TIBCO ActiveMatrix BusinessWorks™

Getting Started

Software Release 5.13
August 2015

Two-Second Advantage®

Important Information

Contents

Preface

TIBCO ActiveMatrix BusinessWorks is a scalable, extensible, and easy to use integration platform that allows you to develop and test integration projects. TIBCO ActiveMatrix BusinessWorks uses the TIBCO Designer graphical user interface (GUI) for defining business processes and the TIBCO ActiveMatrix BusinessWorks process engine executes the process.

TIBCO ActiveMatrix BusinessWorks processes can be deployed and managed using TIBCO Administrator. See the TIBCO Administrator documentation for more information.

Topics

Changes from the Previous Release of this Guide

There are no changes in this guide during this release.

Related Documentation

This section lists documentation resources you may find useful.

TIBCO ActiveMatrix BusinessWorks Documentation

The following documents form the TIBCO ActiveMatrix BusinessWorks documentation set:

- *TIBCO ActiveMatrix BusinessWorks Concepts* Read this manual before reading any other manual in the documentation set. This manual describes terminology and concepts of TIBCO ActiveMatrix BusinessWorks, and the other manuals in the documentation set assume you are familiar with the information in this manual.
- *TIBCO ActiveMatrix BusinessWorks Getting Started* This manual steps you through a very simple example of designing, deploying, and monitoring a TIBCO ActiveMatrix BusinessWorks process.
- *TIBCO ActiveMatrix BusinessWorks Process Design Guide* This manual describes how to create, edit, and test business processes using TIBCO ActiveMatrix BusinessWorks.
- *TIBCO ActiveMatrix BusinessWorks Palette Reference* This manual describes each of the palettes available in TIBCO ActiveMatrix BusinessWorks.
- *TIBCO ActiveMatrix BusinessWorks Administration* This manual describes how to use TIBCO Administrator to deploy, manage, and monitor TIBCO ActiveMatrix BusinessWorks processes.
- *TIBCO ActiveMatrix BusinessWorks Installation* Read this manual for information on installing one or more components of TIBCO ActiveMatrix BusinessWorks and setting up a TIBCO ActiveMatrix BusinessWorks domain.
- *TIBCO ActiveMatrix BusinessWorks Error Codes* This manual describes errors returned by TIBCO ActiveMatrix BusinessWorks.
- *TIBCO ActiveMatrix BusinessWorks Release Notes* Read the release notes for a list of new and changed features. This document also contains lists of known issues and closed issues for this release.

Other TIBCO Product Documentation

TIBCO ActiveMatrix BusinessWorks is used with other products. You may find it useful to read the documentation for the following TIBCO products:

- TIBCO Designer™ software: TIBCO Designer is an easy to use graphical user interface for design-time configuration of TIBCO applications. TIBCO Designer includes online help for each palette.
- TIBCO Administrator™ software: TIBCO Administrator is the monitoring and managing interface for new-generation TIBCO products such as TIBCO ActiveMatrix BusinessWorks.
- TIBCO Adapter software
- Third-Party Documentation

Typographical Conventions

The following typographical conventions are used in this manual.

Table 1 General Typographical Conventions

Convention	Use
ENV_NAME *TIBCO_HOME* *BW_HOME*	TIBCO products are installed into an installation environment. A product installed into an installation environment does not access components in other installation environments. Incompatible products and multiple instances of the same product must be installed into different installation environments. An installation environment consists of the following properties: • **Name** Identifies the installation environment. This name is referenced in documentation as *ENV_NAME*. On Microsoft Windows, the name is appended to the name of Windows services created by the installer and is a component of the path to the product shortcut in the Windows Start > All Programs menu. • **Path** The folder into which the product is installed. This folder is referenced in documentation as *TIBCO_HOME*. TIBCO ActiveMatrix BusinessWorks installs into a directory within a *TIBCO_HOME*. This directory is referenced in documentation as *BW_HOME*. The default value of *BW_HOME* depends on the operating system. For example on Windows systems, the default value is `C:\tibco\bw\5.12`.
`code font`	Code font identifies commands, code examples, filenames, pathnames, and output displayed in a command window. For example: Use `MyCommand` to start the foo process.
`bold code font`	Bold code font is used in the following ways: • In procedures, to indicate what a user types. For example: Type **`admin`**. • In large code samples, to indicate the parts of the sample that are of particular interest. • In command syntax, to indicate the default parameter for a command. For example, if no parameter is specified, `MyCommand` is enabled: MyCommand [**`enable`** | disable]

Table 1 General Typographical Conventions (Cont'd)

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

Connecting with TIBCO Resources

How to Join TIBCOmmunity

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

How to Access TIBCO Documentation

You can access TIBCO documentation here:

http://docs.tibco.com

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

How to Contact TIBCO Support

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

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

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

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

  https://support.tibco.com

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

TIBCO ActiveMatrix BusinessWorks Getting Started

This document steps you through the process of designing and testing a simple TIBCO ActiveMatrix BusinessWorks project.

For more information about designing and testing TIBCO ActiveMatrix BusinessWorks processes, see *TIBCO ActiveMatrix BusinessWorks Process Design Guide*.

Topics

Introduction

This tutorial steps you through the creation of a simple TIBCO BusinessWorks project. The goal of this tutorial is to introduce you to the BusinessWorks project lifecycle. The phases of the project lifecycle are similar to standard project phases:

1. Design — determining the requirements of the system, developing a prototype solution to your business needs.
2. Testing — running the system to determine that it works properly and meets the project's requirements.

The project in this tutorial is fairly simple so that you can focus on how to use BusinessWorks within each phase of the project lifecycle. Once you complete the tutorial, you should be more comfortable applying the methodology to your own projects.

Before starting this tutorial, you should become familiar with TIBCO BusinessWorks terminology and basic concepts. It is not necessary to learn all aspects of BusinessWorks, but you should at least read Chapter 1 of *TIBCO BusinessWorks Concepts*. That chapter introduces much of the terminology that will be used in this tutorial. TIBCO Designer Main Window on page 7 is a summary of key concepts you should be familiar with.

Once a project has been developed and tested, you can deploy it using TIBCO Administrator. The *TIBCO Administrator User's Guide* describes deployment and includes a tutorial that uses the project created in this manual.

Overview of Example Process

The project you will create watches a directory for a specific file. When the file changes, a new file is created that contains the contents of the original file plus the time the change was made to the original file. The new file is named after the change that occurred (`create.txt`, `modify.txt`, or `remove.txt`). If you modify the file multiple times, the new file overwrites the existing `modify.txt`.

With this simple project, you will perform many of the same tasks that are required for larger, more complex projects. This tutorial is not intended to illustrate every aspect of TIBCO BusinessWorks, so only a small subset of the available activities will be used.

The tutorial steps you through the following tasks:

- Starting TIBCO Designer and Saving Your Project
- Creating the FileTest Process
- Testing the FileTest Process

Prerequisites

To perform the tasks in this tutorial, you must have installed and configured the TIBCO ActiveMatrix BusinessWorks software properly.

1. Install all components of TIBCO Runtime Agent (TRA) on your system.
2. Install all components of TIBCO ActiveMatrix BusinessWorks on your system.

Starting TIBCO Designer and Saving Your Project

To start TIBCO Designer and save your project, follow these steps:

1. From the **Start** menu, choose **All Programs > TIBCO > TIBCO Designer <version> > Designer <version>**.

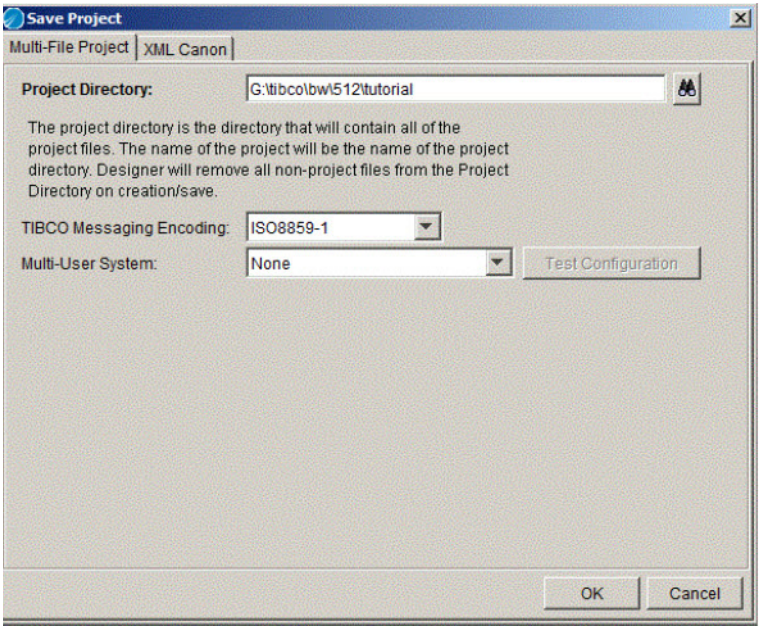
   The TIBCO Designer Startup window appears.

2. Choose **New Empty Project**.

   The TIBCO Designer main window appears, with the Save Project dialog on top.

3. In the Save Project dialog, make sure that the Multi-File Project tab is selected.

4. In the Project Directory field, click the **Browse** button to locate the directory in which you wish to save the project. Locate the TIBCO BusinessWorks installation directory, and create a new subdirectory named `tutorial`. Click **OK** to return to the Save Project dialog.



5. Click **OK** to create the new project.

You are now ready to create a process definition using TIBCO Designer. The next section gives an overview of TIBCO Designer. If you would like to start process design right away, skip the overview and start with Creating the FileTest Process on page 10.

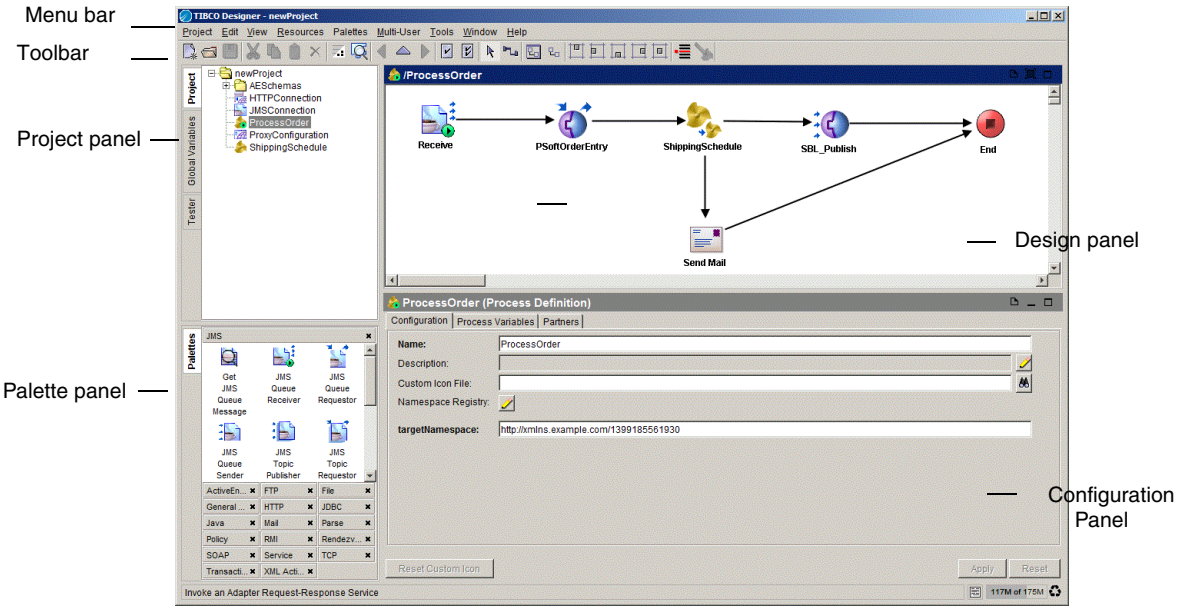
See Also

For some introductory information on TIBCO Designer, see TIBCO Designer Main Window on page 7. The *TIBCO Designer User's Guide*, available from the **Help > Designer Help** menu, gives additional information, including an introduction to the display preferences.

TIBCO Designer Main Window

The TIBCO Designer main window has these components:

- Menu bar and menus.
- Toolbar icons.
- Four panels, which are (starting in the top left corner and continuing clockwise):
  - Project tree panel
  - Design panel
  - Configuration panel
  - Palette panel



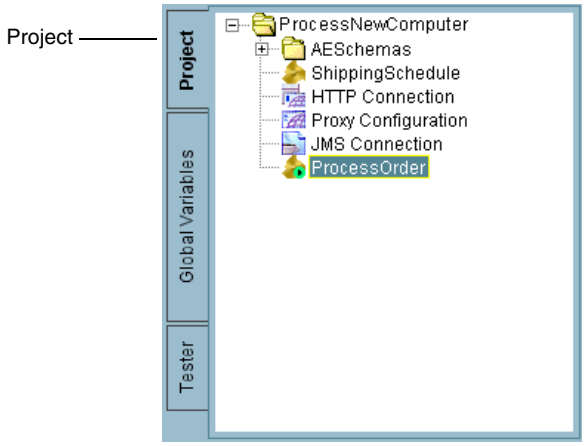
The following sections explain each panel.

Projects

A project consists of objects that contain the functionality needed for your enterprise integration. This includes services (producers and consumers of information), any business logic that may be applied to that information, and deployment information.

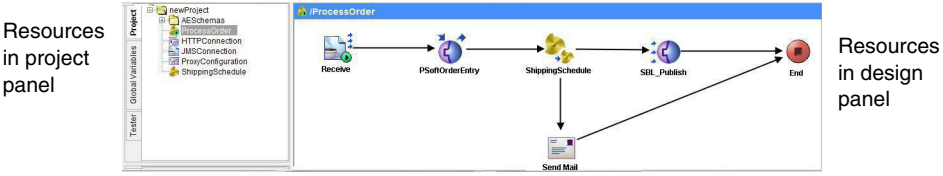
Each TIBCO Designer window contains one and only one project, which is represented as the top-level folder in the window.

The `ProcessNewComputer` project, shown below in the project tree panel, includes two process definitions, a PeopleSoft adapter (`PSoft_ReqRep`), a Siebel adapter (`SBLAccount`), and several other resources.



Resources

Resources are the components of a project. A TIBCO Designer resource corresponds to an object in a TIBCO application, such as `FTP Put` activity, a process definition, or a specific adapter instance.



Resources can be complex and contain other resources, much like a folder can contain other folders on your computer's file system. For example, an adapter instance may contain multiple folders with multiple publisher or subscriber resources. A process definition contains multiple activities.

Resources can also be simple. In the illustration above, `PSoft_OrderEntry` is a simple resource.

Activities

Resources used in process design are called activities. You can create a process flow linking activities with transitions. You can have multiple transitions from one activity to others, and each transition can be conditional.

Palettes

A palette provides access to resources. You drag and drop resources from the palette in the palette panel into the design panel to add them to your project.

TIBCO Designer contains a number of native palettes. In addition, each TIBCO application you install adds one or more palettes to TIBCO ActiveMatrix BusinessWorks during installation.

Which palette is displayed depends on the resource selected in the project tree and on your preferences.

Creating the FileTest Process

This section guides you through creating a simple process definition. The process, which will be named `FileTest`, polls a directory for a specified file and writes a new file to the same directory each time the file changes. The new file's name includes the type of change that occurred to the original file (create, modify, or remove). The new file's content is the same as the polled file's content, but the time of the change in the file is appended to the end of the file. The time of the file change is represented as the number of milliseconds since January 1, 1970.

The tutorial uses a variable file name to illustrate how to use the TIBCO BusinessWorks mapping capabilities.

Before you start to design the process, create a directory. Then create text file with some simple content (for example, "The cherry blossoms are beautiful.") in the directory. The file will be needed by the `File Poller` activity. This example uses the directory `c:\tibco\test` and the file `PolledFileTest.txt`.

To create the FileTest process, follow these steps:

1. In TIBCO Designer, select the project name (e.g. `tutorial`) in the project panel.
2. In the palette panel, select the Process palette.

   If no palettes are in the palette panel, click the Switch Palette Mode  icon to display the palettes.
3. From the palette panel, drag a Process Definition resource into the design panel.
4. In the configuration panel, type the name `FileTest` in the **Name** field to rename the process. Then click **Apply**.
5. Save your project by choosing **Project > Save** from the menu.

See Also

For introductory information about processes, see *TIBCO BusinessWorks Concepts*. For detailed information about processes, see the *TIBCO ActiveMatrix BusinessWorks Process Design Guide*.

To add activities to the process, follow these steps:

1. Select the FileTest process in the project tree.

   The Start and End activities should be displayed in the design panel.

2. Find the File palette in the palette panel and select it.

If the File palette is not one of the available palettes, choose **Palettes > Activities > File** to make the palette available.

3. Drag a File Poller activity into the design panel (but not on top of the `Start` activity).

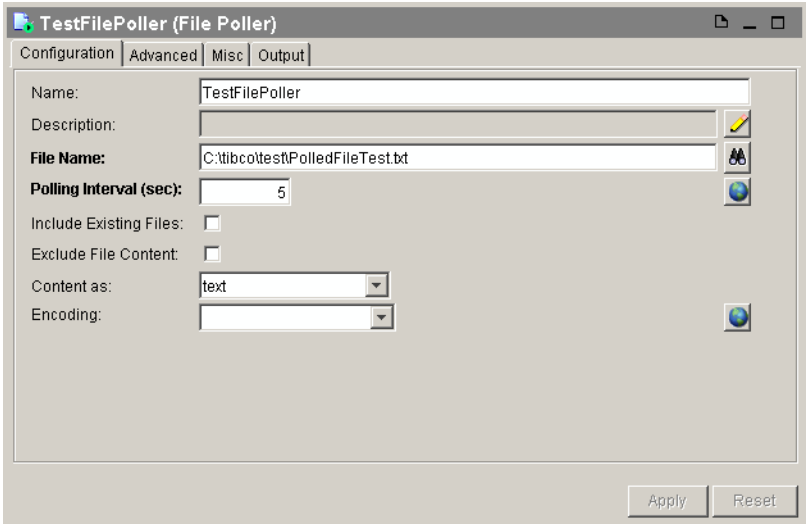
   The Start activity is replaced by the File Poller activity.

4. With the File Poller still selected, enter the following values in the configuration panel:

   a. Name the File Poller `TestFilePoller`.

   b. Click the **Browse** button to the right of the File Name field and select the file you want to poll. Use the Select File dialog to locate the directory and file you created.

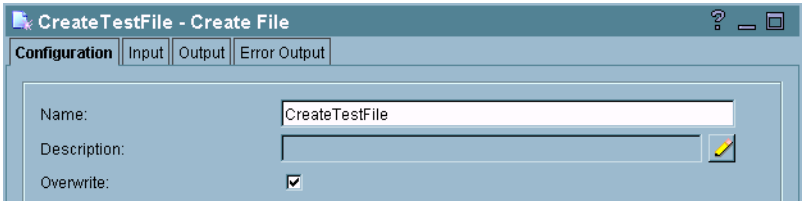
   c. Leave the Polling Interval, Include Existing Files, and Exclude File Content fields as they are. Select text in the drop-down list in the Content as field, and select the appropriate encoding for your operating system in the Encoding field.



   d. Click the **Apply** button.

5. Drag a Create File activity into the design panel and place it to the right of TestFilePoller.

6. Name the Create File activity CreateTestFile, and click the Overwrite check box, then click the **Apply** button.



7. Drag a Write File activity into the design panel and place it to the right of the CreateTestFile activity (before the End activity).
8. Name the Write File activity `WriteToTestFile`, then click the **Apply** button.

9. In the toolbar, select the Transition icon  .
10. Select the TestFilePoller process starter and drag a transition to the CreateTestFile activity. Connect the CreateTestFile and WriteToTestFile and the WriteToTestFile and End activities in the same manner.

    The result should appear as follows:

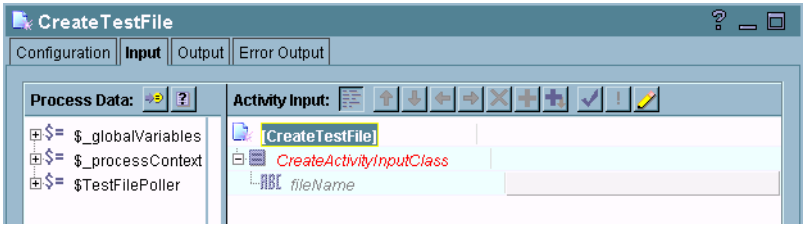
11. Choose **Project > Save** from the menu.

The process now includes appropriately connected activities. However, no information about the name and content of the files is included. To set those, you use the TIBCO Designer mapping facilities.

The goal in this exercise is to create a file that has the name `File<`*changeType*`>.txt`, where <*changeType*> is the type of change that occurred to the original file (create, modify, or remove). The contents of the changed file is then written to the new file, and the time the change in the file occurred is appended to the end of the contents. For example, if the text in the changed file is "The cherry blossoms are beautiful." the content of the new file will be "The cherry blossoms are beautiful. 1017163931036"

To map the data flow between activities, follow these steps:

1. Choose the Select icon  in the toolbar, if it is not already selected.
2. Select the CreateTestFile activity and choose the Input tab in the configuration panel. Expand the CreateActivityInputClass item in the activity input tree by clicking on the plus sign (+) to the left of the item.



   Each activity's output is available to subsequent activities in the process definition. You can use data from previous activities to specify the input of the current activity. For example, you can use the content of the original text file as the content of the new text file.

   The left panel of the Input tab contains a list of data from all activities preceding the current activity in the process diagram. Each activity's name appears with a dollar sign ($) in front of it to indicate that this is a process variable.

   The right panel of the Input tab lists the current activity's input.

3. Click the plus (+) sign next to the process variable $TestFilePoller in the Process Data panel and expand the schema tree containing the output of the TestFilePoller process starter.
4. In the right panel, select the fileName element in the Activity Input pane, then click the XPath Formula Builder (pencil) icon.
5. In the XPath Formula Builder dialog that appears, follow these steps:
   a. Select the Functions tab, open the String folder, select concat, and drag it into the XPath Formula panel.

      The display in the right panel changes to display a `concat` XPath expression.

   b. Replace << *string1* >> with `"c:\tibco\test\File"` (include the quotes).
   c. In the left panel, select the `Data` tab, choose the $TestFilePoller/EventSourceOutputTextClass/action element and drag it over << *string2* >>. A red box appears over << *string2* >> indicating you

can release the data over this item and the correct XPath expression will appear.

d. Add a comma after $TestFilePoller/EventSourceOutputTextClass/action, then add the string `".txt"` (include the quotes).

The expression should look like the following:

```
concat("c:\tibco\test\File",
$TestFilePoller/EventSourceOutputTextClass/action, ".txt")
```

6. Click the **Apply** button to accept the formula and dismiss the XPath Formula Builder by clicking **Close**. Then click the **Apply** button in the Input tab of the activity.
7. Select the WriteToTestFile activity, then click the Input tab in the configuration panel.
8. Map the data as follows:
   a. Select $CreateTestFile/CreateActivityOutputClass/fileInfo/fullName and drag it to the fileName item in the Activity Input pane.

   You do not need to use the XPath Formula Builder to map this item because you do not need to use XPath functions. The content of the field is exactly the same as the value of the $CreateTestFile/CreateActivityOutputClass/fileInfo/fullName process variable.

   b. In the right panel, select the textContent field and click the XPath Formula Builder icon.

   c. In the XPath Formula Builder, drag a concat function into the XPath formula panel.

   d. Add `" "`, between <<*string1*>> and <<*string2*>> so that there is a space between the two strings in the `concat` function.

   e. Click the `Data` tab and drag $TestFilePoller/EventSourceOutputTextClass/fileContent/textContent over <<*string1*>>.

   f. Drag $TestFilePoller/EventSourceOutputTextClass/timeOccurred over <<*string2*>>.

   The formula should look like this:

```
concat($TestFilePoller/EventSourceOutputTextClass/
fileContent/textContent," ",$TestFilePoller/
EventSourceOutputTextClass/timeOccurred )
```

   g. Click the **Apply** button to accept the formula and dismiss the XPath Formula Builder by clicking **Close**.

9. Click the **Apply** button on the activity's Input tab, then choose **Project > Save** to save your project.

You are now ready to test the project.

Testing the FileTest Process

You can test the FileTest process directly from TIBCO Designer. This allows you to make sure the process works correctly before you deploy it. Follow these steps:

1. Click the Set Breakpoints icon  .
2. In the window that appears, choose **Select All**, then click **OK**.

   Breakpoints allow you to step through the process. Stepping helps you see what happens when each activity executes.
3. Click the Tester tab to the left of the project panel. The test panel replaces the project tree.
4. Click the Start testing viewed process button. 
5. In the process selection window that appears, the FileTest process is selected by default. Click **Load and Start Current**.

   The process is now in Test mode.
6. Make a change to the polled file to start the process.
7. Once the TestFilePoller process starter is highlighted (indicating a process has started), click the Step to next activity icon  to step through the process.

   TIBCO BusinessWorks creates an output file named `Filemodify.txt` after you have stepped into the WriteToTestFile activity and writes the appropriate text to the file.

   The text should be the text of `PolledFileTest.txt` and, in a new line, the time, in milliseconds, since January 1, 1970.

   You can click on each activity in the process definition as you step through it. If you click on the Process Data or Output tabs for the activity, you will see the actual process data and output of the activity as the process executes.
8. Next, delete `PolledFileTest.txt`.
9. Step through the process once more.

   TIBCO ActiveMatrix BusinessWorks creates a file `Fileremove.txt`. The content of Fileremove.txt is just the time of modification, because the polled file no longer exists.
10. Click the Stop Test Mode icon  to return to design mode.

See also For more information on using test mode, see the *TIBCO ActiveMatrix BusinessWorks Process Design Guide*.

Using BusinessWorks Engine Command Line to Run a TIBCO ActiveMatrix BusinessWorks Project

In the absence of a GUI environment or an administrator to deploy a TIBCO ActiveMatrix BusinessWorks project, you can test your project by using command line to run the TIBCO ActiveMatrix BusinessWorks Engine and view the test results.

To run a TIBCO ActiveMatrix BusinessWorks project using the TIBCO ActiveMatrix BusinessWorks Engine command line, provide an absolute path of your project location such as, `<BW_HOME>/bin/bwengine` <*root directory of the BW project*>.

Replace the following with the appropriate values as per your environment:

- `-propFile` to use a different `.tra` file instead of `bwengine.tra`.
- `-name` to provide name for the engine
- `-p` to specify `props.cfg` file which contains the engine properties

Use option "`-name <descriptive name>`" in the command line for providing each engine a descriptive name, when starting the TIBCO ActiveMatrix BusinessWorks Engine using the command line.

For example, if the descriptive name is "`myproject`", then a message "`Engine myproject started`" appears after the engine is started.

The commands to start the TIBCO ActiveMatrix BusinessWorks Engine with the name option are:

- `bwengine <absolute path of the project> -name <name>`
- `bwengine -propFile <tra file> <absolute path of the project> -name <name>`
- `bwengine -propFile <tra file> -p <properties file> <absolute path of the project> -name <name>`