obtained from the job slots).
- Flow control is disabled in the TIBCO IntegrationManager engine. Use TIBCO BusinessWorks to control the flow of process instances.
- When the IM Job Creator activity has the Wait for IM Job field unchecked, the TIBCO IntegrationManager job is executed asynchronously, and any Checkpoint tasks within the job are performed. When the Wait for IM Job field is checked, you can optionally specify to perform checkpoints in the IM job by checking the Checkpoint field. If the Checkpoint field is unchecked, any Checkpoint tasks in the IM job are ignored.

Transport Conflicts

Just as you must resolve transport conflicts between TIBCO IntegrationManager engines, any transport conflicts between the TIBCO IntegrationManager process and the TIBCO BusinessWorks process must be addressed. For example, RV transports should not use the same subject for incoming messages, or both the TIBCO BusinessWorks and TIBCO IntegrationManager processes will receive the message.

Running Multiple Engines

The IM Engine shared configuration resource specifies the TIBCO IntegrationManager engine characteristics. An engine is run for each IM Engine resource that is referred to by a IM Job Creator task in a process definition. Therefore, if you create multiple IM Engine resources, you should ensure that the engines can co-exist in a single Java VM. For example, do not use custom Java code that is incompatible.

Deploying Projects that Use the Plug-in

When you specify a locally-stored repository (that is, a .dat file or a multi-file repository) for an IM Engine shared configuration resource, only the reference to the repository location is stored in the project. When the project is deployed, the TIBCO IntegrationManager repository is not automatically copied to the machine where the TIBCO BusinessWorks engine is deployed. The TIBCO BusinessWorks engine requires the repository to be accessible in the specified location in order for the plug-in's resources to function properly.

To address this, you should use one of the following methods for specifying the repository location in the IM Engine shared configuration resource:

- Use a reference to a repository server that stores the TIBCO IntegrationManager repository. The repository server must be accessible to all machines where the projects that use the plug-in are deployed.
- Use one or more global variables to specify the location of the locally stored repository. The value of global variables can be altered when a project is deployed, so you can specify the location of the repository file(s) on the machine where the project will execute. You must also copy the repository file(s) to the specified location on the target machine.

Properties files specified in the Engine Flags field of the IM Engine resource must also be available in the location specified on the machine where a project is deployed. Therefore, you should use a global variable in this field to specify the location of the properties file, then copy the files to the target machine and specify the correct location in the global variable when the project is deployed.

Installing the Plug-in

The following sections detail the installation and configuration required for the TIBCO BusinessWorks IntegrationManager Plug-in.

Prerequisites

The following software is required for using the TIBCO BusinessWorks IntegrationManager Plug-in.

- TIBCO BusinessWorks 5.1.3 or greater. Note that TIBCO Runtime Agent is required software for TIBCO BusinessWorks.
- TIBCO IntegrationManager 5.0.1-hotfix 7 or greater.

The plug-in should operate properly with repositories created in earlier versions of TIBCO IntegrationManager, but the process diagrams and other items that are used within the project must be compatible with release 5.0.1 or later, so migrating the project to release 5.0.1 is only necessary if the items you are using do not operate in the same way in TIBCO IntegrationManager release 5.0.1.

TIBCO BusinessWorks and TIBCO IntegrationManager must be installed on the same machine where you plan to create your TIBCO BusinessWorks integration projects. It is recommended that TIBCO IntegrationManager be installed in the default location `<TIBCO_HOME>/im/5.0`, but if it is installed in another location, you must place the following line in the `bwengine.tra` and `designer.tra` files:

```
java.property.IM_HOME: <im_installation_directory>
```

where `<im_installation_directory>` is the non-default location where you have installed TIBCO IntegrationManager.

Also, TIBCO IntegrationManager must be installed on any machine where TIBCO BusinessWorks engines are deployed and you intend to run process instances that use the TIBCO BusinessWorks IntegrationManager Plug-in functionality.

Installing the Plug-in

Use the installation program to install the TIBCO BusinessWorks IntegrationManager Plug-in. Follow the instructions given during the installation process.

Once the plug-in is installed, start TIBCO Designer to begin creating process definitions with the TIBCO BusinessWorks IntegrationManager Plug-in.

Example Projects

The `<IM_HOME>/tools/bwplugin/samples/im` directory contains a number of example projects. The readme files contained in each project directory provide information on the example, detail how to run the example, and contain other useful notes.

Frequently Asked Questions

The following sections detail commonly asked questions and answers.

Can I continue to run an independent TIBCO IntegrationManager engine along with this plug-in?

Yes, as long as the two are partitioned to prevent unwanted duplication of event handling.

Can I run multiple TIBCO IntegrationManager engines in a single TIBCO BusinessWorks process engine?

Yes, although the engines need to be designed to co-exist in a single Java Virtual Machine. That is, you should not use common custom Java code that is incompatible.

When does the TIBCO IntegrationManager engine start, and is there any way to control it?

The engine is started as a service agent during the TIBCO BusinessWorks process engine startup. The service agent is activated after the TIBCO BusinessWorks process engine initialization is completed. The configuration settings for the TIBCO IntegrationManager engine are specified in the repository.

Command line parameters are not passed from the TIBCO BusinessWorks engine command line to the TIBCO IntegrationManager engine startup, although system environment variables are available to the TIBCO IntegrationManager engine as it is running in the same JVM as the TIBCO BusinessWorks process engine.

Can all of the job creators run in the embedded engine?

Yes, although you should ensure that duplicated event processing is not done by TIBCO BusinessWorks and TIBCO IntegrationManager.

Can a subset of the TIBCO IntegrationManager job creators run in the embedded engine?

Yes, a property file can be used to control the job creators that are activated. These job creators are usually needed to receive messages sent from a job inside of the TIBCO IntegrationManager engine to start another TIBCO IntegrationManager job.

How do I use TIBCO ActiveEnterprise schemas defined in TIBCO IntegrationManager within a TIBCO BusinessWorks project?

TIBCO Designer has a tool that allows you to convert .dat project files into TIBCO Designer projects. When you use this tool to convert a TIBCO IntegrationManager project, the AE schemas contained in that project are placed in the AESchemas folder of the resulting project.

For more information about converting .dat files to TIBCO Designer projects, see TIBCO Designer User's Guide.

Can TIBCO BusinessWorks and TIBCO IntegrationManager share RVCM publish queues?

Yes, both TIBCO BusinessWorks and TIBCO IntegrationManager use standard TIBCO Rendezvous implementations, so both can work together.

Can TIBCO BusinessWorks and TIBCO IntegrationManager both listen on the same RVCM subject?

Yes, although they must each provide their own RVCM Name, as that name must be unique to each listener.

Can TIBCO IntegrationManager confirm a RVCM message that TIBCO BusinessWorks receives?

No, the confirmation must be done by TIBCO BusinessWorks.

Can TIBCO IntegrationManager commit a transaction for a RVTX message that TIBCO BusinessWorks receives?

No, the transaction must be committed by TIBCO BusinessWorks.

Why does my process definition not pick up changes to the IM Engine resource when I test the process definition?

If you change an IM Engine resource (for example, to point to a new repository), testing process definitions that contain IM Job Creator activities that reference the IM Engine resource may not always pick up the change. You must select both the process definition and the IM Engine resource in the Select Processes to Load dialog before testing the process definition.

Will the immon tool provided with TIBCO IntegrationManager continue to work with the embedded TIBCO IntegrationManager engine?

Yes, immon should function as it would with a stand-alone TIBCO IntegrationManager engine, however, the not all commands on the Engine Control tab will function.

Will the embedded TIBCO IntegrationManager engine listen for TIBCO Hawk events?

Yes, although some microagent methods are ignored, such as methods to move job creators or move jobs.

What causes the "Failed to find process..." error?

A TIBCO IntegrationManager engine determines which process diagrams to load by examining which process diagrams job creators call. It also loads all processes marked with "Always Load". Other than typos, the likely cause of the error is that all the job creators that call the process are in partitions that are not loaded.

Another possible cause is that TIBCO BusinessWorks is attempting to call a process that is exclusively used as an inline subprocess in TIBCO IntegrationManager. TIBCO IntegrationManager does not keep inline processes as actual process objects; instead, they are "flattened" into the caller processes.

One solution for this problem is to enable the "Always Load" flag on the specified process diagram using the TIBCO IntegrationManager editor. Then save the change to the repository and reload the repository into the IM Engine resource in TIBCO BusinessWorks.

How do I ensure that the correct XML parser is used?

Certain TIBCO IntegrationManager features, in particular SOAP and Web Services, require XML parsing. In some cases, a certain XML parser is preferred or required. By default, TIBCO BusinessWorks uses the Xerces parser. If the incorrect XML parser is used, you may get exceptions such as Connection Refused when attempting to send a request to a SOAP server.

One possible solution to ensure that TIBCO IntegrationManager uses the correct XML parser is to perform the following:

1. Comment out the following properties in file
`<TIBCO_HOME>/bw/<versionNum>/bin/bwengine.tra:`

```
java.property.javax.xml.parsers.SAXParserFactory
java.property.javax.xml.parsers.DocumentBuilderFactory
```
2. Also, set the following property

```
java.property.com.tibco.sax.SaxSupport.USE_DEFAULT_FACTORY=true
```

To ensure the TIBCO Designer environment is properly configured, make the same changes in steps 1 and 2 to the file

```
<TIBCO_HOME>/designer/<versionNum>/bin/designer.tra.
```

If TIBCO IntegrationManager still does not use the correct XML parser after performing the procedure above, contact TIBCO Support.

Why does the IM Engine activity sometimes return an error even if the error is handled in the TIBCO IntegrationManager process diagram?

Upon returning from a call to an TIBCO IntegrationManager process, the IM Engine activity looks for exception-related data in the "_error" slot. If this is found, an exception is created and thrown to force an error transition in the TIBCO BusinessWorks process definition.

If some task in TIBCO IntegrationManager returns an error, data is placed into the _error slot. Unless logic is added to remove the data after the error is handled, the data remains on the slot and is detected by the IM Engine activity in TIBCO BusinessWorks.

You can work around this problem by either changing the logic of your TIBCO IntegrationManager process diagram to remove the data from _error, or you can continue to let an error be raised to the TIBCO BusinessWorks process definition, but create an error handling routine to determine if the exception was already handled in the TIBCO IntegrationManager process.

Chapter 2 **IM Palette Reference**

This chapter describes the resources contained in the IM Palette.

Topics

- *IM Engine, page 14*
- *IM Job Creator, page 17*

IM Engine

Shared Configuration



IM-Engine

The IM Engine shared configuration resource specifies the characteristics of a connection to a particular repository containing a TIBCO IntegrationManager project. This repository connection will be used to create an instance of the TIBCO IntegrationManager engine to run jobs. You can specify any flags that are normally used when you start a TIBCO IntegrationManager engine. See the TIBCO IntegrationManager documentation for more information about engines and startup options.

Configuration

The Configuration tab has the following fields.

Field	Global Var?	Description
Name	No	The name to appear as the label for the resource.
Description	No	Short description of the shared resource.
Repository Location	Yes	<p>This field is only available when Remote Repository is selected in the Repository Type field. This field specifies the location of the repository containing the TIBCO IntegrationManager project.</p> <p>You can specify additional information about where to locate the repository by using the fields on the Advanced tab.</p> <p>The Browse button allows you to locate the repository. The repository can be a .dat file, a multi-file project, or a repository URL.</p>
Engine Flags	Yes	<p>The engine flags to use when starting the TIBCO IntegrationManager engine. See the TIBCO IntegrationManager documentation for a full description of the available engine flags.</p> <p>It is recommended that you do not specify the required flags (-s and -name). When these values are not specified, the plug-in generates appropriate values.</p>

Field	Global Var?	Description
Encoding	No	The encoding used by the TIBCO IntegrationManager repository.
Start Job Creators	No	<p>When this field is checked, listeners for channels specified by TIBCO IntegrationManager Job Creators within the loaded repository partition are started. This allows the IntegrationManager processes to accept incoming events on these channels.</p> <p>This field should only be checked when these listeners will not interfere or conflict with the TIBCO BusinessWorks event listeners. For example, if RV is the transport for an IntegrationManager channel, make certain that the TIBCO BusinessWorks process is not expecting incoming messages for the same subject.</p>
Merge Traces	No	<p>When this field is checked, TIBCO IntegrationManager trace messages are output to the same location as TIBCO BusinessWorks messages (see <i>TIBCO BusinessWorks Process Design Guide</i> for more information on setting the location for trace messages).</p> <p>When this field is unchecked, TIBCO IntegrationManager trace messages are sent to the location specified in the properties file used to configure the engine. See the TIBCO IntegrationManager documentation for more information on configuring the location of trace messages.</p>

Advanced

The Advanced tab allows you to configure the way in which the TIBCO IntegrationManager repository is located. This tab is roughly analogous to the Advanced Logon Properties dialog of the TIBCO IntegrationManager editor. The settings on this tab only control where to find repositories for the list of repositories displayed when using the Browse button in the Repository Location field on the Configuration tab.

The Advanced tab has the following fields.

Field	Global Var?	Description
Search Using Local Directory	No	Specifies that the repository should be found by searching a directory on the local machine. The location of the directory is specified in the Local Directory field.
Local Directory	No	Specifies the location of the local directory to search for TIBCO IntegrationManager repositories.
Search Using TIBCO Rendezvous	No	Specifies that the repository should be discovered using a TIBCO Rendezvous subject.
Discovery Subject	No	Subject to use to discover TIBCO IntegrationManager repositories.
Timeout	No	Specifies the amount of time (in milliseconds) to wait for operations with the TIBCO Repository server. This parameter is useful if you are loading a large configuration from a repository server. Larger configurations can take longer to load, so you may want to increase this value.
RVD Daemon	No	The rvd daemon parameter to use when communicating with the repository.
RVD Network	No	The name of the rvd service to use when communicating with the repository.
RVD Service	No	The rvd network parameter to use when communicating with the repository.

IM Job Creator

Activity



The IM Job Creator activity allows you to call a TIBCO IntegrationManager process diagram from a TIBCO BusinessWorks process definition.

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 process definition.
Description	No	Short description of the activity.
IM Engine	No	The IM Engine shared configuration resource that contains the process you wish to run. Use the Browse button to locate the correct resource.
IM Process Diagram	No	The name of the TIBCO IntegrationManager process diagram you wish to call. Use the Browse button to display a list of available process diagrams for the selected IM Engine.
Wait for IM Job	No	<p>This field determines whether to wait for the TIBCO IntegrationManager job to complete before taking the next transition in the process definition. If this field is unchecked, the transition is taken after calling the specified process diagram and the TIBCO IntegrationManager job executes asynchronously.</p> <p>If this field is checked, the process instance waits for the job to complete before taking the next transition. Also, the Output Editor and Output tabs appear and you can specify the expected output of the completed TIBCO IntegrationManager job. This output can then be made available to subsequent activities in the process definition. Also, the Checkpoint and Timeout fields appear when this field is checked.</p>

Field	Global Var?	Description
Checkpoint	No	<p>When this field is checked, Checkpoint tasks in the TIBCO IntegrationManager process diagram are performed. When this field is unchecked, Checkpoint tasks are ignored (any ignored checkpoints are noted as warnings in the trace output).</p> <p>When this field is checked, an implicit checkpoint is performed in the TIBCO BusinessWorks process when the IM Job Creator activity is executed. This ensures that a restarted TIBCO BusinessWorks job can restart the associated checkpointed TIBCO IntegrationManager job and continue processing.</p>
Timeout (seconds)	Yes	<p>Time (in seconds) to wait for the TIBCO IntegrationManager job to complete. Specifying 0 signifies that no timeout is enforced. After the specified timeout, TIBCO BusinessWorks attempts to kill the job, if it still exists.</p>

Input Editor

The Input Editor tab has a table containing a list of job slots for the specified TIBCO IntegrationManager process diagram. The job slots specified in this table become input elements on the Input tab so that you can pass data to the process you wish to call.

The buttons to the right of the table allow you to add, delete, or move job slots. You can use the Show IM Data Wizard button  to obtain a list of potential job slots and select which slots you wish to include in the input elements of this activity. See IM Data Wizard on page 20 for more information.


The table in the Input Editor tab has the following columns:

Column	Description
Job Slot Name	Name of the TIBCO IntegrationManager job slot that you would like to pass a value to through this activity's input.
Field Type	The job slot type. Double click on the cell to obtain a selection list to pick either Java Primitive or AE Instance.

Column	Description
Data Type	The data type of the job slot. Cells in this column have values depending upon what is selected in the Field Type column. For Java Primitive job slots, you can select from a list of Java primitives such as String, Integer, and so on. For AE Instance job slots, a Browse button is available for you to select an AE class for the data contained in the job slot.
Required	This column indicates whether the job slot is required, and therefore an input mapping for the job slot is required on the Input tab. Check the box in this column if the job slot is required. Uncheck the box in this column if the job slot is not required.

Output Editor

The Output Editor tab is only available when the Wait for IM Job field is checked on the Configuration tab. This tab has a table containing a list of job slots for the specified TIBCO IntegrationManager process diagram. The values of the specified job slots will be obtained from the completed TIBCO IntegrationManager process and placed into the output process variable for this activity.

The buttons to the right of the table allow you to add, delete, or move job slots. You can use the Show IM Data Wizard button  to obtain a list of potential job slots and select which slots you wish to include in the output elements of this activity. See IM Data Wizard on page 20 for more information

The table in the Output Editor tab has the following columns:

Column	Description
Job Slot Name	Name of the TIBCO IntegrationManager job slot that you would like to retrieve from the IM process and store in this activity's output.
Field Type	The job slot type. Double click on the cell to obtain a selection list to pick either Java Primitive or AE Instance.
Data Type	The data type of the job slot. Cells in this column have values depending upon what is selected in the Field Type column. For Java Primitive job slots, you can select from a list of Java primitives such as String, Integer, and so on. For AE Instance job slots, a Browse button is available for you to select an AE class for the data contained in the job slot.

Column	Description
Required	This column indicates whether the job slot is required, and therefore the IM process must place a value in this slot. Check the box in this column if the job slot is required. Uncheck the box in this column if the job slot is not required.

IM Data Wizard


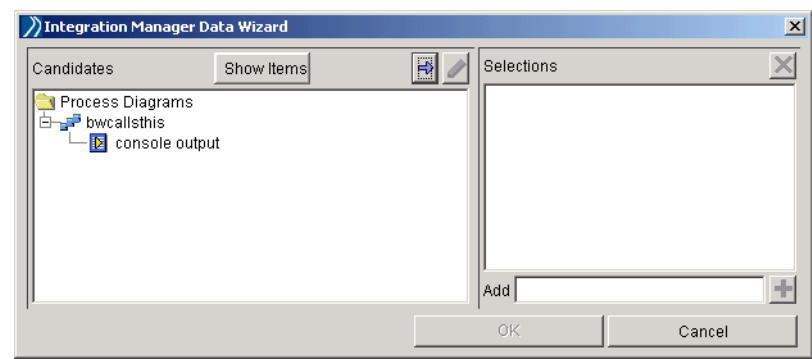

The IM Data Wizard dialog is available by clicking the Show IM Data Wizard  button on the Input Editor or Output Editor tab. This wizard allows you to quickly and easily select the job slots you wish to use. This wizard analyzes the TIBCO IntegrationManager repository and presents the potential job slots that could be used as input or output for the IM process. Figure 3 illustrates the IM Data Wizard dialog.

Figure 3 IM Data Wizard



The left panel of the dialog displays a tree of candidate objects and their associated job slots. For example, for a job creator, the binds that define the information that is placed on to the job are displayed. The tree can be modified to show more or fewer items by using the Show Items menu.

You can select job slots listed in the left panel and use the move button  to place the slots into the list of selected items on the right. The selected job slots will populate the job slot table on the editor tab from where you invoked the IM Data Wizard.

You can select objects in the tree and click the edit button  to display the contents of the Edit dialog for the object.

Input

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

The input for the activity is the following.

Input Item	Datatype	Description
Job	varies	An object containing the input to the TIBCO IntegrationManager process. The contents of this element depend upon what job slots are specified on the Input Editor tab.

Output

The output for the activity is the following.

Output Item	Datatype	Description
Job	varies	An object containing the output of the completed TIBCO IntegrationManager process. The contents of this element depend upon what job slots are specified on the Output Editor tab.
Call-Status	complex	An object containing the return value (returned as a string) specified on the End task of the TIBCO IntegrationManager job.

Error Output

The Error Output tab lists the possible exceptions that can be thrown by this activity. See *TIBCO BusinessWorks Error Codes* for more information about error codes and corrective action to take.

Exception	Thrown When...
IMEngineException	An error occurs when communicating with the process engine.

Exception	Thrown When...
IMEngineProcessException	An error occurs when executing the IM process.
ActivityTimedOutException	The activity failed to complete within its configured timeout period.

Chapter 3 **Error Codes**

This chapter describes error codes that can be returned by activities within the IM palette.

Topics

- *IM Error Codes, page 24*

IM Error Codes

BW-IM-100000: Error starting IM Engine: %1

Role: errorRole

Category: BW_IMPlugin

Description: Encountered an error while starting the IM engine.

Resolution: Examine the configuration settings.

BW-IM-100001: Error creating IM job for process %1: %2

Role: errorRole

Category: BW_IMPlugin

Description: Encountered an error while creating the IM job.

Resolution: Examine the configuration settings.

BW-IM-100002: Error getting results from IM job for process %1: %2

Role: errorRole

Category: BW_IMPlugin

Description: Encountered an error while extracting data from the IM job.

Resolution: Examine the configuration settings.

BW-IM-100003: Required property IM_HOME not defined

Role: errorRole

Category: BW_IMPlugin

Description: Property IM_HOME needs to be defined.

Resolution: Define property IM_HOME.

BW-IM-100004: Unable to find file %1

Role: errorRole

Category: BW_IMPlugin

Description: Unable to locate imse.tra.

Resolution: Make sure imse.tra exists under im-install/bin.

BW-IM-100005: Unable to find property %1

Role: errorRole

Category: BW_IMPlugin

Description: Unable to find property tibco.class.path.extended in imse.tra.

Resolution: Make sure to define property tibco.class.path.extended in imse.tra.

BW-IM-100006: Method %1 not supported

Role: errorRole

Category: BW_IMPlugin

Description: Calling a method that is not supported (should happen only in development).

Resolution: Call TIBCO Support.

BW-IM-100007: Method %1 not found through reflection

Role: errorRole

Category: BW_IMPlugin

Description: Certain required method is not found on some class as expected.

Resolution: Make sure the correct version of IM is installed.

BW-IM-100008: Unable to convert object of type %1

Role: errorRole

Category: BW_IMPlugin

Description: Encountered a datatype that's not supported.

Resolution: Call TIBCO Support.

BW-IM-100009: ANY type not substituted with a concrete type

Role: errorRole

Category: BW_IMPlugin

Description: Encountered a field whose declared type is ANY which is not substituted with a concrete type at runtime.

Resolution: Examine the configuration bindings.

BW-IM-100010: Object of type %1 not serializable

Role: errorRole

Category: BW_IMPlugin

Description: BW requires that objects stored on the process context be serializable.

Resolution: Change the Java code to make sure the specified class implements Serializable, and is indeed serializable.

BW-IM-100011: Error initializing IM Editor: %1

Role: errorRole

Category: BW_IMPlugin

Description: Error encountered while initializing the IM Editor.

Resolution: Check the repository setting in the engine shared resource.

BW-IM-100050: Required minimum BW version %1; found %2

Role: errorRole

Category: BW_IMPlugin

Description: Certain features in BW which are required for the IM plugin are available only in certain version of BW and later versions.

Resolution: Install the correct version of BW.

BW-IM-100051: Required minimum IM version %1; found %2

Role: errorRole

Category: BW_IMPlugin

Description: Certain features in IM which are required for the IM plugin into BW are available only in certain version of IM and later versions.

Resolution: Install the correct version of IM.

BW-IM-100100: Create IM Engine: %1 with %2

Role: infoRole

Category: BW_IMPlugin

Description: Create an IM Engine with given parameters if a similar instance does not exist.

Resolution: N/A

BW-IM-100101: Activate IM Engine: %1 with %2

Role: infoRole

Category: BW_IMPlugin

Description: Called from ServiceAgent.activate(), create an IM Engine with given parameters if a similar instance does not exist.

Resolution: N/A

BW-IM-100102: IM Plugin %1 * NOT FOR PRODUCTION *

Role: infoRole

Category: BW_IMPlugin

Description: This is a beta version of the IM Plugin. Not to be put in production.

Resolution: N/A

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