TIBCO Business Studio™ - BPM Edition

Modeling Guide

Version 5.5.0 | March 2024

Document Updated: July 2024

Contents

Introduction to TIBCO Business Studio - BPM Edition

TIBCO Business Studio™ - BPM Edition can be installed using the Studio for Designers installation.

For more information, see *TIBCO Business Studio - BPM Edition Installation*.

Studio for Designers

Studio for Designers provides a project-based view and enables the solution designer to add details to and manage the processes at a project level. This installation is suited to users who are more comfortable with developer tools, and who need access to all files related to the project.

To launch TIBCO Business Studio - BPM Edition as a solution designer, go to **Start > TIBCO > Studio for Designers 5.x**.

Creating a Project Package and Process

You can create a new TIBCO Business Studio project, package and process are part of the same procedure using a template.

> **Note:**
> - If you have processes that you created using previous versions of TIBCO Business Studio, you must migrate them to the current version as described in Migration of Projects Created in Previous Versions.
>
> - This topic describes how to create a project, and at the same time create a package and process using a template. You can however, perform each operation separately.

Procedure

1. Go to **File > New > BPM Process Project**.

2. Complete the New BPM Process Project dialog as follows:

Field	Description
Project name	Enter a descriptive name for the project.
Location	Either accept the default location for the project (your workspace) or de-select the **Use default location** checkbox and click **Browse** to select a different location.

Click **Finish** on this dialog (or on any of the subsequent dialog) to create a project with the settings you have made to that point. Click **Next** to modify the default project settings and create a process using a template.

3. In the Business Processes dialog, enter the name of the folder that you want to designate for Business Processes.

   Under Package Details, you can accept the preselected checkbox and either enter a file name or accept the default file name.

   By default, when you create a project, TIBCO Business Studio creates a package and process as well. The default packages Folder is called **Process Packages** and the default packages file is `ProcessPackage.xpdl`. Either accept the default names or rename the packages file and folder. Click **Finish** if you are done, or **Next** to specify more options.

4. The Package Information dialog is displayed. Either accept the default properties of the package, or modify them as necessary and click **Finish** if you are done, or **Next** to specify more options.

   - **Package Label**

     Descriptive label for the package. Defaults to the same name as the file name of the package and is used for purposes such as simulation reports.

   - **Author**

Username of the user who created the package.

> **ⓘ** **Note:** The name of the author can be defined in the User Name: field on **Window** > **Preferences** > **User Profile**. If no user is defined there, it uses the default user system property.

- **Created**

  Displays the date/time that the package was created.

- **Description**

  Text description of the package.

- **Documentation Location**

  URL or file name of any supporting documentation.

- **Language**

  Provides context for user-visible language in processes. For example, annotations in a process might be in a language or character set unfamiliar to the user of the process. Use this field to specify the language used. Note that this field is informational; it does not change any system or TIBCO Business Studio-specific language settings.

5. The Select Template dialog allows you to create a process using a template. Select a template from those available and click **Finish** if you are done, or **Next** to specify more options.

6. The Set Special Folders dialog displays the default special folders. Either accept the default names or enter your own names and click **Finish**.

   The newly-created package, process, and project are displayed in the Project Explorer. For more information about the Project Explorer, see Project Explorer View.

Process Editing

There are a number of common tasks and shortcuts to help you use the Process Editor to create processes.

See Gadgets for an Object

See Adding Objects Using the Palette

See Using an Object's Gadget to Connect Objects

See Using Connection Tools on the Palette to Connect Objects

See Selecting Objects

See Tools for Finding Objects in a Diagram

See Customizing Palette Favorites
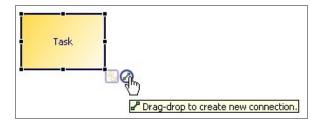
For additional information, see Tips and Tricks.

Gadgets for an Object

A gadget is a user interface aid that allows you to easily create sequence flows or other links between objects.

When an object is selected, initially one gadget of each applicable type is displayed, and if multiple gadgets of a particular type are available, these are displayed when the mouse cursor is moved over the first.

For example, if a task is selected, the **Create Connection** gadget is visible to the lower right of the task:
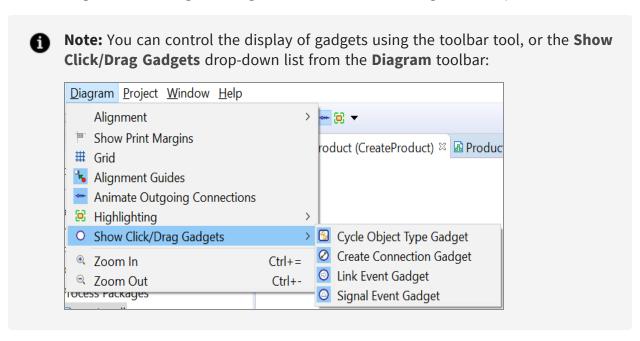
Gadgets that can be used to designate references to other objects can be used to designate a reference (drag-drop gadget onto target object) or go-to a currently referenced object.

These gadgets are provided:

- ▣ Cycle Object Type Gadget - Change the activity type by cycling through the different types.

- ▣ Create Connection Gadget - Create sequence flows to existing object or create and connect to new object.

- ▣ Link Event Gadget - Designate a throw and catch link event pair.

- 🔵 Signal Event Gadget - Designate a throw and catch signal event pair.
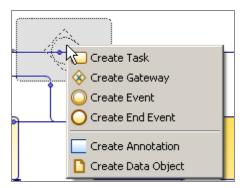
> ℹ️ **Note:** You can control the display of gadgets using the toolbar tool, or the **Show Click/Drag Gadgets** drop-down list from the **Diagram** toolbar:
>
>

A gadget is a user interface aid that allows you to easily create sequence flows or other links between objects.

- To add an object, click the **Create Connection** gadget, and drag-and-drop it in a lane content area or embedded sub-process content area.

  A popup menu is displayed showing a selection of applicable main object types that can be created (available types governed by the source object and drop location).

  You can also drag onto an existing sequence flow, and the object is inserted onto the sequence flow. If the target flow is not to or from the selected object then a new flow is added to the new object.
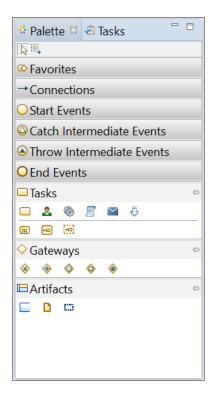
Adding Objects Using the Palette

You can use the palette to add objects (for example, a task).

> **i** **Note:** When you first start TIBCO Business Studio, if the palette is not visible, expand it by clicking the **Show Palette** button to the right of the window:
>
>

Procedure

1. Click the appropriate tool in the palette. If an object has more than one type (for example, a task can be a service task, or user task, and so on), each type has a tool on the palette. For example:

   Click another tool to display the available sub-types. For example, click the Gateway tool to see the different types of gateways; this closes the currently open tool drawer

if more space is required to open the new tool drawer. To change this behavior and cause the available tasks to remain open, click the **Pin Open** button (![pin]).

> ✔ **Tip:**
>   - To add more than one object of the same type, hold down the **Ctrl** key.
>
>   - You can customize certain palette preferences by selecting **Customize** from the right-click menu on the palette. This allows you to define preferences such as the default tool drawer states on editor startup. There is also a Favorites drawer that you can customize (see Customizing Palette Favorites).

Position the pointer on the process at the place where you want to place the object. The pointer changes shape: ![cursor]

2. Click process to add the object.

Result
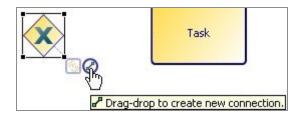
> ✔ **Tip:** You can also drag-and-drop from the palette. So, select an item on the palette and drag-and-drop it to where you require it in the process.

Using an Object's Gadget to Connect Objects

You can connect objects in the process by creating a sequence flow using the **Create Connection** gadget, but a similar procedure applies to all connection types.

Procedure
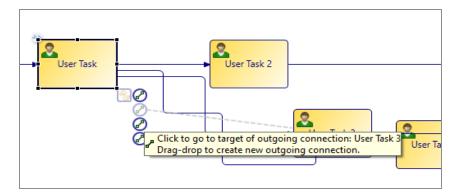
1. Select the object. For example:

2. Drag the **Create Connection** gadget to connect to another object. For example:

3. If you add more connections or references, additional gadgets are added. These are only visible if you position the mouse over the visible gadget. For example:

In this example, there is a **Create Connection** gadget for each outgoing sequence flow. Clicking a gadget selects the referenced or connected object in the Process Editor (for example, clicking the gadget attached to a reference task selects the referenced task).

Using Connection Tools on the Palette to Connect Objects

To connect two objects with sequence flow, use the **Sequence Flow** tool.

Procedure

1. Click the **Sequence Flow** tool.

2. Position the pointer over the object that is the source of the sequence flow.

   The pointer changes shape:

3. Draw the sequence flow using one of these methods:

   • Click the source object, then position the pointer over the target of the sequence flow. If you are satisfied with the shape of the flow, click the target.

   • Click the source object, holding down the mouse button, drag the pointer to the

target object and release the mouse button.

> ✅ **Tip:** While drawing the sequence flow, you can add bend points by right-clicking or pressing the spacebar as you create the flow.

> ✅ **Tip:** You can also drag-and-drop from the palette. So, select an item on the palette and drag-and-drop it to where you require it in the process.

> ✅ **Tip:** When you connect objects, as the default the sequence flows use Multi Entry/Exit Point connection routing (meaning that there are multiple separate lines from the entry or exit point to those objects they are connected to. You can tailor this behavior, by selecting the process, and from the **Properties** tab, select the **Appearance** tab. You can then select from these connection routing styles:
>
> - Multi Entry/Exit Point
> - Single Entry/Exit Point
> - Uncentered on tasks
>
> Once you have selected a different connection routing style, the diagram is reformatted to use this selection.

Selecting Objects
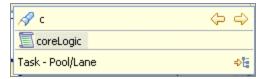
You can select objects using the **Select** tool on the palette or the **Marquee** tool.

- Using the **Select** tool on the palette. Hold down **Ctrl** to add single objects to the selection or **Shift** to select a range of objects.
- Using the **Marquee** tool. This allows you to drag a rectangle around all the objects that you want to select.

Tools for Finding Objects in a Diagram
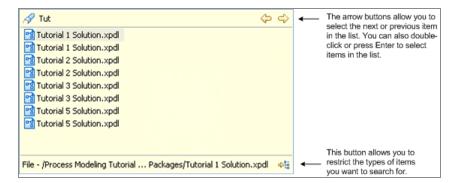
TIBCO Business Studio provides different tools to find objects in a diagram.

- To find an object on a process, press Ctrl+F or click the ![icon] icon on the toolbar. In the resulting dialog box enter the name or partial name of the object you are looking for. For example:

In this example the only task that starts with "c" is a script task called *coreLogic*. Clicking on the task displays it in the Process Editor.

- You can find workspace elements such as processes, package names, and process interfaces by pressing Ctrl+F or the search toolbar button in the Project Explorer view. For example:
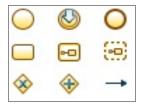
- You can also find a business object model package, class, primitive types and enumerations, as well as organization models, by pressing Ctrl+F or the Find toolbar button in the Project Explorer view.

- You can also find items using the first characters from the start of each capitalized word (CamelCase searching). For example, "BP" returns a file called `BankPayment.wsdl`.

The wildcard **?** returns all elements. Use the ***** wildcard to restrict the results (for example, ***2** to return all matches ending in 2). Note that the wildcard ***** by itself does not return any results; it only works in conjunction with a string.
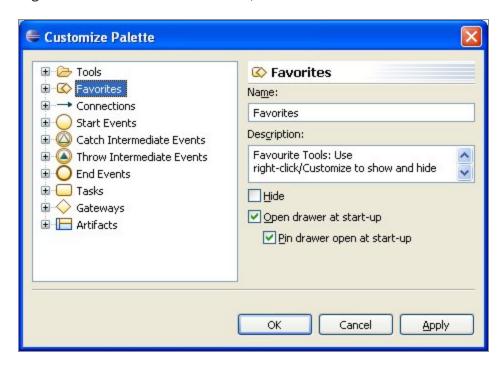
Customizing Palette Favorites

The palette contains a drawer labeled **Favorites** that contains some of the most commonly used objects., which you can customize by adding or removing objects.
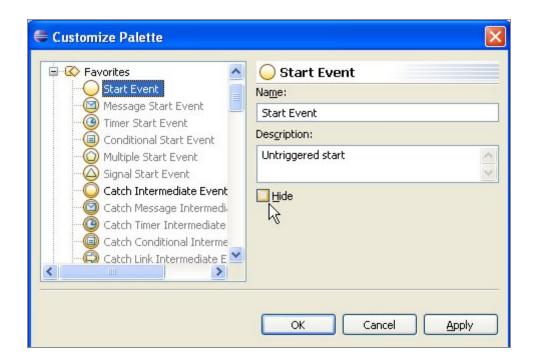
Procedure

1. Right-click in the Favorites drawer, and select **Customize**.

2. Expand the **Favorites** item in the Customize Palette dialog box.

3. Select an object and use the **Hide** check box to display or hide the object in the Favorites drawer:

Projects

This section describes how to work with projects in TIBCO Business Studio.

BPM applications comprise of projects that contain different asset types required for the application.

There are various project types available in TIBCO Business Studio - BPM Edition.

Projects allow encapsulation and segregation of the related aspects of your application. They also allow the re-use of processes, data, and so on.

You can import existing projects into TIBCO Business Studio and export projects from it. See Import and Export of Projects.

Migration of Projects Created in Previous Versions

Projects created in previous versions of TIBCO Business Studio might need to be migrated to the current version before they can be opened, depending on how you import them.

- To migrate a project created in a Studio version prior to v5.x, you must import using **File > Import > Existing Studio Projects into Workspace**.

  Use the import dialog box to successfully guide you through importing your projects in the correct sequence.

  You cannot checkout your existing projects directly from a version control system. See Importing Pre-Version 5.x Projects into TIBCO Business Studio - BPM Edition Version 5.x.

- If you are importing a project from SVN, then you might be unable to access all files in the imported project until you have reviewed the Problems view and resolved the problem covering migration using the **Quick Fix** provided.

  Alternatively, if there is a problem marker on the project in the Project Explorer view, press Ctrl+1 and look for the Problem

"Project 'xxx' is of an older version and needs to be migrated."

Select the "Migrate the Project" quick fix in the popup.

- If you are importing a single file, then you might need to migrate this file using the **Quick Fix** available.

- If you are importing a project created in a newer version of TIBCO Business Studio, you can see a problem marker (for example, "Project 'xxx' was created by (or migrated to) a newer version of the product and should not be used with this version"). Install a newer version of TIBCO Business Studio if that is appropriate or return to an earlier version of the product/project.

Import and Export of Projects

You can import existing projects, MAA files and archive files into TIBCO Business Studio, and export projects from it to archive files, MAA files, a work data model, or file systems.

> **Note:** TIBCO recommends that you import or export individual projects, and do not attempt to import or export the workspace.

Importing Existing Studio Projects into Workspace

You can import a project into the workspace.

Procedure

1. From the File menu, select **Import**, and you see the **Select** page of the Import dialog box.

2. Expand the General folder, select **Existing Studio Projects into Workspace** and click **Next**.

   > **Note:** TIBCO recommends that you use the **Existing Studio Projects into Workspace** and not the **Existing Projects into Workspace** option, as it only imports the files you require.

3. Do one of the following:

- Click on the **Browse** button for **Select root directory:** to locate other projects that are somewhere on the file system (for instance, in another workspace).

- Check the radio button for **Select archive file:** and click on the **Browse** button to see projects that have already been archived which you might want to import.

4. Select the project you want to import, and click **Open**. The project is now selected.

> ⓘ **Note:** This does not work if there is already a project of the same name in the workspace.

5. Select the **Copy projects into workspace** check box and click **Finish.** The project is now imported and appears in Project Explorer.

Importing Existing Modelled Application Archive (MAA) Files into Workspace

You can import existing Modelled Application Archive (MAA) files into the workspace.

Procedure

1. From the File menu, select **Import**, and you see the **Select** page of the Import dialog box.

2. Expand the General folder, select **Existing MAA into Workspace** and click **Next**.

3. Do one of the following:

   - Click on the **Browse** button for **Select root directory for MAA files:** to locate other MAA files that are somewhere on the file system (for instance, in another workspace). This can be used to import multiple MAA files in one single go.

   - Check the radio button for **Select MAA file:** and click on the **Browse** button to see MAA files that have already been archived which you might want to import. This is used to import one single MAA file at a time.

4. Select the MAA file you want to import, and click **Open**. The MAA file is now selected.

> ℹ **Note:** This does not work if there is already a project of the same name in the workspace.

5. Click **Finish.** The MAA file is now imported and appears in Project Explorer.

> ℹ **Note:** You can create an MAA file in TIBCO Business Studio for Analysts, save it and then import it as an existing MAA into TIBCO Business Studio. You can then work on the projects it contains and save it, and export it to MAA, and then access it again from TIBCO Business Studio for Analysts.

> ℹ **Note:** When importing an MAA created in TIBCO Business Studio for Analysts there is no destination set on the project and therefore you must set this before you use the project. You can do this in the following ways:
>
> - Right-click on the project and select **Properties > Lifecycle** and select the appropriate destination environment.
>
> - Right-click on the project and select **Refactor > Project Lifecycle...** to apply the destination to each process.

Importing Archive Files into Workspace

You can import an archived project into the workspace.

Procedure

1. From the File menu, select **Import**, and you see the **Select** page of the Import dialog box.

2. Expand the General folder, select **Archive File** and click **Next.**

3. In the **From archive file:** field, use the **Browse** button to locate the archive file you want to import.

4. In the **Into folder:** field, use the **Browse** button to identify the folder into which you want to import the file. This can be one of your existing projects. You can choose whether to check the **Overwrite existing resources without warning** check box.

5. Click **Finish**. The archive file is now imported into the location you have identified.

Importing Nimbus Process Diagrams

Nimbus Process Diagrams can be imported into an existing TIBCO Business Studio project.

> **Note:** In order to be imported into TIBCO Business Studio, Nimbus Process Diagrams must be exported from the Nimbus Control application using the **Export To Business Studio** option in the Nimbus Process Map editor (or **Export Simplified XML** in previous versions of Nimbus). See the TIBCO Nimbus Control documentation for more details.

Procedure

1. Right-click at the process package level of an open project and select **Import > Import Nimbus Process Diagram(s)**.

   Alternatively, from the File menu, select **Import**, and from the **Select** page of the Import dialog box expand the **Business Process Management** folder, select **Nimbus Process Diagram(s)** and click **Next**. This method involves additional pages to those in the process below, which are explained in the wizard.

2. On the **Import Nimbus Process Diagram(s)** page, in the **From Directory:** field, enter the directory where you saved your Nimbus Process Diagrams, or use the Browse button to find it.

3. The Nimbus Process Diagrams in the directory you selected appear on the right-hand side. Select the one(s) you require

4. In the **Into folder:** field, enter the directory in which you want to place the Nimbus Process Diagrams.

5. The **Validate Import Files** screen shows the validation status of Nimbus Process Diagram files. If the files are valid (in the expected simplified XML export format and containing only Nimbus simple diagrams) click **Finish**. If the files are not valid, you cannot finish and must go back and re-export the files from Nimbus Control as simplified XML.

6. The Nimbus Process Diagram files are now imported into the Process Packages folder you specified in .

Equivalences between Nimbus Process Diagrams and TIBCO Business Studio BPMN Processes

Nimbus Export File	Process Package (xpdl File)
Process Diagram	**Business Process** per diagram - One pool and one lane for all activities. - Diagram documentation URL is added to the process (visible on the **Description** property tab) and to each individual task sourced from that diagram.
Task Type	- Activity Type: - Creates a sub-process task for a Nimbus drill-down activity. - Parameter mappings are created where the data created for start/end connections in the drill-down process have equivalent named data in the calling process diagram. - If drill-down activities reference Nimbus diagrams in other export files then these should be imported either at the same time or prior to the referencing file (if you do not do this, you get a broken reference and a validation problem that you then have to resolve manually). - If a non-drill-down activity has a resource then it is a **User Task**. - If a specific Activity Type is selected then an equivalent BPMN type (Manual, User, Service, Script, Send, Receive, Reference, Call Sub-Process, Embedded Sub-Process, and Event Sub-Process) is created. - If an activity has no resource then it is an **Abstract Task** with no resource.
Activity Notes	**Text annotation** attached to task.
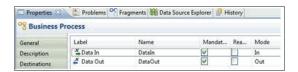
Nimbus Export File	Process Package (xpdl File)
(Notes bubble)	
Activity Commentary	Start of **Task Description**.
Statement Links	Appended to **Task Description** (for example, statements of required compliance with standards).
Diagram URL	• Added to each task sourced from a given diagram. • It is provided in the Process Description Documentation URL and Activity Description Documentation URL, and as an activity tooltip popup including the Documentation URL as a clickable hyperlink. See Activity Properties for more information on the Documentation URL. • You can browse to the original Nimbus Diagram and documentation.
Activity Resource	• One package participant per unique named resource. • User tasks are assigned participant(s) for the activity resource(s).
Connections	• Treats connections both as routing between activities and as incoming/outgoing data. • Multiple connections in the same direction, between the same Nimbus activities, are collapsed into a single connection. • All start connections (connection without source object) are connected to a single start event implying that all data is passed and all connections happen at the start of a process. • All end connections (connection without a target object) are connected to a single end event.
Start/End Connection Label	• For each unique start/end connection label a formal parameter is created. • The uniqueness of labels is based only on their alphanumeric content (white space and symbols are ignored) and is case-

Nimbus Export File	Process Package (xpdl File)
	insensitive. • The formal parameter mode is set according to whether the label appears on a start connection (In) or end connection (Out) or both (In-Out). • All formal parameters are associated in the start-event activity interface data.
Connection Between Activities Label 	• For each unique label that only appears on connections between activities (not on start/end connections) a **data field** is created.
All Connection Labels 	• As the connection labels are treated as process data, **interface data associations** are added to user tasks for the data identified by its incoming / outgoing connections. • The interface **data mode** is set according to whether the label appears on an incoming connection (In) or outgoing connection (Out) or both (In-Out).
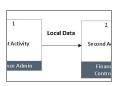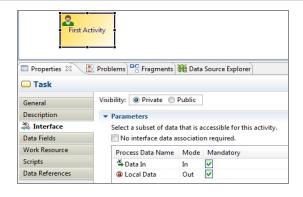
Nimbus Export File	Process Package (xpdl File)
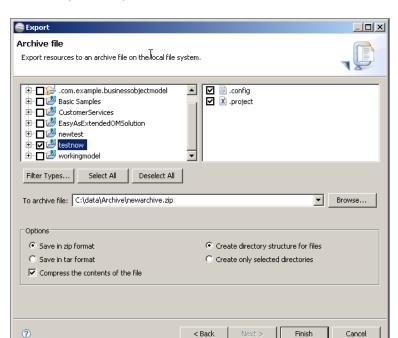
Connection Commentary	• Added to **formal parameter / data field** description
	
	    ◦ For multiple connections with equivalent labels, all commentaries are added.
	
	• Added to **sequence flow description**.
	
	    ◦ For multiple connections between the same activities all commentaries are added.

Exporting TIBCO Business Studio Projects to Archive File

You can export a project from Project Explorer to an archive file.

Procedure

1. In your workspace, make sure you have the project you would like to export selected, and from the File menu, select **Export**. You see the **Select** page of the Export dialog box:

2. Expand the General tab, select **Studio Projects to Archive** and click **Next**.

3. Select the project you want to archive from the list of projects available. Enter a location in the **To archive file:** box. You can use the Browse button to see existing archive files, and either use one of these or create a new one.

4. A number of archive options are available. Either accept the default settings or adjust

them to your requirements, and click **Finish**.

Exporting Projects to a File System

You can export a project from Project Explorer to a file system.

Procedure

1. In your workspace, make sure you have the project you would like to export selected, and from the File menu, select **Export**. You see the **Select** page of the Export dialog.

2. Expand the General tab, select **File System** and click **Next**.

3. Browse to the place you wish to save the files and click **Finish**.

Exporting Projects to Modelled Application Archive (MAA)

You can export a project or multiple projects from Project Explorer to a Modelled Application Archive (MAA) file.

Procedure

1. From the **File** menu, select **Export > General > Studio Projects to MAA**. You see the **Export** page of the Modelled Application Archive (MAA) Export Wizard.

2. Select the project or projects you want to export to MAA, and the location you want to export them to and click **Finish**. The default project location is **Exports/MAA** for each project.

Project Lifecycle
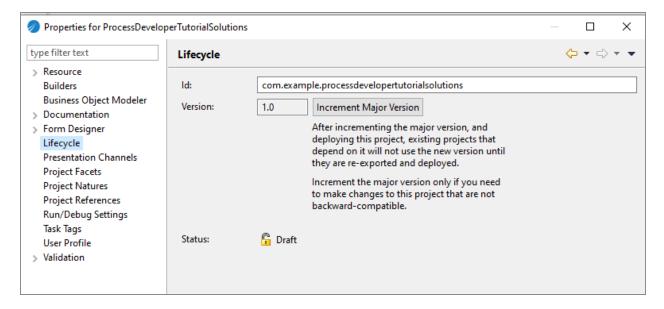
The project lifecycle consists of the following phases:

*   Generating test deployment artifacts

*   Deploying the generated artifacts

*   Deploying production artifacts

*   Creating a new draft

For more information about the project lifecycle phases, see the Project Lifecycle topic in the *TIBCO Business Studio™ - BPM Edition Application Designer's Guide*.

Changing Project Lifecycle Settings

You can change project lifecycle settings in TIBCO Business Studio - BPM Edition.

In the left pane, expand **Form Designer**, and select **Lifecycle**, which contains the following fields:

Id - The unique project identifier which is used by cross-project reference in design time and runtime.

> **ℹ Note:** If you change the project ID after deploying it to a runtime environment, then it appears to be an entirely different project than the already deployed one (as far as existing deploy projects that reference it are concerned). So, caution should be taken when changing project IDs.

Increment Major Version - To edit a project that makes it incompatible with existing projects that depend on it, you must increment the major version before you can deploy it. This can be achieved by using the **Increment Major Version** button.

Project References

When an asset in one project (for example, a business process) uses an asset in another project (for example, a business data type), then a dependency reference is created between those projects.

You can view your project dependencies using the dependency view (see Using the Projects Dependency Viewer).

Editing Project References

When you select an asset type in one project (for example, a participant) that uses an asset type in another project (for example, org model item), a project reference (from the BPM project to the org model project) is required and created automatically when the reference is first established.

To edit or remove a project reference, perform the following steps:

Procedure

1. Right-click the project, select **Properties**, and highlight **Project References**:

2. In this dialog box, select or deselect any referenced projects as required.

Assets

Assets include XPDL package files, WSDL files, documents, business object models, and so on that relate to the project, and are usually stored in special folders under the project.

For more information, see "Assets" in the *TIBCO® BPM Enterprise Concepts Guide*.

Adding Ad-hoc Assets

Ad-hoc assets include Microsoft Office documents and image files not recognized as project management assets.

Procedure
1. Add business assets by right-clicking and selecting **New > Folder** or **New > File**, and selecting the appropriate **Parent Folder**.

2. To view the folder or files you have created, go to the Navigator view. In the Navigator view, you can also drag files and folders to different locations.

Using the Projects Dependency Viewer

Use the Dependency Viewer to show an interactive, graphical representation of your project's file dependencies.

Procedure
1. Right-click a resource in Project Explorer (for example, a project, a BOM file, or a form file) and select **View Dependencies**.

2. The Dependency Viewer displays the dependencies.

   For example, right-clicking the `easyAsInsurance_Process.xpdl` file shows references from the form files to the XPDL file and references from the XPDL file to the `easyAsInsurance.bom` (business object model) and `easyAsInsuranceOrganizationModel.om` (organization model).

> **ℹ Note:** You can select different views in the Dependency Viewer to make these relationships clearer:

To focus on a resource, do one of the following:

- Select the resource in the Project Explorer.
- Right-click the resource in the Dependency Viewer and choose **Focus on** or **Focus on *Resource name***.
- Click the ⚷ button.
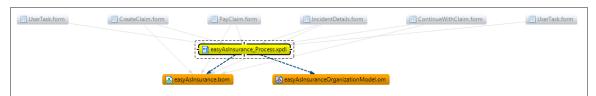
To reset the layout and refresh the contents of the viewer, click ⟲.

To show everything in the workspace, including resources which are not related to the resource you have focused on, click ⊞.
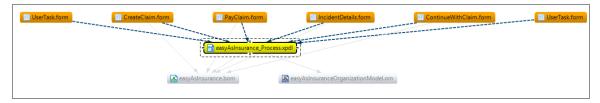
> **ℹ Note:** To break the link between the Project Explorer and the Dependency Viewer, click ⇄. Doing this means that resources that you select in the Project Explorer are not focused in the Dependency Viewer.

To highlight resources that are referenced *from* the resource you are focusing on, click ⊟. In the following graph, the `easyAsInsurance_Process.xpdl` file references `easyAsInsurance.bom` (Business Object Model) and `easyAsInsuranceOrganizationModel.om` (Organization Model).

To highlight resources that have a reference to the resource on which you are focused, click ⬚. In the following graph, a number of form files reference the `easyAsInsurance_Process.xpdl` file.

To show all the resources which are part of the relationship graph of the focused resource (that is, all the resources which are directly or indirectly related to focused node), click ⬚.

Finding Cyclic Dependencies

The Dependency Viewer highlights any connections that are part of a cycle.

A simple example of a cyclic dependency is where Project A refers to Project B, which refers back to Project A.

Procedure

1. Display the list of projects.

2. Selecting every resource as the focus using the Dependency Viewer, check for cyclic connections. You can identify these by this connection:

   For a given resource, get the list of resources it depends on and make each of these the focus in Dependency Viewer, and check for cyclic dependencies.

Enabling and Disabling Special Folders

Special Folders are folders in the Project Explorer that are reserved for storing specific types of assets. Special folders can be enabled or disabled in TIBCO Business Studio.

See the "Special Folders" topic in the *TIBCO® BPM Enterprise Concepts Guide*.
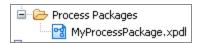
- Disable a special folder by highlighting it in the Project Explorer, right-clicking, and

selecting **Special Folders > Do not use as SpecialFolderType**
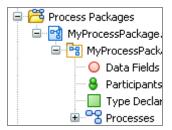
> **ⓘ** **Note:** The example uses the special folder for business processes as an example, however the special folders for other asset types are enabled and disabled in the same manner.

- Disable the packages folder by highlighting the **Process Packages** folder in the Project Explorer and selecting **Special Folders > Do not use as Process Packages Folder**, which results in a view of the package as follows:

- Conversely, you can enable the use of the special packages folder by highlighting the packages folder in the Project Explorer and selecting **Special Folders > Use as Process Packages Folder**. This results in a view of the package as follows:

Source Control

You can use Subversion with TIBCO Business Studio to provide source control to manage your projects and processes. For more information, see the following topics:

- Using Subversion with TIBCO Business Studio

- Creating a Project from an Existing Project in Source Control

- Browsing SVN Repositories

- Deletion of Projects from SVN Repositories

> **⚠** **Caution:** The MKS source control system adds a `project.pj` file to every folder in the project.

Using Subversion with TIBCO Business Studio

Subclipse is an Eclipse plug-in that adds Subversion to the Eclipse environment, and is bundled with TIBCO Business Studio.

> **Note:** In this topic, it is assumed that the user or the Subversion administrator have installed an SVN server.

Procedure

1. Right-click an existing project that contains items you wish to source control. Select **Team > Share Project**. Obtain the URL for the Repository Location from your Subversion administrator.

Creating a Project from an Existing Project in Source Control

You can create a project from an existing project in source control.

Procedure

1. Go to **File > Import** to open the Import wizard.

2. Expand **SVN**, select **Checkout projects from SVN** and click **Next**.

3. Set up the repository with the assistance of your Subversion administrator, (the repository should point to the parent directory that has the project folder) and click **Next**.

4. Select the project folder and click **Next**.

5. Select the method for checking out the project and click **Next**.

6. Either use the default workspace or click **Browse** to check out the project in a different location.

7. Click **Finish**. The project is checked out to your workspace.
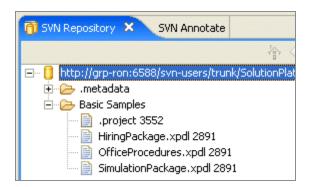
> **Note:** Ensure that you import or export individual projects, and do not attempt to import or export the workspace.

Browsing SVN Repositories

You can browse SVN repositories as follows:

Procedure

1. Select **Window > Open Perspective > Other**.

2. Select **SVN Repository Exploring**.

3. This opens a perspective from which you can browse SVN repositories. For example:

Deletion of Projects from SVN Repositories

To delete a project that is in Subversion, use a tool such as Tortoise SVN, the command line interface to Subversion, or a web-based tool.

BPM Packages and Processes

This section describes how to work with packages and processes in TIBCO Business Studio.

Creating a Package

You can create a package as part of creating a project or independent of project creation.

See Creating a Project Package and Process.

Procedure

1. Right-click the Process Package folder under which you want to create the package and select **New > Process Package**.

2. If you want to change the Packages Folder under which the package is created, click **Browse** or enter an existing folder name.

3. Enter the name of the **File** or accept the default file name. The file name must have `.xpdl` as the extension. Click **Next**.

4. The Package Information dialog box shows the name of the package and its default properties (for a full explanation, see step 10 in Creating a Project Package and Process).

   Either accept the default properties of the package, or modify them as necessary. Then, click **Finish** to create a process using the default template, or click **Next** to create a process using a different template.

5. By default, a process is created with start and end events connected by sequence flow. The Select Template dialog box allows you to create a process using a different template. Select a template from those available and click **Finish**.

Result

The newly-created packages and any processes that you elected to create are displayed in the Project Explorer.

> **(i)** **Note:** TIBCO Business Studio restricts the number of open editors to 8 by default to avoid adverse performance issues. To edit this setting, go to **Window > Preferences > General > Editors** and under **Close editors automatically**, edit the value for **Number of opened editors before closing**.

Copying a Package

You can copy a package into the same project, or into a different project in your workspace.

Procedure

1. In the Project Explorer, highlight the package file you want to copy.

2. Press Ctrl+C to copy the package.

3. Open the project into which you want to copy the package.

4. Select the folder into which you want to copy the package (for example, the **Process Packages** folder).

5. Press Ctrl+V to paste the package. If copying the package within the same project, you are prompted to enter a new name. If copying the package to a different project when a package of that name already exists, you are prompted to overwrite the file.

   > **(i)** **Note:** After copying a package, errors similar to this are displayed in the Problems view:
   >
   > ⊗ XPDL 2.0 : The following files have duplicate process IDs: /mond/Process Packages/ProcessPackage.xpdl
   >
   > To correct this, right-click the problem, and select **Quick Fix**. Accept the suggested fix for this problem to resolve the duplicate IDs.

Creating a Business Process

You can create a Process and its containing package and Project in one operation or you can create a business process.

See Creating a Project Package and Process.

Procedure
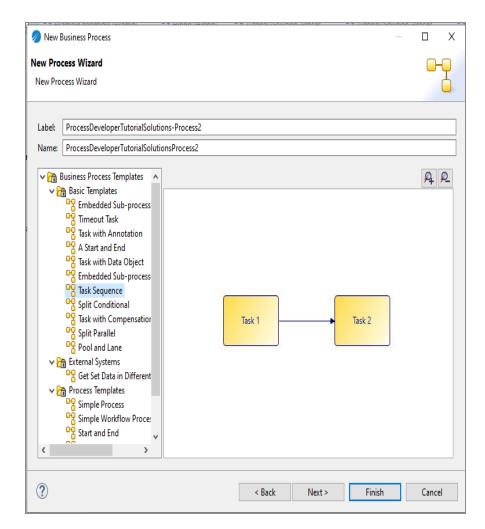
1. Before creating a process, you must create a project and a package to contain your process.

2. In the Project Explorer, select the package you created, right-click and select **New > Business Process**.

3. The New Business Process wizard is displayed.

   > **ⓘ** **Note:** If you start this wizard from the **File > New** menu, the first dialog is the Project and Package dialog, where you must specify a valid project and package. This dialog is not displayed if you right-click at the package level to start the dialog; however, you can click **Back** to display it if necessary.
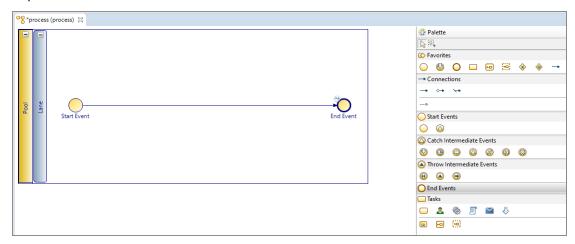
4. Enter the **Label** of the process. To use a template to create the process, select the template and click **Next**. This example shows one of the basic templates (a task sequence).

In addition to the process templates, you can select a process interface as the basis for your new process. This creates a process with the necessary events, parameters that are specified in the process interface.

5. In the Description dialog, add optional text that describes the process, an optional URL that links to documentation about the process, and click **Next**.

6. In the Destinations dialog, select the **Destination Environment** (optional).

7. The Extended dialog is displayed. This allows you to add optional supplemental information to the XPDL for the process. For more information see Creating Extended Attributes.

8. Click **Finish**.

9. The process that you created is displayed in the Process Editor. When you first start the Process Editor, the palette (on the right side of the diagram) might collapse; if so,

expand it:

You can expand this window to fill your screen by double-clicking the title bar (in this example, the area labeled **Process2**).

The Process Editor provides a **Pool** and **Lane** that you can rename if you plan on using pools and lanes (see Controlling Flow in a Process). You add elements of your business process using the Palette.

Creating a Pageflow Process

A pageflow is a sequence of tasks that defines the flow of form pages which, a user must work through before submitting a work item.

You can create a Process and its containing package and Project in one operation or create a pageflow process.

See Creating a Project Package and Process.

Procedure
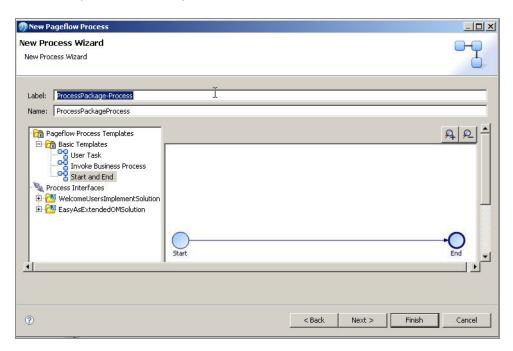
1. Before creating a pageflow process, you must create a project and a package to contain your process.

2. In the Project Explorer, select the package you created, right-click and select **New > Pageflow Process**.

3. The **New Pageflow Process** wizard is displayed.

> **ⓘ** **Note:** If you start this wizard from the **File > New** menu, the first dialog box is the Project and Package dialog box, where you must specify a valid project and package. This dialog box is not displayed if you right-click at the package level to start the dialog box. However, you can click **Back** to display it if necessary.

Enter the **Label** of the process. If you want to use a template to create the process, select the template and click **Next**.

In addition to the process templates, you can select a process interface as the basis for your new pageflow process. This creates a process with events and parameters that are specified in the process interface.
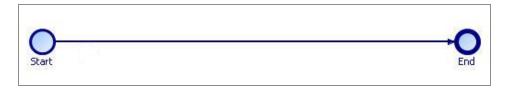
4. In the Description dialog box, add optional text that describes the process, an optional URL that links to documentation about the process, and click **Next**.

> **ⓘ** **Note:** The **Documentation URL** field is intended for design-time collaboration; it is not displayed in the runtime environment.

5. The Extended dialog box is displayed. This allows you to add optional supplemental information to the XPDL for the process.

6. Click **Finish**.

7. The process that you created is displayed in the Process Editor:

When you first start the Process Editor, the palette (on the right side of the diagram) might collapse; if so, expand it. You can expand this window to fill your screen by double-clicking the title bar. A pageflow process has a different default color scheme from a business process.

> **ℹ Note:** Pageflows do not contain pools or lanes.

Creating a Case Action Process

You can either create a new case action or generate one directly from a case class. Template case action processes are provided that allow you to view or update the contents of a case object, but you can modify these templates to provide whatever functionality you need for a particular case class.

> **ℹ Note:** You can generate a Case Action from a Case Class definition in the Business Object Model (BOM) editor.

Before you begin
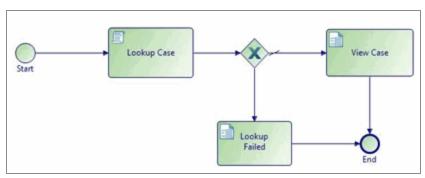
Before creating a case action, you must create/import a business data project with a case class and add a case state attribute to that case class. You must also create/import a BPM project and have a package to contain your case action.

Procedure

1. In the Project Explorer, select the package you created, right-click and select **New > Case Action**.

   You can also create a case action from context menus on the case class in the BOM.

2. The Case Action wizard is displayed. Enter a **Label** and **Name** for the Case Action.

3. (optional) On the **Case Class** selector, **Select a Case Class type from a Business Object Model** to select the Case Class that this action applies to.

   If you do not set this here, you can set it from the Properties for the Case Action when you have created the case action using the wizard.

4. Select a template for the case action from **View Case Action Process** or **Update Case Action Process**.

5. Set the Destination to BPM and other properties as required.

6. Click **Finish**.

7. The case action that you created is displayed in the Process Editor. For example, **View Case Action process**:

Generating Case Actions from Case Classes

You can generate a Case Action from a Case Class definition in the BOM editor.
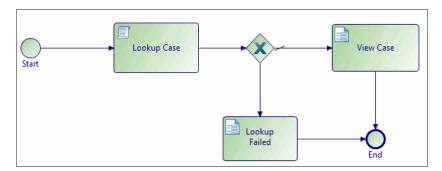
Procedure

1. Right-click on a Case Class in the BOM and select **Generate Case Action**.

2. Select one of the following actions:

   - **To View Case Data**: Fetches the data for the case reference provided by Openspace and shows that data to the user in a form.

   - **To Update Case Data**: Fetches the data for the case reference provided by Openspace and shows that data to the user in a form. The user can change that data and the case object is subsequently updated.

3. From the **Generate Case Action** dialog box, open the project and Process Packages
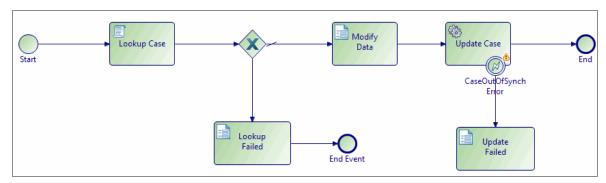
where you want to place the xpdl. You can also select an existing xpdl. Click **Finish**.

The case action is generated with the appropriate template (**View Case Data** or **Update Case Data**) and you can edit it to meet your needs.

View Case Data:

Update Case Data:

Creating a Service Process

You can create a service process and its containing package and project in one operation or create a service process only and add it to existing package/project.

See Creating a Project Package and Process.

A video called Modeling a Service Process is available that shows how to model a typical service process.

As service processes should be of short duration and have only one function, some activity types are not supported in service processes.

Activity Type	Description
User tasks	No direct user interaction with a service process is supported.
Manual ad-hoc activities	No direct user interaction with a service process is supported.
Event sub-processes responding to externally sourced signals/incoming request events and inter-process signals	This could result in unacceptably long pauses and, as service processes can be invoked from both pageflows and business services, this feature is disabled for service processes. Event sub-processes for internal process signals are supported.
Attached Sub-process calls to non-service process types	Service processes can only synchronously invoke other service processes. However, they can asynchronously invoke conventional stateful business processes.
Non-boundary timers	Timers that pause rather than monitor the execution of a thread of a service process are not supported.

When modeling a service process, you must specify a deployment target. You can deploy service processes to either:

- the process engine
- the pageflow engine

The deployment target you choose depends on whether you are invoking your service processes from business processes or pageflow processes. When you create a service process, the service process is set to deploy to the process engine by default.

Procedure

1. Before creating a service process, you must create a project and a package to contain your process.

2. In the Project Explorer, under Process Packages, select the package you created, or Processes within an existing package, right-click and select **New** > **Service Process**.

   The **New Service Process** wizard is displayed.

3. Enter the **Label** of the process. You can change the label on the **General** tab in the Properties view if necessary. If you want to use a predefined template to create the service process, select the template and select **Next**.

In addition to the service process templates, you can select a service process interface as the basis for your new service process. This creates a service process with the deployment target, events and parameters that are specified in the service process interface. Specifying a service process interface allows the dynamic selection of service processes at runtime. See Service Process Interfaces.

4. In the **Description** dialog box, add optional text that describes the process, an optional URL that links to documentation about the process, and click **Next**.

> **ⓘ** **Note:** The **Documentation URL** field is intended for design-time collaboration; it is not displayed in the runtime environment.

5. The **Extended** dialog box is displayed. This allows you to add optional supplemental information to the XPDL for the process.

6. Select **Finish**.

The service process that you created is displayed in the Process Editor.

When you first start the Process Editor, the palette (on the right side of the diagram) might collapse; if so, expand it. You can expand this window to fill your screen by double-clicking the title bar. A service process has a different default color scheme from other processes.

> **ⓘ** **Note:** Service processes do not contain pools or lanes.

7. Once you have created your service process, you must configure the deployment target that you want the service process to be deployed to.

When you create a service process, the deployment target is automatically set to **Deploy to Process Run-time** so, if you want your service process to deploy to the pageflow engine, you must select **Deploy to Pageflow Run-time** in the **General** tab of the Properties view.

> **ⓘ** **Note:** There are other tabs available in the Properties view for service processes. For more information, see Process Properties.

Refactoring Service Processes and Service Process Interfaces

You can convert an existing business, pageflow or sub-process into a service process or, alternatively, a service process into a business, pageflow or sub-process. You can also refactor a service process interface into a process interface, and vice versa.

Right-click the business, pageflow or sub-process you want to convert and select **Convert to service process**. In the same way, you can convert a service process to a business process or pageflow process.

You can also refactor a service process interface into a process interface by right-clicking a service process interface and selecting **Convert to Process Interface**. Similarly, you can convert a process interface into a service process interface by selecting a process interface and selecting **Convert to Service Process Interface** . When you convert a process interface into a service process interface, the deployment target is automatically set to **Deploy to Process Run-time** so, if you want your converted service process interface to implement service processes deployed to the pageflow engine, you must go back and configure this in the service process interface after conversion.

Activities

An activity represents work that a company or organization performs using business processes.

See "Activities" in the *TIBCO® BPM Enterprise Concepts Guide*.
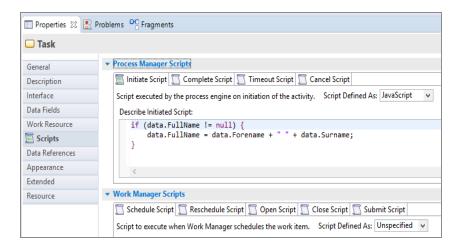
Creating Scripts

All types of tasks can have scripts that write information to a destination-specific system. User tasks can have scripts that are run, for example, when the work item is opened or closed.

On the **Scripts** tab, you can add text that describes these scripts. The solution engineer translates the outline of the script into a scripting language supported by the selected destination environment.

Procedure

1. Click the task to which you want to add a script.

2. In the Properties view for the task, click the **Scripts** tab.

3. The Scripts available are divided into two sets, **Process Manager Scripts** and **Work Manager Scripts**. Open the set you require (if one set is not available to you for this task, it is disabled).

4. Click the tab for the desired type of script. Any tabs that have scripts defined have a script icon before the script name. Tabs with no defined script have an empty script icon. In the image, a script is defined for the **Initiate Script** and **Cancel Script** tab.

5. Select **Free Text** from the **Script Defined As** list. Describe your script in the area provided. For more information about how the various types of scripts are implemented, see the appropriate implementation guide.

Result

> ℹ **Note:** You can highlight tasks in a process that contains scripts. Click the Process Editor for the process. The Enable/Disable highlighting button is displayed on the toolbar.
>
> Click the Enable/Disable highlighting button (⬚) to see the drop-down list, and select **Highlight Activities with Scripts**.
>
>
>
> This option highlights all activities in a process that contain scripts, and all other activities are grayed out.

User Tasks and Pageflow Processes

In addition to creating a standalone pageflow process, you can do other actions from a user task to select or create a pageflow process.

- Select an existing pageflow process.

- Create a pageflow process that is referenced from the selected user task.

In the runtime environment, the pageflow process is run when the work item associated with the user task is opened.

When you right-click a user task, the **Pageflow** menu provides these options:

- **Open**

  Select this option to open the associated pageflow process in the Process Editor (if a pageflow process has already been selected for the task).

- **Synchronize Parameters**

  Select this option if you have made changes to the parameters in the user task,

and want the changes reflected in the corresponding parameters in the associated pageflow process (see Synchronizing Parameters With a Pageflow Process).

- **Generate**

  Select this option to generate a new pageflow process that can be associated with this user task. The parameters associated with the user task are replicated for the pageflow process.

- **Use Existing**

  Opens the Select Form dialog box from which you can select an existing pageflow process.

- **Delete**

  Deletes the reference from the user task to the pageflow process. The pageflow process itself is not affected.

Selecting a Pageflow Process

If you have already created a pageflow process, you can select it from a user task.

Procedure

1. Select the user task.

2. Do one of the following:

   - On the **General** tab for the user task, select the Pageflow option and click the picker to display the Select Pageflow Process dialog box.

     Expand the projects to select a pageflow process and click **OK**.

   - Right-click the user task and select **Pageflow** > **Use Existing** to display the Select Pageflow Process dialog box. Expand the projects to select a pageflow process and click **OK**.

3. The **Pageflow** field is automatically completed with a URL that points to the pageflow process (relative to the **Forms** special folder). You can open the pageflow

process by clicking **Open Pageflow Process**.

Creating a Pageflow Process from a User Task

You can create a pageflow process from a user task.

Procedure

1. Select the user task to which you want to associate a pageflow.

2. Right-click and select **Pageflow > Generate**. The New Pageflow Process dialog box is displayed.

3. Confirm the data that you want to associate with the pageflow process and click **Next**:

   • **User Task Interface Data**

      Select from the process data specified on the **Interface** tab of the user task. If no explicit process data is selected on the **Interface** tab, all process data is available.

   • **Other Available Process Data**

      Select from the process data that is not associated with the user task.

      > ✓ **Tip:** The parameters that you associate with the pageflow process are available to user task forms after the pageflow process is created.

4. Enter the **Label** of the process. If you want to use a template to create the process,

select the template and click **Finish** to create the pageflow process or **Next** to specify additional options.

Synchronizing Parameters with a Pageflow Process

When a pageflow process is first generated from a user task, a dialog box is displayed that allows you to create the pageflow process with its own set of parameters (either replicating the existing data fields and parameters of the user task, or a subset thereof).

User tasks in the pageflow process can display forms that utilize these parameters.

If you add or remove new parameters to the user task in the parent process (after the pageflow process is generated), you can update the list of user task parameters that are known to the pageflow process as follows:

Procedure

1. Right click the user task, and select **Pageflow > Synchronize Parameters**. The Synchronize Pageflow Parameters With User Task dialog box is displayed:

2. Confirm the changes and click **Finish**. For example, if parameters have been added to the pageflow process but not the user task, synchronizing deletes them from the pageflow process. If parameters have been added to or removed from the user task, synchronizing adds or removes the corresponding parameters in the pageflow.

Result

After synchronizing, the parameters in the Project Explorer listed for the pageflow process should be identical to the parameters listed for the parent process.

Mandatory Parameters and Pageflow Processes

When a pageflow process has a mandatory parameter, that parameter must have a value before the pageflow can be considered complete.

This is different to sub-process parameters, where the mandatory flag controls whether mapping to the parameter is required or optional.

This means that a pageflow process and associated user task are expected to have the same data available. As a result, mandatory pageflow parameters are mandatory in all user task forms within the pageflow. However, if this is not the desired behavior, explicitly associate the parameter with the user task in the pageflow and de-select the mandatory flag.

Resource Patterns and Work Distribution

A number of patterns are available to model how you want work to be distributed to resources. Resources are the people who carry out the work, and are represented in TIBCO Business Studio by participants. How these patterns are interpreted depends on your runtime environment, which might not support all the patterns.

See the "Resource Patterns and Work Distribution" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Specifying Separation of Duties

Specify that tasks should be considered separate by using the right-click menu on the Process Editor.
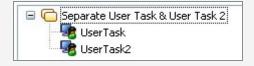
Procedure
1. Select the user or manual tasks that you want performed by separate resources (use the Ctrl or Shift keys to select multiple tasks).

2. Right-click and select **Resource Patterns > Create a > Separation of Duties > Group**.

3. If you have not already done so, you must assign participants to the tasks.

4. The selected tasks are displayed on the **Resources** tab in the Properties view:

> ℹ️ **Note:** To see other task groups, click the **See all task groups(s) in the process** link on the **Resources** tab. This displays the **Task Groups** tab for the process. This shows task groups of which this task is a member.
>
>

Specifying tasks that should be considered separate using the Resources tab
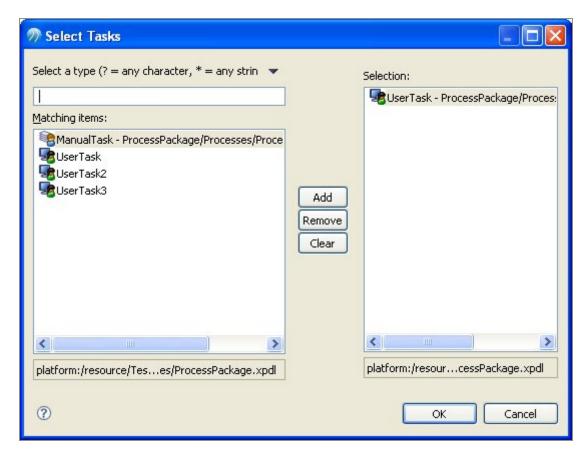
Specify that tasks should be considered separate on the **Resources** tab for the task.

If you have already set up a task group, the **Resources** tab shows the groups to which the selected task belongs.

Procedure

1. Click the **Resources** tab and expand the **Separation of Duties** section.

   Click the [icon] button to create a new task group. The Select Tasks dialog box is displayed.

2. Select the tasks that you want to include in the group and click **OK**.

3. Once you have selected the task group members, you can also use the following buttons:

   - ⊞ Use this button to add or remove tasks to and from the group.

   - ✖ Use this button to either delete tasks for the group or delete the group.

   > ⓘ **Note:** To see other task groups, click the **See all task groups(s) in the process** link on the **Resources** tab. This displays the **Task Groups** tab for the process. This shows task groups of which this task is a member.
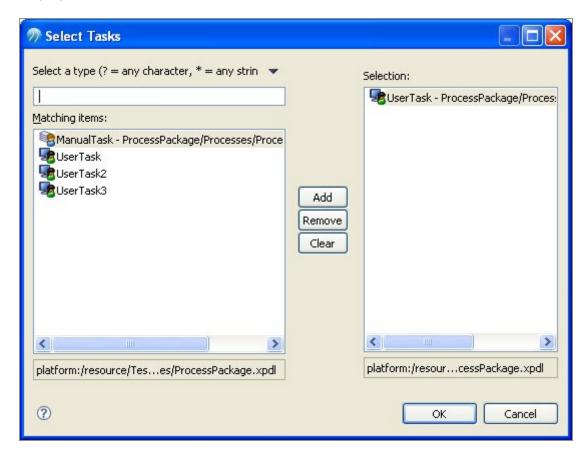
Specifying tasks that should be considered separate using the Task Groups Tab

Specify that tasks should be considered separate on the **Task Groups** tab for the process. If you have already set up a task group, the **Task Groups** tab shows the groups contained in the selected process.

Procedure

1. Select the process in the Project Explorer and click the **Task Groups** tab.

   Click the [button] button to create a new task group. The Select Tasks dialog box is displayed.

2. Select the tasks that you want to include in the group and click **OK**.

3. Once you have selected the task group members, you can also use the following buttons:

- Use this button to add or remove tasks to and from the group.

- Use this button to either delete tasks for the group or delete the group.

Specifying Tasks That Should be Part of a Retain Familiar Group

Specify tasks that should be part of a Retain Familiar group using the right-click menu on the Process Editor.

Procedure

1. Select the user or manual tasks that you want to include in the group (use the Ctrl or Shift keys to select multiple tasks).

2. Right-click and select **Resource Patterns > Create a Retain Familiar Group**.

3. If you have not already done so, you must assign participants to the tasks.

4. The selected tasks are displayed on the **Resources** tab in the Properties view:

> **Note:** To see other task groups, click the **See all task groups(s) in the process** link on the **Resources** tab. This displays the **Task Groups** tab for the process. This shows task groups of which this task is a member.
>
>

Specifying that tasks should be part of a Retain Familiar group using the Resources tab
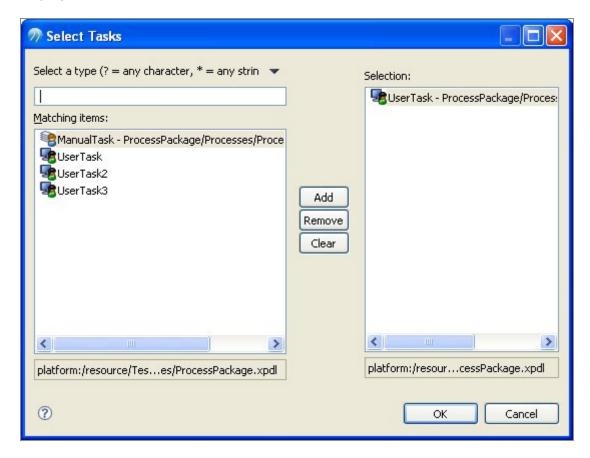
Specify that tasks should be part of a Retain Familiar group on the **Resources** tab for the task. If you have already set up a task group, the **Resources** tab shows the groups to which

the selected task belongs.

Procedure

1. Click the **Resources** tab and expand the **Retain Familiar** section.

   Click the ⬚ button to create a new task group. The Select Tasks dialog box is displayed.

2. Select the tasks that you want to include in the group and click **OK**.

3. Once you have selected the task group members, you can also use the following buttons:

   • ⬚ Use this button to add or remove tasks to and from the group.

   • ⬚ Use this button to either delete tasks for the group or delete the group.

> **Note:** To see other task groups, click the **See all task groups(s) in the process** link on the **Resources** tab. This displays the **Task Groups** tab for the process. This shows task groups of which this task is a member.
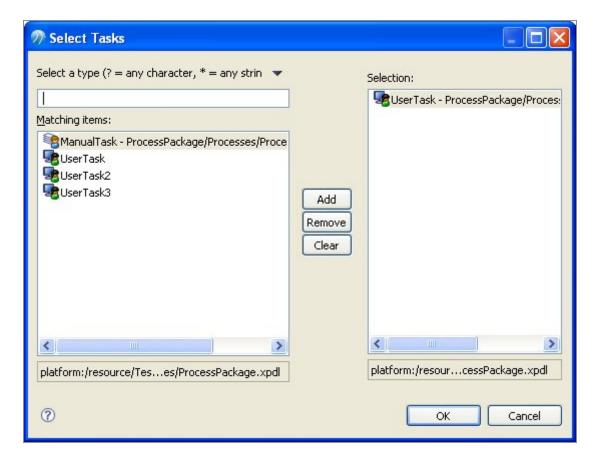
Specifying that tasks should be part of a Retain Familiar group using the Task Groups Tab

Specify that tasks should be considered separate on the **Task Groups** tab for the process. If you have already set up a task group, the **Task Groups** tab shows the groups contained in the selected process.

Procedure

1. Select the process in the Project Explorer and click the **Task Groups** tab.

   Click the button to create a new task group. The Select Tasks dialog box is displayed.

2. Select the tasks that you want to include in the group and click **OK**.

3. Once you have selected the task group members, you can also use the following buttons:

   - Use this button to add or remove tasks to and from the group.

   - Use this button to either delete tasks for the group or delete the group.

Chained Execution – Multiple Parallel Paths in a Chaining Group

When multiple parallel paths exist in a chaining group, items are chained in the order they are scheduled, and not the order of process flow.

For example:

In the example above, User Task 1 or User Task 2 would be performed first. Both would appear in the relevant user's work list. If User Task 1 was opened first then on completion User Task 2 would be performed (it would be the only user task in the chained group available at that point). It is likely that whilst User Task 2 is completed that User Task 3 would be scheduled. This would be performed and then User Task 4 would be performed last. The user tasks would therefore be performed in scheduled order and not according to the connections between the user tasks.

Events

This section describes some of the common tasks that you perform using BPMN events.

See the "Events" topic in the *TIBCO® BPM Enterprise Concepts Guide*.
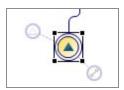
Creating References Between Throw and Catch Events

As an alternative to creating references between throw and catch events in the Properties view, TIBCO Business Studio provides graphical tools called gadgets that allow you to easily create references.
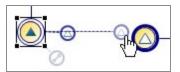
The example in this section shows throw and catch signal events, but the same procedure applies to all throw and catch events.

Procedure
1. Place the throw and catch events on the diagram.
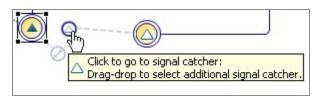
2. Select the throw event.

3. Drag the event reference gadget to the desired catch event.

4. Once you link a throw and catch event, you can click the event reference gadget to go to the catch event, or drag the event reference gadget to select additional catch events:

Timer Event Rescheduling

You can reschedule the timeouts of timer events on user tasks (including the work item deadline). This can be achieved by selecting timers to reschedule from a non-cancelling signal event on the same user task.

> **ⓘ** **Note:** Timer events that have already timed-out are not rescheduled.
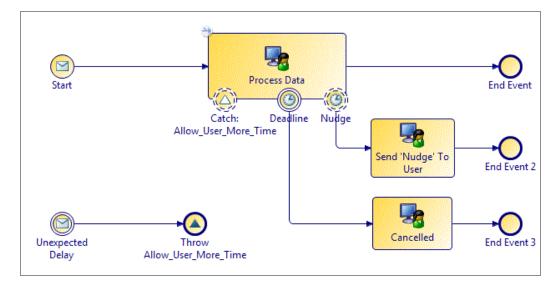
A catch signal event attached to a user task, that is configured as **Continue task when signal is caught** allows selection of timer events to reschedule one of the following:

- all

- The Timer currently set as Activity deadline

- one or more explicitly selected timers
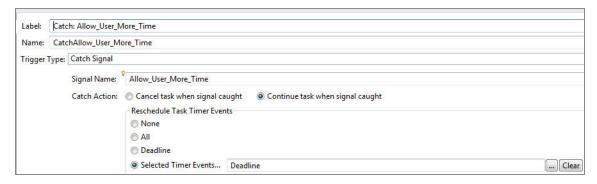
When a timer event is selected for reschedule in any one of the above ways then the user must define a reschedule timer script on the timer event's General properties tab.

In the example below, the process has a user task with two timers, Deadline and Nudge. When "Unexpected Delay" is triggered, the Allow_User_More_Time signal is thrown and
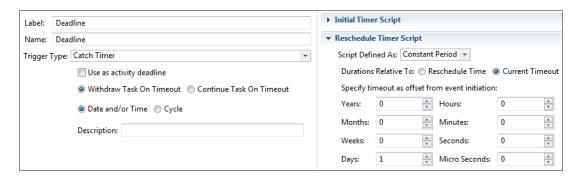
this explicitly reschedules the Deadline timer by adding an extra day to the current Deadline timeout.

The Properties page for Catch: Allow User More Time looks like this:
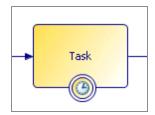
The Properties page for Deadline looks like this:

Configuring Timer Event Scripts

You can specify that a script is executed for a start timer event or an intermediate timer event (either inflow or on a task boundary).
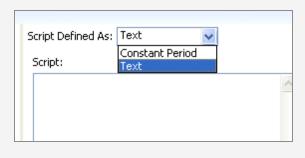
For example, the following intermediate timer event has been placed on a task boundary:

In the Properties view, you can choose a script type from the **Script Defined As** list:

> ⓘ **Note:** Depending on the destination environments selected, there can be other script types in the **Script Defined As** list.
>
>

Select one of the script types:

- **Free Text**

  If you want to leave the implementation of the script for the solution designer, you can select Text and use this area provided to describe the desired behavior for the script.

- **Constant Period**

  This allows you to specify the timeout period after the event is initiated using the following time units: Years, Months, Weeks, Days, Hours, Minutes, Seconds, Micro Seconds.

- **JavaScript**

This script type allows you to enter JavaScript statements in the space provided. For more information, see the appropriate implementation guide.

> **ⓘ** **Note:** The JavaScript script type is not available in the Business Analysis capability.
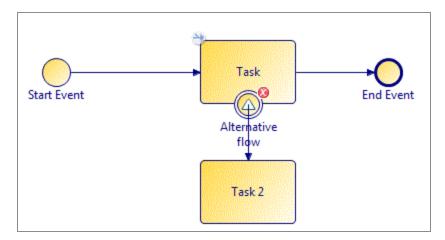
- **Unspecified**

  This means that no description or script is supplied.

Catch Signal Events

In BPMN, when an event on the boundary of a task is triggered, the task is canceled and the alternative flow from that event is followed.

For example:

In this example, if the signal event is triggered, the task to which it is attached is canceled and the sequence flow to Task 2 is followed.

Throw and Catch Signal Events

With throw/catch signal events, an *in-flow* signal event broadcasts a signal, and if there is an active task with a signal event on the task boundary, that event "catches" the signal, and generally follows the exception path.
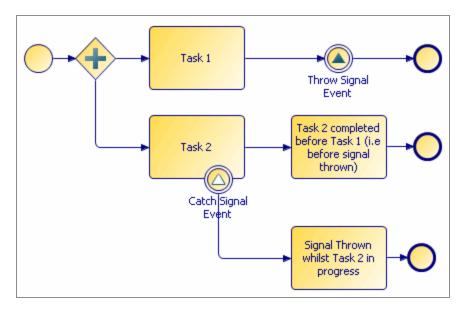
Signal events can be local or global.

Local signal events can be used for triggering event handlers, task cancellations and to halt and resume parallel flows.

Global signal events are thrown and caught across process instances allowing processes to collaborate with each other. They are only available for an event sub-process/handler.

- You can drag-and-drop a global signal onto a process to create throw / catch events.

- A catch signal can cancel the task it is attached to or, for user tasks, can allow the task to continue. If they are set to "continue" they cannot have an outgoing flow but they can map data into the task that they are attached to and also reschedule timers attached to the same task.

A Signal is transient: when it is thrown, if there is nothing to catch it at that moment, it is discarded. It is not stored for later use.

You might specify a signal name with a throw signal event. With a catch signal event, a signal name is optional:

- If a catch signal event has no signal name specified, it catches any thrown signals in the process (while the task it is attached to is active).

- If a catch signal event has a signal name specified, it only catches signal events that throw the named signal.

  When you specify signal names in the Properties view for signal events, you can use content assist. This means for example, that if you have entered SIGNAL1 for a throw signal event, when you specify the signal name for the catch signal event you can press Ctrl+Space and the available signal names are displayed from which you can

select one.

You can define whether you want to update a scheduled work item from a non-cancelling signal event. Select from a pair of radio buttons directly beneath the signal name from the Properties view of a catch signal event attached to a task boundary:

- Cancel task when signal caught

- Continue task when signal caught

  Use the **Map from Signal** tab to map from the throw-signal's payload data (listed in its interface tab) to the data associated with the attached user task.

  See the example in Incoming Request/Global Signal Event Handlers in Business Processes which demonstrates the use of event handlers and non-cancelling signal events to update work item data.
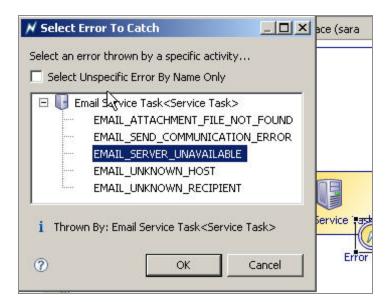
A **signal end event** functions like any other inflow signal event, except that when one fires, if there are more tasks that need to complete as the result of an exception flow, the outstanding tasks complete; if there are no more tasks that need to be completed, the process ends.

Throw and Catch Error Events

An error event attached to a task boundary can be set to catch any error, or errors generated by the task to which it is attached.

Example:

- When attached to a web service task, you can configure the catch error event to catch any WSDL fault associated with the web service operation that is invoked by the service task.

- When attached to an email service task, you can configure the catch error event to catch emails when the email server is unavailable:
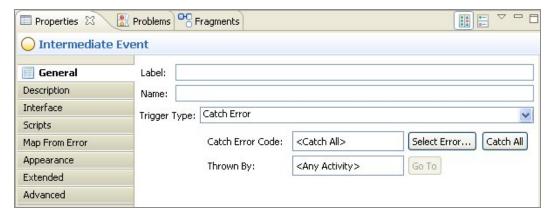
When attached to a call sub-process activity or an embedded sub-process task, the event can catch errors thrown by any of the following events:

- Activities within the sub-process

- End error events

- Process interface error events (if the call sub-process activity references a process interface rather than a process)

- Any other error throwing activity executed within the sub-process (including its sub-process tasks). This includes activities whose errors cannot be caught directly by attaching the error event.

Configuring Error Events

Error events are configured in the Properties view.

In case of a catch error event, perform the following actions:

- **Catch All Errors**
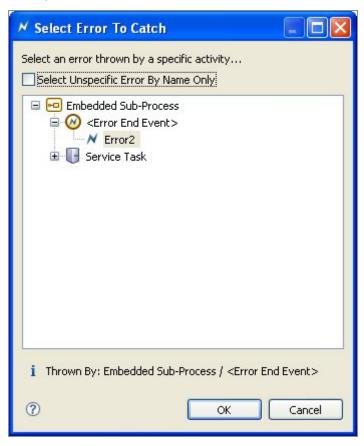
  (default) Catches any error thrown by any event.

- **Catch Named Errors**

  To do this, click **Select Error** and select the **Select Unspecific Error By Name Only** check box. The dialog box lists the catchable error codes. Select the error codes that you want to catch. This configures the event to catch the selected error from any activity.
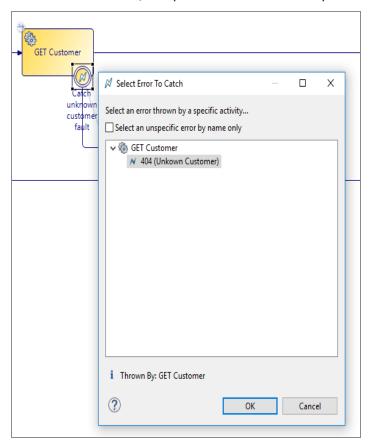
- **Catch Specific Errors from Specific Activities**

  Click **Select Error** and deselect the **Select Unspecific Error By Name Only** check box. The dialog box lists events and activities that throw error codes. Expand the desired event or activity to catch a specific error thrown by a specific activity. For example:

- **Catch Specific REST Service Fault**
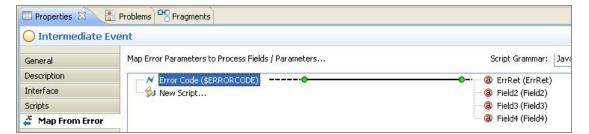
  REST service faults are caught in the same ways as other errors (either named REST service faults, or specific errors from a specific service task). For example:

Error Data Mapping

You can map error parameters to process data from the **Map From Error** tab.

Example:

The process data on the right side of the tab is either all data or a subset of data as specified on the selection on the **Interface** tab.
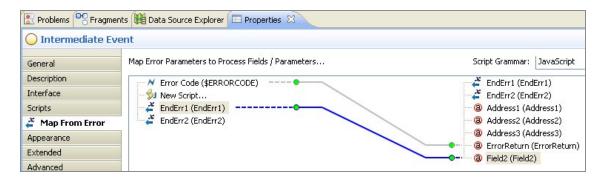
The content of the left side of the **Map From Error** tab depends on the configuration of the **General** tab:

- **Catch All / Catch Named Errors**

  Only the automatically provided error code can be used for mapping as shown in the previous example. Typically, this error code is mapped to a process text data field or parameter for display to the user. At run time, the text data field or parameters is populated with the error code name when the error is caught.

- **Catch Specific Error Thrown By Sub-Process End Error Event**

  All parameters with a mode of **Out** or **In/Out** that are associated with the throw error end event (on the **Interface** tab) are displayed for mapping:

- **Catch Specific REST Service Fault**
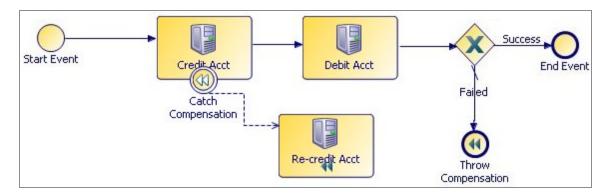
  REST service fault payload parameters are displayed on the left side and can be mapped as normal.
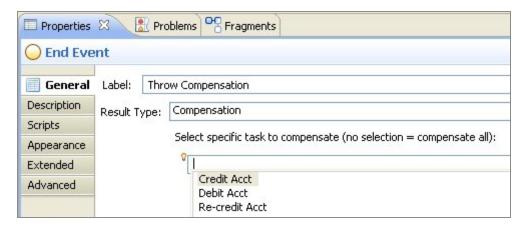
Compensation Events Configuration

Compensation events are used to reverse the effect of previously executed tasks.

For example:

In this example, if the credit/debit fails, a compensation event is thrown. The target of the event is the **Credit Acct** task, which catches the error and proceeds with the **Re-credit Acct** task. In the Properties view for the **Throw Compensation** end event, you can press Ctrl+Space to see a list of tasks from which you can select the target of the compensation. Alternatively, you can compensate all previously executed tasks by not specifying a target for the compensation:

Send/Receive Request Event Implementation

TIBCO Business Studio supports the following Message Exchange Patterns (MEPs).

MEP	Description	How to Model
Receive a one-way request from an external application	The process receives an incoming request via the business process API from an external application and does not send a response.	Start request event (if the process is started on receipt of the request)

(Continued)

MEP	Description	How to Model
	For more information, see the [Controlling flow from an external application]().	Receive task
Send a one-way request to an external application	The process sends a message to an external application but expects no response.	Send task
Send a request-response message to an external application	A client (service consumer) sends a request message to the web service (service supplier). The web service (service supplier) returns a response message to the client (service consumer). The web service might optionally return a fault message in the event of an error.	Service task

Whether a message event performs a one-way operation or is part of a request-response operation is configured on the Properties view for the events.

Event Handlers

Event Handlers are supported in Business processes and Pageflow processes. You can use event handlers to execute a flow that is separate from the main flow of the process (for instance to update process data used by the main flow).
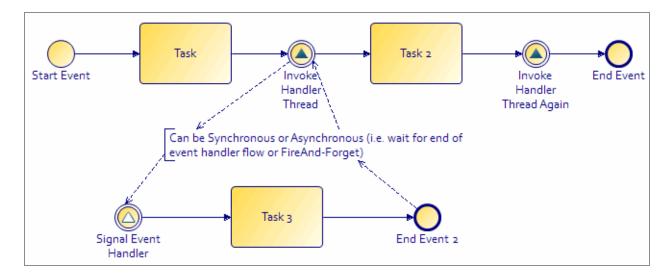
See the "Event Handlers" and "Event Sub-Processes" topics in the *TIBCO® BPM Enterprise Concepts Guide*.

Signal Event Handlers

An event handler flow can be triggered from within the same process instance using signal events. The signal event handler flow can be executed asynchronously or synchronously with the invoking flow (the invoking flow generally waits at the throw-signal event for the

completion of the event handler flow before continuing). This allows process designers to define and re-use complex sets of repeatable activities.

> **ⓘ** **Note:** This could be especially useful when considering the additional tasks and exception handling that are required by global data updates because each update on a single piece of global data could involve several tasks (one to do the update, plus exception handling if the update fails). Therefore, if many updates are performed on global data, then the process could soon become very cluttered with global data handling activities reducing the visibility of the actual business process tasks. Use of the signal event handler could greatly reduce this type of problem by allowing the process designer to implement the set of tasks to update a global data item and handle exceptions only once and re-use that from many places in the process.

The catch signal event Properties tab contains Event Handler configuration controls (which are shown only when the catch signal is an event handler (with no incoming flow).

The default setting is **Wait at the invoking signal until event handler flow is complete**. This setting controls whether the throw signal's outgoing flow is processed after the event handler flow. If you unset this flag it can be processed without waiting.

Note that:

- Signal event handlers can also be used within embedded sub-processes. Place the signal event handler inside the embedded sub-process. This ensures that the embedded sub-process local data is in scope of the signal event handler flow.

- Signal event handlers can be used within pageflow processes.

- Case data signal event handlers allow a process to subscribe to a particular case object that the process uses. The process then is notified if that case object is modified, and can take appropriate action to respond to the change.

Using the Cancellation Event Handler

You can execute a cancellation event handler flow (only one per process) to manage the cancellation of a process and its sub-processes.

Procedure
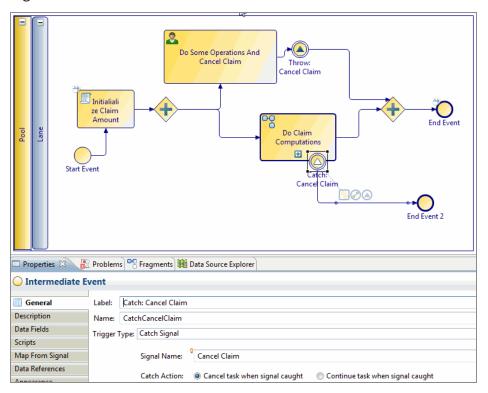
1. **How to cancel a sub-process task**: Attach a catch intermediate event to a call sub-process task in your main process, with a trigger type of Catch Signal. The Catch Action should be **Cancel task when signal caught**.
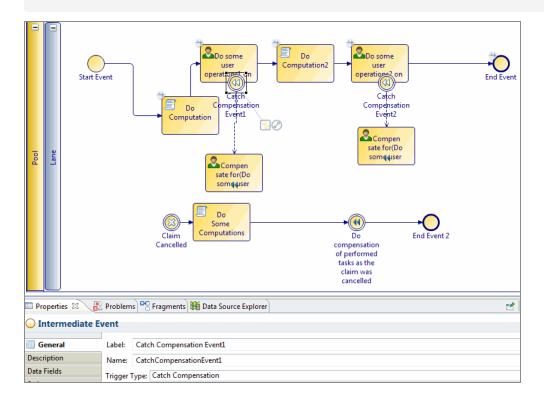
   Alternatively, you cancel a process sub-process task with a task boundary event as follows:

   Timer:

   Signal:

The tree of sub-process instances that were instantiated from a sub-process task are canceled from the bottom up. If the sub-processes need to execute compensation actions to close down gracefully they can do so using Cancellation Event handlers.

2. **The Sub-Process Cancellation event handler**: Add activities to perform any actions required prior to the final sub-process cancellation. A common pattern would be to use throw-catch compensation as in the example below, where there is an intermediate catch event with trigger type Catch Compensation on each task in the sub-process, which requires compensation events. Compensation events execute their actions if only when the task they're attached to has been executed. Thus, there is not a need to manually conditionalize compensating tasks depending on progress through the main process flow.

> **ⓘ Note:** Cancel event handlers are only executed for process-driven cancellation (not for user/API-driven process cancellations).

> **ⓘ Note:** The cancel event handler does not have to trigger compensation event handlers. It might either generate signal events into the main part of the process or just perform the compensatory actions directly.
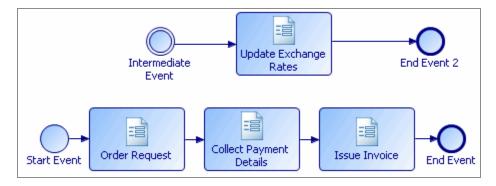
> **ⓘ Note:**
> - The sub-process can also invoke another sub-process (and so on) with more cancel event handlers.
>
> - There does not have to be a cancel event handler in each sub-process if it is not required.
>
> - Cancellation event handlers are not executed when a process instance is canceled through Process Manager API, either from an external application or from the Openspace client.
>
> - If a cancellation event handler fails, then you receive an audit event and should be able to recover from a halted state.

Event Handlers in Pageflows

You could use the event handler to update the process data. Another way to use it would be to add to the runtime identifier array and associated input mapping arrays to add instances to a dynamic sub-process invocation.

In this example, a pageflow process is used to manage an order request. The event handler is used to update exchange rate information regularly. This updated exchange rate information is then used as input to the task **Issue Invoice**.

Incoming Request/Global Signal Event Handlers in Business Processes

Incoming request event handlers allow you to process a separate flow in an existing process instance via a runtime process REST API call. As with any incoming request activity, correlation to a process instance is done using the runtime process instance ID.

> **ⓘ** **Note:** Catch Global Signals have event handler controls similar to those of catch incoming request event handlers and the behavior is the same as that of catch incoming request event handlers.
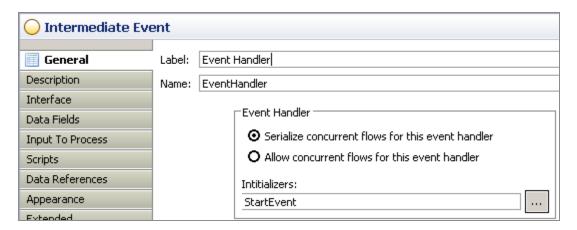
Blocking and Non-Blocking Incoming Request Handlers

You can configure what happens when an event handler is triggered prior to completion of the flow from a previous triggered instance.

The following configuration options are available:

- **Blocking**: The **Serialize concurrent flows for this event handler** option means that further event triggers are queued until an existing event handler flow completes (unless the main process flow completes).

- **Non-blocking**: The **Allow concurrent flows for this event handler** option means that if the event is triggered multiple times, the flow from each can be processed in parallel.

The configuration options are shown under Event Handler in the following image:

Initializing Event Handlers

For global signal event handlers, you must specify a list of activities after which the event handler can be initialized (or reset if already initialized). You need to do this because if the value of correlation data associated with the event handler is changed during the life of the process then existing event handlers are not triggered according to the new correlation data value unless they are initialized.

Select initializers for the event handler using the **Initializers:** selection under Event Handler (as shown in the image). You can select any task, embedded-sub-process or event activity (except those attached to task boundary, or events that are themselves event handlers). This includes activities on event handler outgoing flows.

If you do not specify any activities then the event handler initializes during processing of the first start-activity, but before the start-activity's Complete script. For this to happen one of the following conditions must be met:
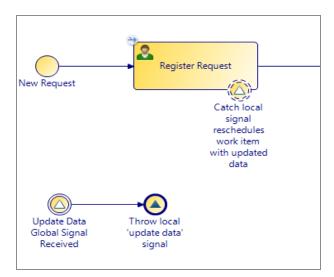
- The correlation data associated with each event handler must be initialized in correlation data mappings in each start activity.

- You must explicitly state the activities after which the event handler(s) are initialized. Once any activities are explicitly stated in this way, then the event handler is only initialized after those activities complete.

  Even if the correlation data is initialized in the complete script of a start activity, if you wish an event handler to initialize correctly you must use this method of explicitly stating the initialize-after activities on each event handler (that is, if the event handler is to be initialized at start of a process instance then the start activity must be explicitly stated).

Example: Using Event Handlers in a Business Process

The following example illustrates the process of updating work item data using an event handler and a non-canceling signal event.

In this example, a business process is used to manage a request. The event handler is used to update information related to the request. This updated information is then used as input via a non-canceling signal event to the task **Register Request**.

Migration and Upgrade when using Event Handlers

There are certain issues regarding event handlers that you should be aware of when migrating and upgrading.

Migration:
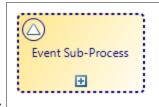
See Design Considerations for Process Migration for information on process migration considerations when using event handlers.

Upgrade:
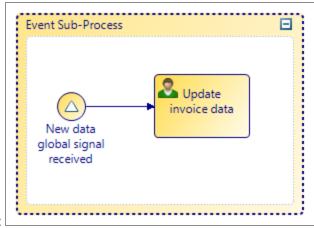
Adding, deleting or modifying event handlers from which web-service operations are generated affect the interface and therefore prevent upgrade, but subsequent event handler changes are valid.

Event Sub-Processes

An event sub-process executes an internal sub-process when an event is triggered. You can use event sub-processes within business processes and pageflows.

Collapsed form:

Expanded form:

> ℹ **Note:** Event sub-processes and event handlers provide similar functionality. See the "Event Handlers" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Ensure the following details when using event sub-processes:

- A process can contain zero or more event sub-processes of any supported type or configuration.

- Each event sub-process must start with a single start event.

- There is no in-process communication between event sub-processes (sequence flow, signals and so on).

You can use event sub-processes with the following start events:

- Event Sub-Processes placed in a Business process: Incoming Request Start Event and Signal Start Event

- Event Sub-Processes placed in a Pageflow: Signal Start Event and Type None Start Event

Business processes support interrupting/non-interrupting event sub-processes.

> ℹ️ **Note:** Pageflows support non-interrupting event sub-processes. They do **not** support interrupting event sub-processes.

This is defined on the start event of the event sub-process by checking **Interrupt Process Flow** or **Continue Process Flow**. This affects the process as follows:

Interrupt Process Flow:

> ℹ️ **Note:** An interrupting event sub-process start event has a solid border.

- The main process flow is suspended until completion of the event sub-process.

- This does not affect the processing and completion of individual activities that are already in progress related to the process instance. However, those activities' outgoing flow is not processed until the event sub-process completes.

- This does not affect the processing of other event handler flows, event sub-processes and ad-hoc activities.

- This does not affect the processing of activities in active reusable sub-processes.

- Incoming events, submits, sub-process completions and so on in the main process are preserved but ignored until the event sub-process has been completed.

Continue Process Flow:

> ℹ️ **Note:** A non-interrupting event sub-process start event has a dashed border.

- The main process flow is not suspended during processing of the event sub-process.

- All activity can continue as normal.

Sub-Process Call Tasks

This section describes how to work with sub-processes in TIBCO Business Studio.

Creating Call Sub-Processes

There are several different ways of creating a call to a sub-process:

You can create a call to a sub-process:

- By refactoring objects in your process (see Creating a New Embedded Sub-Process).

- By dragging a process from the Project Explorer and dropping it onto your process (described in this section).

- Using the call sub-process activity tool from the palette (see Refactoring Activities into a Sub-Process).

> ℹ **Note:** If you modify a sub-process (for example, by adding a parameter) and that sub-process is referenced by a main process in a different package, validation in the main process does not occur until you save the sub-process package.

Creating a Call Sub-Process Activity Call Using drag-and-drop

Procedure

1. Expand the Project Explorer to locate the process that you want to be the sub-process.

2. Click the intended sub-process, holding down the mouse button, drag the pointer to the calling process (open in the Process Editor), and release the mouse button.

   > ℹ **Note:** You can select multiple processes for drag-and-drop operations using the Ctrl key.

3. If you are dropping more than one process, a menu is displayed with two options:

   - **Create Sub-Process Task Sequence**

     Selecting this option allows you to create sub-process tasks connected by sequence flow. A dialog box is displayed to allow you to control the order of the tasks: Use the **Move Up** and **Move Down** buttons or drag-and-drop to

control the order of the tasks. When you are finished, click **OK** to place the tasks.

- **Create Unsequenced Sub-Process Tasks**

  Selecting this option places the tasks in the process without a connecting sequence flow.

Creating a call sub-process call using the palette
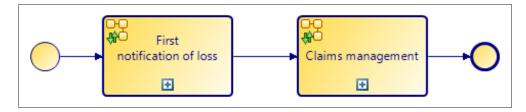
Procedure

1. In the Process Editor, select the **call sub-process** tool.

2. Click in the process where you want to place the activity that calls the sub-process.

3. On the Properties view for the activity, browse for the process you want to call as a sub-process.

> **ⓘ Note:** If the process you select is not in the current project, you are prompted to create a project reference.

Call Sub-Process Example

The following example demonstrates how a top-level process could use sub-processes in an insurance environment.

Each of the activities in the process calls sub-processes that are executed in the runtime environment. For example, the sub-process called from the Claims management activity could look like this:

Note the following about this sub-process:

- The Validate Policy sub-process can be re-used. For example, when a customer calls to renew their policy, the first step of the Renewal Process could be to confirm that they have an existing policy. The Validate Policy Activity could be re-used for this purpose in the Renewal process.

- The Process claimant activity has a **Loop** Activity Marker, that indicates that the activity is repeated for each Claimant.

- The *actual* sub-process called by the Assess liability activity is a manual Process. However, the *to be* sub-process (planned for the future), could be implemented as an automatic process that consists of a series of questions used to determine liability. Simulation could be used to demonstrate the performance and cost-savings of migrating the Assess liability activity to an automatic process.

Expanding a Sub-Process

You can expand a sub-process associated with an activity.
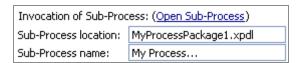
An activity that calls a sub-process looks like this:

To expand the sub-process associated with this activity, either click the plus symbol, or do the following:

Procedure

1. In the Process Editor, select the activity that calls the sub-process.

2. In the Properties view, select the **General** tab.

3. Click **Open Sub-Process**:

Invocation of Sub-Process:	(Open Sub-Process)
Sub-Process location:	MyProcessPackage1.xpdl
Sub-Process name:	My Process...

4. The sub-process opens in the Process Editor.

Configuring a Sub-Process

You can configure the sub-process invocation mode, and whether it should execute immediately or be queued.

Use the Lifecycle option, on the **General** tab in the **Properties** view to select the invocation mode from the following:

- Synchronous

- Asynchronous Attached

- Asynchronous Detached

For definitions of the different types of invocations, see "Synchronous and Asynchronous Sub-Process Invocations" in *TIBCO® BPM Enterprise Concepts Guide*. There are a number of restrictions that are indicated via validation problem markers.
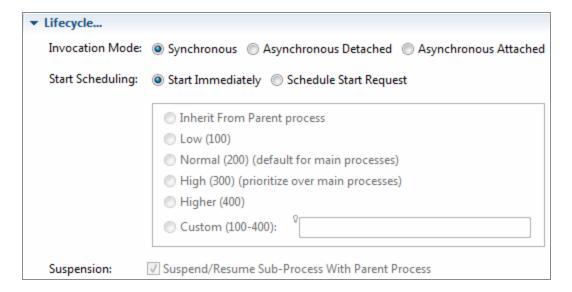
You can access the process-id of the new process instance as a sub-process output mapping. This is mappable to a string-typed field or parameter.

> **ℹ Note:** You cannot map from sub-process output parameters when invoking asynchronously because the invoking process does not wait for the sub-process to complete and return.

Use the Lifecycle option, on the **General** tab in the **Properties** view to select whether the sub-process should execute immediately or whether its start request should be queued.

- Select **Schedule Start Request** to set the initial priority for the queued sub-process start request and the tasks within that using the options in the **Priority** radio buttons.

- Select **Start Immediately** to set the priority of the task within the process in the process **Resource** tab. See Prioritizing a Scheduled Reusable Sub-Process.

- Specify whether sub-process instances should suspend and resume when the parent process is suspended or resumed by selecting or deselecting the **Suspend/Resume Sub-Process With Parent Process** check box.
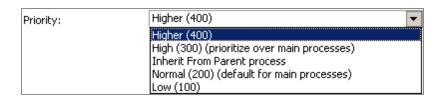
Prioritizing a Scheduled Call Sub-Process

Call sub-processes configured to **Schedule Start Request** are started with the default priority at which a main process is started.

This means they might be queued behind a large number of main processes already waiting to be executed. In this case you might want to prioritize call sub-processes in a process.

Procedure

1. Use the drop-down from the Priority field from the **Resource** tab for the call sub-process. Set one of the following priorities:

Priority: [Higher (400) ▼]
Higher (400)
High (300) (prioritize over main processes)
Inherit From Parent process
Normal (200) (default for main processes)
Low (100)

Invoking a Sub-Process Asynchronously

You can create asynchronous sub-processes from a process to allow you to run sub-processes independent of the main process, when you are not concerned if they complete before the main process.
See the "Synchronous and Asynchronous Sub-Process Invocations" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Procedure

1. Create the main process containing a call sub-process activity.

2. On the Properties for the call-sub-process activity, use the Lifecycle option, on the **General** tab in the **Properties** view to select **Asynchronous** invocation mode.

3. Click on the [+] sign on the call sub-process activity to open the asynchronous sub-process in a new window.

4. Create the content of your asynchronous sub-process.

Embedded Sub-Processes

To create an embedded sub-process, refactor one or more objects in your process

See Creating a New Embedded Sub-Process.

> **ⓘ** **Note:** If you want to use the chained execution resource pattern, you can do so by selecting the **Chained Execution** check box in the Properties view for the embedded sub-process. For more information, see Chained Execution- Multiple Parallel Paths in a Chaining Group.

Adding Local Data Fields

You can add data fields that are local to a sub-process (they are not used in the process that contains the embedded sub-process).

By default, activities in the embedded sub-process have access to all local data and process data. However, using the **Interface** tab, a subset of data can be selected.
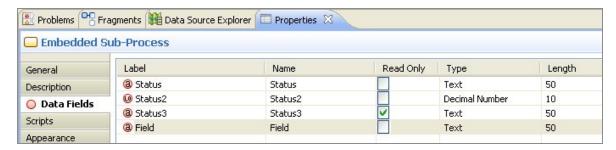
Procedure

1. Click the **Data Fields** tab in the Properties view for the embedded sub-process.

2. At the right of the **Data Fields** tab, click the plus sign to add local data fields. The properties of the data fields that you create are the same as for process data (see Adding Data Fields or Parameters to a Package or Process).
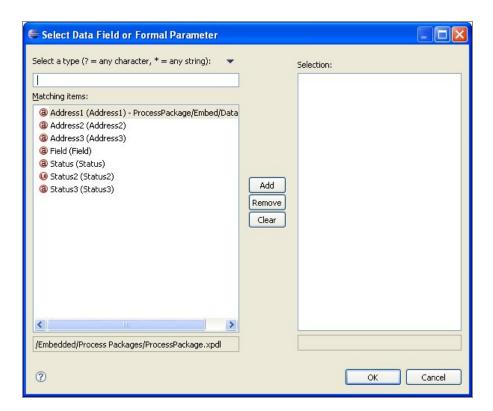
    > **ℹ Note:** Local data fields are not displayed in the Project Explorer.

    For example:

	Label	Name	Read Only	Type	Length
General	ⓐ Status	Status	☐	Text	50
Description	⑴⓪ Status2	Status2	☐	Decimal Number	10
○ **Data Fields**	ⓐ Status3	Status3	☑	Text	50
Scripts	ⓐ Field	Field	☐	Text	50
Appearance					

Embedded Sub-Process / Problems, Fragments, Data Source Explorer, Properties

In this example, the data fields **Status**, **Status2**, **Status3**, and **Field** are local to the embedded sub-process. On the **Interface** tab for activities within the embedded sub-process, you can access the local data as well as the process data:

In this case the address data fields (process data) and the local data defined on the **Data Fields** tab are both available.

> **Tip:** You can quickly create an embedded sub-process that has local data by using the fragment **BPMN Process Fragments > Basic Fragments > Embedded Sub-Process with Data Fields**. For more information about fragments, see Creating Call Sub-Processes.

Local Data Fields in Loops

When using local data fields in loops, the value taken by the local data field during each iteration depends on the type of loop.

Multi-instance loop

Each instance of a multi-instance loop has a separate instance of the local data field, allowing parallel loops to execute without interfering with each other. However, the local data fields cannot be used in the loop expression.

Standard loop

The local data field is shared between all instances of a standard loop. It can be used to pass data between instances, and can be used in the loop conditional script.

> ℹ **Note:** You cannot initialize a local data field prior to the first "Before" condition test.
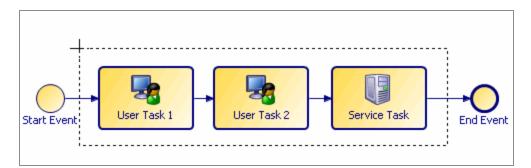
> ℹ **Note:** For both multi-instance and standard loops, the task initiate script runs just before executing the task for each iteration of the loop.

Creating a New Embedded Sub-Process

You can create a new embedded sub-process by refactoring existing objects into an embedded sub-process.

Procedure
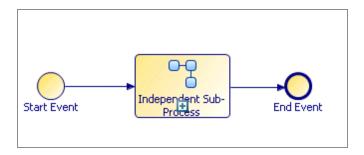
1. Select the objects that you want to put in the embedded sub-process. For example:

2. Right-click and select **Refactor > Move into New Embedded Sub-Process**.

3. Complete the dialog box as follows:

   a. Enter a name for the embedded sub-process that you want to create.

   b. Select the **New Sub-Process is a transaction** check box if you want the new sub-process to become a transaction and therefore be under transaction control (see User Tasks and Pageflow Processes).

   c. Select the **Insert start event in new sub-process** and **Insert end event in new sub-process** check boxes to control whether start and end events are

added to the refactored sub-process.

4. Click **Finish**. The objects that you selected are placed within a new embedded sub-process (with start and end events if those options were selected):
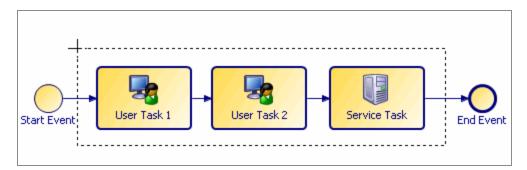
Refactoring Activities into a Sub-Process

You can create a new call sub-process activity and sub-process by extracting existing objects.

Procedure

1. Select the objects that you want to put in the sub-process. For example:
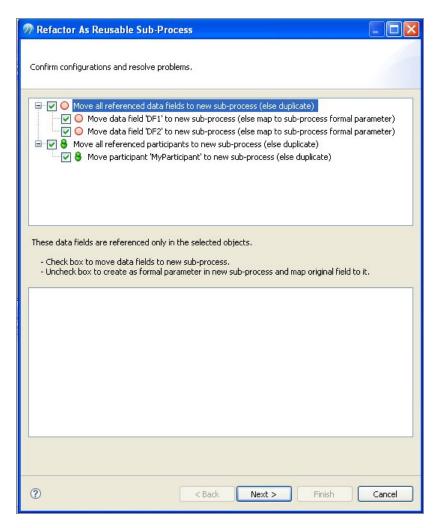
In this example, the two user tasks have the following parameters (two data fields and one formal parameter):

The user tasks also have a participant associated with them.
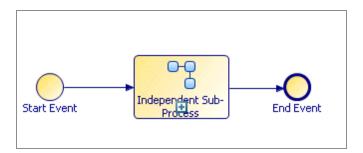
Select all three tasks.

2. Right-click and select **Refactor > Extract into New Sub-Process**.

3. Because the data fields and participants are only referenced in this activity (and not used by any other activities), the following message is displayed:
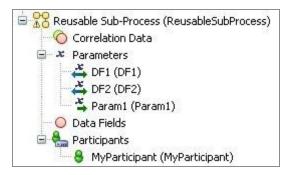
- For the participant, TIBCO Business Studio gives you the option of either moving this participant into the sub-process, or duplicating the participant in both the parent process and the sub-process.

- If you select the data fields, they are moved into the sub-process.

- If you do not select the data fields, they are created as formal parameters in the sub-process (and mapped to those formal parameters).

4. Complete the dialog box follows:

   a. Enter a name for the sub-process that you want to create.

   b. Select the **New Sub-Process is a transaction** check box if you want the new sub-process to become a transaction and therefore be under transaction control (see User Tasks and Pageflow Processes).
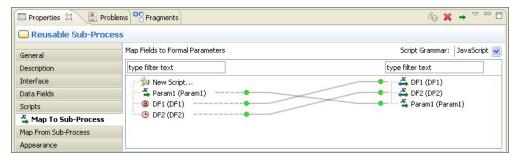
    c. Select the **Insert start event in new sub-process** and **Insert end event in new sub-process** check boxes to control whether start and end events are added to the refactored sub-process.

5. Click **Finish**. The objects that you selected are copied to the new sub-process and the selected objects are replaced with a task that calls the call sub-process.

If you chose to create formal parameters for the data fields, you can see them in the Project Explorer, under the sub-process:

In addition, if you click the task in the parent process that calls the sub-process and go to the Properties view, you can see the mappings that have been created between data fields and formal parameters of the parent process and the formal parameters created in the sub-process. For example:

Result
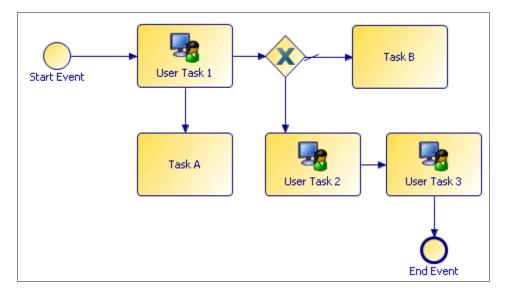
Notes on Refactoring Objects into Sub-Processes:

- Formal parameters in the parent process are created as formal parameters in the sub-process. They are mapped according to their mode as defined in the process API.

- If a data field is referenced only in the selection that you are refactoring, you have the option of moving or copying it. Data fields that are *copied* into the sub-process are created as formal parameters and mapped. Data fields that are *moved* into the sub-process are created as data fields. By default, data fields are *moved*. In order to *copy* them as formal parameters, you must deselect the selection boxes on the dialog box.

- If a data field is referenced in one or more of the tasks you select for refactoring but is also referenced elsewhere, it is *automatically copied* into the sub-process as a formal parameter.

- A mapping is created between data fields and formal parameters of the sub-process and any corresponding formal parameters that are created in the sub-process. You can view this mapping by selecting the task that calls the sub-process and clicking the **Map To Sub-Process** and **Map From Sub-Process** tabs in the Properties view.
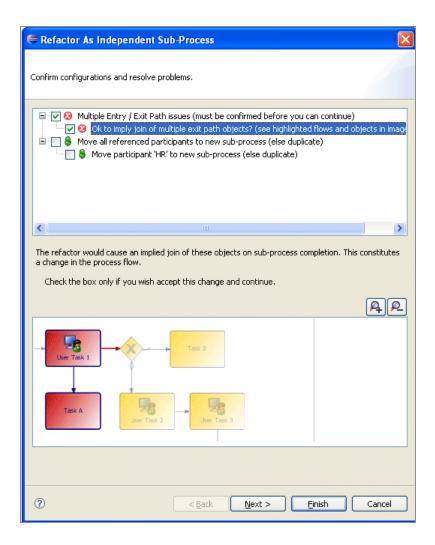
Changes in Process Logic:

When refactoring objects into a call sub-process, you can potentially change the logic of the process flow.

Consider the following process:

In this process, flow proceeds from **User Task 1** to the gateway without necessarily waiting for **Task A** to finish. If **User Task 1** and **Task A** are refactored into a sub-process, an end event is inserted into the sub-process, effectively synchronizing the flow. TIBCO Business Studio prompts you to confirm this change to the process:

Inline Sub-Process Content

This option creates an embedded sub-process from a call sub-process activity. The reason for making a call sub-process inline is that in some cases the tasks in the sub-process execute relatively quickly and the overhead of invoking a sub-process can be comparatively high.

Refactoring a Call Sub-Process into an Embedded Sub-Process

You can refactor a call sub-process activity into an embedded sub-process.
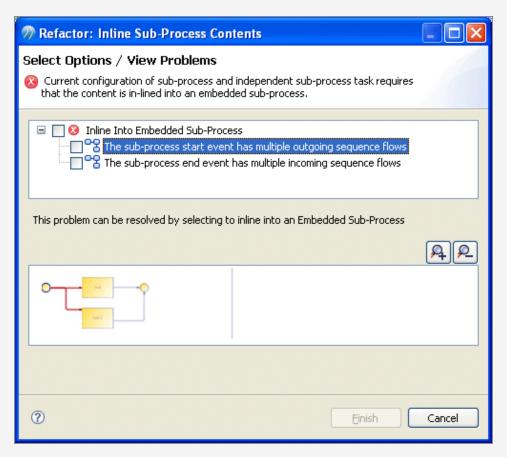
Procedure
1. Right-click the call sub-process activity, and select **Refactor > Inline > Sub-Process**

Content.

> ℹ **Note:** Only a single level of a process hierarchy can be made in line at a time. If the sub-process you want to make inline contains a sub-process task, after refactoring, it is brought into the embedded sub-process as a sub-process task (the refactor does not extend into additional levels of the process hierarchy).

2. The sub-process called by the selected task is analyzed, and a dialog box is displayed with the results:

   - If there are no problems with the refactoring operation, a dialog box is displayed. Select **Inline into Embedded Sub-Process** and click **Finish**.

   - If there are problems with the refactoring, but the problems can be resolved by making the sub-process inline, a dialog box is displayed showing the problems:
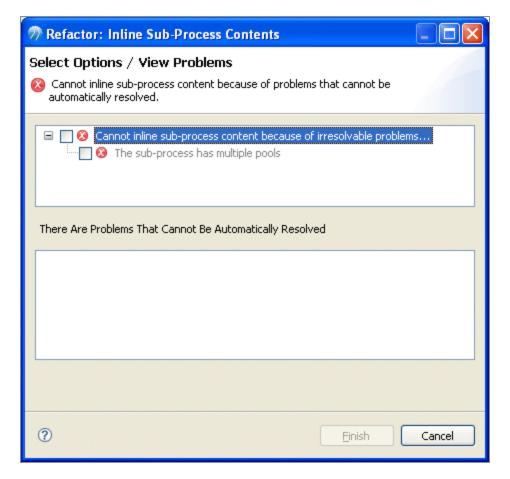
> **Note:** The possible problems displayed in this dialog box are similar to those for process package optimization, except that some of these problems that are not resolvable for package optimization are resolvable by refactoring into an embedded sub-process (such as those reported in the previous dialog box).
>
>
>
> Also, problems dealing with nesting of sub-processes are not applicable because manual refactoring affects only a single level of sub-process hierarchy at a time.

You can see the location of each problem by highlighting it. If you select all of the problems in this dialog box, the **Finish** button is enabled and you can refactor the sub-process.

- If there are problems that cannot be resolved by refactoring, a dialog box similar to the following is displayed:

Because the errors cannot be resolved, click **Cancel**, resolve the problems manually, and retry the refactoring.

3. If the sub-process was able to be refactored, its contents are placed in an embedded sub-process, however the sub-process that was made inline is not removed.

Result

> ℹ️ **Note:** The following are potential consequences of a refactoring. For more information, see Inline Sub-Process in Detail:
>
> - References to sub-process parameters in the sub-process content are swapped for the calling process data fields that are mapped to them.
>
> - Sub-process data fields and unmapped parameters are copied up to the calling process and renamed with a sequence number if the data field or parameter already exists in the calling process.
>
> - Sub-process participants are copied to the calling process (if they do not already exist).
>
> - Type declarations referenced by data copied up from the sub-process are copied to the package of the calling process *only* if the sub-process is in a different package.
>
> - If the sub-process implements a process interface (see Process Interfaces), the start or intermediate events that implement interface-defined events are changed so that they are no longer flagged as such.

Inline Sub-Process in Detail

This section describes in detail what happens when you use an inline sub-process (including its parameters, participants, and so on).
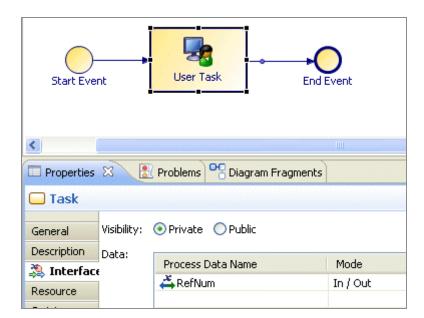
Data Fields and Mapped Parameters

References to parameters in sub-processes are replaced according to the parameter mapping.

For example, consider the parameter mapping to the following sub-process:

The data field **CustRef** in the parent process is mapped to **RefNum** in the sub-process. In the sub-process, the parameter **RefNum** is used by the single user task:

After refactoring as an inline sub-process, the user task is brought into the main process with **RefNum** as its parameter.

> ⓘ **Note:** Every effort is made to ensure that when a sub-process is in lined, it is semantically the same as if it were not in-lined. However, not every potential scenario can be catered for.
>
> For example, if the same calling-process field is used in the parameter mappings for two parallel call sub-process activities, the calling-process field now can be used in-parallel in the two sets of sub-process contents that were moved up into the calling-process. This might have undesired effects.

Sub-Process Data Fields and Unmapped Formal Parameters

Sub-process data fields and unmapped formal parameters are moved up to the calling process after refactoring. In order to preserve the original semantics of the sub-process, any data fields or unmapped formal parameters in the sub-process that also exist in the calling-process are renamed (each new instance of the same named data is suffixed with a sequence number). Any references to the renamed sub-process data are updated when the sub-process activities and flows are moved up to the calling process.

> ⓘ **Note:** Package-level data fields are not included in this behavior unless the sub-process is in a different package to the calling process.

For example: A sub-process has a data field called CustomerField which its activities use internally. The calling process also has a field called CustomerField which it uses internally.

When the sub-process is in-lined, the sub-process CustomerField is copied into the calling-process as CustomerField2. All references to CustomerField in sub-process activities and flows are replaced with references to CustomerField2.

Multiple Calls to a Sub-Process

This rule also applies when several sub-processes are called from a single process. If the sub-processes have the same data fields names, then each invocation causes separate, sequence-numbered instances of data fields in the calling process when they are made inline.

For example: There are two calls to the same inline sub-process from a single calling process. The sub-process has a field called CustomerField.

The copy of sub-process activities and flows 'moved up' in place of one call sub-process activity operate on CustomerField and the other operate on CustomerField2.

Field Name Conflicts

This rule also applies when inline sub-processes are nested, and have conflicting field names.

For example: The calling-process (MainProcess) calls an inline sub-process (SubProcess) which in turn calls a nested inline sub-process (SubSubProcess).

Each process has a field called CustomerField.

- SubSubProcess is in-lined into SubProcess so that its instance of CustomerField becomes CustomerField2 in SubProcess.

- SubProcess now has 2 fields, CustomerField and CustomerField2. When this is in-lined into MainProcess CustomerField in SubProcess is dealt with first (alphabetically) and is therefore renamed as CustomerField2 in MainProcess.

- Now when the SubProcess field CustomerField2 is subsequently copied into MainProcess, a CustomerField2 already exists so it is renamed as CustomerField3.

Sub-Process Participants and Type Declarations

Participants are moved up to the calling process if the calling process does not already have a participant with the same name. If the Participant already exists in the calling process, references to the sub-process participant are exchanged for references to the calling process participant in the sub-process content that is moved up.

Similarly, type declarations (that are referenced by sub-process data fields and unmapped formal parameters) are moved up to the calling process if the calling process does not already have a type declaration with the same name. Otherwise, the calling-process type declaration is used.
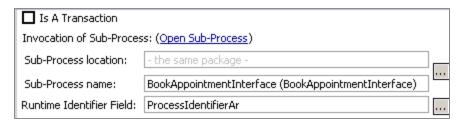
Creating Dynamic Sub-Processes

A dynamic sub-process can be created by modifying a call sub-process activity.

See the "Dynamic Sub-Processes" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Procedure

1. Create a process interface that specifies the start event and its input or output parameters. Each process that is to be invoked from the dynamic sub-process task **must** implement the same process interface. See Process Interfaces.

2. Create one or more call sub-process activities in your process.

3. From the **General** tab for each call sub-process activity:

   a. Using the picker, select the process interface created in step 1.

   b. In the Runtime Identifier Field select a formal parameter or data field using the picker. This must be a text field or an array. Arrays can be used for multi-instance sub-process tasks where potentially different sub-processes are required for each instance of the same task.
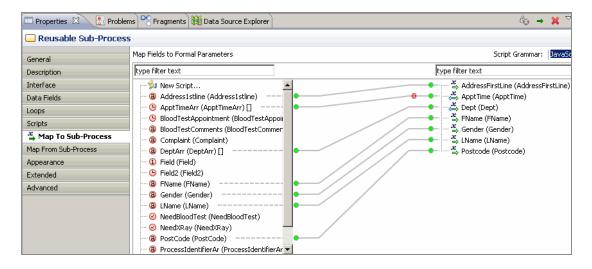
4. Initialize the Runtime Identifier Field. For example, for a multi-instance sub-process

task you could create a Script task before it to populate the array data field with a sub-process name element for each task instance. For a single instance sub-process task simply set the runtime identifier field to the required sub-process name in a script prior to the task.

For a sub-process implementation which resides in an external sub-process library., you could use a script something like the script shown in the following illustration:

5. In the call sub-process activity, map data to and from the called process (to pass data between the process and sub-process):

- Map the input to the interface in Map To Sub-Process.

- Map the output from the interface in Map From Sub-Process.

  For example:

Automatically Passing Different Data to and from Sub-Process Instances

If the call sub-process activity is multi-instance (or loop) it is possible to automatically pass different data to and from each separate sub-process instance.

Inputting Different Data to Each Sub-Process Instance

Procedure

1. Specify an array data field that matches the type of a non-array sub-process/interface input parameter.

2. In a script prior to the sub-process task, populate this array data field with different data for each sub-process instance. For example:

   - `appointmentTypeArray.set(0, "X-Ray");`

   - `appointmentTypeArray.set(1, "PlasterDept");`

   - `appointmentTypeArray.set(2, "Physio");`

3. In the "Map to Sub-Process" property tab, map the array data field to the non-array sub-process/interface parameter. The sub-process invoked from each instance of the task receives the list element corresponding to the instance index of that task. For example:

   - The first instance (activity loop index=0) receives the data "X-Ray" into its "appointmentType" parameter.

   - The second instance (activity loop index=1) receives the data "PlasterDept" into its "appointmentType" parameter.

   - The third instance (activity loop index=2) receives the data "Physio" into its "appointmentType" parameter.

Returning Different Data from Each Sub-Process Instance

Procedure

1. Specify an array data field that matches the type of a non-array sub-process/interface output parameter.

2. In the "Map From Sub-Process" property tab, map the output parameter to that array field.

    At runtime, the array field is populated with the return data from each sub-process instance. The list element index corresponds to the activity loop index from which the sub-process instance was invoked.

    For example, if the sub-process returned an integer parameter "ReturnParam" with value "X-OK" when passed "X-Ray", "PL-OK" when passed "PlasterDept" and "PH-OK" when passed "Physio", and you mapped this to an array data field "ReturnArrayField", then:

    -   ReturnArrayField.get(0) is "X-OK"

    -   ReturnArrayField.get(1) is "PL-OK"

    -   ReturnArrayField.get(2) is "PH-OK"

Result

The way that this data is passed behaves in the same way for multi-instance statically defined sub-process tasks (tasks that reference an actual sub-process at design time).

Control of the Flow in Dynamic Sub-Processes

The flow of processing within dynamic sub-processes can be controlled using the facilities for controlling flow in a process.

See Controlling Flow in a Process.

In particular you can specify whether multiple instances of the sub-processes should be performed sequentially or in parallel by using the **Ordering** and **Flow Condition** fields of the **Call Sub-Process** activity. See Creating a Standard Loop for more details.

You can also add additional instances to the loop while the sub-process is running, using a script on a parallel processing path. For details, see Adding Additional Instances to a Multi-Instance Loop Task Whilst the Task is in Progress.

Making a Sub-Process Call to a Process Interface

There are two different ways of creating a call to a process interface.

-   By dragging a process interface from the Project Explorer and dropping it onto your

process.

- Using the call sub-process tool from the palette.

Creating a Call Sub-Process Call using drag-and-drop

Procedure

1. Expand the Project Explorer to locate the process interface that you want to implement.

2. Click the process interface, holding down the mouse button, drag the pointer to the calling process (open in the Process Editor), and release the mouse button.

> **ℹ️ Note:** You can select multiple processes for drag-and-drop operations using the Ctrl key.

3. If you are dropping more than one process interface, a menu is displayed with two options:

   - **Create Sub-Process Task Sequence**

     Selecting this option allows you to create sub-process tasks connected by sequence flow. A dialog box is displayed to allow you to control the order of the tasks: Use the **Move Up** and **Move Down** buttons to control the order of the tasks. When you are finished, click **OK** to place the tasks.

   - **Create Unsequenced Sub-Process Tasks**

     Selecting this option places the tasks in the process without a connecting sequence flow.

Creating a Call Sub-Process Call Process Interface using the Palette

Procedure

1. In the Process Editor, select the **call sub-process** tool.

2. Click in the process where you want to place the activity that calls the sub-process.

3. On the Properties view for the activity, browse for the process interface you want to call as a sub-process.

> **ⓘ** **Note:** If the process interface you select is not in the current project, you are prompted to create a project reference:

Controlling Flow in a Process

This section describes some of the common tasks that you perform using TIBCO Business Studio to control flow in a process.

See "Flows", "Loops", and "Gateways" topics in the *TIBCO® BPM Enterprise Concepts Guide*.

Controlling Flow with Sequence Flows and Gateways

A sequence flow links one activity with another. A process follows the sequence flow when its entry condition is met. Standard and unconditional flows are activated when the source activity of the flow is completed.

Conditional sequence flow (for example, from an exclusive OR gateway) is activated if the condition is True when evaluated.

- For **exclusive** split gateways, only the first flow whose condition is True is followed, otherwise the default flow is followed.

- For **inclusive** split gateways, all flows whose condition is True are followed. Otherwise, if no condition is True, then the default flow is followed.
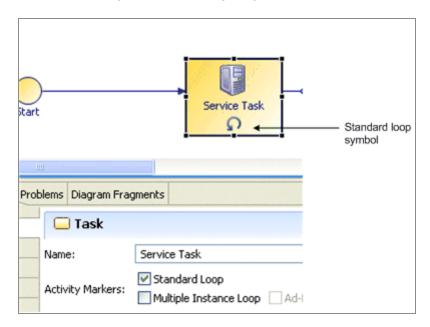
To rejoin split flows, you can link multiple sequence flows into a single join gateway.

- A parallel join gateway follows its outgoing flow when all incoming flows have been followed.

- An exclusive join gateway repeatedly follows its outgoing flow for every incoming flow (so it is mainly used to join exclusive conditionally split flows).

- An inclusive join gateway can be configured to follow its outgoing flow upon certain
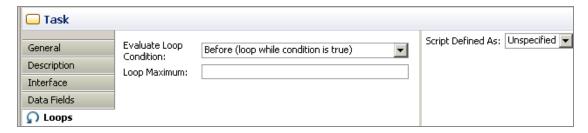
patterns of the incoming flow.

Creating a Standard Loop

A standard loop is indicated by a symbol.

Click the **Loops** tab to set the details of the loop:

Set the following parameters as appropriate for the loop you want to create:

- **Test Time**

    Select either **Before** or **After**. The **Before** option is equivalent to the programming construct "while": the expression is evaluated *before* the activity is performed, and therefore if the expression evaluates to False, the activity is not performed. The **After** option corresponds to the programming construct "Do: while": the expression is evaluated after the activity has been performed, guaranteeing that

the activity is performed at least once.

- **Loop Maximum**

    Optionally specify an integer to control the maximum number of times the activity is performed. In the event of conflict between **Loop Maximum** and the result of the JavaScript defined under **Script Defined As**, the **Loop Maximum** overrides the script calculation.

- **Script Defined As**

    Select one of the following options:

    ◦ **Free Text**

        Allows you to describe how you would like the loop to be tested if you prefer to leave the specific implementation of the loop expression to someone else.

        > ℹ **Note:** A BPMN warning is generated if you leave the script area blank. To remove the warning, enter a text description of the intended script implementation.

    ◦ **JavaScript**

        Allows you to enter JavaScript that is evaluated for the loop expression.

    ◦ **Unspecified**

        Allows you to specify that there is no expression or description for this loop.

Creating a Multi-Instance Loop

A multi-instance loop is indicated by one of two symbols:
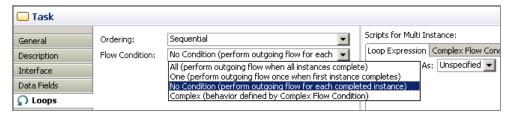
- Parallel multi-instance loop:

- Sequential multi-instance loop:

Click the Loops tab to set the details of the loop:

Set the following parameters as appropriate for the loop you want to create:

Ordering

Select either **Sequential** or **Parallel** ordering. The Sequential option causes the instances of the activity to occur in succession rather than at the same time. The Parallel option causes the instances of the activity to occur at the same time.

Flow Condition

This property can be used to mimic the functions of a gateway. Select one of the following options:

- **All (perform outgoing flow when all instances complete)** The outgoing flow is processed once after all activity instances have completed.

- **One (perform outgoing flow once when first instance completes)** The outgoing flow is processed when the first activity instance completes (existing instances can still be completed but the outgoing flow is not processed when they complete).

- **No Condition (perform outgoing flow for each completed instance)** The outgoing flow is processed for every activity instance as it completes.

- **Complex (behavior defined by Complex Flow Condition)** The outgoing flow is processed for each instance for which the Complex Flow Condition tab evaluates to true.

Scripts for Multi-Instance

Select **Free Text** for the **Script Defined As** field if you want to describe how you would like the loop to be tested, and prefer to leave the specific implementation of the loop expression to someone else. You can also select **Unspecified** if there is currently no condition or description for the loop.

> **ⓘ** **Note:** Depending on the destination environment you have selected, **JavaScript** might be available as an option. Use this option if you want to enter JavaScript that can be evaluated for the loop expression.

There are three tabs on which you can specify scripts:

Loop Expression

Specify either a script that evaluates to an integer or a description of the desired script.

Complex Flow Condition

This expression is evaluated if you selected Complex as the Flow Condition.

Additional Instances Expression

This expression is used for control-flow pattern WCP-15 (additional activity instances might be required at runtime) when you only need to add instances when the task is complete.

If you need to add instances while the task is in progress, see Adding Additional Instances to a Multi-instance Loop While the Task is Still in Progress.

The additional instances script is evaluated after the last instance completes. If the script evaluation calls for additional instances, they can be done and the script can be evaluated again once the last additional instance completes.

> **ⓘ** **Note:** If an Additional Instances Expression is specified then this expression must eventually evaluate to zero so no more instances occur.

Adding Additional Instances to a Multi-instance Loop While the Task is Still in Progress

This implements control-flow pattern WCP-15.

> **Note:** If you have a multi-instance user task and a loop which allows you to generate multiple copies of that task, if you have concurrent copies of the multi-instance user task, each with multiple instances, and then "add additional activity instances", the additional instances are added to every copy of the multi-instance user task.

To do this, you need to execute a script somewhere on a parallel path whilst the loop task is active. The script can add instances to the loop task using an expression similar to the following:

Process.addActivityLoopAdditionalInstances ("OrderStock",1);
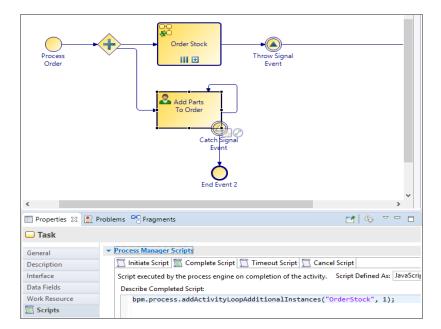
which contains a string for the name of the task (in this example, OrderStock), and an integer for the number of additional instances required (in this example, 1).

> **Note:** If you wish to add additional instances to a dynamic sub-process task, you need to pre-populate the array that is chosen as the runtime identifier field with the name or names of the sub-process implementation that you wish to add, as well as any associated arrays used to provide input into the dynamic sub-process. See Creating Dynamic Sub-Processes.

You can also add additional instances to a loop in the loop task itself, **but only** in the task Complete script.

In this example, the task **Add parts to order** would order an additional item each time it was used.
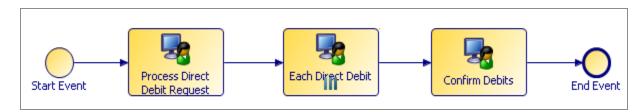
This workflow pattern specifies that multiple instances of an activity should be created, each instance being synchronized and able to run concurrently.
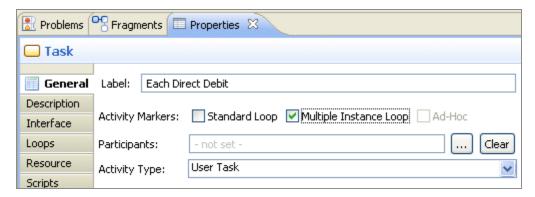
Note that:

- The number of instances required is known and specified at design time.

- Each task instance has access to all the process data (data fields, parameters, and so on).

- All the instances must be complete before the next task is started.
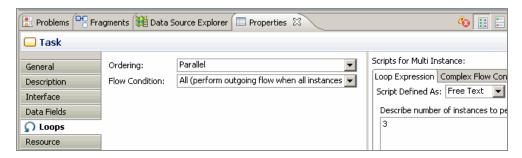
The following process has three activities:

There can be multiple instances of the Each Direct Debit task. This is indicated on the General tab of the Properties view:

The details are specified on the Loops tab:

The **Parallel** ordering setting and **All** flow condition means that the activity instances are performed at the same time and are synchronized. The number of instances is set to **3** on the right side of the Properties view.

Configuring a Task as Automatic Ad-Hoc

The automatic ad-hoc activity allows you to define one or more standalone tasks (with no incoming / outgoing flow) in a business process that are executed zero or more times during the lifetime of a process instance. An automatic ad-hoc activity is executed when it becomes enabled by any of the initializer activities being processed and the transition of the given precondition from false to true.

> ℹ **Note:** This feature is not available for pageflows.

You can have a number of ad-hoc activities in a process. Their preconditions determine if and when they are executed.

Procedure

1. Check the **Ad-hoc** Activity Marker on the General tab of the properties on a User task

or Call Sub-Process task.

2. Click on **Ad-Hoc Configuration Properties**. The **Ad-Hoc Configuration** tab opens.

3. **General**: optionally select **Interrupt main process until completion**.

    This pauses the main process flow, resuming on completion of the ad-hoc activity. It does not stop you processing currently active work items or sub-processes, event sub-processes or other ad-hoc activities. However, note that data is not returned to the process instance until it re-activates.

4. Check **Automatic Invocation**.

5. **Access**: in addition to defining whether users have the ability to cancel an ad-hoc activity using a system action (see System Actions Reference in *TIBCO® BPM Enterprise Concepts Guide*), optionally it is possible to define whether a user can cancel a specific ad-hoc activity by specifying Organization privileges that the user must possess.

6. **Enablement and Execution**: Define the condition under which the activity is enabled and executed automatically.

    *   Initializer Activities: (optional) Select one or more Initializer Activities which are activities which are in the same process. This activity needs to complete before the precondition is evaluated. This can be useful for ensuring that the precondition is not evaluated until the data referenced is initialized.

    *   Precondition: Set an optional precondition script that controls enablement of the ad-hoc activity.

        > **Note:** For Automatic ad-hoc activity, at least one Enablement condition should be specified: that is, either the Initializer Activities **or** the Precondition script must be specified (both can be specified).

        > **Note:** The condition must be a Boolean expression which evaluates to true. The condition has to go from true > false > true in order to re-trigger so you must reset the result of the expression to false before it can become true again.

Configuring a Task as Manual Ad-Hoc

The manual ad-hoc activity allows you to define one or more standalone tasks (with no incoming / outgoing flow) in a business process that are executed zero or more times during the lifetime of a process instance. An ad-hoc activity only becomes available for manual invocation when it is enabled via the preconditions and the user holds the necessary privileges to start and cancel that activity.

> ℹ️ **Note:** This feature is not available for pageflows.

 You can have a number of ad-hoc activities in a process. Their preconditions determine when they become available for execution by permitted users.

Procedure

1. Check the **Ad-hoc** Activity Marker on the **General** tab of the properties on a User task or Call Sub-Process task.

2. Click **Ad-Hoc Configuration Properties**. The **Ad-Hoc Configuration** tab is displayed.

3. **General**: optionally select **Interrupt main process until completion**.

   This pauses the main process flow, resuming on completion of the ad-hoc activity. It does not stop you processing currently active work items or sub-processes, event sub-processes or other ad-hoc activities. However note that data is not returned to the process instance until it re-activates.

4. Check **Manual Invocation**.

5. Optionally check **Allow multiple invocations**. If you check this, you can manually invoke the activity more than once after it has been enabled.

6. **Access**: in addition to defining whether users have the ability to cancel an ad-hoc activity using a system action (see the "System Actions Reference" topic in the *TIBCO® BPM Enterprise Concepts Guide*), optionally it is possible to define whether a user can cancel a specific ad-hoc activity by specifying Organization privileges that the user must possess.

7. **Enablement**: Define the condition under which the activity is enabled and executed automatically.

   - Initializer Activities: (optional) Select one or more Initializer Activities which are activities which are in the same process. The precondition is not evaluated until one of these has been completed.

- Precondition: Set an optional precondition script that controls enablement of the ad-hoc activity. The automatic ad-hoc activity is invoked every time the precondition is changed from false to true. So the activity might be invoked many times.

> **(i) Note:** For manual ad-hoc activities, specifying enablement is optional, so it not mandatory to specify either the initializer activity or the precondition script.

> **(i) Note:** The condition must be a Boolean expression which evaluates to true. The condition has to go from true > false > true in order to re-trigger so you must reset the result of the expression to false before it can become true again.

Refactoring Ad-Hoc Activities

You can refactor one or multiple ad-hoc user tasks into a sub-process.

> **(i) Note:**
> You might want to do this with an ad-hoc user task, as certain actions are not available to you on the ad-hoc user task. However, once you refactor one or multiple user tasks into a reusable sub-process, more actions are available. For example, you can add a deadline to a user task within an ad-hoc reusable sub-process, but not to an ad-hoc user task.
>
> Note that when refactoring a single ad-hoc user task, the reusable sub-process inherits the ad-hoc configuration. When refactoring multiple ad-hoc user tasks the reusable sub-process contains multiple user tasks which retain their ad-hoc configuration.

Procedure
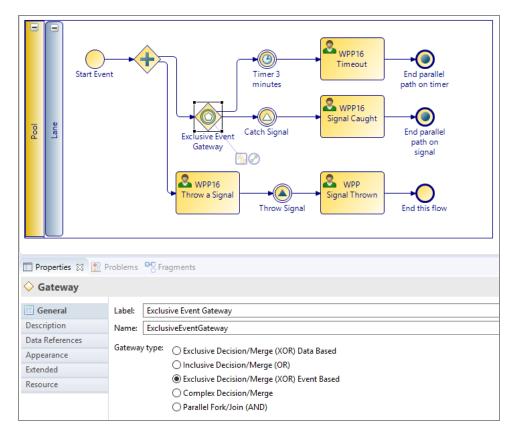
1. Select an ad-hoc user task (or multiple ad-hoc user tasks), right-click and select **Refactor > Extract Into New Sub-Process**.

2. Follow the steps in the wizard to refactor. The ad-hoc user task or tasks now is a reusable sub-process.

Exclusive Event Based Gateway Example

An example of an Exclusive Decision/Merge (XOR) Event Based Gateway that provides an example for workflow process pattern 16, Deferred Choice.

Workflow process pattern 16, Deferred Choice, states:

A point in a process where one of several branches is chosen based on interaction with the operating environment. Prior to the decision, all branches represent possible future courses of execution. The decision is made by initiating the first task in one of the branches i.e. there is no explicit choice but rather a race between different branches. After the decision is made, execution alternatives in branches other than the one selected are withdrawn.

The state remains on the Exclusive Event Based Gateway until a signal is caught, or the timer expires.

When the event occurs, the state is pulled from the Gateway to the relevant task, and this removes other paths from possible operation.

> **Note:** It is possible to have multiple paths, with various timers and signals, but the Gateway only actions the first event to occur.

Controlling Flow from an External Application

You can control the flow of a process from an external application using incoming request events and tasks. You can trigger these events or tasks by an external application using the Process sendEvent REST API.

With Incoming request events and tasks, you can perform the following functions:

- Pause a process flow until you receive the incoming request using an in-flow event or task.

- Cancel a long running task such as a user task, or sub-process, that is in progress by attaching the incoming request event to a task boundary.

- Start a parallel event handler flow in the process by creating an event sub-process with an incoming request start event.

The Process REST API triggers an incoming request event or task. With this API, the process instance ID or incoming business data can be used to identify the specific process instance on which you can trigger the incoming request.

Correlating Incoming Requests

You can trigger an incoming request event or task using the Process REST API. You can use the process instance ID or correlation data to identify the specific process instance on which you can trigger the request using your own business data. The incoming request is only triggered on a single process.

> **Note:** The Business data method of correlation is currently not supported for Incoming Request Event-handlers and Event Sub-Processes.

To use business data for correlating incoming requests with individual process instances, the process must have one or more correlation data fields whose value uniquely identifies an individual process instance. This correlation data can then be associated with an incoming request event or task in its interface property configuration. By default, all correlation data is associated implicitly.

When you invoke the process REST API to trigger an incoming request without a process instance ID, the correlation data field values supplied in the request payload are matched to the correlation data values in an existing process instance. The incoming request is then triggered in that process instance.

You must ensure that the correlation data is set with the appropriate value in each process instance before the incoming request event or task is initialized.

Process Data

This section describes how to use data that is used in processes such as data fields, parameters, and participants.

Adding Data Fields or Parameters to a Package or Process

You can add data fields or parameters to a package or process in two different ways, in the Properties view provided when the **Parameters** or **Data Fields** folder is selected in Project Explorer (this method is better if you need to create several data fields or parameters) or using the wizard to create one at a time.

See "Data Fields and Parameters" in the *TIBCO® BPM Enterprise Concepts Guide*.

You can add data fields or parameters to a package or process:

- in the Properties view table provided when the **Parameters** or **Data Fields** folder is selected in Project Explorer (this method is better if you need to create several data fields or parameters).

  See Using the Properties View to Create a New Data Field or Parameter

- using the wizard to create one at a time.

  See Using the Wizards to Create a New Data Field or Parameter

> ℹ **Note:** See Associating Participants with Activities for information on how to highlight all the tasks in a process that have a particular data field or parameter assigned to them.

See Constraints on Field or Parameter Values

Using the Properties View to Create a New Data Field or Parameter

You can create a new data field or parameter in the Properties view.

Procedure

1. In the Project Explorer, expand the package or process where you want to add a data field or parameter.

   If the **Data Fields** folder is empty under a package, it is hidden by default. This is because the preferred usage is to define Data Fields at the Process level.

   > **Note:** If you want to show the Data Fields folder under a package, regardless of whether it is empty or not, then you need to go to Project Explorer, and click the **View Menu** icon in the top right corner, then select **Customize View**. You can then deselect **BPM Package Data Fields** on the list of filters which are set.

2. As appropriate, click the **Data Fields** or **Parameters** folder in the Project Explorer. If you need to add a Data Field at the Package level, select **New > Data Field** as described in Using the Wizards to Create a New Data Field or Parameter. The Properties view is displayed.

3. Click the plus icon. A new data field or parameter is added. As appropriate, modify the properties.

Using the Wizards to Create a New Data Field or Parameter

You can create a new data field or parameter using the wizards provided:

Procedure

1. In the Project Explorer, expand the package or process where you want to add a data field or parameter.

2. As appropriate, right-click **Data Fields** or **Parameters** and select **New > Data Field** or **New > Parameter**. The **New Data Field** or New Parameter dialog box is displayed.

> ℹ **Note:** If you start this wizard from the **File > New** menu, the first dialog box is the project and package dialog box, where you must specify a valid project and package. This dialog box is not displayed if you right-click at the process level to start the dialog box. however, you can click **Back** to display it.

3. Specify a label for the data field or parameter; you cannot specify leading or trailing spaces.

4. For parameters, specify the following:

Option	Description
Mandatory	(*Parameter only*) Select this check box to specify that the parameter must be present when the process is started.
Read Only	Select this check box to specify that the value of the data field or parameter cannot be modified after it is created.
Mode	(*Parameter only*) Select whether the parameter is an input (**In**) output (**Out**) or both (**In/Out**). **Note:** The parameters specified on the **Interface** tab for a user task are from the perspective of the *form*, not the *user*. This means that input parameters are sent to the form by the process, not the user. Output Parameters are sent to the form by the user. **Note:** You must provide an input mapping when the process is called as a subprocess.

5. Specify the type of data field or parameter you want to create:

Option	Description
Basic Type	If you select this type, you can choose from **Text**, **Decimal**, **Integer**, **Boolean**, **Date**, **Time**, **Date Time** or **Performer**. For more information about using performer data types, see the appropriate implementation guide.
	Note: If you need to create a **Text** field of unlimited length, ensure that the Length field is empty. If you wish to limit the number of characters enter the appropriate numeric value.
	Note: The value of unmapped **Basic Type** parameters has the following defaults: • Text: null • Boolean: false • Integer/Decimal: 0 • Date / Time / DateTime: now (time of process instance creation)
Initial Value	For data fields, you can optionally specify an **Initial Value** by clicking in the provided text entry area and entering a value. For arrays, you can add more than one value. You can add rows by clicking the ⊞ button. You can also delete rows by clicking the ✖ button.
Allowed Values	For parameters, you can optionally specify the permitted input values (values that might be supplied by application starting an instance of the process). You can add rows by clicking the ⊞ button. You can also delete rows by clicking the ✖ button.
Declared Type	This option allows you to select from the declared types that you have already defined.
External Reference	Allows you to refer to a business object defined in the Business Object Modeler.

6. Select whether you want the data field or parameter to be an array. Selecting the

Array check box creates an array of the Basic Type that is selected. For example, if you select the **Array** check box and Text, you are defining the data field or parameter as an array of Text values.

7. Click **Finish** to create the data field or parameter, or click **Next** to specify a documentation URL, description, or extended attributes.

8. The **Documentation URL** and **Description** fields allow you to specify supplementary information about the data field or parameter that you have created.

9. The Extended dialog box allows you to specify extended attributes.

   The parameter that you created appears in the Project Explorer.

Constraints on Field or Parameter Values

If you place any constraint on the possible values of a data field or a parameter of any Basic Type, that constraint is ignored at runtime. This is because BPM's Process Engine cannot enforce these constraints.

> **ⓘ** **Note:** This section applies only if one of the destinations for your process is set as BPM.

For example:

- If an Integer or Decimal field has its **Length** set to 9, a warning is displayed that format restrictions are not enforced, and at runtime you can still assign a value with more than 9 digits.

- If a Decimal field has **Decimal Places** set to 2, a warning is displayed that format restrictions are not enforced, and at runtime you can still assign a value with 3 decimal places.

- If a Text type data field has its **Length** set to 50, you can still assign a value with more than 50 characters.

  > **⚠** **Warning:** Note that in the case of the Text field, no warning is displayed.

You can produce the same effect as limiting the value of the field or parameter by using a BOM data type defined with the restricted values you need.

Adding Data Fields to an Activity

You can create a new data field for an activity as follows:

Procedure

1. Select the activity for which you want to create a data field.

2. On the Properties view, click **Data Fields**.

   > **ⓘ Note:** Activities that do not support activity-level data fields (such as gateways) do not have a **Data Fields** tab on their Properties view.
   >
   > A validation error is displayed if you define a data field for an activity on the **Data Fields** tab, but the destination environment selected for the parent process does not support activity-level data fields for that activity type.

   Click the **Add** icon ⊞. A new data field is added.

3. Modify the data field's properties as per your requirements.

Result

> **ⓘ Note:** You can only assign a value to an activity-level data field by using the **Scripts** tab on the activity. See the appropriate implementation guide for more information.

Creating Correlation Data

Correlation data must be used to ensure that each global signal is received by the process instance to which it applies. It can also be used for certain incoming request events and tasks instead of process instance ID to identify the process instance to which the incoming request applies.

You can create correlation data fields in the following ways:

- using the Properties view table provided when the **Correlation Data** folder is selected in Project Explorer (this method is recommended if you need to create

several data fields or parameters).

- using the wizard available either from the Project Explorer or from the **File** menu.

- refactoring an existing data field into a correlation data field (right-click the data field and select **Convert to Correlation Data**).

- copying a data field and pasting it under the **Correlation Data** folder in the Project Explorer.
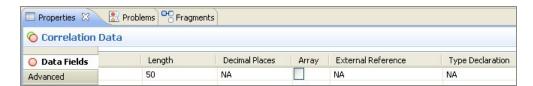
Creating Correlation Data Using the Properties View

Procedure

1. In the Project Explorer, expand the package or process where you want to add a correlation data field.

2. Click **Correlation Data** in the Project Explorer.

   The Properties view is displayed.

   Click . A new correlation data field is added.

   As appropriate, modify the properties.

Creating Correlation Data Using the Wizard

Procedure

1. In the Project Explorer, expand the package or process where you want to add a data field or parameter.

2. Right-click **Correlation > Data** and select **New > Correlation Data**. The New Data Field dialog box is displayed.

> **Note:** If you start this wizard from the **File > New** menu, the first dialog box is the project and package dialog box, where you must specify a valid project and package. This dialog box is not displayed if you right-click at the process level to start the dialog box. However, you can click **Back** to display it.

Result

For information about how to complete the remainder of the fields in the wizard pages, see Using the Wizards to Create a New Data Field or Parameter (the properties of a correlation data field are exactly like those of a standard data field).

The correlation data that you created appears in the Project Explorer.

> **Tip:** If a correlation data field has data that you want to continue to use in your process, but that you no longer want to use for correlation, you can convert the correlation data field to a "standard" data field, by right-clicking it and selecting **Convert Correlation Data to Data Field**.

Associating Process Data with Events and Tasks

There are many reasons to associate process data with tasks or events. For example, data field needs to be displayed in a form or a process cannot be started unless a particular parameter is passed to a start event.

Using drag-and-drop to Associate a Data Field or Parameter with an Activity

> **Note:** You can drop process data onto a blank part of the process to create a new user task with the associated process data. For more information, see Using Participants to Create Tasks.

Procedure

1. In the Project Explorer, click the data field or parameter you want to associate with your activity, holding down the mouse button, drag the pointer to the user task and release the mouse button.

   > **ℹ Note:** You can select multiple data fields or parameters for drag-and-drop operations using the Ctrl (for single selection) or Shift (to select a range) keys.

2. A menu is displayed with the following options:

   - **Add Data To View And Assign**

     Selecting this option adds the process data as an **In/Out** parameter on the **Interface** tab. This means that in the runtime environment, users are able to display the associated form to view the field and also to assign new values to it.

   - **Add Data To View**
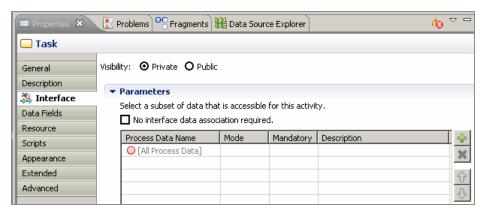
     Selecting this option adds the process data as an **In** parameter on the **Interface** tab. This means that in the runtime environment, users are able to display the associated form to view the field, however they cannot assign new values to it.

   - **Add Data To Assign**

     Selecting this option adds the process data as an **Out** parameter on the **Interface** tab. This means that in the runtime environment, users are able to display the associated form to assign new values to the field.

Using the Interface Tab to Associate a Data Field or Parameter with an Activity

Procedure

1. Select the event or task.

2. In the Properties view, click the **Interface** tab.
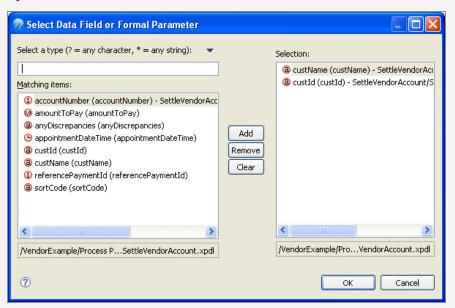
3. Select whether you want the visibility of the event or task to be private or public - see Setting Event and Task Visibility (Private and Public).

4. Choose between the following:

   - Select the check box **No interface data association required** if you do not want to associate process data with the event or task. This deletes any associations that already exist.

   - Click ⊞ to select the process data that you want to associate with the event or task. The Select Data Field or Formal Parameter dialog box displays the list of available process data:

> **ℹ Note:**
> - By default, all process data is available to a task. When you explicitly associate process data with an event or task, only the process data you associate with the event or task can be used by that task.
>
>
>
> - The process data displayed depends on what type of event or task is selected. Most events and tasks can have both data fields and formal parameters associated with them, however receive tasks and events of type None can have only formal parameters associated with them.

5. The process data you select is added to the table of data. Select whether you want the data to be mandatory.

> **ℹ Note:** The mandatory setting on the Interface tab for a formal parameter overrides the mandatory setting in the Properties view for the formal parameter. This allows complete freedom in designing the process - you can define a formal parameter as mandatory in one place in a process, and optional in another.

Use the space provided if you want to add an optional usage description of the process data. Selected parameters also display their mode (In, Out, or In/Out). You

can change the mode by selecting from the drop-down list.

Setting Event and Task Visibility (Private and Public)

The visibility of an event or task (whether it is private or public) controls whether process information (such as required parameters) is available to an external process or application.

Setting the visibility to public results in a subset of events or steps that are then available to external processes or applications.

> **(i)** **Note:** The runtime effect of this setting is entirely destination specific.

For each event or task, you can specify a list of expected input fields (on the **Interface** tab), and define the URL of the document describing the purpose of the public event or task (on the **Description** tab).

By default, events and tasks in a process are private; in a process interface, they are public. If you want to change the visibility of an event or task:

Procedure

1. Select the event or task.

2. On the Interface tab, select the visibility (**Private** or **Public**).

   Click ⊞ to add parameters to the event or task. Use the Mandatory check box to specify parameters that must be present.

3. *(Optional)* Select the **Description** tab. Enter a URL that provides documentation describing how the event or task is used.

Using Process Data to Create Tasks

- **Create User Task To View And Assign Data**

  Selecting this option creates a user task with the process data as an **In/Out** parameter on the **Interface** tab. This means that in the runtime environment, users

are able to display the associated form to view the field and also to assign new values to it.

- **Create User Task To View Data**

    Selecting this option creates a user task with the process data as an **In** parameter on the **Interface** tab. This means that in the runtime environment, users are able to display the associated form to view the field, however they cannot assign new values to it.

- **Create User Task To Assign Data**

    Selecting this option creates a user task with the process data as an **Out** parameter on the **Interface** tab. This means that in the runtime environment, users are able to display the associated form to assign new values to the field.

Creating a Participant

Participants are used to identify who or what (a REST end-point or an e-mail server) performs an activity.

For more information, see the "Participants" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Procedure

1. In the Project Explorer, expand the package where you want to add a participant.

2. Right-click **Participants**, click **New** and then, select **Participant**. The New Participant dialog box is displayed.

3. Click the **Back** button to change either the name of the **Project** or **Package** where the participant is created. If you want to change any one of the names, click the **Project** or **Package** button respectively.

    Participants can be created at either the package level or at the process level. Creating them at the package level is recommended which ensures that they are shared among processes. Select the **Process** check box and specify a process if you want to create the participant at the process level.

> **ℹ** **Note:** If the Participants folder is empty at the Process level, it is hidden by default. This is because the preferred usage is to define Participants at the Package level.

Click **Next**.

4. Specify the **Label** and **Name** of the participant (either a Basic Type, or an External Reference as previously described in this section) and click **Finish**.

- To create a basic type participant, select **Basic Type** and choose from the **System** and **Organization Model Query** radio buttons, and click **Finish**.

  If you select the **Organization Model Query** radio button, you can then enter the Organization Model Query Script in Resource Query Language (RQL) by using a script or expression on the **General** tab of the Properties view. This is evaluated when a referencing task is executed at run-time, so the actual participant is resolved and the activity dispatched and offered to the participant. A query could resolve to a participant in the package/process or to an entity in the organizational model.

- To create an external reference to an organization model, select **External Reference**, and click the **Select a reference** icon to select a type from the organization model.

  Choose a type from those shown in **Matching items**, or enter the first few characters of the name you are looking for in the field under **Select type(s)(? = any character, * = any string)** and choose from those shown. Click **OK**.

  The participant that you created appears in the project explorer.

> **ⓘ Note:**
>
> - You can import participants from other projects. At the process package level, right-click and select **Import Participants Wizard**. You can then select which project/s you wish to import participants from.
>
> - All external references to participants from within the same project must be to the same **major version** of the organization model. However, you can reference different minor or micro versions of the model. For example, if you have included a reference to a participant in version 1.0.0.qualifier of the organization model, and the model subsequently changes, you could reference a participant in version 1.1.0.qualifier, but not version 2.0.0.qualifier.

Associating Participants with Activities

You can associate a participant with an activity to identify who or what performs the activity. You can do this either by dragging and dropping the participant onto the activity or in the Properties view for the activity.

Using drag-and-drop to associate a participant with an activity

You can drag a participant onto an activity.

Procedure

1. Expand participants in the Project Explorer.

2. Click the participant you want to associate with your activity, holding down the mouse button, drag the pointer to the activity and release the mouse button.

> **ⓘ Note:**
> - You can select multiple participants for drag-and-drop operations using the **Ctrl** (for single selection) or **Shift** (to select a range) keys.
> - You can also select as a participant a data field or formal parameter of the type **Performer**.

3. A menu is displayed with two options:

Option	Description
Add Task Participant(s)	Selecting this option adds the participants to any existing participants for the activity.
Set Task Participant(s)	Selecting this option clears any existing participants associated with the activity, before setting the participants to those you selected.

Using the Properties View to associate a participant with an activity

You can associate a participant with an activity.

Procedure

1. In the Process Editor, highlight the desired activity.

2. Either:
   - In the Properties view, click the picker.
   - Right-click the activity, and select **Participant**.

     The Select Participants dialog box is displayed.

3. Highlight participants you want to select and click **Add** to move them to the **Selection** column. When you have finished selecting Participants, click **OK**.

> **Tip:**
>   - You can select multiple participants by pressing either the **Ctrl** (for single selection) or **Shift** (to select a range) keys while making your selection.
>
>   - The wildcard **?** returns all matching participants. Use the ***** wildcard to restrict the results (for example, ***2** to return all Participants ending in 2. Note that the wildcard ***** by itself does not return any results; it only works in conjunction with a string.
>
>   - You can also select a data field of the type **Performer** as a participant.

4. The participants you selected are displayed in the Properties view and also when you hover the pointer over the activity in the Process Editor.

Highlighting Participants
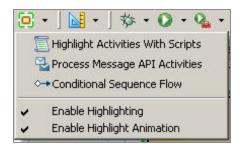
You can see what tasks a participant is assigned to by using highlighting.

Procedure

1. Click in the Process Editor for the process.

   On the toolbar, you can see a button: ▣

2. Click this to see the drop-down list, and select **Enable Highlighting**.

   Alternatively, you can select **Diagram** > **Highlighting** > **Enable Highlighting**.

3. Select the participant in Process Explorer, and in the Process Editor the tasks which use this participant are highlighted (framed with green lines). Other tasks in the process are grayed out.

   This behavior also applies to data fields and parameters.

Result

Highlights are cumulative.

- If you select more than one participant, data field or parameter in Project Explorer, only tasks which reference all of those selected are highlighted.

- If you select "Activities With Scripts" followed by "Migration Point Activities" then the diagram objects highlighted are migration point activities that have scripts.

The current highlight filter is shown when you use the Process Editor mouse-over tooltip.

Highlights are removed when anything other than the highlighted diagram objects are selected.

Using Participants to Create Tasks

If you have participants, you can drag them to a blank area of a process to automatically create several types of task:

Procedure

1. In the Project Explorer, click the participant, and holding down the mouse button drag the pointer to a blank part of the process and release the mouse button.

    > **Note:** You can select multiple participants for drag-and-drop operations using the **Ctrl** (for single selection) or **Shift** (to select a range) keys.

2. A menu is displayed with the following options:

    - **Create User Task For Participant(s)**

        Selecting this option creates a user task with the selected participants.

    - **Create Service Task For Participant(s)**

Selecting this option creates a service task with the selected participants.

- **Create Manual Task For Participant(s)**

    Selecting this option creates a manual task with the selected participants.
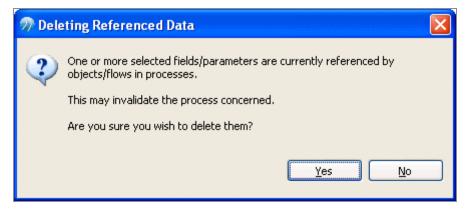
- **Other Task Types**

    This submenu contains more task types that you can create from a participant.
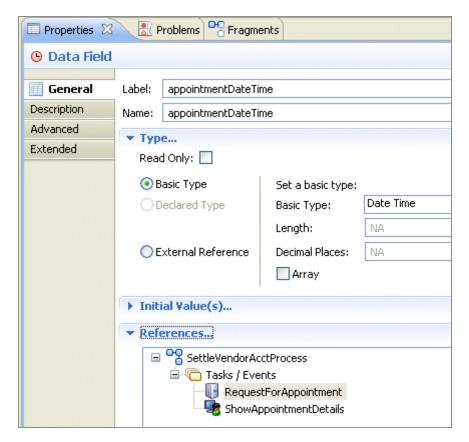
Deletion of Data Fields Parameters Participants and Type Declarations

You can delete a project object such as a data field, parameter, participant, or type declaration by right-clicking it in the Project Explorer and selecting **Delete**.

However, if the project object has been associated with another object such as an activity or a sequence flow, the following message is displayed:

If you click **Yes**, the project object (in this example, a data field) is deleted, but it still is referenced in XPDL for the project, which can cause problems. If you click **No**, the project object is not deleted. You can then go to the Properties view and examine the references to that object:

In this example, the data field is referenced in the service task **RequestForAppointment** and in the user task **ShowAppointmentDetails**. Click **Go To** to show that task in the Process Editor.

Creating a Dynamic Organization Participant

The Organization Units and Positions within a Dynamic Organization might be assigned to Process Participants - known as Dynamic Organization Participants.

See the "Dynamic Organization Participants" topic in *TIBCO® BPM Enterprise Concepts Guide*

Procedure

1. In the Project Explorer, expand the package where you want to add a participant.

2. Right-click **Participants** and select **New > Participant**. The New Participant dialog box is displayed.

3. Specify the **Label** and **Name** of the participant.

4. To create an external reference to a dynamic organization model, select **External Reference**, and click the picker to select a type from the dynamic organization model. Choose a type from those shown in Matching Items, or key in the first few characters of the name you are looking for in the field under **Select type(s)(? = any character, * = any string)** and choose from those shown. Click **OK**. The dynamic organization participant that you created appears in the Project Explorer.

5. Click **Finish**.

What to do next

When a Dynamic Organization Participant is assigned to a task you need to provide information to identify the correct instance of the Dynamic Organization to use to resolve this participant. See Dynamic Organization Identifier Mapping to identify the correct instance of the Dynamic Organization in which the participant can be found at runtime.

Auditing Process Data

By default, process data does not appear in the audit trail (that is, in the Event Viewer) for a process instance. But you can configure a process so that certain data fields appear in the audit trail.

This capability makes use of the process data to work item attributes mapping facility that is available in TIBCO Business Studio - BPM Edition. For example, the following shows process data in the Event Viewer that has been mapped to Attributes 3 and 8.

If a *work list facade* has been defined, and display labels were assigned to Attributes 3 and 8, the labels would be shown in the Event Viewer rather than "Attribute3" and "Attribute8". For more information, see Creating a Work List Facade.

> **Note:** The Event Viewer displays audit entries across all processes on the system, and therefore it is usual that specific attributes are used for the same data items across all processes. For example, you might want to consistently use Attribute2 for the value of 'Order Id'. Creating and sharing the same work list facade project across all BPM applications on the system can help to achieve this consistency.

To configure your system to show process data in the Event Viewer, you must map process data fields to the desired work item attributes. For more information, see Mapping Process Data to be Audited.

Mapping Process Data to be Audited
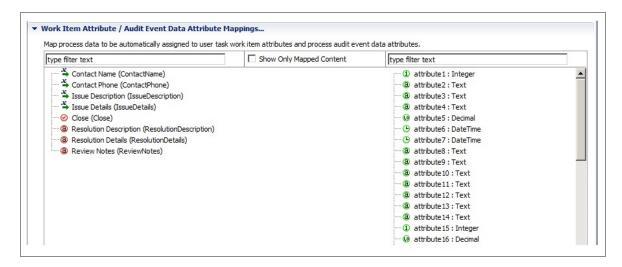
For process data to appear in the Event Viewer, you must map process data fields to the desired work item attributes.
This mapping process is the same as the process for mapping data fields to work item attributes when creating a work list facade - see Creating a Work List Facade. If you have defined a work list facade, and you map process data fields to attributes for which you have specified a display label in the facade, those custom labels also appear in the Event Viewer for the process data entries.

Procedure

1. In TIBCO Business Studio, open your process and select it in the Process Editor.

2. In the **Properties** view, select the **Work Resource** tab, then expand **Work Item Attribute / Audit Event Data Attribute Mappings**.
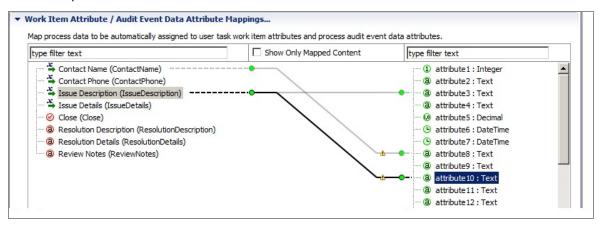
   This displays all of the data fields defined for the process (in the left column) and all of the work item attributes (in the right column). For example:

If you have a work list facade defined, the list of attributes in the right column shows the display labels for those attributes that were mapped to data fields in the facade.
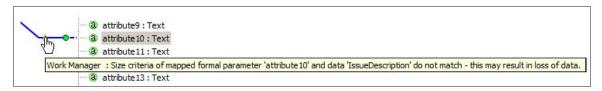
3. Map the data fields that you want to appear in the Event Viewer to attributes that are of the same data type.

For example:

As shown in this illustration, data fields can be mapped to multiple attributes, if desired.
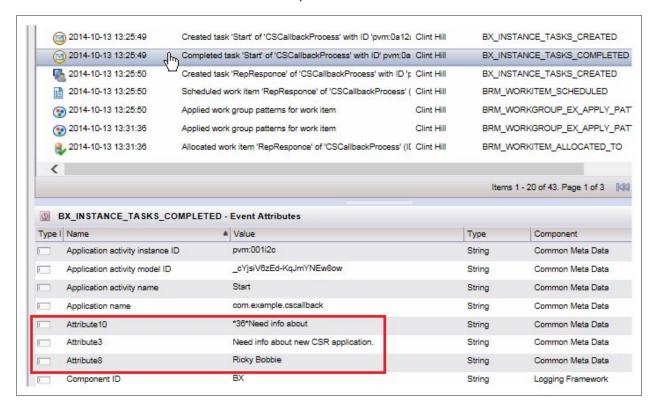
Note that if you map a data field to an attribute of a smaller size, a warning marker is shown that indicates this:

This might result in data shown in the Event Viewer being truncated to the length of the attribute. For information about the type and size of each work item attribute, see the "Work Item Attributes" topic in the *TIBCO Business Studio Process Modeling Concepts* guide.

Result

The example shown above results in the value in the **Contact Name** field appearing in Attribute8, and the value in the **Issue Description** field appearing in Attribute3 and Attribute10 in the Event Viewer. For example:
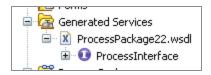
Note that this example also illustrates the result of mapping a data field to an attribute whose length is not sufficient to hold the entire value entered in the data field. In this example, the **Issue Description** field was mapped to an attribute (Attribute10) that is 20 characters in length. Since the value entered in the **Issue Description** field exceeds 20 characters, the value shown in the Event Viewer is truncated. Since it is truncated, the value shown in the Event Viewer is prefixed with ***nn***, where **nn** is the number of characters that were entered into the data field.
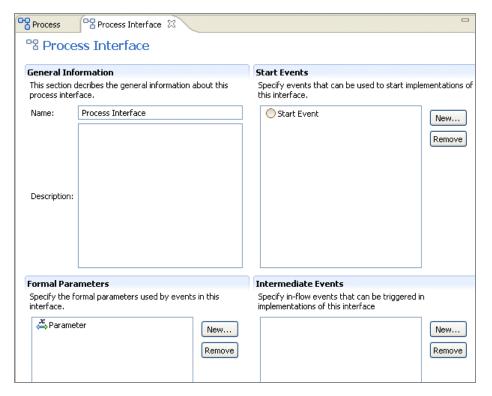
Process Interfaces

You can create a process interface that describes present start and error events that any sub-process that implements the interface must conform to. In this way, a main process dynamically decides which sub-process to use at runtime as it guarantees the required parameters and known potential errors via the sub-process interface.

See Creating Dynamic Sub-Processes.

Using the Process Interface Editor, you can modify the interface to add events or parameters:
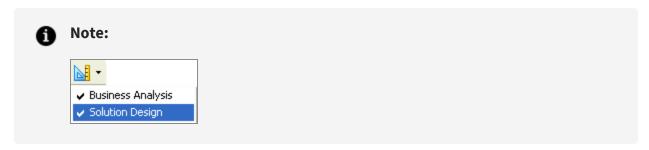
Once created, a process interface can be used by several different processes. If a process is created using a process interface, all the events and parameters specified in the interface must be present in a process that implements that interface. You can add additional events or parameters, but removing any of those required by the process interface invalidates the process.
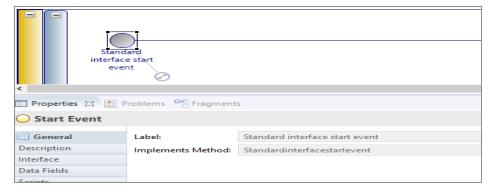
> **Tip:** If you have additional parameters that are local to a process that implements a process interface, you can move the parameters into the process interface by right-clicking the parameter and selecting **Move Parameter to Interface**:
>
> This option is only available for processes that implement a process interface in the same package, and only for parameters that do not have problems in the Problems view.

If you create a process using a process interface, the process that you create inherits the events and parameters created in the interface. For example, a start event in a process created using a process interface displays the following properties:

> **Note:**
>
>

Creating a Process Interface

You can create a process interface from Project Explorer.

Procedure

1. Go to **File > New > Other**.

2. Expand **Business Modeling > Business Process Modeling**, select **Process Interface**,

and click **Next**.
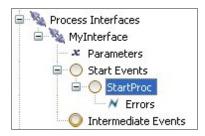
3. Enter a name for the process interface you are creating and click **Next**.

4. Enter a description for the process interface you are creating and click **Next**.

5. Enter any extended attributes and click **Next**.

Creating Error Events
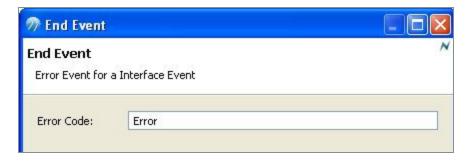
Error events are created in the Project Explorer.

Procedure

1. Create a process interface.

2. In the Project Explorer, under the process interface, expand an event. For example:

3. Right-click **Errors** and then, select **New > Error**. The following dialog box is displayed:

4. Enter a name for the error code and click **Finish**. The error code you created is displayed in the Project Explorer, and in the Process Interface Editor:

Continue with Error Codes and Process Interfaces to see how these error codes are used in processes created from a process interface with error codes.

Modification of a Process Interface

You can modify a process interface using the Process Interface editor, however any changes made cause validation errors in processes that have already implemented the interface.

For example:

To correct this problem, ensure that the changes made to the process interface are reflected in any processes that have already implemented the interface.

Creating a Service Process Interface

A service process interface allows the dynamic selection of service processes at runtime. A service process interface specifies the deployment target, events and their parameters that must be present in the service processes created using that service process interface. At runtime, any of the service processes that implement the interface might be chosen based on the data available at that time.

> **Note:** You can only use service process interfaces with service processes.

Using the Service Process Interface Editor, you can add the deployment targets, events and parameters you require. You must specify one of the following deployment targets:

- the process engine
- the pageflow engine

The deployment target you choose depends on whether you are invoking your service processes from business processes or pageflow processes.

Once created, a service process interface can be used by several different service processes. If a service process is created using a service process interface, the deployment target, the events and parameters specified in the interface must be present in a service process that implements the interface. You can add additional events or parameters, but removing any of those required by the interface invalidates the service process.

If you do have additional parameters that are local to a service process that implements a service process interface, you can move the parameters into the service process interface by right-clicking the parameter and selecting **Move Parameter to Interface**. However, this option is only available for service processes that implement a service process interface in the same package, and for parameters that do not have any problems in the Problems view.

If you create a service process using a service process interface, the service process that you create inherits the deployment target, events and parameters created in the interface.

Procedure

1. In the Project Explorer, select the package where you want to create your service process interface, right-click and select **New > Service Process Interface**.

2. Enter the **Label** of the service process interface and select **Next**.

3. In **Description**, add optional text that describes the process, an optional URL that links to documentation about the process, and select **Next**.

   > 🛈 **Note:** The **Documentation URL** field is intended for design-time collaboration; it is not displayed in the runtime environment.

4. (Optional) In **Destinations**, select a destination environment.

5. (Optional) In **Extended**, add any optional supplemental information to the XPDL for the process.

6. Select **Finish**.

   The Service Process Interface editor is displayed. Use this to configure the deployment target for the service process interface and add or remove start events, intermediate events, and parameters.

7. Once you have created your service process interface, you must configure the

deployment engine that you want the service process interface to be deployed to.

When you create a service process interface, the deployment target is automatically set to **Deploy to Process Run-time** so, if you want your service process interface to deploy to the pageflow engine, you must select **Deploy to Pageflow Run-time** in the **General** tab of the Properties view. Add any start events, intermediate events, and parameters and select **Save**.

> **Note:** There are other tabs available in the Properties view for service processes. See Process Properties for more information.
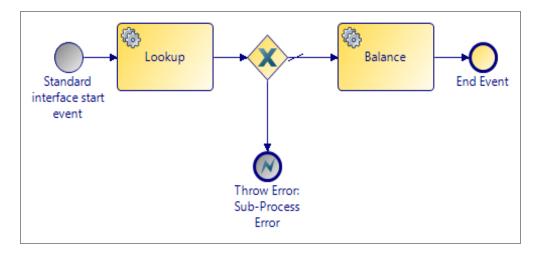
Error Codes and Process Interfaces

The following example shows how a "get balance" example could be implemented as a sub-process.
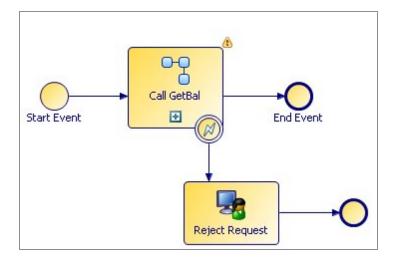
The process flow is as follows:

- The process is started upon receipt of a start event that contains an account.

- The REST service task looks up the account in the database to verify if it is valid.

- If the account is valid, another REST service task gets the balance, and the balance and account number are sent as output.
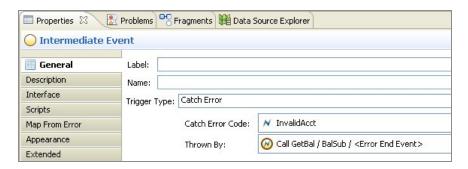
  If the account is not valid, an error code is generated.

In this case, the sub-process generates an error, and in the calling process the error is resolved.

The catch error event is configured to detect the error thrown from the sub-process.

Deleting a Process

You can delete a process and decide whether to delete referenced processes.

Procedure

1. Do one of the following:

   - Right-click the process in the Project Explorer, and select **Delete**.

   - Highlight the process and select **Edit** > **Delete**.

   - Highlight the process and press **Delete**:

2. If the process you are deleting is referenced in the parent package (for example, you are deleting a sub-process), a dialog box is displayed:

   - If you are sure that you want to invalidate the process that is referring the

process you are deleting, click **Yes**.

- If you do not want to delete the process, click **No**.

3. If the process you are deleting is not referenced in the parent package, it is still possible that it is referenced by a process in a different package. TIBCO Business Studio cannot validate against this however and a dialog box is displayed:

   - If you are sure that processes in different packages do not reference the process you are deleting, click **Yes**.

   - If you do not want to delete the process, click **No**.

> ℹ️ **Note:** It is also possible to delete a process by deleting the XPDL file of the package that contains the process in Windows Explorer. This deletes all processes in that package. If you delete a package in Windows Explorer while TIBCO Business Studio is open, you must refresh the Project Explorer to see an updated view of the workspace.

Creating Extended Attributes

Extended attributes can be used to add extra information to the schema.

Extended attributes are as follows:

- **XML**

  For example, an XSD file used by a web service.

- **Plain text**

  For example, Supply Chain Management (SCM) metrics and best practices.

  > ℹ️ **Note:** You can also add extended attributes when creating a new Process or Process Interface as described in Creating a Business Process.

Procedure

1. Click the **Extended** tab.

> **Note:** This tab is only available on the Properties view for objects that support extended attributes.

2. Click **Add** to add a new extended attribute.

3. Modify the following:

- **Name**

    Provide a **Name** for the attribute (you cannot include spaces in the name).

- **Value**

    Add any text for the **Value**.

- **Escape Body**

    Select this check box if you want the parser to interpret the contents of the body attribute as text rather than XML (you do not want the parser to interpret symbols such as < or >). If you are entering XML, do not select this check box so the parser can validate the body attribute.

- **Body**

    Enter whatever text or XML you want to make up the body of the attribute.

4. Save the package that contains the process.

Email Presentation Resources

Creating your Email template files

Procedure

1. In Project Explorer, navigate to the project you want to add the Email template to.

2. Right-click on the project and select **New > Folder** and name your folder.

3. Right-click on the folder you created, and select **Special Folders > Use as Presentation Resources Folder**.

4. Right-click the Presentation Resources folder you created, and select **New > File** and create the files you require.

Result

Alternatively:

- Right-click **Presentation Resources > New > File**, and create the files you require.

> **Note:** If you create the files you require elsewhere, copy and paste them by copying them and then right-clicking **Presentation Resources** (or your new Presentation Resources folder) and selecting **Paste**.

> **Note:** This email template is available only to this project. If you attempt to access it from another project, you receive a validation error, as the files contained are not available outside this project.

Applying the Email template to a Project

Procedure

1. From the project, right-click **Properties > Presentation Channels**. Select the check box **Enable project specific settings**.

- or select **Window** > **Preferences** > **Presentation Channels,** and click **Configure Project Specific Settings...** Select the project you want to configure and click **OK**.

2. Expand **Default Channel** and select **Openspace Email**.

3. Click in the **Value** field for **mailTemplateLocation**, and you can see the picker:

4. Use the picker, to navigate to the HTML file you created in the Presentation Resources folder, and click **OK**.

5. Click **Apply**.

Result

Next time you push an email, it uses this template.

> **Note:** Email templates are scoped to one project only. If the template is applied on the workspace level, then all relevant projects should have the specified custom template files available inside them. It is then recommended to overwrite the workspace Presentation Channel definition on the project level when the custom email template needs to be provided.

Creating an Alternative Email Template

You can create your own email template which can contain organization-specific information, with your own logos and corporate style.

After deployment it can be used as the default email template for any Push Destination using the **Openspace Email** channel type.

The files you can use to create your email template are as follows:

- **HTML file** (Mandatory) This contains the information about what you want the email to contain. It typically includes:

  - a reference to the `.css` file as its stylesheet. This can be included using an html line similar to the following:

    ```
    <link rel="stylesheet" type="text/css" href="cid:Easycss" />
    ```

○ references to any of the graphics files contained in the cid.properties file (referred to by their cid: identifier, prefaced by 'cid:'), for example:

```
<img src="cid:cidOne"/>
```

refers to NewProductLogo.png in the example in cid.properties above. Referring to them in this way means they can be shown externally as part of the email when the html file is used to create an email after deployment.

○ the content you want to include in the email.

This html can contain any of the following tokens, each of which is replaced by an actual value at runtime;

%%token.workItemUrl%%	URL of the work item.
%%token.workItemId%%	The id of the work item.
%%token.entityName%%	The entity name who requires push notifications as defined in the Organizational Model.
%%token.mailDate%%	The date and time the pushed mail message was sent.
%%token.mailFrom%%	The name of the sender of the pushed mail message.
%%token.mailSubject%%	The subject line for the pushed mail message.
%%token.mailTo%%	The user/s who the pushed mail message is sent to.
%%token.mailCc%%	The user/s who the pushed mail message is copied to.

`%%token.mailBcc%%`	The user/s who the pushed mail message is blind-copied to.
`%%token.hostIPAddress%%`	The IP address of the host.
`%%token.hostMachineName%%`	The host machine name.
`%%token.baseurl%%`	The base URL.

- **CSS (Cascading Style Sheet) file** This is a stylesheet file, typically for your organization, which contains standard information such as banners or background colors, that you want to be in every email you send.

- **graphics** you are referencing from the `cid.properties` file, which would then be used by the html file. These must be available locally, and can either be in the same directory (**Presentation Resources**), or in a sub-directory.

> ⓘ **Note:**
>
> ○ **cid.properties** This allows you to reference any graphics files you have available locally (in the same directory, or a subdirectory) which you want to be used when you push the work item (which then sends an email to notify the user of the work item). It is specifically used for embedded images / css in emails, rather than providing the option of external calls.
>
> ○ Each file name has a `cid:<`*name* identifier which allows it to be accessed remotely as well as locally. For example, the cid.properties file might contain lines such as the following, where `cidOne` is the cid: identifier for `NewProductLogo.png` when you reference it later in the HTML file:
>
> ```
> cidOne:NewProductLogo.png
> ```

Correcting Validation Errors

Any problems that result from validation are shown in the Problems view.

To correct the problem, do one of the following:
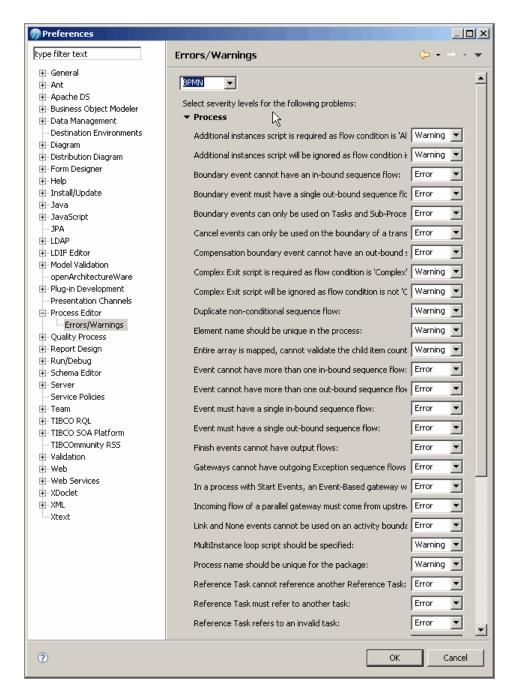
- Right-click the problem and select **Quick Fix** (if enabled for the current problem). This gives you the option of having TIBCO Business Studio correct the problem for you.

- Double-click the problem or right-click the problem and select **Go To**. This displays the Process in the Process Editor, highlighting the offending object and allowing you to manually correct the problem.

Setting the Validation Preferences

You can customize the validation that is performed in the Process Editor. Specifically, for each validation error you can specify its severity level as **Error**, **Warning**, **Info**, or **Ignore**.

Procedure

1. Go to **Window > Preferences**.

2. Expand **Process Editor** and select **Errors/Warnings**. The following dialog box is displayed:

3. If you want to change the severity level for a Process Editor problem, select from the
   drop-down list. When you have finished, click **Apply** to effect any changes you have
   made.

> **ⓘ** **Note:** You can downgrade the severity of BPMN errors, however some
> TIBCO Business Studio errors are not displayed because downgrading
> them would allow processes to be deployed that would be invalid in the
> runtime environment.

4. The following dialog box is displayed:

- Click **Yes** to re-validate your workspace. Depending on the size of the workspace
  and the number of errors, there is a delay while the re-validation occurs.

- Click **No** to re-validate your workspace later. The re-validation takes place when
  the concept file next changes or is saved, or when you explicitly request a
  rebuild of the project or workspace.

- Click **Cancel** if you do not wish to apply your changes.

> **ⓘ** **Note:** At the top of the dialog box there is a drop-down list that
> allows you to select either **BPMN** or **Simulation**.

Configuring the Problems View

You can configure the appearance and display of the Problems view.
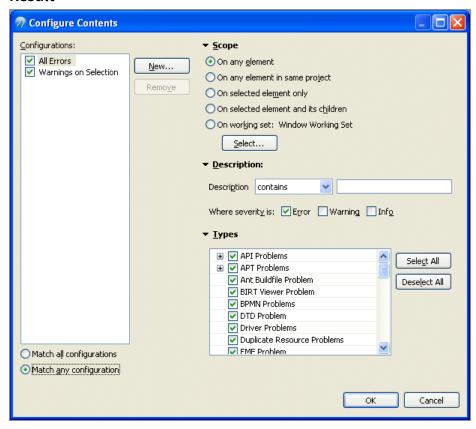
Procedure
1. Select items from the menu in the upper right of the Problems view:

2. Select **Configure Contents** to filter the problems that are displayed:

Result

Two configurations are provided by default, **All Errors** and **Warnings on Selection**. You can create and save your own configurations. You also can reduce the number of errors displayed by selecting a different scope. For example, by choosing **Selected element only** as the scope in conjunction with the **All Errors** configuration, you can see all errors for the selected element only rather than for all elements in the workspace.

By default, problems in the Problems view are grouped by severity of the problems. However, you can change this using the Group By menu option. For example, to arrange

the Problems by their type, select **Group By > Plug-in Problem Type**. You can also add or remove types in the previous Configure Contents dialog box.

Design Considerations for Process Migration
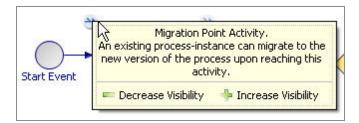
A process instance can only migrate to a new version of a process when certain criteria become satisfied.

These are automatically identified by TIBCO Business Studio at design-time, but you should be aware of the points described in Migration Point Restrictions.
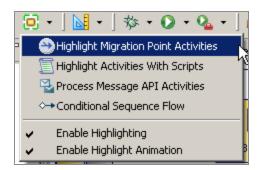
Migration Point Viewing

Valid migration points in a process are denoted by an icon next to the task in the Process Modeler, and by process diagram annotations which allow identification of individual activities as migration points as and when they are viewed in the diagram.

You can increase or decrease the visibility of these icons by hovering over the icon and using the selections (shown in the screen capture below).

Each selection you make is additional to those you have made before. For example, when you select a data field then all the activities that reference that data field are highlighted in the process diagram. If you then also select the Highlight Activities With Scripts option, then only the activities that reference the data field **and** have scripts are highlighted.

To clear selections, click in the Process Editor window again, and it goes back to its default setting, which is to show migration points.

You can also choose to highlight migration points by selecting Highlight Migration Point Activities from the drop-down toolbar.

Migration Point Restrictions

You should be aware of a number of restrictions when designing your process to be sure that it can migrate correctly.

- The task name is used to identify a migration point. This means that all tasks must have names.

  > 🛈 **Note:** By default, gateways do not have names. This means that you must specify a name for all gateways in your process if you want them to be valid migration points.

  Note that:

  - task names must not be duplicated.

  - task names in source and destination process templates must be the same.

- Migration cannot be performed on pageflow processes. Pageflow processes are short-lived processes whose data is not persisted, therefore migration should not be required.

- For a user task, migration should be set before the user task is scheduled. Migration does not happen if the changes are made after the user task is OFFERED to a user.

- Valid migration points are points of the process template where a single process thread executes. Therefore, a task that starts a parallel path is a valid migration point but any tasks that follow are not until those paths are rejoined.

- Part of a process that does not appear to be a parallel flow might be treated as a parallel flow. A primary example of this is to receive tasks without inflows and any sort of task boundary event. If the flows out of these tasks are not merged back into the process then everything after that point is treated as a parallel flow. This is because without an explicit merge back into the flow then there is an implicit merge at the end of the process (hence all other activities on those flows are counted as "in-parallel" with the receive task).

- Any tasks inside embedded sub processes cannot be migration points, but the embedded sub process itself might be a migration point. See Embedded Sub-Processes. Migration takes place before starting the sub process.

- These events cannot be migration points:

  ○ start events

  ○ events placed on the boundaries of tasks.

    See Events.

- Tasks that follow these gateways are not valid migration points:

  ○ Inclusive

  ○ Complex

  ○ Parallel

- Tasks following tasks that have Timer events placed on their boundary with **Continue Task on Timeout** selected are not valid migration points:

- Tasks following tasks with multiple instance loops with ordering set to Parallel and flow conditions that are set to One are not valid migration points. This is equivalent to an exclusive gateway, and means that only the completion of the first activity instance causes flow to continue.

- **BPM Validation Configuration** on the Resource properties tab of a process is used to suppress problems markers for the 'No migration point activities in the process' Problem. It gives you the choice of validation, suppressing the error until the next process flow change, or suppressing the error until a manual reactivation via Resource properties.

- Migration points cannot be set on an event handler flow but it is possible to modify an event handler flow which can then be triggered after a process migration from a migration point set somewhere on the main flow.

- Event handlers (and other incoming request activities) are automatically re-initialized during process migration. This means that they are re-activated using the new values for correlation data.

- When adding an ad-hoc event to a new process version, the initializer for the ad-hoc event must be defined as the migration point or come after the migration point in order for the ad-hoc event to be available after process migration. If the initializer is in a part of the process that has already been executed before migration, the ad-hoc

event does not take effect in process instances that have been migrated.

- Migration is delayed with an audit message if the event handler thread is not complete. The migration completes once all outstanding event handler threads have been completed.

- When you add a new ad-hoc activity, and then upgrade and migrate, you must define an initializer for the activity. This could actually be the migration point itself.

Comparison of Different Versions of a Process Package

You can compare the local Process Package you are working on with another version.

This can be used to identify:

- any changes you have made since the last time you saved that Process Package. See Performing a Two-way Compare.

- any changes made by another user in the Subversion copy since you last checked it out. See Use of the Process Package Comparison Editor with a Two-way Compare.

> **ℹ Note:** This ability to show a comparison graphically is also available for Task Libraries.

See Source Control for more information using source control to manage your processes.

Performing a Two-way Compare

You can compare your current local copy of the Process Package with a previous local revision.

Procedure

1. Select the Process Package .xpdl file in Project Explorer, and right-click it.

2. Select **Team > Show Local History**. This option shows you a list of your revisions to the file.

3. Select the previous revision you are interested in comparing with your current version, and right-click **Compare Current with Local**.
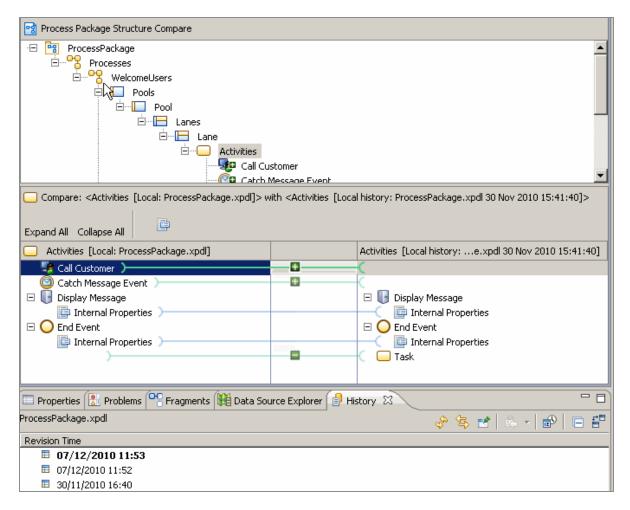
> **Note:** The default is to keep local history available for 7 days. If you need to see more history than this, select **Window > Preferences > General > Workspace > Local History** and edit the settings.

4. You can then compare the file you selected with your current local copy. The Process Package Comparison Editor is displayed showing you a tree of elements that are different in the two files. This is a **two-way compare**. In the Process Package Structure Compare window at the top of the screen, expand the Process Package and select the level you are interested in (for example, **Activities**).

   The left/right revision views are populated with the tree structure of the different descendants of that element. The differences in your local copy are shown in the left-hand column.

Use of Process Package Comparison Editor with Two-way Compare

These notes help you interpret the results of a two-way compare. The screen capture below shows you an example of a two-way compare.

- The following icons indicate changes in a two-way compare:

  As no common ancestor is available for comparison, all differences are treated as if changes were made on the left-hand revision):

	A green [+] (with no indication of direction) indicates elements that appear in the left-hand revision that do not appear in the right-hand revision.
	A green [-] (with no indication of direction) indicates elements that appear in the right-hand revision that do not appear in the left-hand revision.

  Items that do not have an icon by them are changed in either the left or right hand revision, or both (or have added, deleted or changed descendants).

- If you hover the cursor over the relevant icon, tooltip pop-ups let you know that the information was added to the left or deleted to the right - so you might have added something, or the other version might have deleted something.

In a two-way compare it is not possible to identify which version the change was made in.

- In the Comparison view, you see Information elements (as indicated by the ⓘ icon. These elements are always shown regardless of whether there are any differences in the data that they represent. This is to give you a context for given elements and usually contain the 2 or 3 major configurations for that element (such as task type, name and so on).

- Internal Properties (found at the level below a task, for example) is used to group a number of smaller changes made as the result of your main change/s under one heading. You are unlikely to need to examine these, but if you do want to see them in more detail select the 🖼 button above and to the right of the left/right content view.

- The central section of the comparison view shows connection lines between correlating objects on the left and right side. These include icons according to what the difference is (and on the side of the connection line where the change that caused the difference was made). The lines are color coded to indicate the type of change that they represent (red = conflicting change, green = addition or deletion, blue = existing element changed).

Performing a Three-way Compare

A **three-way compare** is used to compare your changes to a Process Package with those of another user, as well as with the original (common ancestor) file on which both are based.

Typically, you might want to do this if another user checked a process package out of Subversion when you did, and they made changes and checked them back in. When you go to check your own version back in, Subversion identifies a potential conflict. To identify areas which the other user has changed and decide whether to adopt their changes and abandon yours, or overwrite them with your own, you can do a three-way compare.

> ⓘ **Note:** Three-way compare is only available once a synchronize has been performed on the file (or its project). Synchronize is performed automatically for any file when it is committed to Subversion (to ensure that no conflicts exist with another user's changes).

See Source Control for information about using source control to control your project information.

To do a three-way compare (when you have checked a project file out of the source repository and made changes and saved them - and another user has done the same and committed their changes):

Procedure
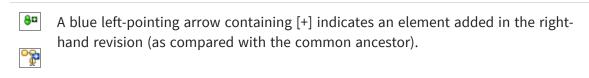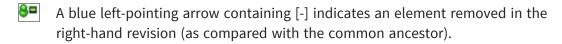
1. Attempt to commit your changes in the Team Synchronizing perspective.

   You might discover that your changes conflict with those of another user and you cannot commit your changes until you have rectified this.

2. Select **Open in Compare Editor** to identify whether you want to adopt the changes from the other user, or commit your own changes instead.
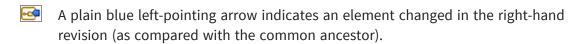
Use of Process Package Comparison Editor with Three-way Compare

These notes help you interpret the results of a three-way compare.

- The following icons indicate changes in a three-way compare:

	A blue left-pointing arrow containing [+] indicates an element added in the right-hand revision (as compared with the common ancestor).
	A blue left-pointing arrow containing [-] indicates an element removed in the right-hand revision (as compared with the common ancestor).
	A plain blue left-pointing arrow indicates an element changed in the right-hand revision (as compared with the common ancestor).
	A gray right-pointing arrow containing [+] indicates an element added in the left-hand revision (as compared with the common ancestor).
	A gray right-pointing arrow containing [-] indicates an element removed in the

left-hand revision (as compared with the common ancestor).

A plain gray right-pointing arrow indicates an element changed in the left-hand revision (as compared with the common ancestor).

Red arrows pointing both ways indicate a conflict: the element or its descendants were changed in both the left-hand revision and the right-hand revision.

- If you hover the cursor over the relevant icon, tooltip pop-ups let you know that the information was added to the left or deleted to the right - so you might have added something, or the other version might have deleted something.

  In a three-way compare, you can distinguish whether an additional element was caused by an addition by someone else or a deletion by you. This is because the comparison can check whether the additional element existed in the common ancestor, and if it did not, then you can know whether you have changed it or whether it was another user.

- In the Comparison view, you see Information elements (as indicated by the ⓘ icon. These elements are always shown regardless of whether there are any differences in the data that they represent. This is to give you a context for given elements and usually contain the 2 or 3 major configurations for that element (such as task type, name and so on).

- Internal Properties (found at the level below a task, for example) is used to group a number of smaller changes made as the result of your main change/s under one heading. You are unlikely to need to examine these, but if you do want to see them in more detail select the ▤ button above and to the right of the left/right content view.

- The central section of the comparison view shows connection lines between correlating objects on the left and right side. These include icons according to what the difference is (and on the side of the connection line where the change that caused the difference was made). The lines are color coded to indicate the type of change that they represent (red = conflicting change, green = addition or deletion, blue = existing element changed).

Process Fragments

TIBCO Business Studio provides predefined fragments in the folder `BPMN Process Fragments`.

Also see the "Process Fragments" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Migrating Fragments from Previous Versions

Any fragments that you created in previous versions of TIBCO Business Studio must be migrated to the current version, but the predefined fragments that TIBCO Business Studio provides do not need to be migrated because they are available in the current version.

Procedure

1. Go to **File > Import > General > Existing Fragments Projects into Workspace**, and click **Next**. In the Import dialog box, click **Browse** to select the directory where your fragments are located.

2. Select the fragments that you want to migrate, and click **Finish**.

Using the Predefined Fragments

You can use one of the predefined fragments.

Procedure

1. Open the process.

2. Make sure that the Fragments view is visible. If it is not, select **Window > Show View > Fragments**.

3. In the Fragments view, there is a navigation tree that looks similar to the Project Explorer. This is the **Fragment Explorer**. Expand **BPMN Process Fragments** folder. This contains categories of BPMN process fragments.

4. Expand the category that contains the fragment you want to use.

5. Select the fragment.

6. Drag the fragment onto the process.

> ✔ **Tip:** You can also use the **Copy** and **Paste** menu options either by right-clicking or by selecting from the **Edit** menu.

Creating Custom Fragments

If a portion of your process is one that you are likely to reuse in other processes, you can capture the useful part of the process and save it as a custom fragment.
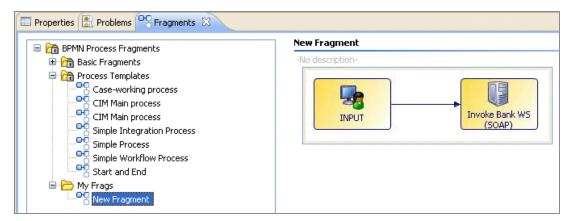
Create a new category by either right-clicking **BPMN Process Fragments** in the Fragment Explorer and selecting **New > New Category** or by clicking the **Create New Category** button (⬜).

Procedure

1. Double-click in the name field of the newly added category and enter a name:

2. Do the following:

   a. Holding down the **Ctrl** key, select the activities and sequence flows in the process that comprise the fragment.

   b. Copy and paste the fragment into the Fragments view:

Importing Custom Fragments

You can import custom fragments from an archive file or a `.bsProject` folder.

Procedure

1. Create an archive file that contains the **.bsProjects** folder from your workspace. This folder contains your custom fragments.

2. The recipient of the archive file can then import it. To do this, go to **File > Import > General > Existing Fragments Projects into Workspace**, and click **Next**.

3. In the Import dialog box, select the **Select archive file** check box and click **Browse** to select the archive file that contains the fragments you want to import.

4. Click **Finish**. The fragments are imported into the current workspace.

Result

> **ⓘ** **Note:** Alternatively, to import from the `.bsProject` folder, go to **File > Import > General > Existing Fragments Projects into Workspace**, and click **Next**. In the Import dialog box, select the **Select root directory** check box and click **Browse** to select the location of the `.bsProject` folder from the file system. Click **Finish**. The fragments are imported into the current workspace.

Business Object Models

The business object (data) model is where you define in business terms the Classes, Attributes, Primitive Types, Operations, Associations, and so on that describe your business data.

There are a number of common tasks that you perform using the Business Object Modeler in TIBCO Business Studio.

> **Note:** You can use quick-find (Ctrl+F) in the project explorer to find existing business object model entities and select them in the project explorer.
>
> When you have created a business object model, you can search for business object model diagram elements within it using quick-find (Ctrl-F) within the diagram, and entering the initial characters of the name you are searching for. Double-click the element you are shown in the search to go to its location in the diagram.

Business Object Model Creation

A Business Data project contains Business Object Models within the **Business Objects** folder.

When you create a new Business Data Project (**File > New > Business Data Project**), the initial Business Object Model (.bom) asset is created.

You can add more business object models to describe other aspects of your business data by creating additional business object model assets in this folder. You can also organize your business data into a discrete hierarchy of reusable business data projects.
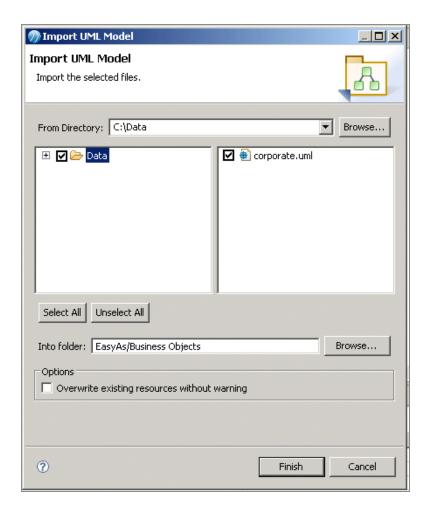
Creation of a Model by Import

As an alternative to using the Business Object Modeler to create a business object model, you can import it to a Unified Modeling Language (UML) model and TIBCO Business Studio automatically converts it to a business object model.

Importing Existing UML Models into the Business Object Modeler

You can import existing unified modeling language (UML) models into the Business Object modeler.

Procedure

1. Start the import wizard using one of the following methods:

    *   Right-click the **Business Objects** folder, and select **Import** > **UML Model**.

    *   Go to **File** > **Import** > **Business Object Modeler** > **UML Model**.

2. The Import UML Model dialog box is displayed:

Click the **Browse** button to select the **From Directory** where you have stored the UML model. Any UML models that are found are displayed.

In this example, the UML model `C:\Data\corporate.uml` is selected.

3. Browse to select the **Business Objects** folder into which you want to import the model.

Select the **Overwrite existing resources without warning** check box if you know you want to replace an existing model with the one you are importing; otherwise TIBCO Business Studio prompts you to confirm whether to overwrite the existing model.

4. Click **Finish**. The Model is imported into the folder that you specified.

Business Object Model Editor
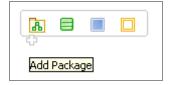
You can add objects to your business object model or concept model, and edit them, using the Business Object Model Editor.

Adding Diagram Nodes to a Business Object Model

To create a business object model, you add diagram nodes (Package, Class, Attribute, Primitive Type and Operation) and connect them with Connections (Association and Composition).

You can add diagram nodes and connections in any of the following ways:

- Using the tools on the diagram editor's palette. The palette contains tools that enable you to add a diagram node or a connection either by selecting the required tool in the palette and dragging and dropping on to the diagram, or by clicking on the tool in the palette and then clicking on the diagram.

  If there is a stereotype already applied to your business object mode, the palette contains additional tools to create business objects with the stereotype already applied to them. See Applying Stereotypes to Business Objects for more detail about stereotypes.

- Using the pop-up icons. If you hover your mouse over the empty area of the diagram, or over a Package, a pop-up containing icons appears. Hover over these icons to display label as shown in the following illustration, and then click to create a new node of that type in the diagram.

  Similarly, hovering the mouse over a Class displays icons for Attribute and Operation.

- Using the Project Explorer. You can add new diagram nodes (such as adding a new Package, Class, or Attribute) using right-click menus in the Project Explorer. For example, to add a new Class, you can expand the Project Explorer, select the business object model, and right-click **Add Child > Class**.

  The Project Explorer menus list the objects appropriate to the context. For example, if you select a Class and right-click **Add Child**, the following menu is displayed:
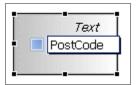
Adding Classes and Attributes

You can add classes and attributes to your Business Object Model.

Procedure

1. Using the Class tool, place a Class on the model and name it.

2. Using the Attribute tool, place Attributes within the Class.

3. In the Properties view for each Attribute, select the Type and specify whether there can be multiple values for the Attribute (whether it is an array). (See "Attributes" in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attribute types and multiplicity). When you specify multiplicity values in the Properties view for Attributes, you can use content assistance. Press Ctrl+Space in the field and the available multiplicity values are displayed.

    To apply restrictions to your Primitive Type, click the **Resource** tab and expand **Restrictions**.

4. Using the Operations tool, place Operations within the Operations Compartment in the lower section of the Class graphic.

5. In the Properties view for each Operation, specify the return value type and any parameters or parameter types.

6. In the **Properties View** for each Class, Attribute or Operation, click the **Stereotypes** tab to apply any stereotypes you want to apply. See Applying Stereotypes to Business Objects for more information.

Adding Primitive Types

To add a Primitive Type to your business object model, use the Primitive Type tool, drag-and-drop a Primitive Type on the model and name it.

When you create a Primitive Type, it is always created with a standard type of Text. To select another standard type for the Primitive Type:

Procedure

1. In the **Properties View** for the Primitive Type, select the **General** tab.

2. Click the picker to display the Select Type dialog box. To display a list of the available types you can set, type **?** in the **Select Type(s)** field. A list of the available standard types is displayed.

3. From the **Matching Items** box, select a standard type and click **OK**.

Result

To apply stereotypes to the Primitive Type, click the **Stereotypes** tab. See Applying Stereotypes to Business Objects for more information.

To apply restrictions to your Primitive Type, click the **Resource** tab and expand **Restrictions**.

Connections

Connections indicate the relationships between Classes and include Association and Composition.

See Creating an Association between Two Classes

See Composition

Creating an Association between Two Classes

You can create an association between two classes. An association is a relationship between two classes.

Procedure

1. Click the Association tool on the Palette.

2. Drag from one Class to the other. This creates a bi-directional Association. You can change the direction of the Association by selecting from the **Navigability** drop-down list in the Properties view. You can also change the **Source** or **Destination** of the Association in the Properties view.

   > ℹ **Note:** A bi-directional Association shows both the **Source** and **Destination** on the business object model. A Unidirectional Association shows only the **Destination**.

   You can also set the Multiplicity of each end of the Association by selecting from the **Source Role Multiplicity** and **Target Role Multiplicity** drop-down lists in the **Properties** view.

3. In the Properties View for each Association, click the **Stereotypes** tab to apply any stereotypes you want to apply. See Applying Stereotypes to Business Objects for more information.

Composition

Compositions are created in the same way as an Association and share the same properties. The only difference is the meaning and appearance of the Connection.

See Creating an Association between Two Classes.

Adding Text to a Model

You can add a note or text to your business object model to describe the business object model or to add any supporting explanations to the diagram nodes.

> ⓘ **Note:** When adding text or a note, press Ctrl+Enter to start a new line.

To add a note
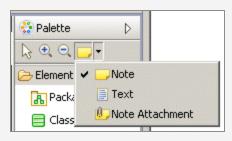
- Right-click on the Business Object Model Editor and select **Add** > **Note**.

- In the Business Object Modeler palette, select the Note tool in the upper part of the palette.

Then, click the Business Object Model Editor.

> ⓘ **Note:** You can also select Text or Note Attachment from this menu. The icon for the tool changes to show the item you have selected.
>
>

A Note is displayed where you can enter any text you require. Use the **Note Attachment** option to draw a line connecting a Note to the Class it comments on.

To add text

- Right-click on the Business Object Model Editor and select **Add** > **Text**.

- In the Business Object Modeler palette, select the Text tool in the upper part of the palette and then click on the Business Object Model Editor.

A Text box is displayed where you can enter any text you require.

Models

You can use various methods to create your Business Object or concept models.

Copying Diagram Nodes Between Models
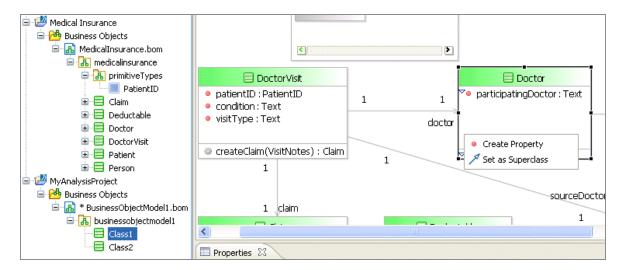
You can copy Classes, Attributes, and Primitive Types between models.

The business object models can be in the same project or in different projects. To copy business objects between projects, you must create a project reference between the two projects.

To copy business objects between projects, follow these steps:

Procedure

1. In the Project Explorer, expand the business object model that contains the diagram nodes you want to copy.

2. Open the business object model that you want to copy the diagram nodes to.

3. Drag the diagram node to the Business Object where you want to add or create a new object. A menu is displayed in the new model that prompts you to specify what action to take for the new object. The menu that is displayed depends on the type of business object you have copied. The following example displays the menu based on the type of business object:

If the business object models are in the same project, the item is copied to the new

model. If the models are in different projects, a Project Reference message is displayed. Click **Yes** to create the project reference or click **No**. If you click **Yes**, the object is copied to the new model.

Model Organization Tools

Some models are simple to follow but larger and more complex models are more difficult to read. The Business Object Modeler provides tools to make models easier to understand.

Icon	Command	Description
	Apply the applicable appearance properties of the first selected shape to the other selected shapes	Applies the applicable appearance properties of the first selected shape to the other selected shapes.
	Select All	Selects all business objects in the Model.
	Select All Shapes	Selects all shapes in the selected Package.
	Select All Connectors	Selects all connections in the selected Package
	Arrange All	Arranges all the business objects in the Model so that they are evenly spaced.
	Arrange Selection	Arranges the business objects in the Model that you have selected so that they are evenly spaced.
	Align Left	Aligns the selected business objects to the left of the Model.
	Align Center	Aligns the selected business objects to the center of the Model.
	Align Right	Aligns the selected business objects to the right of the Model.

Icon	Command	Description
	Align Top	Aligns the selected business objects to the top of the Model.
	Align Middle	Aligns the selected business objects to the middle of the Model.
	Align Bottom	Aligns the selected business objects to the bottom of the Model.
	Autosize	Automatically sizes the selected business objects to the smallest size.
	All Connector Labels	Displays all connector labels in the Model
	No Connector Labels	Displays no connector labels in the Model.
	All Compartments	Displays all the compartments within a selected Class.
	No Compartments	Only displays the name of a selected Class. Attributes and Operations are not displayed.

Applying Stereotypes to Business Objects

You can apply stereotypes to all the business objects in your business object model. You can apply as many UML profiles to a model or Package as you require.

You can apply the UML profile to the business object model or a package first, or it can be applied automatically when you apply a stereotype to an object.

The UML profile must exist in the BOM Special Folder (typically, the **Business Objects** folder for your project). The Select Type(s) dialog box is used to apply stereotypes and then display all the available stereotypes in that profile. If you select a stereotype from a profile that has not yet been applied to the business object model or Package, the profile is automatically applied when you click **OK** to apply a stereotype.

Procedure

1. In your business object model, select **Properties View** for the business object that you want to apply the stereotypes to.

2. On the **Stereotypes** tab, click the picker to display the Select Type(s) dialog box.

3. Type **?** in the Select Type(s) dialog box to display a list of the available stereotypes that you can apply.

4. From the **Matching items** box, select a stereotype and click **Add**.

5. Click **OK** to close the dialog box.

6. To edit your stereotypes, select **Properties View** for the diagram node which has the stereotype applied to it and click the **Resource** tab. The Stereotype is displayed in the **Resource** tab.

Setting Diagram Preferences

You can customize the appearance of the Business Object Modeler by following these steps:

Procedure

1. Go to **Window > Preferences**.

2. On the **Preferences** window, expand **Diagram** and then, expand **Business Object Model Diagram**. The following options are displayed:

   - **Appearance**: Displays a dialog box where you can change the color of fonts, backgrounds, fill colors, and so on.

   - **Connections**: Displays a dialog box where you can change the line style of the Connections in the Business Object Modeler (for example, Associations).

   - **Pathmaps**: Displays a dialog box where you can specify path variables to modeling artifacts that you might want to use in your business object model.

   - **Printing**: Displays a dialog box where you can specify the print settings for your business object models (for example, orientation, page size and the margins).

   - **Ruler and Grid**: Displays a dialog box where you can specify whether or not the ruler or grid is displayed when defining business object models in the Business Object Modeler.

> ℹ **Note:** The **Printing** and **Ruler and Grid** options apply only to the Business Object Modeler and not to the Process Modeler.

Result
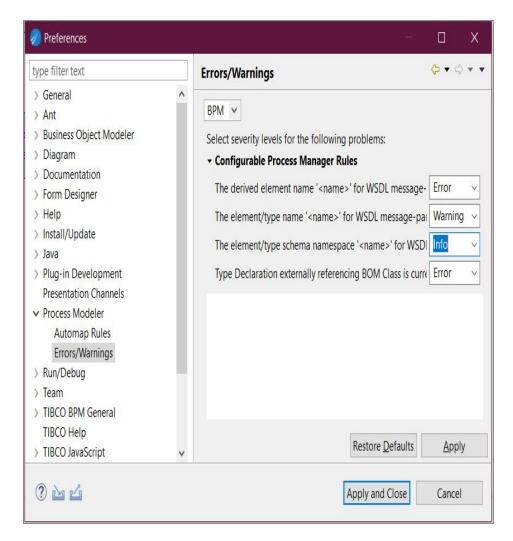
Any changes you apply only affect the new objects. To change the appearance of existing objects, select the object then, use the **Appearance** tab in **Properties view** or the options on the **Diagram** menu.

Setting the Validation Preferences
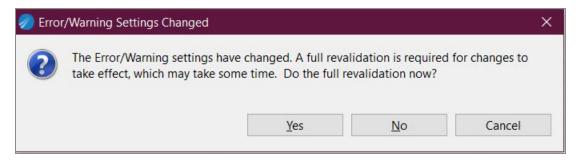
You can customize the validation that is performed on the business object models that you create. You can specify its severity level as **Error**, **Warning**, **Info**, or **Ignore**.

You can customize the validation preferences by following these steps:

Procedure

1. Go to **Window > Preferences**.

2. Expand **Business Object Modeler** and select **Errors/Warnings**. The following dialog box is displayed:

3. To change the severity level for a business object model problem, select **Error**, **Warning**, **Info**, or **Ignore** from the drop-down list.

4. After making the selection, click **Apply** to apply the changes while keeping the dialog box open. Alternatively, click **Apply and Close** to save the changes and close the dialog box.

5. The following Error/Warning Settings Changed dialog box is displayed:

- Click **Yes** to re-validate your workspace. Depending on the size of the workspace and the number of errors, there is a delay while the re-validation occurs.

  > **Note:** This rebuilds every Project in the workspace. It might result in the deployment of any Projects that are configured to deploy up when they are saved.

- Click **No** to re-validate your workspace later. The re-validation takes place when the business object file next changes or is saved, or when you explicitly request a rebuild of the project or workspace.

- Click **Cancel** to override your changes.

Organization Model

This section describes how to create a basic Organization Model using the Organization Modeler in TIBCO Business Studio.

Organization Model Creation

An Organization Model must be contained within a project that contains an Organization Model special folder.

You can create an Organization Model in the following way:

- Create a new Organization Model Project (which by default creates an Organization Model and corresponding special folder).

Creating a Project Containing an Organization Model

You can create an Organization Model in a new project.

Procedure

1. Go to **File > New > Organization Model Project**.

   > 🛈 **Note:** You can also select **File** > **New > Analysis Project** or **File** > **New > BPM Developer Project** and create a project containing an Organization Model as well as other assets.

2. The **New Project** wizard is displayed. Enter a name for your project in the **Project name** field and click **Next**.

   > 🛈 **Note:** This accepts default values for **Location, Id, Version,** and **Status**.

3. In the Asset Type Selection dialog box, ensure that the **Organization Model** box is checked. Click **Next**.

4. In the Organization Model dialog box, ensure that **Create initial Organization Model** is checked. In the **file name** field, enter a name for the Special Folder for Organization Models, or use the one provided by default. Click **Finish**.

> **ⓘ** **Note:** Leave the **Create default schema types** box checked to use the delivered schema.
>
> Check the **Apply default Organization Type to Organization** box if you want the Organization Type delivered in the default schema to be applied to the initial organization created. If not, leave it unchecked.
>
> See Creating a Schema for further details.

5. If you are not already in the **BPM Modeling** (or **Modeling**) perspective, you are prompted to switch to **BPM Modeling**. Click **Yes** to switch perspective.

Adding an Organization Model in an Existing Project

You can add an Organization Model to an existing project. However, you must first create a special folder.

Procedure

1. Right-click the project where you want to add the Organization Model and select **New > Folder**. The New Folder dialog box is displayed.

2. In the **Folder Name** field, type the appropriate folder name. Click **Finish** to close the dialog box.

3. Right-click the **Organization** folder and select **Special Folders > Other > Use as Organization Models Folder**. If you right-click on the **Organization** folder now, the option to create a new Organization Model is available.

Creating a Schema

The Organization Schema is contained in the Organization Model file (named by default *organization*.om, where *organization* is the name of the organization for which you are

creating the Organization Model).

Procedure

1. To create the default schema, when you are creating an organization model, either as part of creating a new project or separately, ensure that you leave the **Create default schema types** check box selected.

   If you select the **Apply default Organization Type to Organization** check box, the default Organization Type (called **Public Company**) from the default schema is applied to the initial Organization that is automatically created as part of this Organization Model. If you leave this check box empty, the Standard Organization Type is not applied.

   Note that if you do not select **Create default schema types**, the **Apply default Organization Type to Organization** check box is not available:

2. Click **Finish**. The default schema is created.

Using Your Own Schema Types

You can use your own schema types by following the procedure described for creating a schema, but without selecting the **Create default schema** check box.

See Creating a Schema.

Procedure
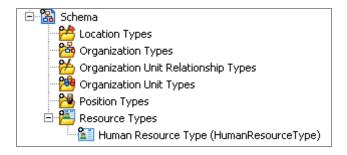
1. To use your own schema type, when you are creating an organization model, either as part of creating a new project or separately, ensure that you deselect the **Create default schema types** check box.

   Note that if you do not select **Create default schema types**, the **Apply default Organization Type to Organization** check box is not available so the Standard Organization Type is not applied:

2. Click **Finish**. Your own schema type is created.

   The schema created does not include the standard types provided with the default schema. The only type created is one Resource type, the Human Resource Type.

> **Note:** Unlike the Human Resource Type created in the default schema, this one has no attributes defined.

Result

The following illustration shows what is visible in the Project Explorer when you have created a non-default schema:

Creation Types in the Schema

If you are building your own schema, you need to create the types that make it up.

If you are using the default schema provided, you can create new types to add to the schema in the same way as you would for a new schema.

You can also modify the types provided. You can extend the default schema provided by setting up additional attributes to define more closely the elements that make up the organization you wish to model.

Creating a Location Type

You can create a location type in a schema.

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. In the **Schema** folder, right-click **Location Types** and select **Add Child > Location Type**. A new Location Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the

Location Type.

Click the **Attributes** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about the types you can specify. You can also add a default value for the Attribute, depending on your requirements.

Click to remove attributes.

Creating an Organization Type

You can create an Organization type in a schema.

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. In the **Schema** folder, right-click **Organization Types** and select **Add Child > Organization Type**. A new Organization Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the Organization Type.

4. To add an Organization Unit as a member to the Organization Type:

   a. In the **Unit Members** box, click . Type the name of the member in the **Label** field.

   b. To specify that the member should be of a particular Organization Unit Type, click on the **Type** field and then click the button that then becomes available.

   c. The Select Type dialog box is displayed. Click on the Organization Unit Type you require, and then click **OK**.

5. In the **Multiplicity** field, type in the multiplicity you want.

   Click to remove Organization elements.

   Click the **Attributes** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about the types you can

set for attributes. You can also add a default value for the Attribute, depending on your requirements.

Click to remove attributes.

Creating an Organization Unit Type

You can create an Organization Unit type in a schema.

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. In the **Schema** folder, right-click **Organization Unit Types** and select **Add Child > Organization Unit Type**. A new Organization Unit Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the Organization Unit Type.

4. To add another Organization Unit as a member to the Organization Unit Type:

    a. In the **Unit Members** box, click . Type the name of the member in the **Label** field.

    b. To specify that the member should be of a particular Organization Unit Type, click on the **Type** field and then click the button that then becomes available.

    c. The Select Type dialog box is displayed. Click on the Organization Unit Type you require, and then click **OK**.

5. In the **Multiplicity** field, type in the multiplicity you want.

6. To add a Position as a member to the Organization Unit Type:

    a. In the **Position Members** box, click . Type the name of the member in the **Label** field.

    b. To specify that the member should be of a particular Position Type, click on the **Type** field and then click the button that then becomes available.

    c. The Select Type dialog box is displayed. Click on the Position Type you require, and then click **OK**.

7. In the **Multiplicity** field, type in the multiplicity you want.

   Click to remove Position and Unit elements.

   Click the **Attributes** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about the types you can specify for Attributes. You can also add a default value for the Attribute, depending on your requirements.

   Click to remove attributes.

Creating a Position Type

You can create a Position type in a schema.

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. Right-click **Organization** and select **Add Child > Position Type**. A new Position Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the Position Type.

   Click the **Attributes** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. For more information about the types you can specify, see the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide*. You can also add a default value for the Attribute, depending on your requirements.

   Click to remove attributes.

Creating an Organization Unit Relationship Type

You can create an Organization unit relationship type in a schema.:

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. In the **Schema** folder, right-click **Organization Unit Relationship Types** and select **Add Child > Organization Unit Relationship Type**. A new Organization Unit Relationship Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the Organization Unit Relationship Type.

   Click the **Attributes** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. For more information about the types you can specify, see the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide*. You can also add a default value for the Attribute, depending on your requirements.

   Click to remove attributes.

Creating a Resource Type

You can create a resource type in a schema.

Procedure

1. In the **Project Explorer**, expand the **Schema** folder for your Organization Model.

2. In the **Schema** folder, right-click **Resource Types** and select **Add Child > Resource Type**. A new Resource Type is created.

3. Click the **General** tab in the **Properties** view. In the **Label** box, type the name of the Resource Type.

   Click the **Attribute** tab. Click to add an attribute. Type in the name and select a type for the Attribute from the **Type** drop-down list. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about the types you can specify. You can also add a default value for the Attribute, depending on your requirements.

   Click to remove attributes.
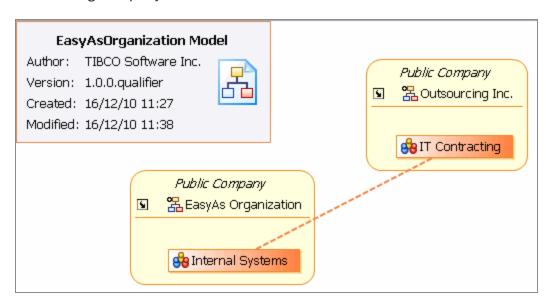
Organization Modeler Diagram Editors

Organization Modeler provides two graphical editors for producing organization diagrams:

- An Organization Model Editor for the root Organization Model diagram

- An Organization Editor for the diagrams of each Organization included in the Model

The Organization Model Editor shows a high-level view of the organization or organizations that you have created.

The following example shows an Organization Model diagram which includes two organizations, one being your own organization and the second a representation of an external organization with which your organization has dealings, in this case an outsourcing company.
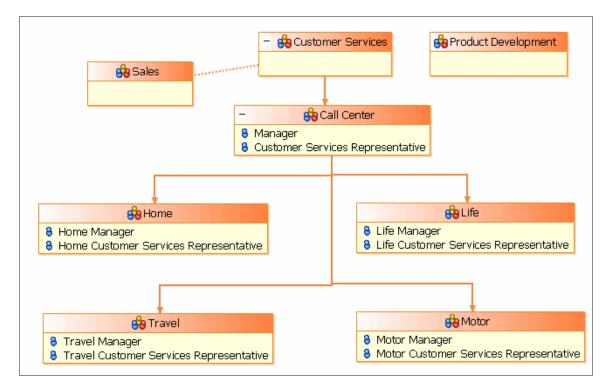
The Organization Model Editor opens when you:

- Double-click on an Organization Model **.om** file in the Project Explorer,

- Right-click on an Organization Model **.om** file in the Project Explorer, and select **Open** or **Open With > Organization Model Diagram Editing**,

- From the Organization Editor displaying any Organization in that Organization Model, click on the shortcut arrow that is displayed on the badge.
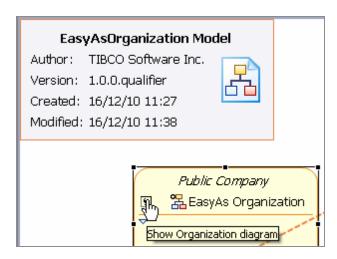
The Organization Editor shows a more detailed view of one Organization, including the Organization Units and Positions that it includes, and the relationships between them.

The Organization Editor opens:

- Automatically for the default Organization that is created when you create a new Organization Model Diagram,

- When you double-click on the header part of the representation of an Organization in the Organization Model Editor,

- When you double-click on an Organization in the Project Explorer,

- From the Organization Model Editor, when you click on the shortcut arrow that is displayed on the representation of each Organization within the model.

Adding Objects in Organization Modeler Diagrams
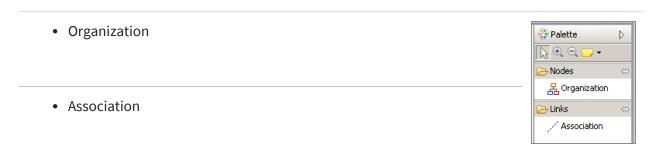
You can add objects to Organization Modeler diagrams in several ways.

- Using the tools on the diagram editor's palette

- Using the pop-up icons

- Using the context menu

- Using the Project Explorer

To add Objects in Organization Modeler Diagrams using the Palette

To add an object to an organization diagram, you can use the tools provided on the diagram editor's palette.

In the Organization Model Editor, the following tools are always available in the palette:

- Organization

- Association
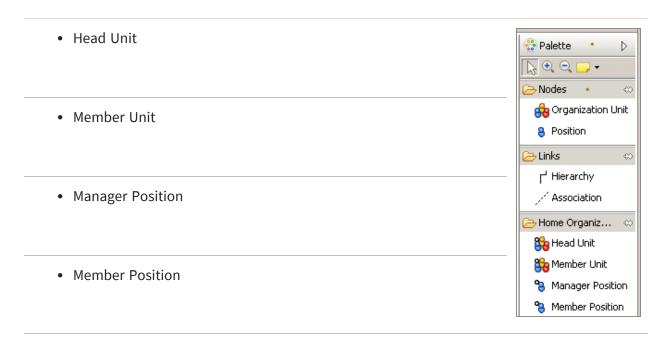
If you have applied a Schema to your organization model, and it contains any Organization Types, tools for adding these are also available. For example, if you have used the standard Schema but added a new Organization Type to it, both the Standard Organization Type and the additional one is available in the palette, as in the following illustration.

In the Organization Editor, the following tools are always available in the palette:

- Organization Unit

- Position

- Hierarchy

- Association

Additional tools are available if you have applied a Schema to your organization model. If you have applied the Standard Organization Type to the Organization, the palette contains the following tools for the elements that are defined in that Standard Organization Type:

- Head Unit

- Member Unit

- Manager Position

- Member Position

> ℹ **Note:** Note that the Sub Unit element is not available from the palette.

Similarly, if the Organization that you are editing has a different or modified Type applied, tools are included in the palette for the elements that are defined for that Type. The following illustration shows an example. Here an Organization is used that has two Organization Unit Types defined.

The availability of these tools on the palette is dynamic; if you add a new Type to the Schema, it is immediately made available on the palette.

To use any of these tools, you can either:

- Select the required tool and drag-and-drop on to the diagram, or

- Click on the required tool in the palette to select it, and click on the diagram.

Where you should drop, or click, depends on the object you are adding:

- For Organization and Organization Unit (including Types of Organization Unit), use the empty part of the diagram.

- For Position (including Types of Position), drop into or click on the position compartment of an Organization Unit - that is, the empty space below the title bar.

- For Hierarchy or Association, drop into or click on the Organization Unit where the connection is to start from, and drag the connection to the Organization Unit where it is to end.

When you add an Organization, Organization Unit, or Position object, the Label field on the title bar is automatically selected. Enter a name for the object.
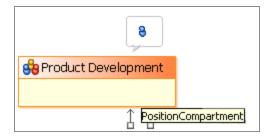
To add Objects in Organization Modeler Diagrams using the Pop-up Icons

You can add objects to an organization diagram using the pop-up icons that are available.

If you hover your mouse over the empty area of the diagram, an icon appears. In the Organization Model Editor, this is the **Add Organization** icon. Move your cursor on to the icon to display the Add Organization label as shown in the following illustration, and then click to create a new Organization in the diagram.
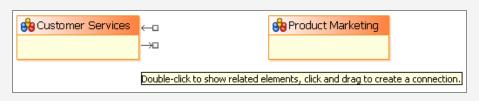
In the Organization Editor, hovering your mouse in the empty area produces the **Add Organization Unit** icon, which works in the same way as the **Add Organization** icon. Similarly, hovering your mouse over the Position compartment of an Organization Unit displays the **Add Position** icon, as shown in the following illustration.

You can add a connection between two objects in a diagram by clicking and dragging one of the handles that are displayed when you hover your cursor over the object. Click the handle and drag to the object to which you want to connect, as shown in the following illustration.

> **Note:** This process creates a Hierarchy. If you want a non-hierarchical connection, you can change it to an Association as described in Hierarchy and Association Properties.
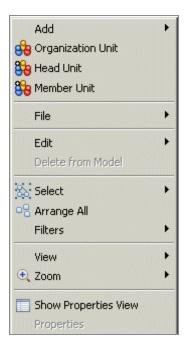
To add Objects in Organization Modeler Diagrams using the Context Menu

You can add objects to the organization diagram by right-clicking in the Organization Editor and selecting the object you require from the context menu that is displayed.

If you right-click on the background of the Organization Editor, you can select:

- An Organization Unit with no Type defined;

- If the Organization has the Standard Organization Type set, a Head Unit, Member Unit, or Sub Unit;
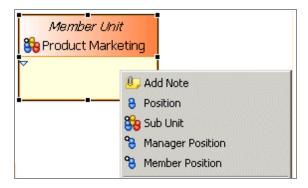
- If the Organization is set to another Type of Organization defined in the Schema, an Organization Unit of any of the Types defined for that Organization Type.

If you right-click on an Organization Unit in the diagram, you can select:

- A Position with no Type defined;

If the Organization Unit has an Organization Unit Type set, a Position of any of the Types defined for that Unit Type.

Adding Objects in Organization Modeler Diagrams using the Project Explorer

You can add objects to the diagram editor from the **Project Explorer**.

1. Select the parent in the Project Explorer.

2. Right-click the parent and select **Add Child**.

For example, to add an untyped Organization Unit you would right-click on the parent Organization and select **Add Child > Organization Unit**. If you are using Schema, the choices displayed include not just the basic Organization Unit but the Types of Organization Unit available.
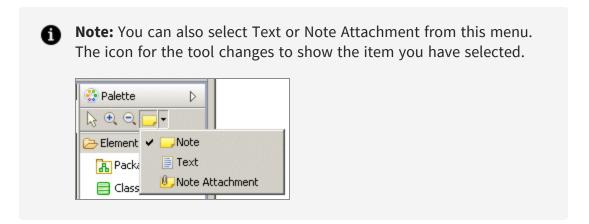
Adding Notes and Labels

You can add notes or text labels to the organization diagram.

Procedure

1. Do one of the following:

    - Right-click on an object in the editor and select **Add Note** from the pop-up context menu,

    - Right-click on the background in the editor and select **Add - > Note** or **Add - > Text** from the pop-up context menu,

    - In the Organization Editor palette, select the Note tool in the upper part of the palette.

    - Click on the Organization Editor.

    > **Note:** You can also select Text or Note Attachment from this menu. The icon for the tool changes to show the item you have selected.
    >
    >

Result
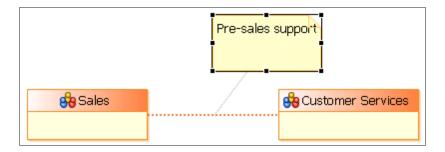
The following illustration shows a note being used to add explanation to an Association. A note attachment is drawn between the note and the object with which it is associated.
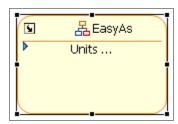
Tailoring the Appearance of Organization Modeler Diagrams

You can change the level of detail that the Organization Modeler diagrams display.

In the overview diagram, each Organization is by default shown including all the Organization Units that make it up, and the Hierarchies and Associations that link them. To hide the detail, click on the downward-pointing arrowhead that is shown in the corner when you select the Organization.
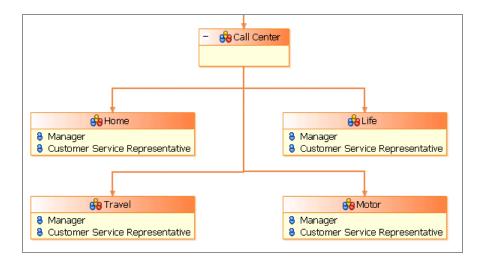
This action hides the contents of the Organization, and displays the collapsed version shown below.
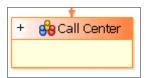
A solid right-pointing arrowhead is now displayed in place of the downward-pointing one when the Organization is selected. Clicking on this restores the display of the Organization's contents.

In the Organization Editor, the same arrowheads appear in Organization Units, and you can use them to hide or to display the Positions defined within those Organization Units.

Also, in the Organization Editor, you can choose to display or to hide the hierarchy of Organization Units that depend on the selected unit. The following illustration shows an excerpt from an organization diagram, with several Organization Units dependent on the Call Center unit.

If you click on the small minus sign in the title bar of the Call Center, the display changes to the following collapsed view.

Click on the plus sign to restore the hierarchical view.

You can also:

- use the options in the **Diagram** menu to arrange the objects on the diagram editor screen,

- right-click on the background of the diagram and select **Arrange All** to make the diagram more ordered.

Creating an Organization Model

The Organization Model is contained in a file called *name*.**om**, where *name* is typically the name of the entity for which you are creating the Organization Model. An Organization Model can contain more than one Organization.

Procedure

1. In the **Project Explorer**, select the **Organization** folder in the project where you want to create your Organization Model.

2. Right-click the **Organization** folder or the **OrganizationModel.om** folder and select

New > Organization Model.

3. The **Create Organization Model Diagram** wizard is displayed.
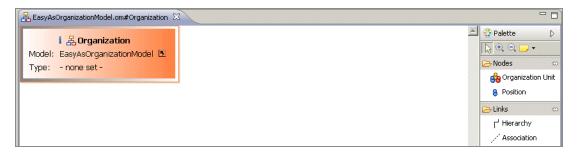
   Make sure that the **Create default schema types** box is checked.

   The folder you selected should be displayed in the **Create Organization Model Diagram** wizard. You can use the folder you selected or select a different folder, depending on your requirements. However, it must be a special folder of the **Organization** type.
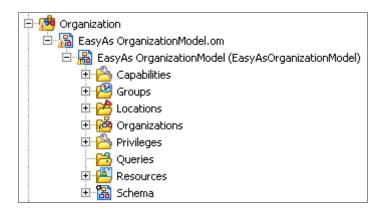
4. In the **File name:** field, type the name you want to apply to your Organization Model, followed by the suffix **.om**. Click **Finish**.

Result

The Organization Editor is displayed, representing the single default Organization created in the Organization Model. This information is displayed in the badge in the top left-hand corner of the editor. You can navigate to the parent Organization Model editor by clicking on the shortcut arrow in the badge.

The Organization Model is also displayed in the Project Explorer view.

> **ⓘ** **Note:** You can use quick-find (Ctrl+F) in the project explorer to find existing organization model entities and select them in the project explorer.
>
> When you have created an organization model, you can search for organization model diagram elements using quick find (Ctrl-F) within the diagram, and entering the initial characters of the name you are searching for. Double-click on the element you are shown in the search to go to its location in the diagram.

Creating an Organization

You can create an Organization within your Organization Model.

Before you begin

See the "Organizations" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

See Creating an Organization Model

> **ⓘ** **Note:**
> If you want to create an organization that is likely to be replicated elsewhere - for example a Branch which consists of a similar structure in a number of geographical locations - then you might want to consider creating a Dynamic Organization. See the "Dynamic Organizations" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Procedure

1. Activate the Organization Model Editor for your Organization Model.

2. Select the Organization tool in the Organization Model Editor palette, and click on the empty part of the Organization Model editor. This places an Organization in the Model.

   > **ⓘ** **Note:** You can alternatively expand the Organization Model in the Project Explorer. Right-click **Organizations** and select **Add Child > Organization**. A new Organization is created.

> **ⓘ** **Note:** If you want to use a template of a typical public company as a starting point for your own organization, right-click **Organizations** and select **Add Child > Public Company**. This provides you with a number of sample department types which you can edit and add to your company (Department, Business Unit, Team) and Positions already defined for Manager and Member which you can also edit.

3. At this point the **Label** field of the Organization is automatically selected. Enter the label you require. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces. For example, if you put Head Office in the **Label** field, the **Name** is HeadOffice.

4. If the **Properties View** is not already displayed, right-click the organization you just created and select **Show Properties View**. The **Properties View** is displayed.

> **ⓘ** **Note:** For a complete description of all the properties you can configure for an Organization, see Organization Properties.

5. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Organization and/or any supporting explanations, depending on your requirements.

   Next to the **Type** field, click ⊡ to display the Select Type dialog box. You can change the type for the Organization, depending on your requirements.

   Next to the **Location** field, click ⊡ to display the Select Type dialog box. You can specify a Location for the Organization, depending on your requirements.

6. If you have assigned a Type to the Organization, the **Attribute Values** tab is displayed. Any attributes that are defined for this type of Organization are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

> **ⓘ** **Note:** The **Attribute Values** tab is available only if you have previously applied a Type.

What to do next

When you have created an organization, you can model it to contain a structure using Organization Units and Dynamic Organization Units which can be connected using

Hierarchy links.

> **ⓘ** **Note:** Association links are not supported in the runtime model. If you create an association a warning is displayed.

Creating a Dynamic Organization

You can create a Dynamic Organization within your Organization Model. A Dynamic Organization is an organizational pattern that can be referenced from a number of different Organizations.

See "Dynamic Organizations" topic in the *TIBCO® BPM Enterprise Concepts Guide*

Procedure

1. Activate the Organization Model Editor for your Organization Model.

2. Select the Dynamic Organization tool in the Organization Model Editor palette, and click on the empty part of the Organization Model editor. This places a Dynamic Organization in the Model.

   > **ⓘ** **Note:** You can alternatively expand the Organization Model in the Project Explorer. Right-click **Organizations** and select **Add Child > Dynamic Organization**. A new Dynamic Organization is created.

3. At this point the **Label** field of the Dynamic Organization is automatically selected. Enter the label you require. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces. For example, if you put Head Office in the **Label** field, the **Name** is HeadOffice.

4. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Organization and/or any supporting explanations, depending on your requirements.

5. If you have assigned a Type to the Organization, the **Attribute Values** tab is displayed. Any attributes that are defined for this type of Organization are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

> **ⓘ** **Note:** The **Attribute Values** tab is available only if you have previously applied a Type.

What to do next

Once you have created a Dynamic Organization, you can open it and model it by adding organization units and positions. See Creating a Dynamic Organization Unit.
The Properties section of the Dynamic Organization is the same as that of an Organization but has an additional tab for the **Dynamic Organization Identifiers**. Dynamic Organization Identifiers are arbitrary strings that you can define. They have values assigned at runtime to identify an instance of the Dynamic Organization. The Dynamic Organization participant in a process that references an organization entity within this Dynamic Organization requires a mapping between process data (which provides the values for the identifiers at runtime) and these identifiers. See Dynamic Organization Identifier Mapping.

Creating an Organization Unit

You can create an Organization Unit within your Organization.

Procedure

1. In the Organization Model editor, double-click on the organization in which you want to place an Organization Unit. The Organization Editor for that organization is opened.

2. Select the Organization Unit tool in the Organization Modeler palette, and click on the empty part of the Organization diagram. This places an Organization Unit in the Organization.

3. At this point the **Label** field of the Organization Unit is automatically selected. Enter the label you require. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

4. If the **Properties View** is not already displayed, right-click the organization Unit you just created and select **Show Properties View**. The **Properties View** is displayed.

> **ℹ** **Note:** For a complete description of all the properties you can configure for an Organization Unit, see Organization Unit Properties.

5. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Organization Unit and/or any supporting explanations, depending on your requirements.

6. If you are using the default schema, or if you have created your own schema and defined any Organization Unit Types, you can assign a Type to this Organization Unit by selecting it in the **Element** field.

   Next to the **Location** field, click [...] to display the Select Type dialog box. You can specify a Location Type for the Organization.

   To specify start and end dates for the Organization Unit, click [...] next to the date fields to display the calendars.

7. If you have applied a Type to the Organization Unit, the **Attribute Values** tab is displayed. Any attributes that are defined for this type of Organization Unit are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

   See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.

   Click the **Privileges** tab. Click [...] to display the Select Type dialog box. You can specify the Privileges for the position. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about Privileges.

Creating a Dynamic Organization Unit

You can create a Dynamic Organization Unit within your Organization. This can be used to reference a Dynamic Organization. This in turn allows you to model a repeating organizational pattern such as a Branch in an organization.

Before you begin

See Creating an Organization.

See Creating a Dynamic Organization.

Procedure

1. In the Organization Model editor, double-click on the organization in which you want to place a Dynamic Organization Unit. The Organization Editor for that organization is opened.

2. Select the Dynamic Organization Unit tool in the Organization Modeler palette, and click on the empty part of the Organization diagram. This places a Dynamic Organization Unit in the Organization.

3. At this point the **Label** field of the Dynamic Organization Unit is automatically selected. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces. The Label and Name are derived from the root organization unit of the referenced Dynamic Organization. This is not editable.

4. If the **Properties View** is not already displayed, right-click the Dynamic Organization Unit you just created and select **Show Properties View**. The **Properties View** is displayed.

What to do next

Dynamic Organization Identifiers are arbitrary strings that are defined on a Dynamic Organization by the user. These strings have values assigned at runtime to identify an instance of the Dynamic Organization. The Dynamic Organization participant in a process that references an organization entity within this Dynamic Organization has a mapping between process data (which provides the values for the identifiers at runtime) and these identifiers.
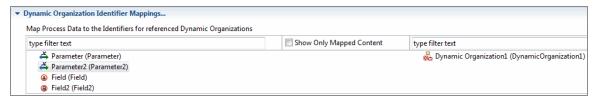
Dynamic Organization Identifier Mapping

When a Dynamic Organization Participant is assigned to a task you need to identify the correct instance of the Dynamic Organization to use to resolve this participant at runtime. This is done using Dynamic Organization Identifiers which are mapped to process data.

> **Note:** The mappings are between the process data and the Dynamic Organization Identifiers of the referenced Dynamic Organization (**not** the Dynamic Organization).

Procedure

1. In the business process, select the **Work Resource** tab, and expand **Dynamic Organization Identifier Mappings...**.

2. Map your process data (data fields and parameters) to a Dynamic Organization Identifier (which you set up when you created the Dynamic Organization Model). See the "Dynamic Organizations" topic in the *TIBCO® BPM Enterprise Concepts Guide* and "Creating a Dynamic Organization" in the *TIBCO Business Studio™ - BPM Edition Modeling Guide*.

What to do next

A Dynamic Organization declares its Identifier Fields. These are arbitrary fields that are used to uniquely identify a generated instance of the Dynamic Organization at runtime.

When a Dynamic Organization is assigned to an Extension Point, those Identifier Fields must be mapped/assigned to named LDAP Attributes. This is done after deployment.

A generated instance of a Dynamic Organization takes its Identifier values from those named Attributes; of the LDAP Entry from which it originates.

A Dynamic Organization Participant carries values for the Dynamic Organization Identifiers. These values are derived from process data (data fields and parameters) mapped to those Dynamic Organization Identifiers. With this information the User Task can identify the instance of the Dynamic Organization in which the Participant can be found.

Creating a Position

You can create a Position within your Organization Unit.

Procedure

1. Select the Position tool in the Organization Modeler palette, and click on the Organization Unit where you want to create the Position.

2. At this point the **Label** field of the Position is automatically selected. Enter the label you require. The **Name** field is automatically filled with the same text as the **Label**,

but without any internal spaces.

3. If the **Properties View** is not already displayed, right-click the Position you just created and select **Show Properties View**. The **Properties View** is displayed.

> **Note:** For a complete description of all the properties you can configure for a Position, see Position Properties.

4. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Organization and/or any supporting explanations, depending on your requirements.

5. If you are using the default schema, or if you have created your own schema and defined any Position Types, you can assign a Type to this Position by selecting it in the **Element** field.

   Next to the **Location** field, click [...] to display the Select Type dialog box. You can specify a Location for the Position.

   To specify start and end dates for the Organization, click [...] next to the date fields to display the calendars.

6. If you have applied a Type to the Position, the **Attribute Values** tab is displayed. Any attributes that are defined for this type of Position are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

   See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.

   Click the **Capabilities** tab. Click [...] to display the Select Type dialog box. You can specify the Capabilities for the Position. See the "Capability and Privilege" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about capabilities.

7. Do the same for the **Privileges** tab.

Creating a Group

You can create a group within your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Groups** folder and select **Add Child > Group**. Right-click the Group and select **Rename**. Type the label of the Group you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

   > **Note:** To add a sub-group, right-click on the group where you want to create your sub-group and select **Add Child** > **Group**.

3. If the **Properties View** is not already displayed, right-click the Group you just created and select **Show Properties View**. The **Properties View** is displayed.

   > **Note:** For a complete description of all the properties you can configure for a Group, see Group Properties.

4. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Organization and/or any supporting explanations, depending on your requirements.

   Click the **Capabilities** tab. Click to display the Select Type dialog box. You can specify the Capabilities for the position. See the "Capability and Privilege" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about capabilities.

5. Do the same for the **Privileges** tab.

Creating Capabilities

You can add Capabilities to your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. You can either:

   - Right-click the **Capabilities** folder and select **Add Child** > **Capability**. A new **Capability** is created.

   - Right-click on a Category and select **Add Child** > **New Capability**. A new **Capability** is created.

3. Right-click on the Capability you just created and select **Rename**.

4. Type the label of the Capability you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

5. If the **Properties View** is not already displayed, right-click the Capability you just created and select **Show Properties View**. The **Properties View** is displayed.

> ℹ **Note:** For a complete description of all the properties you can configure for a Capability, see Capability Properties.

6. Click the **General** tab.

7. You can specify a type for your capability by doing the following:

   a. Select the **Has qualifier** check box. The **Show qualifier ...** option is displayed.

   b. Click the **Show qualifier ...** option. The **Qualifier** tab is displayed.

   c. Click the **Qualifier** tab. In the **Type** field, select an available type from the drop-down list.

   d. If required, specify a default value for the qualifier.

      For more information on the types you can specify, see the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

8. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Privilege and/or any supporting explanations, depending on your requirements.

Creating Capability Categories

You can add Capability Categories to your Capabilities in your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Capabilities** folder and select **Add Child > Capability Category**. A new **Category** is created.

3. Right-click on the Category you just created and select **Rename**.

4. Type the label of the Category you wish to create. The **Name** field is automatically

filled with the same text as the **Label**, but without any internal spaces.

> ℹ **Note:** For a complete description of all the properties you can configure for a Category, see Capability Category and Privilege Category Properties.

Creating Privileges

You can add Privileges to your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. You can either:

    -   Right-click the **Privileges** folder and select **Add Child** > **New Privilege**. A new **Privilege** is created.

    -   Right-click on a Category and select **Add Child** > **New Privilege**. A new **Privilege** is created.

3. Right-click on the Privilege you just created and select **Rename**.

4. Type the label of the Privilege you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

5. If the **Properties View** is not already displayed, right-click the Privilege you just created and select **Show Properties View**. The **Properties View** is displayed.

    > ℹ **Note:** For a complete description of all the properties you can configure for a Privilege, see Privilege Properties.

6. Click the **General** tab.

7. You can specify a type for your privilege by doing the following:

    a. Select the **Has qualifier** check box. The **Show qualifier ...** option is displayed.

    b. Click the **Show qualifier ...** option. The **Qualifier** tab is displayed.

    c. Click the **Qualifier** tab. In the **Type** field, select an available type from the drop-down list.

    d. If required, specify a default value for the qualifier. For more information on the types you can specify, see the "Capability and Privilege" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

> 🛈 **Note:** Organization model deployments to the same major version are always additive.
>
> This means that changes in the qualifier value of privileges reflect every previous value you set. So, if you set the qualifier for Position 'Tester' with Privilege 'All' to 10 and deploy the organization model, and then change the qualifier to 11 and redeploy it (as a different minor version), Position 'Tester' now has two assignments of privilege 'All'; one with a qualifier of 10, and with a qualifier of 11.

8. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Privilege and/or any supporting explanations, depending on your requirements.

Creating Privilege Categories

You can add Privilege Categories to your Privileges in your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Privileges** folder and select **Add Child > Privilege Category**. A new **Category** is created.

3. Right-click on the Category you just created and select **Rename**.

4. Type the label of the Category you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

> 🛈 **Note:** For a complete description of all the properties you can configure for a Category, see Capability Category and Privilege Category Properties.

Creating a Location

You can create a Location for an Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Locations** folder and select **Add Child > Location**.

3. Right-click the Location and select **Rename**.

4. Type the label of the Location you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

5. If the **Properties View** is not already displayed, right-click the Location you just created and select **Show Properties View**. The **Properties View** is displayed.

   > 🛈 **Note:** For a complete description of all the properties you can configure for a Location, see Location Properties.

6. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Location and/or any supporting explanations, depending on your requirements.

   Next to the **Type** field, click ⬚ to display the Select Type dialog box. You can change the type for the Location, depending on your requirements.

   To specify start and end dates for the Location, click ⬚ next to the date fields to display the calendars.

7. If you have assigned a Type to the Location, the **Attribute Values** tab is displayed. Any attributes that are defined for the Type are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

   See "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.

Creating a Resource

You can create a Resource for your Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Resources** folder and select **Add Child > Resource**. A new **Resource** is created.

3. Right-click the Resource and select **Rename**.

4. Type the label of the Resource you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

5. If the **Properties View** is not already displayed, right-click the Resource you just created and select **Show Properties View**. The **Properties View** is displayed.
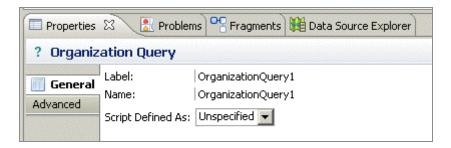
   > **❕ Note:** For a complete description of all the properties you can configure for a Resource, see Resource Properties.

6. In the **Purpose** field on the **General** tab, and on the **Description** tab, you can enter some text to describe the purpose of the Resource and/or any supporting explanations, depending on your requirements.

   Next to the **Type** field, click 🔲 to display the Select Type dialog box. You can change the type for the Resource, depending on your requirements.

7. If you have assigned a Type to the Resource, the **Attribute Values** tab is displayed. Any attributes that are defined for the Type are displayed here. Click the **Value** field next to each defined attribute to display a list of available values for that attribute.

   See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.
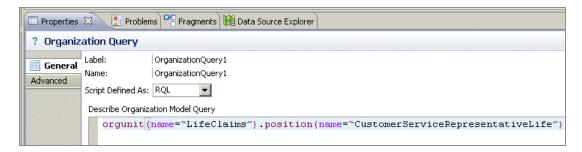
Creating Queries

You can create a Query for an Organization Model.

Procedure

1. In the **Project Explorer**, expand the folder for your Organization Model.

2. Right-click the **Queries** folder and select **Add Child > Organization Query**. A new **Organization Query** is created.

3. Right-click the Query and select **Rename**.

4. Type the label of the Query you wish to create. The **Name** field is automatically filled with the same text as the **Label**, but without any internal spaces.

5. On the **General** tab of the Properties View, select either **Free Text** or **RQL** from the drop-down list in the **Script Defined As** field. An input field is displayed.

6. Type the Query into the **Describe Organization Model Query** field. You can either enter free text that describes to the solution designer what you intend the query to accomplish, or use the structure of RQL to enter a query that can be validated by TIBCO Business Studio.

Using a Schema in an Organization Model

This is an overview of the steps required to create the example shown as a Schema and then use it in an Organization Model.
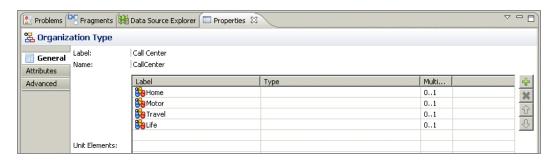
An example of an organization unit that you might want to model as a Schema is shown below.

Procedure
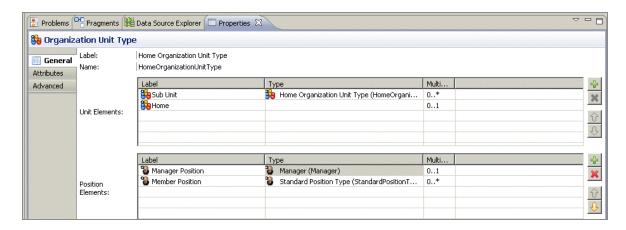
1. Create a project. On the Organization Model dialog box of the **New Project** wizard, deselect the **Create default schema types** field.

   The Schema for this project therefore contains only those types that you define.

2. Create the following types in the Organization Schema:

   • An Organization Type called **Call Center**. See Creating an Organization Type.

   • Organization Unit Types called **Home**, **Life**, **Travel** and **Motor**. See Creating an Organization Unit Type.

   • A Position Type called **Manager**. See Creating a Position Type.

   • A Position Type called **Customer Services Representative**. See Creating a Position Type.

3. For the **Call Center** Organization Type, specify the **Home, Life, Motor** and **Travel** Organization Unit Types as Organization elements.
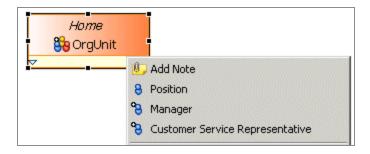
4. For the **Home, Life, Travel** and **Motor** Organization Units, specify the **Manager** and **Customer Service > Representatives** as Position Elements.

5. Create an Organization Model. Ensure that you deselect the **Create default schema** check box.

6. Create an Organization within that Organization Model.

7. On the **General** tab in Properties view, change the Type of the Organization you have just created from a **Standard Organization Type** to the **Call Center Type**.

8. In the Organization diagram editor, right-click on the empty canvas. On the context menu that pops up, you can select **Home**, **Life**, **Motor** and **Travel** Organization Units, as shown below. You can also select an untyped Organization Unit.

9. Create either a **Home**, **Life**, **Travel** or **Motor** Organization Unit.

10. If you right click on the Organization Unit you created, the **Manager** and **Customer Service Representative** Positions are displayed, as shown below.

Global Signal Definitions

Global Signal projects define the signals that you can send and receive across multiple processes and the data payload that they carry. You define a Global Signal Definition project to define global signals, which can be referenced from multiple projects.

You can define more than one Global Signal Definition project if desired.

Procedure

1. Go to **File > New > Global Signal Definition Project**. Enter the project name and select the **BPM** destination environment. Click **Next**.

2. Accept the default settings (including the selection of **Create initial Global Signal Definition** and click **Finish**.

   The Global Signal Definition project is created, with an initial Global Signal. You can then define the payload data to be associated with the global signal. See Creating Payload Data for Global Signals.

   On the Properties tab for the **Global Signal**, define the correlation timeout setting. The default setting is **Correlate Immediately**. You can change this to **Timeout Signal After:** *n* **seconds**.

   > ℹ **Note:** It is possible to deploy a process with global signal events without deploying the Global Signal Definition project. However, if you do this, then the process halts with an error at runtime. You should deploy the Global Signal Definition Project before you deploy processes which contain global signal events.

Creating Payload Data for Global Signals

You can define either *normal* or *correlation* payload data for global signals. Normal payload data is simply process data that is passed from the throw signal event to the catch signal event.

Correlation payload data is used to match waiting catch signal event process instances to specified process instances.

For example, a catch global signal might have a correlation payload parameter of 'Invoice Number'. When the catch is initiated, the current value of 'Invoice Number' for that process instance becomes the 'key' on which the signals are matched. The throw global signal maps a value to the 'Invoice Number' correlation payload parameter, and the system finds the corresponding process instance for the catch global signal that was initiated with that same value.

After defining the payload data in your global signal definition project using the procedure below, the global signal throw and catch events in your process map to this payload data. On the throw signal event, use **Map To Signal** to map process data to the defined payload data. On the catch signal event, use **Map From Signal** to map from the defined payload data to process data. For more information, see Throw and Catch Signal Events.

> **Note:** Correlation data payload changes are not permitted on global signal definition project upgrade. Therefore, signal correlation parameters cannot be changed unless the major version is changed. You must take care to ensure that only valid changes are made. If you upgrade a global signal definition project, any changes you have made to a BOM class referenced by a payload data parameter are not validated against.

Procedure

1. On the **Global Signals** panel, select the global signal you want to add payload data for.

2. On the **Payload Data** panel, select **PayloadData**.

3. On the **Properties** pane **General** tab, use the **Use for Signal Correlation** selection to specify whether you are defining normal or correlation payload data, as follows:

   - Select **Use for Signal Correlation** to define correlation payload data.

   - Deselect **Use for Signal Correlation** to define normal payload data.

4. If you are defining normal payload data, specify whether the payload data is mandatory or optional by selecting or deselecting the **Mandatory** check box. (The **Mandatory** check box is not visible if you are defining correlation payload data, as it is always mandatory.)

5. In the **Type** section, specify the appropriate type information for the payload data,

depending on the process data it is mapped to.

Work List Facades

The Work List Facade allows you to optionally declare the design-time definition of a set of display labels for the predefined work item attribute set. The display label set is contained in the Work List Facade.
See the "Work Item Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide*.

Procedure

1. Go to **File > New > Work List Facade Project**.

2. Enter the project name.

3. Click **Finish**.

> ⓘ **Note:** If you have deleted the Work List Facade file for any reason, you can add a new Work List Facade file. From the Work List Facade Special Folder select **New > Work List Facade**. However, multiple Work List Facade files are not allowed.

What to do next

Now go to the work list facade editor to define the display names of your work list attributes. See Setting the Display Label for Work Item Attributes.

Setting the Display Label for Work Item Attributes

The work list facade editor is a table editor that allows you to optionally set the display label for any of the predefined set of 40 work item attributes.

Display labels are used throughout the organization.

Procedure

1. When you create a Work List Facade project, the **Work Item Attributes** table opens. If it is not already open, select **WorkListFacade.wlf** from your Work List Facade project.

2. Add values to the Display Label column.

You can add as many or as few display values as you want. When you use the Work List Facade Editor as described in the "Work Item Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide*, to add values, the attributes with display values appear at the top of the list of attributes wherever they appear in the user interface.

The attribute name and type column are **read-only**. Only the Display Label can be edited. The Display Labels have length restriction of 64 characters.

What to do next

When you have completed your display labels, deploy the Work List Facade project.

If you need to change your display labels at any time, edit them as described and redeploy the Work List Facade project.

Mapping Process Data to Work Item Attributes
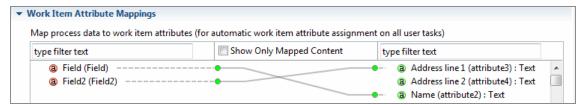
You can map process data to work item attributes to allow automatic work item attribute assignment on all user tasks which implicitly or explicitly reference the mapped process data. This can be done to avoid the use of scripts to achieve the same result.

Procedure

1. On the Work Resource tab of the Business Process, expand **Work Item Attribute Mappings**.

   The left column shows all data fields defined for the process. The right column lists the 40 work item attributes available, with those with defined display labels at the top of the list. When there is no Work List Facade file in the Workspace scope, the Work Item Attributes are sorted by the numeric values in their name. See Setting the Display Label for Work Item Attributes

2. Map a data field to an attribute.

   For example, **Field** could be mapped to the **Name** attribute. Do this for all data fields you would like to map to attributes.

Each user task in the process, with the mapped process data associated, contains the script equivalent to the mappings defined here.

> **ℹ** **Note:** If you use the Work Manager script from the **Scripts** tab for a user task, you can only use the physical attribute names (attribute 1, attribute 2, and so on) which appear in content assist and not the display names.

Troubleshooting

This section describes some issues encountered when working with TIBCO Business Studio and their possible solutions.

> **ⓘ** **Note:** In previous versions of TIBCO Business Studio, TIBCO recommended disabling in-memory validation by deselecting **Project > Build Automatically** as a way of achieving performance gains. Because of performance enhancements with this version of TIBCO Business Studio, this is no longer necessary and is not desirable as it causes problems resolving references.

Default Channels are Unavailable

The default presentation channels are unavailable if the default channel is not enabled.

Procedure

1. Select the project in the Project Explorer, and click **File > Properties**.

2. In the navigation pane on the left side of the Properties dialog box, click **Presentation Channels**.

3. Ensure that the **Enable project specific settings** check box is checked.

Importing Projects

For more information about importing projects, see the following topics:

- Previous Version 5.x Projects not Imported Correctly

- Importing Projects into your Workspace which were Created in a Previous Version of TIBCO Business Studio

- Importing Projects from Subversion

Previous Version 5.x Projects not Imported Correctly

The following validation error is displayed if the project is imported without using the correct import wizard or checked out from a source control system:
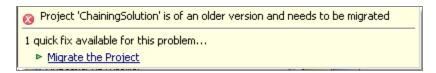
Older BPM related projects must be imported using Import Studio Projects or MAA Projects (delete and re-import the project)

You must perform a one-time migration by importing the project using Importing Existing Studio Projects into Workspace or Importing Existing Modelled Application Archive (MAA) Files into Workspace .
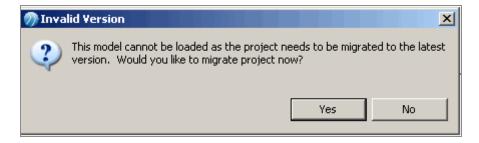
Importing Projects into your Workspace which were Created in a Previous Version of TIBCO Business Studio

When you import projects into your workspace which were created in a previous version of TIBCO Business Studio, they might show a problem marker by the project name in Project Explorer. This occurs when a newer version of TIBCO Business Studio has different project configuration and/or file format requirements. The normal validation and build of projects are disabled until this problem is fixed.

Select the project, and click **Ctrl + 1**. You can then select one quick fix to automatically migrate the entire project (including all the BOM & XPDL files) to the current version, and clean (**Project > Clean**) and build it (**Project > Build Project**).

If you attempt to open an individual package within the project before you migrate the project, an error message similar to the following message is displayed:

You can also see a migration validation error in the Problems view for an old XPDL.

Select **Yes** and the quick fix is applied to migrate the whole project.

Checkout Projects from Subversion

When you import projects from Subversion, they might generate a number of validation errors.

This is an expected behavior. When you apply the "missing special folder" resolution, it can produce a full project build, which means that the missing generated BOMs are generated and all problems are resolved.

When you commit the project to Subversion, any folder or file that is marked as "derived" is not committed. As a result, these resolved special folders are not committed and the error might reoccur.

It is a good practice to run a clean build on projects checked out of Subversion.

Disabling Flow Validation to prevent lockups in the User Interface

TIBCO Business Studio - BPM Edition complex processes (with flows that are ultimately invalid for TIBCO Business Studio - BPM Edition deployment) can cause the flow-analyzer to take a very long time to analyze, which might lock the user interface. Follow the workarounds described in this topic to prevent this issue.

> ℹ **Note:** This issue can occur after converting iProcess XPDL to TIBCO Business Studio - BPM Edition XPDL.

- Alternatively, switch off migration point decoration for a given process or the whole process-package (to prevent lock ups in the user interface). From the process, select **Resource > BPM User Interface Configuration > Migration Point Decorations**. Select **Show** or **Hide**.

  This can be done at process and/or process-package level. If you set the **Hide** option on either a process or its parent package then no migration point decoration (and

hence flow analysis) is performed, thus improving performance.

- Temporarily switch off process flow analysis (for an individual process or the whole package) so you can work on the process up until the point that you need to fix the process flow so that it is suitable for TIBCO Business Studio - BPM Edition. From the process, select **Resource > BPM Validation Configuration > Process flow analysis and validation**.

    The option to further highlight migration point activities using the process editor highlighter toolbar drop-down is also removed when migration point decorations are hidden.

    This can be set on a process package and / or individual processes (if set on a package then flow validation is disabled for all processes regardless of their own setting).

    Choose one of the following options:

    - **Validate** Returns process flow validation to normal.

    - **Suppress until manual reactivation via Advanced properties** Switches off process flow validation altogether until reactivated here or via the quick fix for "Process flow validation has been disabled rule".

    - **Suppress until next process flow change** Switches off process flow validation until the user makes a change that affects the process flow (such as delete/add activities or move/add /remove sequence flows and so on.)

What to do if a URL does not open in the default internal browser

If a URL does not open in the default internal browser, change the TIBCO Business Studio preference to use the external browser as the default.

When you select the hyperlink for **Documentation URL** (on the Description tab of the Properties view for a process artifact) on Nimbus imports within TIBCO Business Studio for Analysts on Linux 64 (SUSE), it throws a ssl bad certificate error.
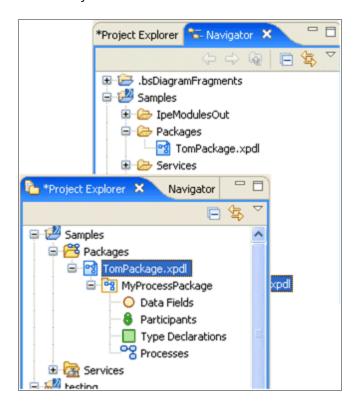
Use the TIBCO Business Studio preferences (**Window > Preferences... > General > Web Browser** and select **Use external web browser** radio button) to point to an external browser rather than the default internal browser.

Reference

This section describes the major parts of the TIBCO Business Studio user interface, including the perspectives and views that are provided.

Project Explorer View

The Project Explorer view shows a view of the project in which you can view and create projects, packages, processes and assets such as services and so on. In contrast to the Navigator view (available within the Resource Perspective) the Project Explorer view shows a contextual view of the Project.

For example, the following shows both the Navigator and Project Explorer views of the same Project.

To see this view, go to **Window > Show View > Project Explorer**, or **Window > Show View > Other**, then expand the **General** folder and select **Project Explorer**.

You can also use the search facility to locate workspace elements in the Project Explorer view such as processes, package names, and process interfaces by pressing Ctrl+F or the search toolbar button in the Project Explorer view. For more information, see Tools for Finding Objects in a Diagram.

Problems View

The Problems view is where the software displays warnings, errors and messages about the resources used in your Project.

To see this view, go to **Window > Show View > Problems**, or **Window > Show > View > Other**, then expand the **General** folder and select **Problems**.

The Problems view also displays error messages that result from validation of your process. When you save your process, it is validated for BPMN correctness and for deployment or export to the selected destination environments.

For information about correcting problems, see Correcting Validation Errors.
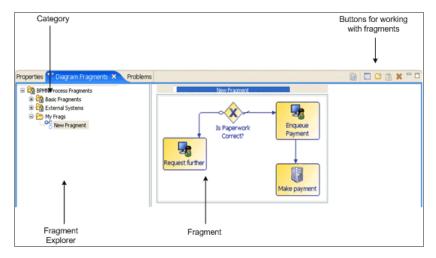
Outline View

The Outline View allows you to focus on specific areas of a large process.

To see this view, go to **Window > Show View > Outline**. By positioning the mouse pointer over the shaded area and holding the left mouse button down, you can reposition the shaded area of the Outline View and thus see different parts of the process.

Area of the Process that is shown in the Process Editor.

Remainder of Process (not visible in the Process Editor).

Fragments View

The Fragments view allows you to store selected objects from your process and reuse them in a different process. You can also select predefined process fragments and use them in your process:

To see this view, go to **Window > Show View > Fragments**. The buttons in the upper right of the view allow you to do the following:
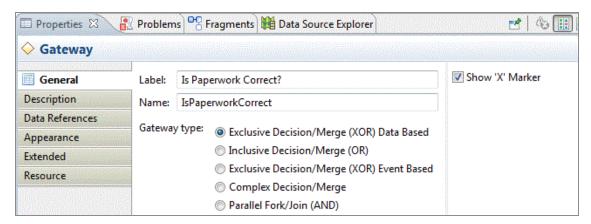
- Copy a diagram fragment to the clipboard in preparation for pasting it onto a Process.

- Edit fragment/category properties such as the **Name** and **Description**.

- Create a custom fragment category in which to store your fragments.

- Paste a fragment from clipboard into the Fragments view or into the process.

- Delete a fragment or category.

Process Modeler Properties View

The Properties View shows you detailed information about the currently selected object and allows you to specify the characteristics of an object.

A partial set of the Business Process Modeling Notation (BPMN) is supported by the Properties View. For example, if you are creating a gateway in your process diagram, you can select the type of gateway you want in the Properties View:

To see this view, go to **Window > Show View > Properties** or **Window > Show View > Other**, then expand the **General** folder and select **Properties**. To view property information, you must have an object selected.

> **Note:** Properties related to the implementation of a process (for example, the **Input To Service** and **Output From Services** tabs for service tasks) are described in the appropriate implementation guide.

Labels and Names

The Name is usually made up of the Label without white space or special characters. The Name is used for referencing items where white space or special characters are restricted (for example, scripts, and expressions). The Label is used for on-screen display.

If the Name has not been modified from the default, it automatically changes to match the Label when the Label is changed.

Process Properties

Process Property Reference

Tab	Property	Description
General	Label	Label associated with the process. You can change the label if necessary.
	Process Interface	Lists the location and name of the process interface implemented by the selected process. Specifying a process interface allows the dynamic selection of sub-processes at runtime. For more information, see Process Interfaces.
	Inline Sub-Process:	Select the **Inline sub-process during Process Package Optimization** check box so that at runtime, the objects such as activities and events contained in the call sub-process are brought into the top-level process and executed there, rather than by making a call to the sub-process.
	References	Lists any processes or tasks that use the selected process, and the contexts in which the data is used. For example, if you select a call sub-process, the process and task that use the call sub-process are displayed. Click **Go To** to display the referencing object. This field helps prevent deleting a process that is used in another. However, a process might be used by other packages and these references cannot be displayed in this field.
Description		Optional textual description of the activity.
	Documentation URL	The Documentation URL controls allow you to launch a web browser for the given URL (you can use the actual **Documentation URL:** label or the browser button).

Tab	Property	Description
		The browser is opened either in TIBCO Business Studio (in the editor pane) or in an external browser according to the user defined settings (**Preferences > General > General**).
Work Resource	Resources...	You can specify the Initial Priority, which indicates the relative urgency with which the item should be completed. You can edit this from the Default setting, to be one of the values below, with Higher (400) being the one which would be processed first. • Higher (400) • High (300) • Default • Normal (200) • Low (100)
	Separation Of Duties *(Manual and user tasks)*	Allows you to specify that certain manual or user tasks must be executed by different resources at runtime. For more information, see Specifying Separation of Duties.
	Retain Familiar *(Manual and user tasks)*	Tasks within a Retain Familiar task group, by preference, be offered to the same user.
	Calendar Reference	Allows you to choose a calendar reference alias (content assist shows references which already exist), or pick a Runtime Identifier field that provides the Calendar Reference alias at runtime.
Participants		Provides the Label, Name, Type, and External Reference for all participants used in the process.
Parameters		Provides information about all parameters defined in

Tab	Property	Description
		the process.
Data Fields		Provides information about all data fields defined in the process.
Appearance	Connection Routing	The connection routing style is used to change the appearance of entry and exit connections on activities such as events and gateways.

The connection routing style can be one of the following:

- **MultiEntry/Exit Point** (default). This means that connection points are to/from the same activity side, and are automatically spaced out from the center of that side.

- **Single Entry/Exit Point**. This means that all entry and exit points are amalgamated into one entry point and one exit point on each side of an activity.

- **Uncentered On Tasks** . This means that entry and exit points on task activities are automatically positioned towards the corners when the source/target object is not in-line. This is the equivalent default from earlier versions of TIBCO Business Studio.

With all the above styles, it is still possible to manually set a specific entry / exit point by dragging the end of a connection to the required position on an activity's border (rather than the center of the object).

| Extended | | Extended attributes can be used to add extra information to the schema. Click **Add** to add a new extended attribute. |

Modify the following:

- **Name** - provide a name for the attribute (you

Tab	Property	Description
		cannot include spaces in the name). • **Value** - add any text for the value. • **Escape Body** - Select this check box if you want the parser to interpret the contents of the body attribute as text rather than XML (you do not want the parser to interpret symbols such as < or >). If you are entering XML, do not select this check box so the parser can validate the body attribute. • **Body** - enter whatever text or XML you want to make up the body of attribute.
Resource	BPM Fault Configuration System Error Action	BPM only: This configures how an instance of this process behaves at runtime if an executing activity encounters an unexpected error condition: • **(server defined default)** - use system wide default behavior. • **Halt** - process instance halts. You can then use Openspace or the BPM API to investigate/fix the problem. • **Error** - process instance fails immediately and cannot be resumed.
	BPMN Extensions	Allows you to enter duration values for the process as per BPMN. How these durations are used is dependent on how they are implemented in a particular destination environment.
	BPM Validation Configuration...	This is used to suppress problem markers for the **'No migration point activities in the process' Problem**. It gives you the choice of validation, suppressing the error until the next process flow change, or suppressing the error until a manual reactivation via Resource properties.

Case Action Properties

Case Action Reference

Tab	Property	Description
General	Label	Label associated with the case action. You can change the label if necessary.
	Case Action	**Select Case class that this action applies to...: Case Class:** Allows you to select the case class to which the case action applies.
		Select Case States that this action is visible for...: Once a case class has been selected this provides selection of the case state attribute values that the case action should be visible for at runtime. **All States** switches off the case state value filter. **Specific States** enables selection of case states using check boxes.
		• No Case State Set means that the case action is visible when none of the defined case states are set for a particular case.
		• Other states displayed are the values defined for the Case State enumeration for the selected class.
		Select the privileges required to use this action... Provides selection of one or more organization model privileges that a resource must have to be able to see and use the case action at runtime. If no privileges are selected then all resources can see and use the case action.
	Process Interface	Lists the location and name of the process interface implemented by the selected case action. Specifying a process interface allows the dynamic selection of sub-processes at runtime. For more information, see Process Interfaces.
	References	Lists any processes or tasks that use the selected case action, and the contexts in which the data is used. Click

Tab	Property	Description
		Go To to display the referencing object. This field helps prevent deleting a case action that is used elsewhere. Note, however that a case action might be used by other packages, and these references cannot be displayed in this field.
Description		Optional textual description of the activity.
	Documentation URL	The Documentation URL controls allow you to launch a web browser for the given URL (you can use the actual **Documentation URL:** label or the browser button). The browser is opened either in TIBCO Business Studio (in the editor pane) or in an external browser according to the user defined settings (**Preferences > General > General**).
Participants		Provides the Label, Name, Type, and External Reference for all participants used in the case action.
Parameters		Provides information about all parameters defined in the case action. **Note:** When a case action is auto-generated from a case class, then you auto-create a case reference parameter with the mode set to IN.
Data Fields		Provides information about all data fields defined in the case action. **Note:** When a case action is auto-generated from a case class, you auto-create some data fields.
Appearance	Connection Routing	The connection routing style is used to change the appearance of entry and exit connections on activities such as events and gateways. The connection routing style can be one of the

Tab	Property	Description
		following:
		MultiEntry/Exit Point (default). This means that connection points are to/from the same activity side, and are automatically spaced out from the center of that side. **Single Entry/Exit Point**. This means that all entry and exit points are amalgamated into one entry point and one exit point on each side of an activity. **Uncentered On Tasks** . This means that entry and exit points on task activities are automatically positioned towards the corners when the source/target object is not in-line. This is the equivalent default from earlier versions of TIBCO Business Studio. With all the above styles, it is still possible to manually set a specific entry / exit point by dragging the end of a connection to the required position on an activity's border (rather than the center of the object).
Extended		Extended attributes can be used to add extra information to the schema. Click **Add** to add a new extended attribute. Modify the following: **Name** - provide a name for the attribute (you cannot include spaces in the name). **Value** - add any text for the value. **Escape Body** - Select this check box if you want the parser to interpret the contents of the body attribute as text rather than XML (you do not want the parser to interpret symbols such as < or >). If you are entering XML, do not select this check box so the parser can validate the body

Tab	Property	Description
		attribute.
		• **Body** - enter whatever text or XML you want to make up the body of attribute.
Resource	BPM Fault Configuration System Error Action	BPM only: This configures how an instance of this case action behaves at runtime if an executing activity encounters an unexpected error condition: • **(server defined default)** - use system wide default behavior. • **Halt** - process instance halts. You can then use Openspace or the BPM API to investigate/fix the problem. • **Error** - process instance fails immediately and cannot be resumed.

Activity Properties

Activity Property Reference

Tab	Property	Description
General	Label	Label for the activity that is displayed on the diagram.
	Activity Markers	Select from **Standard Loop**, **Multiple Instance Loop**, or **Ad-Hoc**. For more information, see User Tasks and Pageflow Processes.
	Participants	Specify the participant responsible for this activity (see Creating a Participant).
	Activity Type	For example, **Task**, **User Task**, **Service Task**, and so on. If you select **Call Sub-Process Activity**, you must browse to locate the sub-process.

Tab	Property	Description

	• No Form URL
	• User Defined Form
	• Form
	• Pageflow
		Configure the user task as follows:
		
		• **No Form URL**
		
		  Select this option if you do not want to display a form for the user task.
		
		• **User Defined Form**
		
		  Select this option if you want to use the **Form Identifier** field to point to a specific URI (for example, if you authored a form outside of TIBCO Business Studio). Manually enter the URI. TIBCO Business Studio cannot validate the URI, so ensure it is correct. If you select this option but do not specify a URI, upon export a standard form is created.
		
		• **Form**
		
		  Use this option if you have created a form using TIBCO Business Studio Forms. Either automatically create a form (in which case the **Form** field is completed automatically) or browse to select a form from a **Forms** special folder.
		
		• **Pageflow**
		
		  Select this option if you want the user task to call a pageflow. Browse to select a pageflow process. When deployed, the specified pageflow process is run when the work item associated with the user task is opened.

	Chained Execution (Activities of type *Call Sub-Process* or *Embedded*	Specifies that the selected sub-process implements the chained execution resource allocation pattern (see Creating a New Embedded Sub-Process).

Tab	Property	Description
	Sub-Process)	
	Sub-Process location (Activities of type *call sub-process*)	**Sub-Process location** is populated with the path to the **Sub-Process name** that you select.
	Sub-Process name (Activities of type *call sub-process*)	Browse to select the **Sub-Process name**.
	Runtime Identifier Field (Activities of type *call sub-process*)	Specify the field that is to be used in the runtime process engine to dynamically select a sub-process that implements a process interface. For more information, see Process Interfaces.
	Lifecycle (Activities of type *call sub-process*)	Use this to configure whether the sub-process should execute immediately or whether its start request should be queued. If you select **Schedule Start Request**, then you set the initial priority for the sub-process start and the tasks within that using the options in the Priority drop-down. If you select **Start Immediately**, then you can still set the priority of the task within the process in the process Work Resource tab. You can specify whether sub-process instances should suspend and resume when the parent process is suspended or resumed by selecting or deselecting the **Suspend/Resume With Parent Process** check box.
Description		Optional textual description of the activity.
	Documentation	The Documentation URL controls allow you to launch a

Tab	Property	Description
	URL	web browser for the given URL (you can use the actual **Documentation URL:** label or the browser button).
		The browser is opened either in TIBCO Business Studio (in the editor pane) or in an external browser according to the user defined settings (**Preferences > General > Web Browser**).
		The activity tooltip popup includes the Documentation URL as a clickable hyperlink to launch the URL in a browser.
Interface *(all task types except Reference)*	Visibility	Specify the visibility of an event or task (whether it is private or public). Public events or tasks publish information (such as required parameters) to an external process or application. Private events or tasks to publish any information to external applications.
	Reschedule work item: *(User tasks)*	**Overwrite Data Already Modified In Work Item** is unset by default. Check it to overwrite data already modified in a work item when you reschedule a user task.
		This is the same as the setting available on the Map From Signal tab for a catch signal which reschedules a task.
	Parameters	Allows you to select the data fields or parameters that the task requires as input and output.
		By default, all process data is available to a task. When you explicitly associate process data with an Event or task, only that process data is associated with the event or task. After you add data fields, you can control whether it is an input parameter, output parameter, or both by setting its **Mode** (to **In**, **Out**, or **In/Out**). You can also specify whether the process data is mandatory. For more information, see Associating Process Data with Events and Tasks.

Tab	Property	Description
		Note that for user tasks, inbound and outbound parameters are from the perspective of the *form*, not the *user*. This means that inbound parameters are sent to the form by the process, not the user. outbound parameters are sent to the form by the user. For more information, see the appropriate implementation guide.
Data Fields		Provides information about all data fields defined in the activity.
Work Resource	Participants *(Manual and user tasks only)*	This is the same as the Participant specified on the **General** tab.
	Initial Priority *(Manual and user tasks only)*	Specifies a relative priority for the work item. The affect and meaning of this setting are destination specific (refer to appropriate implementation guide).
	Distribution Strategy *(user tasks only)*	Allows you to specify a resource allocation pattern. For more information, see Resource Patterns and Work Distribution.
	Re-offer Work Item Strategy...	Allows you to govern the behavior when you open an offered work item and then close or cancel the work item to place it back in the work item list. You can choose to 'Re-offer On Close' or 'Re-offer On Cancel'.
	Piling *(Manual and user tasks only)*	
	Separation of Duties *(Manual and user tasks)*	Allows you to specify that certain manual or user tasks must be executed by different resources at runtime. For more information, see Specifying Separation of Duties.

Tab	Property	Description
	Retain Familiar *(Manual and user tasks)*	
Scripts		Allows you to add text that describes various types of scripts that you want added to a task. It is the task of the solution engineer to translate the outline of the script into a scripting language supported by the selected destination environment. For more information about implementing scripts, see the appropriate implementation guide.
Map To Sub-Process (Activities of type *call sub-process*)		Use this section to create a mapping from an actual parameter (data field or parameter) into the formal parameters of the sub-process. Create a mapping by clicking a parameter, dragging to the destination parameter, then releasing the mouse button.
Data References	Grouped by Data	Contains a table with a row for each referenced data field, along with a list of the contexts in which it is used.
	Grouped by Reference Context	Contains a table with a row for each context along with the data which is referenced.
Map From Sub-Process (Activities of type *call sub-process*)		Use this section to create a mapping from a formal parameter of a sub-process to an actual parameter (data field or parameter). Create a mapping clicking a parameter, dragging to the destination parameter, then releasing the mouse button.
Appearance	Line Color	Click the button next to **Color** to select the line color for the border of the selected activity. Click **Set As Default For Type** to apply your current color settings to any new activities of that type that you place on the process. You can revert to the default color settings by clicking **Restore Factory Settings**.

Tab	Property	Description
	Fill Color	Click the button next to **Color** to select the fill color for the selected activity. Click **Set As Default For Type** to apply your current color settings to any new activities of that type that you place on the process. You can revert to the default color settings by clicking **Restore Factory Settings**.
	Task Icon	Select a valid image file for the Studio project if one is available.
Extended		See the description of the **Extended** tab for the Process Properties.
Resource	BPMN Extensions	Allows you to enter duration values for the task as per BPMN. How these durations are used is dependent on how they are implemented in a particular destination environment.
	Dynamic Sub-process Task... *(Dynamic sub-process tasks)* Allow Unqualified Sub-Process Identification	**False:** Sub-process names provided in the Runtime Identifier Field must be fully qualified unless they are located in the same XPDL package. Full qualification means `/project/Process Packages/`*`PkgName`*`.xpdl.`*`MyProcessName`*. **True**: allow unqualified sub-process names to be used even if they are located outside of the XPDL package (when they are dynamically discovered at runtime).

Tab	Property	Description
		Note: When an unqualified sub-process is provided in the Runtime Identifier Field, the process manager looks for the process in the following locations: • The same deployed XPDL package. • Any XPDL package in the same deployed project. • Any XPDL package in any deployed project. The first matching named process is used. If there are multiple processes with the same name in any one of these locations (i.e. the sub-process identification is ambiguous) then it results in a runtime exception that can halt the process instance.

Gateway Properties

Gateway Property Reference

Tab	Property	Description
General	Label	Label for the gateway that is displayed on the diagram.
	Gateway type	Choose the type of gateway.
	Discriminator Type *(Complex Gateway)*	Allows you to select a structured discriminator.
	Parallel Split Name *(Complex Gateway)*	Allows you to specify the name of the upstream parallel gateway that this complex gateway is handling.

Tab	Property	Description
	Incoming Paths *(Complex Gateway)*	Specifies how many input Sequence flows are required before the output sequence flow is followed.
Description		Optional textual description of the gateway.
Data References	Grouped By Data	Contains a table with a row for each item of referenced process data, along with a list of the contexts in which it is used.
	Grouped By Reference Context...	Contains a table with a row for each context along with the process data which is referenced.
Appearance		See the description of the **Appearance** tab for the Activity Properties.
Extended		See the description of the **Extended** tab for the Process Properties.
Resource		Shows properties and values for the gateway.

Sequence Flow Properties

Sequence Flow Property Reference

Tab	Property	Description
General	Label	Label for the flow that is to be displayed on the diagram.
	Type	Choose the type of Sequence Flow.
Description		Optional textual description of the Sequence Flow.
Data	Grouped By	Contains a table with a row for each item of referenced

Tab	Property	Description
References	Data	process data, along with a list of the contexts in which it is used.
	Grouped by Reference Context	Contains a table with a row for each context along with the process data which is referenced.
Appearance		See the description of the Appearance tab for the Activity Properties.
Extended		See the description of the Extended tab for the Process Properties.
Resource		Shows properties and values for the sequence flow.

Event Properties

Event Property Reference

Tab	Property	Description
General	Label	Label for the event that is displayed on the diagram.
	Trigger Type (*for Start or Intermediate events*) or **Result Type** (*for End events*)	You specify the trigger for a Start or Intermediate event and the result for an End event. The properties displayed on this page depend on the **Trigger Type** or **Result Type** you have selected. For more information about the types of events, see Events.
	Catch Action (*for catch signal intermediate events only*)	Select either **Cancel task when signal caught** or **Continue task when signal caught**. When you select the latter, you can select between the following Reschedule Task Timer Events: • **None** No timer events are rescheduled when signal arrives.

Tab	Property	Description
		• **All** All timer events attached to same task are rescheduled when signal arrives. • **Deadline** The timer event set as the activity deadline; note this is evaluated at runtime rather than statically when this option is selected (so that if the deadline timer event is changed, this still works). • **Select...** One or more timer events can be manually selected.

	Catch Error Code (*for catch error intermediate events only*)	Set to one of the following, depending on what error codes you want caught:
		
		• **Catch All**
		
		  The event catches any error thrown by any event.
		
		• **Catch By Name**
		
		  The event catches an error of the specified name, thrown by any activity.
		
		• **Catch Specific**
		
		  The event catches a specific error thrown by a specific activity.

Description		Optional textual description of the Event.
Interface		See description for Activity Properties.
Scripts		See description for Activity Properties.
Data References	Grouped By Data	Contains a table with a row for each item of referenced process data, along with a list of the contexts in which it is used.
	Grouped by	Contains a table with a row for each context along with

Tab	Property	Description
	Reference Context	the process data which is referenced.
Map From Error *(for catch error intermediate events only)*		Use this section to create a mapping from error parameters to process data fields or parameters.
Map From Signal *(for catch signal intermediate events only)*		Use this section to create a mapping from signal parameters to process data fields or parameters.
Appearance		See the description of the Appearance tab for the Activity Properties.
Extended		See the description of the Extended tab for the Process Properties.

Lane Properties

Lane Property Reference

Tab	Property	Description
General	Label	Label for the lane that is displayed on the diagram.
Appearance		See the description of the Appearance tab for the Activity Properties.
Extended		See the description of the Extended tab for the Process Properties.
Resource		This tab might contain destination-specific properties.

Cheat Sheets View

When you first start TIBCO Business Studio, a Welcome Cheat Sheet is displayed. You can view TIBCO Cheat Sheets and other Cheat Sheets by selecting **Help > Cheat Sheets** and selecting from the list.

Process Editor

The **Process Editor** is where you create your business process. It includes a Palette that contains the tools you use to create your Process.

Palette
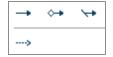
You can create your Process using the tools on the palette. The Business Process Modeling Notation (BPMN) core set is supported by the palette, which contains the following tools:

Palette Tool Reference

Palette Item	Description
Select	Allows you to select objects.
Marquee	Allows you to select several objects by drawing a box around them.
Favorites	Displays some of the most common process objects. You can customize the Favorites drawer by right-clicking it and selecting **Customize**.
Connections	Allows you to connect objects: • Sequence flow shows the order of objects in the process. • Conditional sequence flow is followed based on the evaluation of a condition. • Default sequence flow is followed if other conditions evaluate to

Palette Item	Description
	false.
	• Association either connects flow and non-flow objects or specifies the compensation task for a compensation event on a task boundary.
Start Events	Indicates the beginning of the process as None or Signal.
Catch Intermediate Events	Catches a "throw" event. The following Types are available: Incoming Request, Timer, Link, Signal, Error, Compensation, and Cancel.
Throw Intermediate Events	Throws an event. The following Types are available: Compensation, Signal, and Link.
End Events	Indicates the end of the process. The following types are available: None, Error, Compensation, Cancel, Signal, and Terminate.
Tasks	Tasks are of the following types: Abstract, User, Service, Script, Send, Receive, Call Sub-Process, Embedded Sub-Process, and Event Sub-Process. For more information, see Activities.
Gateways	Controls the flow of the process with the following types of gateways: Exclusive (Data), Parallel, Exclusive (Event), Inclusive, and Complex.
Artifacts	Allows you to enhance the process with Text Annotations, Data Objects, and

Palette Item	Description
	Groups.

Alignment Tools

For easier alignment of objects in the Process Editor, you can select either or both of the Grid or Alignment Guides options.

- **Diagram > Grid** - This allows you to align objects to a grid.

- **Diagram > Alignment Guides** - As you move objects in a Process Editor, a blue line appears when the center of two objects coincide.

You can also align objects that you have selected by choosing options from the **Diagram > Alignment** menu. For example, if you have two Activities selected, you can align them horizontally on their centers by selecting **Diagram > Alignment > Align Middle**. Alternatively, you can use the alignment buttons on the toolbar that correspond to the menu options.

Business Object Modeler Properties View

This section describes the major parts of the TIBCO Business Studio Business Object Modeler User Interface (UI).

In Eclipse, a Perspective includes the views and set of editors that you commonly use for a specific type of work. TIBCO has created several TIBCO Business Studio perspectives that include the views and editors you commonly use when creating business processes. The Business Object Modeler and its associated views are part of the **BPM Modeling Perspective**. For more information about parts of the BPM Modeling Perspective that are not related to the Business Object Modeler, see the *TIBCO Business Studio™ - BPM Edition Modeling Guide*.

The **Properties View** shows you detailed information about the currently selected object and allows you to specify the characteristics of an object.

Package Properties

Tab	Property	Description
General	Name	Name of the Package. You can rename the Package here by entering a new name.
Description		Enter text to describe the Package or any supporting explanations.
Profiles	Profiles	Lists the UML profiles that have been applied to this package. Clicking the picker displays the Select Type dialog box from which you can add or remove profiles.
	Applied Profiles	The name of the applied profile.
	Location	The location of the file that contains the applied profile.
Stereotypes		Lists the stereotypes that have been applied to this package. Clicking the picker displays the Select Type dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Export	XML Schema Export Options	Lists the available elements and allows selection of which to export as top-level elements in the XML Schema.
Resource	Property	
	Value	The name of the package.

Class Properties

Tab	Property	Description
General	Name	Name of the Class. You can rename the Class here by entering a new name.
	Superclass	In object-oriented terms, the Super Class provides attributes which are inherited by any Derived Classes. Clicking the picker displays the Select Type dialog box from which you can select a Class to form the SuperClass. Click **Clear** to remove a SuperClass.
Description		Enter text to describe the Class or any supporting explanations.
Attributes		Lists the Attributes that belong to the Class, including its **Name**, **Type**, **Multiplicity** (whether there can be several of the Attribute), and **Stereotypes** (whether any stereotypes have been applied). You can add additional Attributes by clicking ⊕. You can delete an Attribute by selecting it and clicking ✖.
Summary		Lists the Case Class attributes that are included in the Summary description of the Case that is displayed in Openspace. You can add additional Attributes by clicking ⊕. You can delete an Attribute by selecting it and clicking ✖. The Case Identifier and Case State are automatically included (and cannot be removed). If you wish to add additional attributes, then they must have: • Multiplicity no more than 1 • An attribute of a primitive type (for example, Integer, Text) or enumeration

Tab	Property	Description
		Note: The order in which the attributes are listed in the Summary screen is the default order they are displayed in Openspace, or returned over the Summary interface at runtime.
Operations		Lists the Operations that belong to the Class, including its Name, Return Type, Multiplicity (whether there can be several of the Operation), Arguments and Stereotypes (whether any stereotypes have been applied). You can add additional Operations by clicking ⊞. You can delete an Operation by selecting it and clicking ✖.
Stereotypes		List of stereotypes that have been applied to this class.
		Clicking the picker displays the Select Stereotype dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Appearance	Fonts and Colors	You can change the font type and size of the text on your business object model. You can also change the weight and color of both the text and the business objects in the business object model.
	Lines and Arrows	You can change the appearance of lines and arrows in your business object model. This is currently deselected.
	Gradient	You can change the gradient of colors for your business objects in the business object model.
Resource	Property	

Tab	Property	Description
	Value	The name of the class.

Attribute Properties

Tab	Property	Description
General	Name	Name of the Attribute. You can rename the Attribute here by entering a new name.
	Multiplicity	Specifying multiple copies of an Attribute are permitted. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for information on the values you can set.
	Type	Select the type of data you expect the Attribute to contain. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for information on the types an Attribute can have. Clicking the picker displays the Select Type dialog box from which you can change the type of an attribute. Click [Clear] to remove a type.
Description		Enter text to describe the Attribute or any supporting explanations.
Stereotypes		List of stereotypes that have been applied to this package. Clicking the picker displays the Select Type dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.

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Tab	Property	Description
	Location	The location of the file that contains the stereotype.
Resource	Property	
	Restrictions	Expand this to specify any restrictions for the Attribute. For example, you can specify a default value, or maximum length, depending on the type of your Attribute.
	Value	The name of the Attribute.

Primitive Type Properties

Tab	Property	Description
General	Name	Name of the Primitive Type. You can rename the Primitive Type here by entering a new name.
	Superclass	In object-oriented terms, the Superclass provides attributes which are inherited by any Derived Classes. Clicking the picker displays the Select Type dialog box from which you can select a Type to form the Superclass for the Primitive Type. Click **Clear** to clear a Superclass.
Description		Enter text to describe the Primitive Type or any supporting explanations.
Stereotypes		List of stereotypes that have been applied to this package. Clicking the picker displays the Select Type dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.

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Tab	Property	Description
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Appearance	Fonts and Colors	You can change the font type and size of the text on your business object model. You can also change the weight and color of both the text and the business objects in the business object model.
	Lines and Arrows	You can change the appearance of lines and arrows in your business object model. This is deselected by default.
	Gradient	You can change the gradient of colors for your business objects in the business object model.
Resource	Property	
	Restrictions	Expand this to specify any restrictions for the Primitive Type. For example, you can specify a default value, or maximum length, depending on the type of your Primitive Type.
	Value	The name of the Primitive Type.

Enumeration Properties

Tab	Property	Description
General	Name	Name of the Enumeration. You can rename the Enumeration here by entering a new name.
Description		Enter text to describe the Enumeration or any supporting explanations.

Tab	Property	Description
Enum Literals		
Stereotypes		List of stereotypes that have been applied to this Enumeration.
		Clicking the picker displays the Select Type dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Appearance	Fonts and Colors	You can change the font type and size of the text on your business object model. You can also change the weight and color of both the text and the business objects in the business object model.
	Lines and Arrows	You can change the appearance of lines and arrows in your business object model. This is currently deselected.
	Gradient	You can change the gradient of colors for your business objects in the business object model.
Resource	Property	
	Value	The name of the Enumeration.

Enumeration Literal Properties

Tab	Property	Description
General	Name	Name of the Enumeration Literal. You can rename the

Tab	Property	Description
		Enumeration Literal here by entering a new name.
	Value	**Single:** The text value of the enumeration literal. **Range:** is not supported.
Description		Area in which you can enter text to describe the Enumeration Literal or any supporting explanations.
Stereotypes		Lists the stereotypes that have been applied to this Enumeration Literal. Clicking the picker displays the Select Type dialog box from which you can add or remove stereotypes.
	Applied Stereotype	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Resource	Property	
	Value	The name of the Enumeration Literal.

Association Composition Properties

Tab	Property	Description
General	Name	Name of the Association or Composition. You can rename the connection here by entering a new name.
	Navigability	Select the direction of the connection from the drop-down list either **Bi-directional** or *ClassName1*

Tab	Property	Description
		to *ClassName2*.
Description		Enter text to describe the Association or Composition and any supporting explanations.
Stereotypes	Applied Stereotypes	The name of the stereotype.
	Profile	The name of the profile that contains the stereotype.
	Location	The location of the file that contains the stereotype.
Appearance	Fonts and Colors	You can change the font type and size of the text of the labels on your connections on your business object model. You can also change the weight and color of the connections.
	Routing	You can determine how the connections are routed in the model. For example, you can choose to make the connections avoid obstructions to make the model easier to read.
	Lines and Arrows	You can change the appearance of lines and arrows in your business object model. This is currently deselected.
	Jump Links	If you have connections that overlap in your model, specify jump links so that the connections jump over each other.
	Smoothness	You can change the smoothness of the connections.
Resource	Property	
	Value	The name of the Association/Composition Property

Organization Modeler Properties View

This section of the help describes the major parts of the TIBCO Business Studio Organization Modeler User Interface (UI).

In Eclipse, a Perspective includes the views and set of editors that you commonly use for a specific type of work. TIBCO has created several TIBCO Business Studio perspectives that include the views and editors you commonly use when creating business processes. The Organization Modeler and its associated views are part of the **BPM Modeling Perspective**.

For more information about parts of the BPM Modeling Perspective that are not related to the Organization Modeler, see the *TIBCO Business Studio™ - BPM Edition Modeling Guide*.

The **Properties View** shows you detailed information about the currently selected object and allows you to specify the characteristics of an object.

Organization Model Properties describes the Properties that are available for the elements in an Organization Model.

Organization Model Properties

Tab	Property	Description
General	Label	The displayed name of the Organization Model. You can rename the Organization Model here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Version	The version of the Organization Model. This defaults to the version specified when the project was created, which in turn defaults to **1.0.0.qualifier**. You can retain this or enter a different version for the Organization Model in the standard Eclipse form of: `major.minor.micro`.`qualifier` There is a limit of 6 on the number of organization model

Tab	Property	Description
		versions supported.
		Changes to the version of the Organization Model do not directly affect other project artifacts, such as process packages. However, all references within a project must be to the same **major** version of the Organization Model.
		At run-time, the **Organization Model Version** field in the Organization Browser in Workspace displays only the first digit of this version number, that is the major version.
	Author	The username that created the Organization Model.
		The name of the author can be defined in the User Name: field on Window > Preferences > User Profile. If no user is defined there, it uses the default user system property.
	Date Created	The date the Organization Model was created.
Privileges - Assigned	Privilege	The name of the Privilege associated with this Organization Model. Click the picker to open the Select Type dialog box to add or remove a Privilege.
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
System Actions	Name	The name of the system action.
		If you associate one or more privileges with a system action, they are listed on the lines below that action. Click ⊞ to expand the display and show the privileges, and click ⊟ to collapse the display.
		Click 🔑 to assign a privilege to a system action. The Select Type dialog box is displayed, enabling you to add or remove a privilege. You can also remove a privilege by selecting it and

Tab	Property	Description
		clicking .
		Click to move the privilege up the list, or to move it down. These icons are only available if there is more than one privilege attached to a system action.
	Qualifier Value	If a privilege has qualifying information specified, this column lists the value of the qualifier.
		Click to reset the value of a qualifier to the default value defined for it.
Resource	Property Value	Displays the Label and Name of the Organization Model. You can edit the values from this tab by clicking on the Value field.

Organization Properties

Tab	Property	Description
General	Label	The displayed name of the Organization. You can rename the Organization here by entering a new name.
		The default name of the Organization Model is used here, which is Organization1. To change the default, select **Window > Preferences > User Profile** and edit the Organization Name field.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Type	The type for the Organization. This can be the Standard Organization Type, for example or might be a type that you have defined yourself. See the "Schemas" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about

Tab	Property	Description
		types.
		Clicking the picker displays the Select Type dialog box from which you can add or remove Organization Types.
	Allocation Method	One of Random or Round Robin. Determines how work is allocated.
	Purpose	Enter text to describe the purpose of the Organization.
	Dates	You can specify start and end dates for the Organization. Click the picker next to the date fields to display the calendars.
	Location	The location for the Organization. Click the picker next to the Location field to select it.
Units	Label	The name of any Organization Units that are defined as being children of this Organization. Click ⊞ to add an Organization Unit. You can delete an Organization Unit by selecting it and clicking ✖.
	Type Location Start Date End Date	The characteristics of the Organization Unit named by **Label**. These are display-only.
Appearance	Fonts and Colors	
	Lines and Arrows	
Resource	Property Value	Displays the Label and Name of the Organization. You can edit the values from this tab by clicking on the Value field.

Dynamic Organization Properties

Tab	Property	Description
General	Label	The displayed label of the Dynamic Organization. You can rename the Dynamic Organization here by entering a new label. The default label of the Dynamic Organization Model is used here, which is Dynamic Organization 1.
	Name	The internal name. This defaults to the same value as the Label, but with any spaces and special characters removed.
	Purpose	Area in which you can enter text to describe the purpose of the Dynamic Organization.
Dynamic Org Identifiers	Label	The displayed label of the Dynamic Organization Identifier.
	Name	The internal name. This defaults to the same value as the Label, but with any spaces and special characters removed.
Units	Label	The label of any Organization Units that are defined as being children of this Organization. Click to add an Organization Unit. You can delete an Organization Unit by selecting it and clicking .
	Name	The internal name. This defaults to the same value as the Label, but with any spaces and special characters removed.
	Type	The characteristics of the Dynamic Organization Unit named by **Label**. These are display-only.
	Location	The location for the Dynamic Organization. Click the picker next to the Location field to select it.
Appearance	Fonts and Colors	

Tab	Property	Description
	Lines and Arrows	
Resource	Property Value	Displays the Label and Name of the Dynamic Organization. You can edit the values from this tab by clicking on the Value field.

Organization Unit Properties

Tab	Property	Description
General	Label	The displayed name of the Organization Unit. You can rename the Organization Unit here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Member of	If you are using the default schema, or if you have created your own schema and defined any Organization Unit Types, you can assign a Type to this Organization Unit by selecting it in the Member of field.
	Allocation Method	One of Random or Round Robin. Determines how work is allocated.
	Purpose	Enter text to describe the purpose of the Organization Unit.
	Dates	You can specify start and end dates for the Organization Unit. Click the picker next to the date fields to display the calendars.
	Location	The location for the Organization Unit. Click the picker next to the Location field to select it.
Units	Label	The name of any Organization Units lower in the hierarchy

Tab	Property	Description
		that are defined as being children of this Organization Unit. Click ![+] to add an Organization Unit. You can delete an Organization Unit by selecting it and clicking ![x].
	Type Location Start Date End Date	The characteristics of the Organization Unit named by **Label**. These are display-only.
Positions	Label	The name of any Positions that are defined as being children of this Organization Unit. Click ![+] to add a Position. You can delete a Position by selecting it and clicking ![x].
	Type Location Start Date End Date	The characteristics of the Position named by **Label**. These are display-only.
Privileges - Assigned	Privilege	The name of the Privilege you want to specify for this Organization Unit. Click the picker to open the Select Type dialog box to add or remove a Privilege.
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
System Actions	Name	The name of the system action. If you associate one or more privileges with a system action, they are listed on the lines below that action. Click ![+] to expand the display and show the privileges, and click ![-] to collapse the display. Click ![key] to assign a privilege to a system action. The Select

Tab	Property	Description
		Type dialog box is displayed, enabling you to add or remove a privilege. You can also remove a privilege by selecting it and clicking . Click to move the privilege up the list, or to move it down. These icons are only available if there is more than one privilege attached to a system action.
	Qualifier Value	If a privilege has qualifying information specified, this column lists the value of the qualifier. Click to reset the value of a qualifier to the default value defined for it.
Appearance	Fonts and Colors	
	Lines and Arrows	
	Gradient	
Resource	Property Value	Displays the Label and Name of the Organization Unit. You can edit the values from this tab by clicking on the Value field.

Dynamic Organization Unit Properties

Tab	Property	Description
General	Label	The displayed label of the Dynamic Organization Unit. The label and name are derived from the root organization unit of the referenced dynamic organization. You cannot change this value.

Tab	Property	Description
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed. The label and name are derived from the root organization unit of the referenced dynamic organization. You cannot change this value.
	Dynamic Organization	The name of the Dynamic Organization that this Dynamic Organization Unit references.
Appearance	Fonts and Colors	
	Lines and Arrows	
	Gradient	
Resource	Property Value	Displays the Label and Name of the Dynamic Organization Unit. Read-only.

Hierarchy and Association Properties

Tab	Property	Description
General	Label	The displayed name of the Hierarchy or Association. You can rename the Hierarchy or Association here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Type	The type for the Hierarchy or Association. This can be an Organization Unit Relationship Type, for example or might be a type that you have defined yourself. See the "Schemas" topic in the *TIBCO® BPM Enterprise Concepts*

Tab	Property	Description
		Guide for more information about types.
		Clicking the picker displays the Select Type dialog box from which you can add or remove Types.
	Is Hierarchical	This check box determines whether the connection is a Hierarchy or an Association. If this is checked, the connection is a Hierarchy; if unchecked, it is an Association. You can change the type of connection by checking or unchecking this box.
	Purpose	Enter text to describe the purpose of the Hierarchy or Association.
	Dates	You can specify start and end dates for the Hierarchy or Association. Click the picker next to the date fields to display the calendars.
Appearance		
Resource	Property Value	Displays the Label and Name of the Hierarchy or Association, and the From and To values. You can edit the values from this tab by clicking on the Value field.
	From	The Organization Unit the relationship runs from. In a Hierarchical relationship, this is the unit at the higher level of the hierarchy.
	To	The Organization Unit the relationship runs to. In a Hierarchical relationship, this is the unit at the lower level of the hierarchy.

Position Properties

Tab	Property	Description
General	Label	The displayed name of the Position. You can rename the Position here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Position Type	If you are using the default schema, or if you have created your own schema and defined any Position Types, you can assign a Type to this Position by selecting it in the Element field.
	Allocation Method	One of Random or Round Robin. Determines how work is allocated.
	Number	Enter the ideal number of people there should be in this Position within the Organization Unit.
	Purpose	Enter text to describe the purpose of the Position.
	Dates	You can specify start and end dates for the Position. Click the picker next to the date fields to display the calendars.
	Location	The location for the Position. Clicking the picker displays the Select Type dialog box from which you can add or remove Locations.
Capabilities - Assigned	Capability	The name of the Capability you want to specify for this Position. Click the picker to open the Select Type dialog box to add or remove a Capability.
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.

Tab	Property	Description
Privileges - Assigned	Privilege	The name of the Privilege you want to specify for this Position. Click the picker to open the Select Type dialog box to add or remove a Privilege.
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
Organization Resources	Label	Shows any Resources allocated to the Position. Click to add a Resource. You can delete a Resource by selecting it and clicking .
System Actions	Name	The name of the system action. If you associate one or more privileges with a system action, they are listed on the lines below that action. Click to expand the display and show the privileges, and click to collapse the display. Click to assign a privilege to a system action. The Select Type dialog box is displayed, enabling you to add or remove a privilege. You can also remove a privilege by selecting it and clicking . Click to move the privilege up the list, or to move it down. These icons are only available if there is more than one privilege attached to a system action.
	Qualifier Value	If a privilege has qualifying information specified, this column lists the value of the qualifier. Click to reset the value of a qualifier to the default value defined for it.

Tab	Property	Description
Description	Description	Enter text to describe the Position or any supporting explanations.
Resource	Property Value	Displays the Label and Name properties of the Position. You can edit the values from this tab by clicking on the Value field.

Group Properties

Tab	Property	Description
General	Label	The displayed name of the Group. You can rename the Group here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Allocation Method	One of Random or Round Robin. Determines how work is allocated.
	Purpose	Area in which you can enter text to describe the purpose of the Group.
Capabilities - Assigned	Capability	The name of the Capability you want to specify for this Group. Click the picker to open the Select Type dialog box to add or remove a Capability.
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
Privileges - Assigned	Privilege	The name of the Privilege you want to specify for this Group. Click the picker to open the Select Type dialog box to add or remove a Privilege.

Tab	Property	Description
	Qualifier Value	You can enter qualifying information here if required. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
Groups	Label	Shows any sub-Groups that are part of the Group. Click ⊞ to add a Group. You can delete a Group by selecting it and clicking ✖.
Organization Resources	Label	Shows any Resources allocated to the Group. Click ⊞ to add a Resource. You can delete a Resource by selecting it and clicking ✖.
System Actions	Name	The name of the system action. If you associate one or more privileges with a system action, they are listed on the lines below that action. Click ⊞ to expand the display and show the privileges, and click ⊟ to collapse the display. Click 🔑 to assign a privilege to a system action. The Select Type dialog box is displayed, enabling you to add or remove a privilege. You can also remove a privilege by selecting it and clicking ✖. Click ⬆ to move the privilege up the list, or ⬇ to move it down. These icons are only available if there is more than one privilege attached to a system action.
	Qualifier Value	If a privilege has qualifying information specified, this column lists the value of the qualifier. Click ↩ to reset the value of a qualifier to the default

Tab	Property	Description
		value defined for it.
Description	Description	Area in which you can enter text to describe the Group or any supporting explanations.
Resource	Property Value	Displays the Label and Name of the Group. You can edit the values from this tab by clicking on the Value field.

Capability Category and Privilege Category Properties

Tab	Property	Description
General	Label	The displayed name of the Category. You can rename the Category here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Capabilities or Privileges	Lists the Capabilities or Privileges that are members of this category.
Resource	Property Value	Displays the Label and Name of the Category. You can edit the values from this tab by clicking on the Value field.

Capability Properties

Tab	Property	Description
General	Label	The displayed name of the Capability. You can rename the Capability here by entering a new name.

Tab	Property	Description
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Has qualifier	Select this option if you want to add qualifying information to a Capability or Privilege. See "Capabilities and Privileges" in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications. If this check box is selected, the **Show qualifier ..** link is enabled. Click **Show qualifier ..** or click on the **Qualifier** tab title to display the **Qualifier** tab. You can specify a data type for your qualifying information.
	Purpose	Area in which you can enter text to describe the purpose of the Capability.
	Category	Shows the Category of which this Capability is a member. Click the picker to open the Select Type dialog box to add or remove a Category.
Description	Description	Area in which you can enter text to describe the Capability or any supporting explanations.
Resource	Property Value	Displays the Label and Name of the Capability. You can edit the values from this tab by clicking on the Value field.

Privilege Properties

Tab	Property	Description
General	Label	The displayed name of the Privilege. You can rename the Privilege here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.

Tab	Property	Description
	Has qualifier	Select this option if you want to add qualifying information to a Capability or Privilege. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about qualifications.
		If this check box is selected the **Show qualifier ..** link is enabled. Click **Show qualifier ..** or click on the **Qualifier** tab title to display the **Qualifier** tab. You can specify a data type for your qualifying information.
	Purpose	Enter text to describe the purpose of the Privilege.
	Category	Shows the Category of which this Privilege is a member. Click the picker to open the Select Type dialog box to add or remove a Category.
Qualifier	Label	The displayed name of the Qualifier.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Type	From the Type drop-down list, select a data type for the qualifying information. See the "Capabilities and Privileges" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about the data types that qualifying information can have.
	Default Value	You can specify a default value for the Qualifier here.
Description	Description	Enter text to describe the Privilege or any supporting explanations.
Resource	Property Value	Displays the Label and Name of the Privilege. You can edit the values from this tab by clicking on the Value field.

Location Properties

Tab	Property	Description
General	Label	The displayed name of the Location. You can rename the Location here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Type	The type for the Location. This can be the Standard Location Type, for example or might be a type that you have defined yourself. See the "Schemas" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about types. Clicking the picker displays the Select Type dialog box from which you can add or remove Location Types.
	Allocation Method	One of Random or Round Robin. Determines how work is allocated.
	Purpose	Enter text to describe the purpose of the Location.
	Dates	You can specify start and end dates for the Location. Click the picker next to the date fields to display the calendars.
Description	Description	Enter text to describe the Location or any supporting explanations.
Resource	Property Value	Displays the Label and Name of the Location. You can edit the values from this tab by clicking on the Value field.

Resource Properties

Tab	Property	Description
General	Label	The displayed name of the Resource. You can rename the

Tab	Property	Description
		Resource here by entering a new name
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Type	The type for the Resource. This can be the Human Resource Type, for example, or might be a type that you have defined yourself. See the "Schemas" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about types. Clicking the picker displays the Select Type dialog box from which you can add or remove Resource Types.
	Purpose	A field in which you can enter text for a brief description of the purpose of the Resource.
	Dates	You can specify start and end dates for the Resource. Click the picker next to the date fields to display the calendars.
Attribute Values	Label	The name of any attributes that are defined for this type of Resource are displayed here.
	Value	Click the **Value** field next to each defined attribute to display a list of available values for that attribute. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.
Description	Description	Area in which you can enter text to describe the Resource or any supporting explanations.
Resource	Property Value	Displays the Label and Name of the Resource. You can edit the values from this tab by clicking on the Value field.

Organization Query Properties

Tab	Property	Description
General	Label	The displayed name of the Query. You can rename the Query here by entering a new name
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
	Script defined as	Whether the query is entered in free text or in Resource Query Language (RQL). Defaults to Unspecified when a query is created.
Resource	Property Value	Displays all the properties of the Query. You can edit the values from this tab by clicking on the Value field.

Properties View for the Organization Schema

A number of Properties are available for the elements in an Organization Schema: Organization Type, Organization Unit Type, Position Type, Location Type, Organization Unit Relationship Type, Resource Type.

Organization Type Properties

Tab	Property	Description
General	Label	The displayed name of the Organization Type. You can rename the Organization Type here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Resource	Property Value	Displays the Label and Name of the Organization Type. You can edit the values from this tab by clicking on the Value field.

Organization Unit Type

Tab	Property	Description
General	Label	The displayed name of the Organization Unit Type. You can rename the Organization Unit Type here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Resource	Property Value	Displays the Label and Name of the Organization Unit Type. You can edit the values from this tab by clicking on the Value field.

Position Type Properties

Tab	Property	Description
General	Label	The displayed name of the Position Type. You can rename the Position Type here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Resource	Property Value	Displays the Label and Name of the Position Type. You can edit the values from this tab by clicking on the Value field.

Location Type Properties

Tab	Property	Description
General	Label	The displayed name of the Location Type. You can rename the Location Type here by entering a new name.

Tab	Property	Description
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Resource	Property Value	Displays the Label and Name of the Location Type. You can edit the values from this tab by clicking on the Value field.

Organization Unit Relationship Type Properties

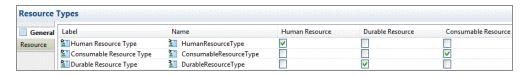| Tab	Property	Description
General	Label	The displayed name of the Organization Unit Relationship Type. You can rename the Organization Unit Relationship Type here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Resource	Property Value	Displays the Label and Name of the Organization Unit Relationship Type. You can edit the values from this tab by clicking on the Value field.

Resource Type Properties

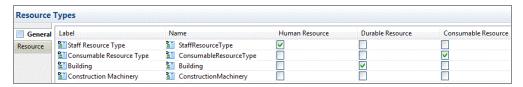| Tab	Property	Description
General	Label	The displayed name of the Resource Type. You can rename the Resource Type here by entering a new name.
	Name	The internal name. This defaults to the same value as the Label, but with any internal spaces removed.
Attributes	Label	The name of any attributes that you want to define for this

Tab	Property	Description
		Resource Type. See the "Attributes" topic in the *TIBCO® BPM Enterprise Concepts Guide* for more information about attributes.
		This tab lists all attributes that are associated with this Resource Type and also all that are associated with its parent, its parent's parent, and any other Resource Types in the chain of inheritance.
		Click ![plus icon] to add an attribute. You can delete an attribute by selecting it and clicking ![delete icon].
	Type	One Resource Type in the schema must be defined as the **Human Resource Type**, for compatibility purposes once the Organization is exported. It cannot be deleted from the Schema.
		This text is displayed on the **General** tab of the Human Resource Type. The Type is therefore still identifiable as the Human Resource Type even if you change its label and name.
Resource	Property Value	Displays all the properties of the Resource. You can edit the values from this tab by clicking the **Value** field.

Human Durable and Consumable Resource Types

One Resource Type must always be the **Human Resource**, whether or not you have used the default Schema. If your Schema retains the default Schema, then in addition one resource type must have the **Durable Resource** property, and one the **Consumable Resource** property. If you select **Resource Types** in the Project Explorer, the **General** tab in the **Properties View** displays a matrix showing which type has which property.

The Resource Type with one of these properties does not have to have the corresponding name. In this example some of the Types have been renamed:

You can change the assignment of these attributes by checking boxes in this matrix - for example, you could check **Durable Resource** in the **Construction machinery** line. If you do this, the corresponding box in the **Building** line would automatically be unchecked: there must be one, and only one Resource Type with each attribute.

Tips and Tricks

This section contains tips for working with the TIBCO Business Studio user interface.

Process Editor

There are a number of tips for using the Process Editor.

I can't see the palette.	Make sure you are in the Process Editor and that the palette is expanded (click the arrow to the right, top of the scroll bar).
I have a large diagram that is difficult to view. How can I find a specific task?	Press Ctrl+F and enter the name or a partial name in the resulting dialog box. A list of search results is displayed. Clicking one of the results displays it in the Process Editor.
How can I create several objects of the same type using the palette?	Press the Ctrl key while adding the objects to your Process. For example, if you want to create several Sequence Flows, press and hold the Ctrl key while clicking the Flow tool and adding the Sequence Flows.
How do I align objects in the Process Editor?	There are two features that allow you to better align objects in the Process Editor - **Grid** and **Alignment Guides**. These are both available from the **Diagram** menu when using the Process Editor. **Grid** allows you to snap objects to the grid lines, and **Alignment Guides** shows a centering line when you have aligned two objects.
	With several objects selected in the Process Editor you can also select options from the **Diagram > Alignment** menu to control the vertical and horizontal alignment of the objects.
I'm using Grid alignment in the Process Editor and I	Pressing the Alt key while moving an object allows you to position it between grid lines.

want to place an object without using the Grid.	
I want to see a larger view of my Process.	You can expand the Process Editor to fill your screen by double-clicking its title bar or pressing Ctrl+M. You can temporarily display the Properties view by double-clicking any diagram element. The Properties view is hidden again when you click on the diagram.
How can I easily resize an Activity in the Process Editor?	Pressing the Ctrl key while resizing one side of an object automatically resizes the opposite side as well.
I can't get my Sequence Flows to look right.	Occasionally when you reposition a Sequence Flow several times you create too many bend points and make the flow illegible. To restore a Sequence Flow, click the flow and select **Reset Bendpoints**.
How can I create bendpoints when I draw a Sequence Flow?	Whilst holding down the left mouse button and positioning the Sequence Flow, right-click to add a bend point.
I can't get a Sequence Flow to dock where I want it to dock.	Sequence Flows are docked at the nearest docking point rather than where you attempt to dock them. Try repositioning the middle of the Sequence Flow to change the docking point.
How can I position Sequence Flows using the keyboard?	Highlight the Sequence Flow, then press the Period key (.) to move along the bend points. With a bend point highlighted, use the arrow keys to position them and change the shape of the flow. When you are done, press the Return key.
A task label is truncated in the Process Editor - how can I show the whole label?	Set the zoom level to width or height and all letters become visible in the Process Editor.

Alternatively, you can add a period (.) to the end of the label. |
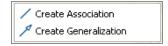
Business Object Model Editor

There are a number of tips relating to the Business Object Model Editor:

How can I quickly create a connection between two Classes?	Make sure you are in the Business Object Modeler and that the Palette is expanded (click the arrow to the right, top of the scroll bar). If you click a Class, the following symbols are displayed on its border:

You can drag either of these to another Class. The following menu is displayed from which you can choose the type of connection you want to create:

How can I quickly add Attributes to a Class?	Click the Class. The following symbol is displayed:

- Clicking adds an Attribute to the selected Class.
- Clicking adds an Operation to the selected Class.

Workbench

There are a number of tips relating to the Eclipse Workbench:

How can I quickly change Perspectives?	There are buttons in the upper right of the screen so you can change between perspectives. You can also do this using **Ctrl+F8**.

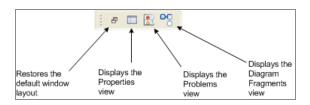| My windows are a mess. How can I reset them?	Go to **Window > Reset Perspective**. This restores the current Perspective to its default.

How can I switch to a different workspace?	Go to **File > Switch Workspace** and browse for the location of the workspace. Note that after you select a workspace and click **OK**, TIBCO Business Studio must restart before you can access the new workspace.
After starting *TIBCO Business Studio*, I get the following error message: `Unable to read workbench state. workbench UI layout will be reset`	This error occurs because a UI element (for example, editor, view, or perspective) that was displayed at the close of the last TIBCO Business Studio session is no longer available. This error usually indicates a change in the installation environment (a product has been removed or upgraded), and can safely be ignored.
How can I navigate to other views while in full screen mode?	When a view or editor is expanded to fill the window, Eclipse provides several buttons around the border of the screen that allow you to display other views in addition to the expanded view of the Process. For example, the following buttons are displayed around the border of the screen:

Problems View

There are a number of tips relating to the Problems view:

How can I correct validation errors?	Either: • Right-click the problem and select **Quick Fix** (if enabled for

the current problem). This gives you the option of having TIBCO Business Studio automatically correct the problem for you.

- or -

- If no quick fix is available, Double-click the problem or right-click the problem and select **Go To**. This displays the Process in the Process Editor, highlighting the offending object and allowing you to manually correct the problem.

In the Problems view I see not only problems for my Process/Project, but problems for all Processes/Projects.	From the menu in the upper right of the Problems view, select **Configure Contents**. This allows you to customize the problems display. For example, you can select options to display problems for the selected resource only, or for any resource in the same Project.

TIBCO Documentation and Support Services

For information about this product, you can read the documentation, contact TIBCO Support, and join TIBCO Community.

How to Access TIBCO Documentation

Documentation for TIBCO products is available on the Product Documentation website, mainly in HTML and PDF formats.

The Product Documentation website is updated frequently and is more current than any other documentation included with the product.

Product-Specific Documentation

The documentation for this product is available on the TIBCO Business Studio™ - BPM Edition Product Documentation page.

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- To create a Support case, you must have a valid maintenance or support contract with a Cloud Software Group entity. You also need a username and password to log in to the product Support website. If you do not have a username, you can request one by clicking **Register** on the website.

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