HP Business Process Testing for SAP Applications

Software Version: 2.00

User's Guide

hp invent

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This manual's title page contains the following identifying information:

- Software version number, which indicates the software version
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- Software release date, which indicates the release date of this version of the software

To check for recent updates, or to verify that you are using the most recent edition of a document, go to:

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You can visit the HP Software Support Web site at: **www.hp.com/go/hpsoftwaresupport**

HP Software online support provides an efficient way to access interactive technical support tools. As a valued support customer, you can benefit by using the support site to:

- Search for knowledge documents of interest

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Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To find more information about access levels, go to: **http://h20230.www2.hp.com/new_access_levels.jsp**

To register for an HP Passport ID, go to: **http://h20229.www2.hp.com/passport-registration.html**

Table of Contents

Welcome to This Guide

Welcome to HP Business Process Testing for SAP Applications. Business Process Testing for SAP Applications adds functionality to HP Quality Center and HP Business Process Testing that enables you to test SAP applications.

Note: This guide assumes familiarity with standard Business Process Testing concepts and functionality. For more information on working with Business Process Testing, refer to the *HP Business Process Testing User's Guide*.

How This Guide is Organized

The HP Business Process Testing for SAP Applications User's Guide describes how to use Business Process Testing to test SAP applications. It explains how to create and manage flows, add flow parameters and run conditions, learn flows automatically, detect and update changes, and work with the Application Model module.

It contains the following chapters:

Chapter 1   Introducing Business Process Testing for SAP Applications

Provides a conceptual overview of flows, and an introduction to using Business Process Testing for SAP applications.

Chapter 2   Working With Flows

Describes how to create and develop flows, and how to use flows to build business process tests.

Chapter 3   Working with Flow Parameters

Describes how to use flow input and output parameters to increase the flexibility and reusability of your business process tests.

Chapter 4   Learning Flows

Describes how to learn a flow automatically by navigating your SAP application.

Chapter 5   Defining Run Conditions

Describes how to add run conditions to your flows, enabling you to run business components selectively, depending on parameter values of previous business components in a flow.

Chapter 6   Detecting and Resolving Changes

Describes how you can detect changes in your SAP application that necessitate modifications to your flows, and how you can instruct Business Process Testing for SAP Applications to make these modifications automatically.

Chapter 7   Working with Application Model Entities in Quality Center

Describes how to work with the Application Model, which enables you to model your SAP application hierarchy within Quality Center.

Documentation Library

The Documentation Library is an online help system that describes how to use Quality Center. You can access the Documentation Library in the following ways:

➤ Click **Documentation Library** in the Quality Center Help menu to open the Documentation Library home page. The home page provides quick links to the main help topics.

➤ Click **Help on this page** in the Quality Center Help menu to open the Documentation Library to the topic that describes the current page.

Documentation Library Guides

The Documentation Library consists of the following guides and references, available online, in PDF format, or both. PDFs can be read and printed using Adobe Reader, which can be downloaded from the Adobe Web site *(*http://www.adobe.com*)*.

Getting Started explains how to use the Documentation Library and how it is organized. (Available online.)

What's New? describes the newest features in the latest version of Quality Center. (Available online and in PDF format.)

You can also access **What's New?** from the Quality Center **Help** menu. In addition, you can choose **Help** > **Product Feature Movies** to view short movies that demonstrate the main product features.

Readme provides last-minute news and information about Quality Center.

Quality Center Guides

HP Quality Center User's Guide explains how to use Quality Center to organize and execute all phases of the testing process. It describes how to define requirements, plan tests, run tests, and track defects. (Available online and in PDF format.)

HP Quality Center Administrator's Guide explains how to create and maintain projects using Site Administration, and how to customize projects using Project Customization. (Available online and in PDF format.)

HP Quality Center Tutorial is a self-paced guide teaching you how to use Quality Center to manage the software testing process. (Available in PDF format.)

HP Quality Center Installation Guide explains how to install Quality Center on a server machine in a cluster environment or as a stand-alone application. (Available in PDF format.)

Business Process Testing Guides

HP Business Process Testing User's Guide explains how to use Business Process Testing to create business process tests. (Available online and in PDF format.)

HP Business Process Testing Tutorial provides a self-paced guide that teaches you the basics of Business Process Testing in the Quality Center application. (Available in PDF format.)

API References

HP Quality Center Database Reference provides a complete online reference for the project database tables and fields. (Available online.)

HP Quality Center Open Test Architecture API Reference provides a complete online reference for the Quality Center COM-based API. You can use the Quality Center open test architecture to integrate your own configuration management, defect tracking, and home-grown testing tools with a Quality Center project. (Available online.)

HP Quality Center Site Administration API Reference provides a complete online reference for the Site Administration COM-based API. You can use the Site Administration API to enable your application to organize, manage, and maintain Quality Center users, projects, domains, connections, and site configuration parameters. (Available online.)

HP Quality Center Custom Test Type Guide provides a complete online guide for creating your own testing tool and integrating it into the Quality Center environment. (Available online.)

Additional Online Resources

Mercury Tours sample Web site is the basis for many examples in this guide. The URL for this Web site is newtours.demoaut.com.

Knowledge Base opens directly to the Knowledge Base landing page on the Mercury Customer Support Web site. Choose **Help** > **Knowledge Base**. The URL for this Web site is support.mercury.com/cgi-bin/portal/CSO/kbBrowse.jsp.

Customer Support Web site accesses the HP Software Support Web site. This site enables you to browse the Support Knowledge Base and add your own articles. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help** > **Customer Support Web site**. The URL for this Web site is www.hp.com/go/hpsoftwaresupport.

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract.

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To register for an HP Passport user ID, go to:
http://h20229.www2.hp.com/passport-registration.html

Send Feedback enables you to send online feedback about **QuickTest Professional** to the product team. Choose **Help** > **Send Feedback**.

HP Software Web site accesses the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. Choose **Help** > **HP Software Web site**. The URL for this Web site is www.hp.com/go/software.

Typographical Conventions

This guide uses the following typographical conventions:

UI Elements and **Function Names**	This style indicates the names of interface elements on which you perform actions, file names or paths, and other items that require emphasis. For example, "Click the **Save** button." It also indicates method or function names. For example, "The **wait_window** statement has the following parameters:"
Arguments	This style indicates method, property, or function arguments and book titles. For example, "Refer to the *HP User's Guide*."
<**Replace Value**>	Angle brackets enclose a part of a file path or URL address that should be replaced with an actual value. For example, <**MyProduct installation folder**>**bin**.
Example	This style is used for examples and text that is to be typed literally. For example, "Type Hello in the edit box."
CTRL+C	This style indicates keyboard keys. For example, "Press ENTER."
[ ]	Square brackets enclose optional arguments.
{ }	Curly brackets indicate that one of the enclosed values must be assigned to the current argument.
...	In a line of syntax, an ellipsis indicates that more items of the same format may be included. In a programming example, an ellipsis is used to indicate lines of a program that were intentionally omitted.
|	A vertical bar indicates that one of the options separated by the bar should be selected.

1

Introducing Business Process Testing for SAP Applications

This chapter provides an overview of working with Business Process Testing for SAP Applications. It introduces the concept of flows, which are central to working with Business Process Testing for SAP Applications. It also describes a typical workflow for working with Business Process Testing for SAP Applications.

Note: For information on installing and setting up Business Process Testing for SAP Applications, and on configuring user permissions, see the *HP Business Process Testing for SAP Applications Installation Guide*.

This chapter includes:

➤ About Business Process Testing for SAP Applications on page 14

➤ What is a Flow? on page 16

➤ Business Process Testing for SAP Applications Workflow on page 18

About Business Process Testing for SAP Applications

Business Process Testing for SAP Applications provides additional functionality to Business Process Testing for use with SAP applications. This guide describes this additional functionality. For more details on the standard Business Process Testing functionality, see the *HP Business Process Testing User's Guide*.

Business Process Testing for SAP Applications enables you to create **flows** in the Test Plan module. A **flow** is type of test that is a collection of business components in a fixed sequence that you can use in multiple business process tests. You can increase the reusability of flows by adding flow parameters, in a similar way to adding parameters for business components. In addition, you can use run conditions to enhance the flexibility of a flow by enabling components to run selectively, based on earlier stages within the flow. For more information on flows, see "What is a Flow?" on page 16.

In addition, if you are working with an SAP application and have QuickTest Professional installed with the SAP Add-in, Business Process Testing for SAP Applications enables you to learn the actions you perform on your SAP application and generate a flow containing automated components based on these operations. Business components are generated within the flow, based on the screens and transactions within your SAP application. This enables a Subject Matter Expert, who has a detailed knowledge of SAP systems, to create automated components for testing SAP applications. The Subject Matter Expert can create these automated components without the involvement of an Automation Engineer, who is an expert in programming and automated testing.

Business Process Testing for SAP Applications also enables you to run flows and tests on an SAP application in change detection mode. This enables you to determine how the application has changed since the flow or test was built, such as whether controls in the user interface were added or deleted. For each change detected, Business Process Testing for SAP Applications offers you a choice of ways to resolve the change, such as opening a defect or removing a step from one of the components in the flow or test. Change detection and resolution simplify component maintenance, thereby reducing the effort needed to invest in automated testing.

Business Process Testing for SAP Applications also includes the Application Model module. You can import the application entity hierarchy from your SAP application to the Application Model module, enabling you to model your SAP application within Quality Center. You can then associate entities in the Application Model module with tests, flows, and business components, enabling you to plan your testing process based on the application entity hierarchy. For more information on the Application Model module, see Chapter 7, "Working with Application Model Entities in Quality Center."

Configuring QuickTest Professional to Work with Business Process Testing for SAP Applications

A number of options are recommended to, or must be set in QuickTest to take advantage of all Business Process Testing for SAP Applications features.

To enable QuickTest to work with Business Process Testing for SAP Applications:

1 Open QuickTest. Select **Tools** > **Options** and click the **Run** tab. Ensure that the **Allow other HP products to run tests and components** check box is checked.

To configure QuickTest to take advantage of all Business Process Testing for SAP Applications features:

1 Open QuickTest. Select **Start** > **QuickTest Professional** > **QuickTest Professional**.

2 Select **Tools** > **Options** and click the **SAP** tab.

  ➤ Under **SAP GUI for Windows** > **Record settings** ensure that:

    ➤ the **Auto-parameterize table and grid controls** check box is checked.

    ➤ the **Record only the selected value when using a Possible Entries (F4) list** check box is checked.

  ➤ Under **SAP GUI for Windows** > **Run settings** ensure that the **Session cleanup** check box is unchecked.

3 If your SAP application contains objects from environments other that SAP and Web, you need to configure Business Process Testing for SAP Applications to recognize these objects.

a Open the **Bpt4ErpCrmCfg**.xml file in the **Dat** folder of your QuickTest Professional installation folder.

b Add the following line to the **Settings** section:

<Config name="additional_addins" value="**add-in name**"/>

Where the **add-in name** is the name of the add-in as it appears in the **Add-in Manager** of QuickTest Professional. You separate multiple add-ins with a semi-colon, with no additional spaces.

For example <Config name="additional_addins" value="Java;ActiveX"/>

Note: Only users who are comfortable editing XML files should perform this operation.

What is a Flow?

A **flow** is a reusable collection of business components. You can combine components into a sequence, or flow, and then use that flow in multiple business process tests. Flows also provide a single point of maintenance. When you modify a flow or any of its components, all business process tests containing that flow reflect that modification.

For example, suppose you are creating business process tests that test various shopping scenarios in a grocery shopping application. Some of your tests might contain one or more of the following sub-processes:

➤ registering for the site and logging in

➤ searching for items

➤ reading customer reviews

➤ viewing the shopping list from past purchases

➤ adding items to the shopping cart

➤ viewing the shopping cart

➤ proceeding to checkout

➤ purchasing items (payment details)

➤ confirming or modifying personal profile details, such as the delivery address

➤ logging out of the site

You would create at least one component for each sub-process in a test. For sub-processes that change depending on the scenario, you might create multiple components. For example, when purchasing items, a user might want to pay by credit card or request to receive a bill in the mail. You could create a component for each of these scenarios.

Some of your business process tests might contain several components that logically follow one another. For example, any test that includes a purchasing scenario might include a component for proceeding to checkout, a component for inserting payment instructions, and a component for verifying the customer's personal profile details. By grouping these components into a single flow and using parameters to change the input and output values during each flow iteration, you can reuse these components more efficiently across multiple business process tests.
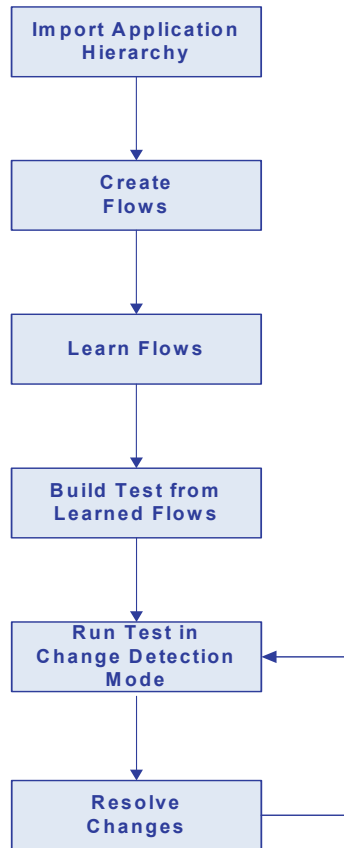
Maintaining business process tests may require adding, modifying, moving, and removing components. For example, you may need to insert a new component that checks the user's payment history according to the credit card number entered. You can include this new component in your existing flow to automatically update all of the relevant business process tests at once instead of inserting the component separately in each of your tests.

For more information on creating and managing flows, see Chapter 2, "Working With Flows."

Business Process Testing for SAP Applications Workflow

This section provides an example of a common workflow using Business Process Testing for SAP Applications, including automatic learning of flows. The actual workflow in an organization may differ for different projects, or at different stages of the application development life cycle. All stages in this workflow can be performed by a Subject Matter Expert, without the involvement of an Automation Expert.

The workflow consists of the following stages:

```
┌─────────────────────┐
│  Import Application  │
│      Hierarchy       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│      Create          │
│      Flows           │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│     Learn Flows      │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Build Test from    │
│   Learned Flows      │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│     Run Test in      │◄──┐
│  Change Detection    │   │
│       Mode           │   │
└─────────────────────┘   │
           │               │
           ▼               │
┌─────────────────────┐   │
│     Resolve          │   │
│     Changes          │───┘
└─────────────────────┘
```

Importing the Application Hierarchy

The Application Model module enables you to manage a hierarchical representation of the entities in your SAP application. You can choose to import entities from your SAP application, and add and modify application entities and folders. This enables Business Process Testing for SAP Applications to create associations automatically between application entities in the Application Model module and the business components created when learning flows automatically.

For more information on importing the application hierarchy, see Chapter 7, "Working with Application Model Entities in Quality Center."

Creating Flows

You create flows in the Test Plan module. You can provide details to the flow, such as a description and comments. You can also assign attachments to the flow, and associate the flow with other Quality Center records, such as requirements, defects, and application entities. In addition, you can create and configure manual and automatic business components and add them to the flow.

For more information, see Chapter 2, "Working With Flows."

Learning Flows

Business Process Testing for SAP Applications offers the option to learn flows automatically as you navigate your SAP application. Business Process Testing for SAP Applications creates automated business components corresponding to screens and transactions in your SAP application, and creates component steps based on the operations you perform. These components are then added to the flow. During the learning process you can insert checkpoints and output values.

When you learn flows, Business Process Testing for SAP Applications automatically creates component input parameters for controls in the SAP user interface that require user input, such as text fields. The default value for these parameters is the value you insert in these fields during the learn flow process.

For more information, see Chapter 4, "Learning Flows."

Building Tests from Flows

You build a business process test based on the flows learned automatically. In addition, you can include other flows, and manual and automatic business components.

For more information, see "Adding Flows to Business Process Tests" on page 29.

Running Tests in Change Detection Mode

If your test includes flows learned automatically, you can run the test in change detection mode. When you run a test in change detection mode, Business Process Testing for SAP Applications checks whether elements in your SAP application have changed since the flow was learned. This enables you to later update your flows to reflect these changes.

For more information on detecting changes, see "Detecting Changes" on page 70.

Resolving Changes

When a test or flow that ran in change detection mode is complete, you can view a report detailing the status of each flow, business component, and component step in your test, including whether objects used in your steps have changed in your SAP application. If changes were detected during the test run, you are offered a variety of options for resolving them, such as removing an obsolete step from a component, or reporting a defect.

After you resolve the changes and update your flows and tests, you can run additional testing cycles to further test your SAP application.

For more information on resolving changes, see "Resolving Changes" on page 83.

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Working With Flows

This chapter describes how to create, build, and manage flows, and how to add flows to business process tests.

This chapter includes:

About Working With Flows

A flow is a collection of business components in a fixed sequence that can be used as a unit in different business process tests. This provides you with a unit that can be maintained in only one place, but which you can use as a building block in multiple tests. You work with flows in the Test Plan module.

After you create a flow, you develop it by providing flow details, adding attachments, and creating associations between the flow and other Quality Center records, such as requirements, defects, and application entities. These associations provide real-time visibility into modifications for interrelated, application-quality elements.

You build a flow by adding existing components to it, by adding component requests, or by learning the flow automatically by navigating your SAP application. When your flow is ready, you can add it to business process tests, together with other flows and business components.

Note: The permission settings for a user group for working with flows are the same as those for the user group for working with tests. For more information on configuring user group permission settings, refer to the *HP Quality Center Administrator's Guide*.

Creating Flows

You create flows within the Test Plan Tree in the Test Plan module.

To create a flow:

1 If the Test Plan module is not open, click the **Test Plan** button on the sidebar. The Test Plan module opens.

2 If the Test Plan Tree is not displayed, choose **View** > **Test Plan Tree**.

3 Select the folder in the Test Plan Tree in which you want to create the flow and click the **New Test** button. The Create New Test dialog box opens.

4 In the **Test Type** box, select **FLOW**.

5 In the **Test Name** box, type a name for the flow.

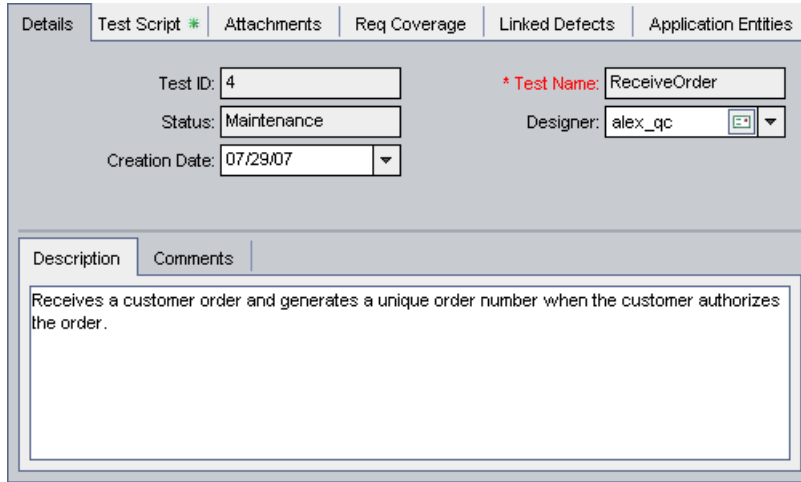**6** Click **OK**. The flow is added to the selected folder in the Test Plan Tree.

Developing Flows

After you create a flow, you can use the following tabs to plan and design the flow:

➤ **Details tab.** Enables you to view and modify flow details. For more information, see "Viewing Flow Details" on page 24.

➤ **Test Script tab.** Enables you to build the structure of the flow by selected one or more business components and adding them to the flow, or by learning the flow automatically by navigating your SAP application. For more information, see "Understanding the Test Script Tab" on page 26.

➤ **Attachments tab.** Enables you to associate the flow with a file, a URL, a screenshot, system information, or the content of the clipboard. For more information on working with attachments, see the *HP Quality Center User's Guide*.

➤ **Req Coverage tab.** Enables you to associate the flow with requirements. You create requirements coverage for a flow in the same way as you would for a test. For more information, see the *HP Quality Center User's Guide*.

➤ **Linked Defects tab.** Enables you to link the flow with existing defects, or to create a new defect and link it to the flow. For more information on defect linkage, see the *HP Quality Center User's Guide*.

➤ **Application Entities tab.** Enables you to associate the flow with this application entities stored in the Application Model module. These entities represent elements of your SAP application hierarchy. For more information on the Application Model module, see Chapter 7, "Working with Application Model Entities in Quality Center."

Viewing Flow Details

You can view and modify details for a flow by selecting the flow in the Test Plan Tree and clicking the **Details** tab.

The following table describes the fields and tabs displayed in the Details tab:

Field/Tab	Description
Test ID	A unique numeric ID assigned by Quality Center to the flow. This field is read-only.
Test Name	The flow's name. This field is read-only in the Details tab, but you can rename a flow by right-clicking the flow in the Test Plan Tree, choosing **Rename**, and typing the new name.

Field/Tab	Description
Status	The flow's status, determined by the statuses of the business components in the flow. The following statuses are possible: ➤ **Ready.** All the components in the flow have status **Ready**. ➤ **Maintenance.** At least one component in the flow has status **Under Development** or **Maintenance**, and no components have status **Error** or are obsolete. ➤ **Error.** At least one component in the flow has status **Error**, and no components are obsolete. ➤ **Outdated.** At least one component in the flow is obsolete. For more details on statuses for business components, refer to the *HP Business Process Testing User's Guide*.
Designer	The designer of the flow. Must be one of the Quality Center users assigned to the project.
Creation Date	The date on which the flow was created.
Description	A description of the flow.
Comments	Comments on the flow. You can click the **Add Comment** button to add a new comment, including the current date and name of the current user.

Understanding the Test Script Tab

The Test Script tab enables you to build the structure of a flow by adding one or more business components to the flow, or by learning the flow automatically. You can also use the tab to configure values for component parameters, define flow parameters and their default values, add run conditions to the flow, validate the flow, run the flow in debug mode, and generate business component requests.
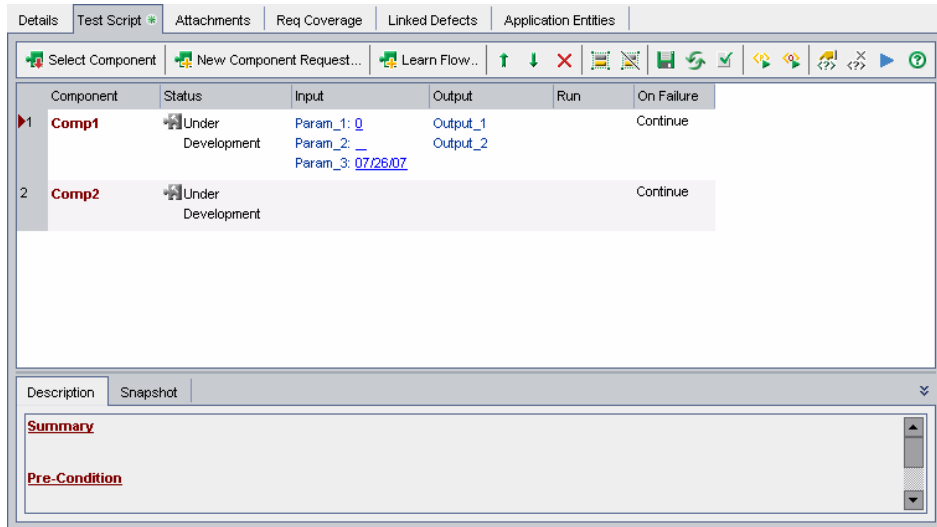
Most of the functionality available in the Test Script tab for flows is the same as that available for business process tests. For more information on this functionality, see the *HP Business Process Testing User's Guide*.

In addition to the standard functionality available for business process tests, the Test Script tab for flows includes the following toolbar buttons:

➤ **Learn Flow.** Enables you to learn a flow automatically by navigating your SAP application. For more information, see Chapter 4, "Learning Flows."

➤ **Flow Input Parameters.** Enables you to define default values for your flow input parameters. For more information, see "Defining Default Flow Input Parameter Values" on page 40.

➤ **Flow Output Parameters.** Enables you to define flow output parameters. For more information, see "Defining Flow Output Parameters" on page 41.

➤ **Add Run Condition.** Enables you to add a run condition to your flow. For more information, see "Adding Run Conditions" on page 64.

➤ **Remove Run Condition.** Enables you to remove an existing run condition from your flow. For more information, see "Removing Run Conditions" on page 68.

Building Flow Structure

A flow consists of a sequence of one or more business components. You build the structure of a flow by selecting the business components from the Component Tree and adding them to the flow.


Notes:

➤ In addition to manually adding existing business components to a flow, you can create a flow comprising components created automatically by recording your actions as you navigate an SAP application. For more information, see Chapter 4, "Learning Flows."

➤ You can group components in a flow as you would for business process tests. However, it is recommended that you do not group components in a flow for compatibility with future versions of Business Process Testing for SAP Applications.

To build a flow:

1 In the Test Plan Tree, select the flow to which you want to add components and click the **Test Script** tab. The Test Script tab displays the components currently in the flow.

2 Click the **Select Component** button. The Component Tree opens in the right pane.
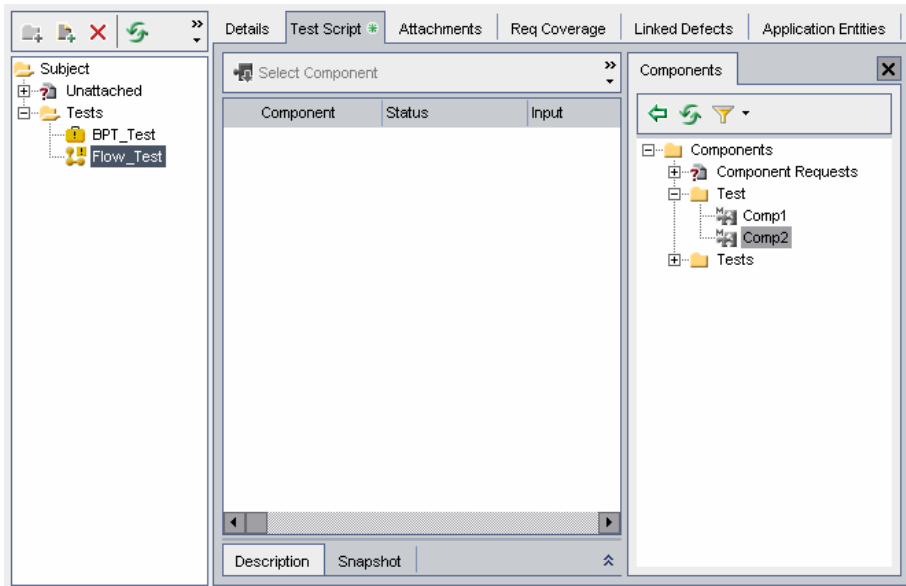
Tip: In addition to adding existing components to your flow from the Component Tree, you can add a component request. A component request acts as a signal to add a new business component to the Business Components module. You add component requests to a flow as you would for a business process test. For more information on component requests, refer to the *HP Business Process Testing User's Guide*.

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3 In the Component Tree, expand the folder containing the business component that you want to add to the flow.

4 In the Component Tree, select the component that you want to add to the flow and click the **Add Component to Test** button. Alternatively, drag the component into the Test Script pane.

5 To add additional components to the flow, repeat steps 3 and 4 for each additional component.

6 Use the **Move Component Up** and **Move Component Down** buttons to arrange the components in the test in the correct order. Alternatively, click the gray sidebar to the left of a component and drag the component to the correct position.

7 You can add flow parameters and run conditions to increase the flexibility of your flow. For more information on flow parameters, see Chapter 3, "Working with Flow Parameters." For more information on run conditions, see Chapter 5, "Defining Run Conditions."

Managing Flows

You can cut, copy, paste, rename, delete, and validate flows. You perform these actions for flows in the same way as you would for business process tests. For more information on performing these actions for business process tests, refer to the *HP Business Process Testing User's Guide*.
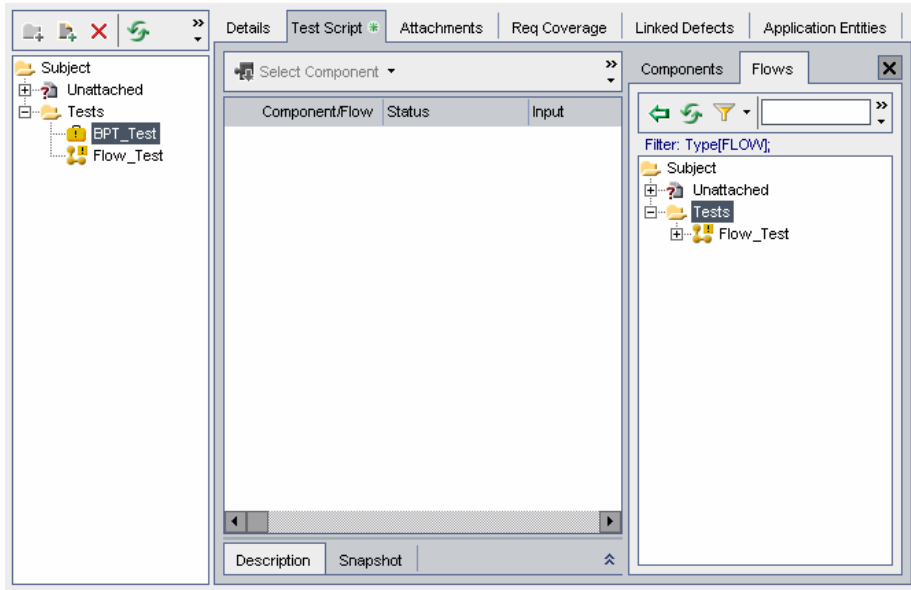
Adding Flows to Business Process Tests

You can use flows in business process tests. A business process test can comprise only business components, only flows, or a combination of business components and flows. This section describes how to add flows to business process tests. For more information on adding business components to business process tests, see the *HP Business Process Testing User's Guide*.

To add a flow to a business process test:

1 In the Test Plan Tree, select the business process test to which you want to add a flow and click the **Test Script** tab. The Test Script tab displays the components and flows that are currently in the business process test.

2 Click the **Select Component** arrow and select **Select Flow**. The Test Plan Tree opens in the Flows tab in the right pane, filtered to display only flows and folders containing flows.

3 In the Test Plan Tree, select the flow that you want to add to the business process test and click the **Add to Test** button.

4 To add additional flows to the test, repeat step 3 for each additional flow.

After you add flows to a test, you can manage the flows within the test in the same way as you would for business components within a test. For more information on managing business components in a business process test, see the *HP Business Process Testing User's Guide*.

Tip: Flows can also be added directly to test sets in the Test Lab module.

3

Working with Flow Parameters

This chapter describes how to use flow input and output parameters to increase the flexibility of your flows and tests.

This chapter includes:

About Working with Flow Parameters

You can use flow parameters to increase the flexibility of your flows and tests. Flow parameters enable you to perform the same operations on the application you are testing with multiple sets of data.

There are two types of flow parameters: flow input parameters and flow output parameters.

➤ **Flow input parameters** enable you to define data used by a flow that is provided to the flow from an external source. You can generate flow input parameters automatically, based on existing component input parameters. You can also define flow input parameters manually by specifying a new flow input parameter as the value for a component input parameter. After you define a flow input parameter, you can assign it a default value.

➤ **Flow output parameters** enable you to define data that is retrieved and stored by a flow and can be used in subsequent components or flows in a business process test.

Note: In addition to flow parameters, you can also define component parameters for business components within a flow or test. For more information on component parameters, refer to the *HP Business Process Testing User's Guide*.

For example, suppose you create three flows corresponding to different stages in processing a customer order:

➤ **ReceiveOrder.** Receives a customer order and generates a unique order number when the customer authorizes the order.

➤ **SendOrder.** Sends the customer the goods the customer ordered.

➤ **BillOrder.** Sends the customer a bill for the goods.

In this example, you want to define a business process test to test the entire order processing workflow from receiving the order to billing it. You could therefore define an output parameter from the flow ReceiveOrder called OrderNumber, which stores the value of the order number generated when the order is placed. You could then use this value as an input parameter for the subsequent flows in the business process test.

Understanding Flow Input Parameters

A **flow input parameter** is an input parameter that can receive a fixed value, use a value returned by a flow output parameter or a component output parameter from the same flow, or use a parameter value that is supplied when the flow runs in a business process test in the Test Lab module.

A flow input parameter must be assigned as an input parameter of a business component that is included in the flow. By default, the value for the flow parameter is then used as the value of the component input parameter. For more information on component input parameters, see the *HP Business Process Testing User's Guide*.

You can generate flow input parameters based on existing input parameters for a component, or define a new flow input parameter by specifying the new parameter as the value for a component input parameter.

This section includes the following topics:

➤ Generating Flow Input Parameters

➤ Defining Flow Input Parameters

Generating Flow Input Parameters

You can generate flow input parameters based on existing input parameters for a component within the flow. When the component runs, these component input parameters take the values assigned to the corresponding flow input parameters.

There are several ways to generate flow input parameters. For example, you can:

➤ specify whether to use the same or unique flow parameters for each iteration

➤ configure the naming convention for your flow parameters

➤ generate flow parameters for all component parameters

➤ specify the cells in the Component Iterations or Group Iterations dialog box for which you want to generate flow parameters

To generate flow input parameters:

1 In the Test Plan Tree, select the flow for which you want to generate flow input parameters. Click the **Test Script** tab.

2 In the Test Script tab, right-click the component whose component input parameters you want to use as a basis for generating flow input parameters and select **Iterations**, or click on the parameter name. The Component Iterations dialog box opens.
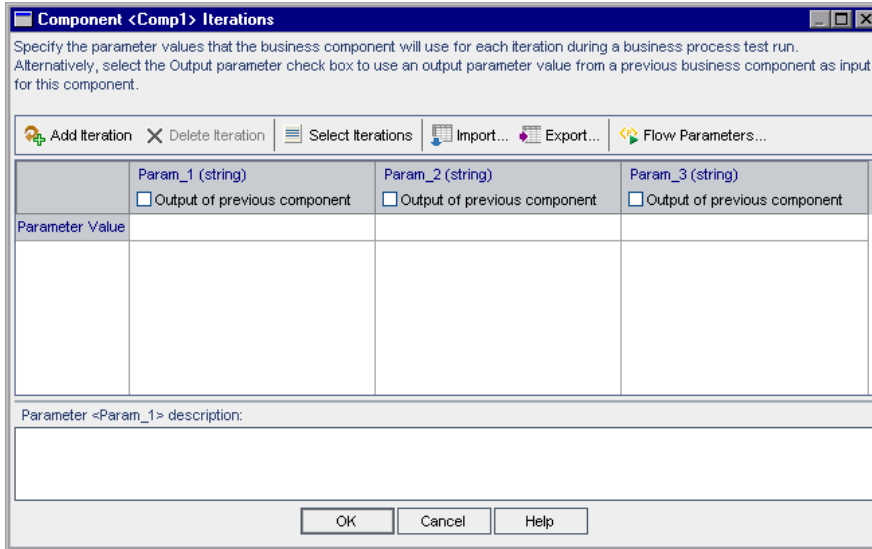
Most of the functionality available in the Component Iterations dialog box for flows is the same as that available for regular components. For more information on this functionality, see the *HP Business Process Testing User's Guide*.

Tip: You can also generate flow input parameters automatically from the Group Iterations dialog box, based on input parameters for components within component groups. You generate flow input parameters from the Group Iterations dialog box as you would from the Component Iterations dialog box. For more information on component groups, see the *HP Business Process Testing User's Guide*.

---

3 Click the **Flow Parameters** button. Define the criteria for creating and naming flow parameters. For more information, see "Understanding the Define Flow Parameters Dialog Box." on page 35.

4 Click **OK**. The Define Flow Parameters dialog box closes and flow input parameters are generated for the flow, based on the criteria you selected.

Understanding the Define Flow Parameters Dialog Box.

The Define Flow Parameters dialog box defines the way flow parameters are created and named.
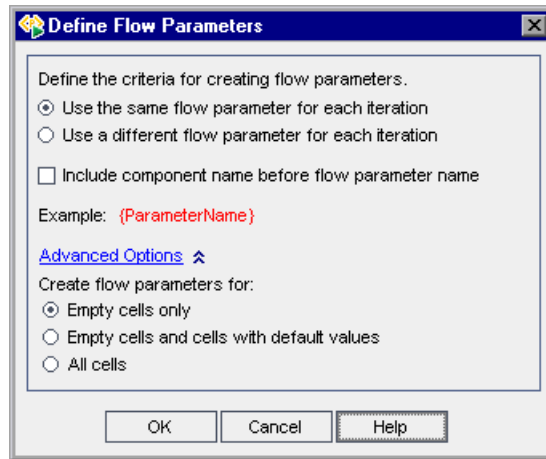
The Define Flow Input Parameters dialog box contains the following options:

Option	Description
Define the criteria for creating flow parameters	➤ **Use the same flow parameter for each iteration.** Clears the flow parameter values between iterations so that the same parameter names are used for every iteration, but the values are not passed from one iteration to the next. ➤ **Use a different flow parameter for each iteration.** Automatically creates a new flow parameter for each iteration. The parameter values are saved with each iteration run.
Include component name before flow parameter name	Adds the component name as a prefix preceding the generated flow parameter name.
Example	Provides an example of the flow parameter name based on the selected criteria.

The **Advanced Options** link expands the dialog box to display the following options:

Option	Cells for which flow parameters are generated
Create flow parameters for	**Empty cells only.** Creates flow parameters only for cells that do not contain any value (default). **Empty cells and cells with default values.** Creates flow parameters for all cells that either do not contain a value or contain the default value defined in the component parameter. **All cells.** Creates flow parameters for all cells in the Component Iterations or Group Iterations dialog box.

Defining Flow Input Parameters

You can define flow input parameters manually from the Component Iterations dialog box, by specifying the new parameter as the value for a component input parameter.

Most of the functionality available in the Component Iterations dialog box for flows is the same as that available for regular components. For more information on this functionality, see the *HP Business Process Testing User's Guide*.


Tip: You can also define flow input parameters from the Group Iterations dialog box. You define flow input parameters from the Group Iterations dialog box as you would from the Component Iterations dialog box. For more information on component groups, see the *HP Business Process Testing User's Guide*.

To define a flow input parameter:

1 In the Test Plan Tree, select the flow for which you want to add a flow input parameter. Click the **Test Script** tab.

2 In the Test Script tab, right-click a business component in the flow and choose **Iterations**, or click on the parameter name. The Component Iterations dialog box opens.
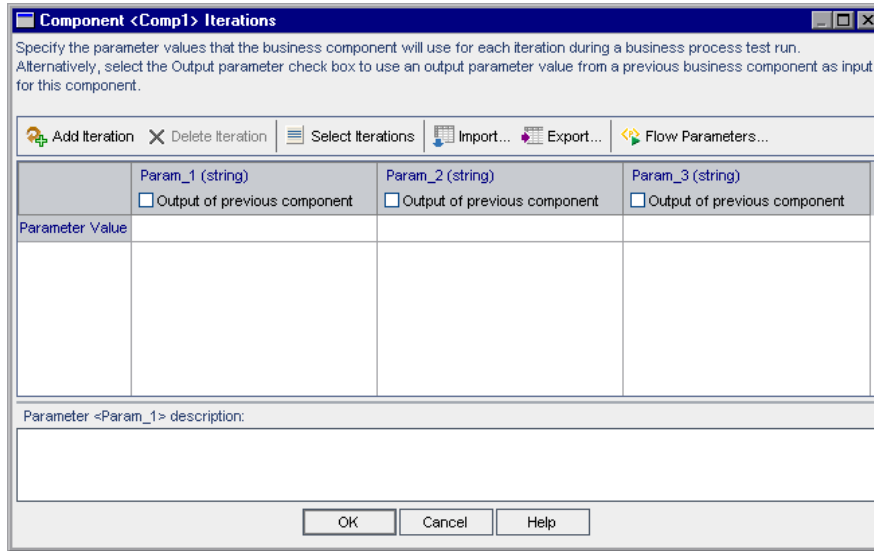
3 If you want to create a flow input parameter to assign to a string or date type component input parameter, proceed to step 4.

If you want to create a flow input parameter to assign to a number, boolean, or password type component input parameter, click the relevant cell, click the down arrow, and select **<New Flow Parameter>**. Type the name of the flow input parameter you want to create. Proceed to step 9.

4 If you want to create a flow input parameter to assign to a string or date type component input parameter, click the relevant cell and click the browse button. The Set String Value or Set Calendar Value dialog box opens.

5 Select **Flow parameter**. A list of existing flow input parameters is displayed.
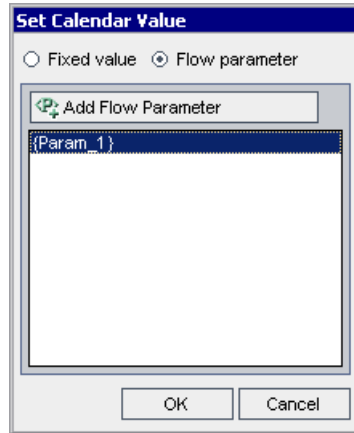
6 Click the **Add Flow Parameter** button. The New Flow Parameter dialog box opens.
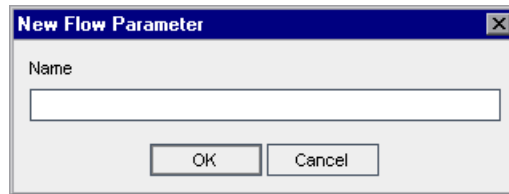
7 In the **Name** box, type a name for the flow input parameter you want to create and click **OK**. The New Flow Parameter dialog box closes.

8 Click **OK**. The Set String Value or Set Calendar Value dialog box closes.

9 Click **OK**. The Component Iterations dialog box closes.

Defining Default Flow Input Parameter Values

You can define default values for flow input parameters. When you run a test containing a flow, and no value is supplied to the flow input parameter from some other source, the default value is used.

To define a default flow input parameter value:

1 In the Test Plan Tree, select a flow that has at least one flow input parameter.

2 In the Test Script tab, click the **Flow Input Parameters** button. The Flow Input Parameters dialog box opens.

3 Select the parameter for which you want to define a default value and click the **Value** column.

4 Type or select the default value you want to use for the parameter. This value must be consistent with the parameter type displayed in the **Value Type** column.

5 In the **Description** box, you can type a description of the parameter.

6 Click **OK**. The Flow Input Parameters dialog box closes.

Defining Flow Output Parameters

A **flow output parameter** is a parameter whose value can be returned from a flow and used as an input parameter value in a subsequent component outside of the current flow in a business process test, or as an input flow parameter.

A flow output parameter must be an output parameter of a business component that is included in the flow. For more information on component output parameters, see the *HP Business Process Testing User's Guide*.

When you create a flow output parameter for a specific component output parameter, it is automatically renamed to match the component and flow parameter naming convention. If required, you can change the flow output parameter name to suit your needs.

To define a flow output parameter:

1 In the Test Plan Tree, select the flow for which you want to define a flow output parameter.

2 In the Test Script tab, click the **Flow Output Parameters** button. The Flow Output Parameters dialog box opens.
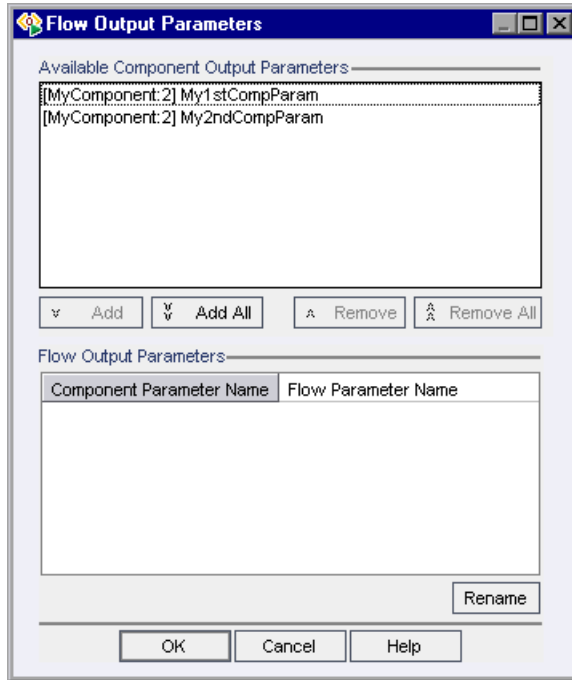
The Available Component Output Parameters list displays the output parameters of the components in the flow that are not already defined as flow output parameters. The components are listed using the following naming convention: **[<ComponentName>:<Iteration>] <ParameterName>**

The Flow Output Parameters list displays the output parameters of components in the flow that are already defined as flow output parameters.

3 In the Available Component Output Parameters list, select the component output parameter that you want to define as a flow output parameter and click the **Add** button.

Tip: You can click the **Add All** button to define all component output parameters in the flow as flow output parameters.

---

4 To rename a flow output parameter, select the parameter in the Flow Output Parameters list, and click the **Rename** button. Type the new name and press ENTER. Note that renaming a flow output parameter does not rename the corresponding component output parameter.

Consider the following when renaming a flow output parameter:

➤ The parameter name must be unique within the flow.

➤ The parameter name must begin with a letter. If the first character of the component name is not a letter, the prefix **comp_** is added.

➤ The parameter name must not contain non-English characters nor any of the following characters: **! @ # $ % ^ & * ( )** + = \ { } | ; ' : " , . / < > **?** ~ ` [ ] – Any invalid character is automatically replaced by an underscore (_).

5 To remove a defined flow output parameter, in the Flow Output Parameters list, select the flow output parameter and click the **Remove** button.

Tip: You can click the **Remove All** button to remove all defined flow parameters.

---

6 Click **OK**. The Flow Output Parameters dialog box closes.

Understanding Table Parameters

When you enter data to a table in your SAP application while learning a flow automatically, Business Process Testing for SAP Applications creates a table parameter.

Note: To create table parameters during the learn flow process, you must enable QuickTest to create table parameters. In QuickTest select **Tools > Options** and click the **SAP** tab. Under **SAP GUI for Windows** > **Record settings** ensure that the **Auto-parameterize table and grid controls** check box is selected.

A **table parameter** is a component input parameter that enables you to use a single parameter to set multiple table cells for a table in your SAP application instead of using separate parameters for each table cell.

Note: Empty columns are ignored when comparing table parameters. For example, suppose table parameter Alpha has columns A, B, and C, with content in all three columns, and table parameter Beta has columns A, B, C, and D but column C is empty. If the content of the three columns with content in table parameter Beta (A, B, and D) matches that of the three columns in table parameter Alpha, the two table parameters are seen as equal.

A table parameter can be created only when learning flows automatically. You can export the table parameter definition to a **.csv** (comma separated values) file or import data from an existing **.csv** file. The table parameter definition includes the table structure and default values.
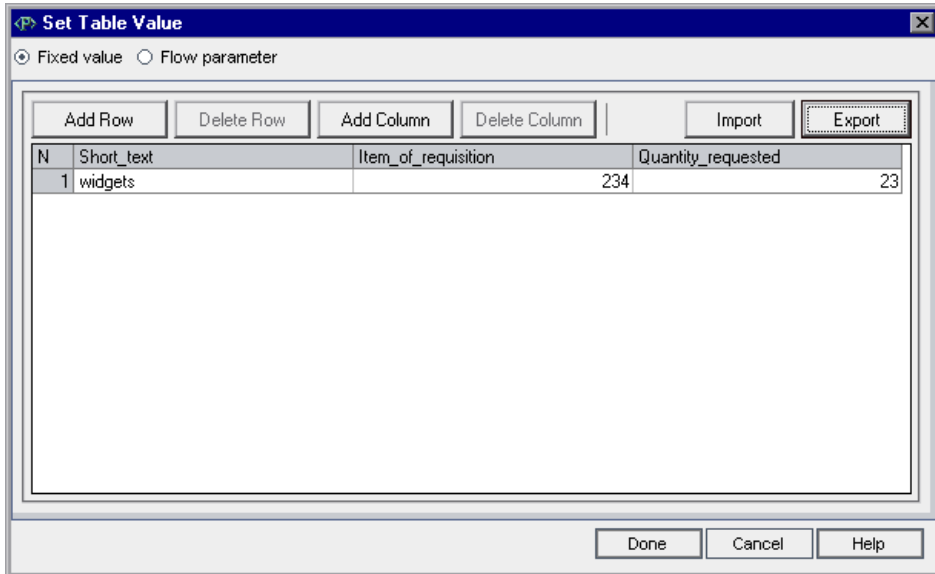
You can access the Set Table Value dialog box:

➤ **On the component level.** When setting default values of parameters, a Table Parameter is displayed as **[Table Data]**. Click this link to open the Set Table Value dialog box.

➤ **On the flow level.** When setting parameter values for component iterations, a Table Parameter is displayed as **[Table Data].** Click this link to open the Set Table Value dialog box.

➤ **On the test level.** When setting parameter values for flow iterations, a Table Parameter is displayed as **[Table Data].** Click this link to open the Set Table Value dialog box.

➤ **On the test set level.** When setting parameter values for test iterations, a Table Parameter is displayed as **[Table Data].** Click this link to open the Set Table Value dialog box.

➤ **In the Run Condition dialog box.** When specifying criteria for run conditions, a Table Parameter is displayed as **[Table Data]** in the **Value** edit box. Click this link to open the Set Table Value dialog box.

The Set Table Value dialog box contains the following options:

Option	Description
Fixed value	Available only when accessing the Set Table Value dialog box via a flow in the **Test Plan** module. Enables you to enter fixed values in the individual cells of the table parameter.
Flow parameter	Available only when accessing the Set Table Value dialog box via a flow in the **Test Plan** module. Enables you to define the table parameter as a flow parameter.
Run-time parameter	Available only when accessing the Set Table Value dialog box via a business process test in the **Test Plan** module. Enables you to define the table parameter as a run-time parameter.

Option	Description
Add Column	Adds a column to the table parameter grid. The column is added to the right of the column in which the cursor is currently located. If the cursor is not in any column, the column is added at the end.
Add Row	Adds a row to the table parameter grid. The row is added below the row in which the cursor is currently located. If the cursor is not in any row, the row is added at the end.
Table cell	Enables editing of the default value for a table cell. Select the cell and enter the default value.
Column headers	Enables renaming of columns. Click on the header to rename the column. Column names must match the column names in the SAP application. You can also use the SAP index of a column with the **#** sign to name a column. For example, **#3**.
Delete Column	Deletes the selected column from the table parameter grid.
Delete Row	Deletes the selected row from the table parameter grid.
Export	Exports the table parameter definition to a **.csv** (comma separated values) file.
Import	Imports a table parameter definition from a .csv file. Ensure that the file is in the proper format.

Tip: Use the export option to generate the .csv file and then edit or add data as necessary. This ensures the proper format of the .csv file.

4

Learning Flows

This chapter describes how to learn flows automatically by navigating your SAP application.

This chapter includes:

About Learning Flows

If you are testing an SAP application and you have QuickTest Professional installed on your machine, Business Process Testing for SAP Applications enables you to learn a flow automatically, as you navigate through your SAP application. You first create an empty flow or select an existing flow, and then start the learn flow process. You then perform the operations in your application that you want Business Process Testing for SAP Applications to learn.

After you finish learning the flow, the extension breaks down the flow learned into a sequence of automated QuickTest keyword-driven business components, each representing a screen or tab in your SAP application. Parameters are automatically created for the steps in the components, based on user interface controls in the SAP application. You can use these learned flows as the basis for creating business process tests to test your SAP application. For more details on how Business Process Testing for SAP Applications breaks up a learned flow into components and creates parameters, see "How Business Process Testing for SAP Applications Creates Components" on page 49.

If you are working with the Application Model and it contains application entities related to the created components, these entities are automatically associated with the related components. For more information on working with the Application Model module, see Chapter 7, "Working with Application Model Entities in Quality Center."

Note: During the Learn Flow process resources are created which are stored in the BPT Resources folder. For the Business Process Test to perform properly, this folder and any of its sub folders should not be renamed or deleted.

You learn flows from the Test Plan module. For more information on learning flows, see "Learning Flows Automatically" on page 51.

How Business Process Testing for SAP Applications Creates Components

When Business Process Testing for SAP Applications learns a flow, it creates a new business component for each screen or tab through which you navigate in your SAP application. Each screen or tab within a particular transaction is represented as a separate business component. A separate component is created for a particular screen or tab for each transaction in which it is used.

The name of a created component is of the form **<Transaction code>-<Screen name>**. If the transaction code or screen name contains spaces or characters that are not valid in the names of business components, these characters are replaced by underscores (_). For example, if a component corresponds to the screen Create Sales Order: Initial Screen in the VA01 transaction, the component is named VA01-Create_Sales_Order_Intial_Screen.

If you navigate from one screen to a different screen or tab, and then return to the original screen, a new component is created with the same name as the component corresponding to the original screen, with a numerical suffix appended to differentiate between the components. For example, suppose the component corresponding to a screen is named VA01_Test. If you return to the screen, a new component is created named VA01_Test_01.

For each user operation within a screen that requires data specified by the user, a component input parameter is created for that step. The component input parameters that are created during the **Learn Flow** process are automatically set as flow parameters. The value input during the learn flow process used as the default parameter value. For example, a parameter would be created for a value entered in a text field.

If you add data to a table in your SAP application, a component table parameter is created. Table parameters enable you to use one parameter for an entire table, rather than using separate parameters for each table cell. For more information on working with table parameters, see "Understanding Table Parameters" on page 43.

Notes:

➤ During the learn flow process the table parameter saves the data only after you move the focus out of the table. If the table data is the last step in a learn process, ensure that you move the focus out of the table before stopping the learn.

➤ To create table parameters during the learn flow process, you must enable QuickTest to create table parameters. In QuickTest select **Tools** > **Options** > **SAP** tab. Under **SAP GUI for Windows** > **Record settings** ensure that the **Auto-parameterize table and grid controls** check box is checked. For more information, see "Understanding Table Parameters" on page 43.

If a screen contains a tab strip, one component is created for the common area on the screen, and a separate component is created for each tab opened. The status bar is included in each component created for the screen. For example, consider the screen below:
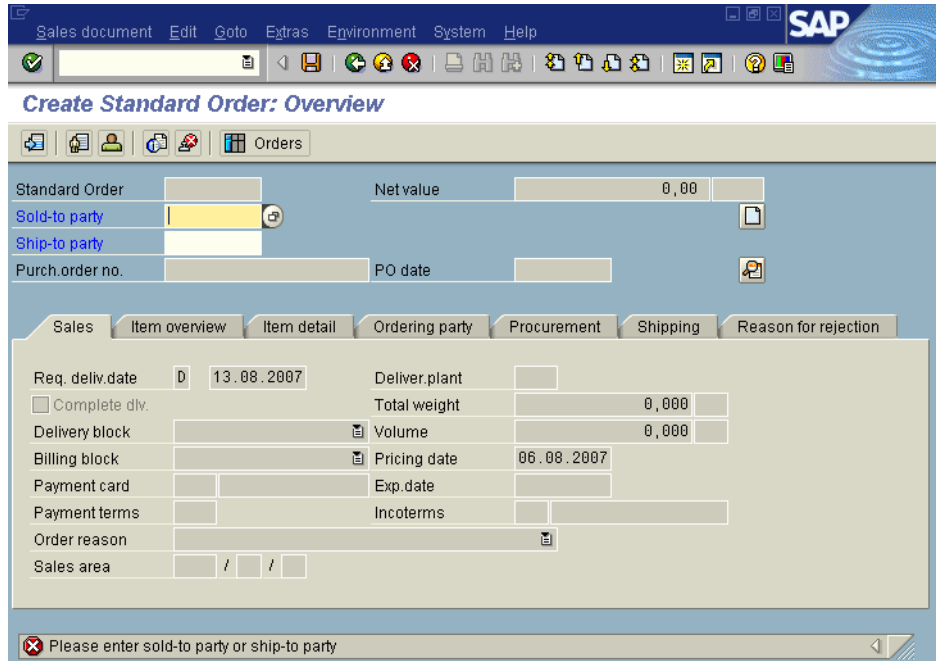
When you learn a flow containing this screen, operations performed on the upper area of the screen containing the menus, toolbars, and common fields (such as **Standard Order** and **Net value**) comprise a single business component. Operations performed in each of the **Sales**, **Item overview**, **Item detail**, **Ordering party**, **Procurement**, **Shipping**, and **Reason for rejection** tabs result in the creation of separate business components.

Learning Flows Automatically

You can learn a flow automatically from the Test Plan module. You can create a new flow or insert components created during the learn flow process into an existing flow.

Notes:

➤ To learn a flow, a user must belong to a user group that has permissions for the **Modify Test** task. For more information on configuring user group permission settings, see the *HP Quality Center Administrator's Guide*.

➤ Only the SAP GUI client is supported by Business Process Testing for SAP Applications.

To learn a flow:

1 Open and log in to the SAP application for which you want to learn the flow, and navigate to the point at which you want to start learning the flow.

Note:

➤ You must log in to your application before you start to learn the flow. Business Process Testing for SAP Applications is not able to learn the login procedure.

➤ If you want to insert learned components into an existing flow, you can use the option described in step 5 to run the initial components to navigate to the correct location in your application.

---

2 In the Test Plan module, create a new flow or select an existing flow. For more information on creating flows, see "Creating Flows" on page 22.

3 Click the **Test Script** tab.

4 If there are already components in the flow and you want to insert the new components between existing components, select the component after which you want to insert the new components.

For example, suppose your flow contains the components Comp_1, Comp_2, and Comp_3. If you want to insert the new components between Comp_2 and Comp_3, select Comp_2.

Note: To insert the new components at the beginning of the flow (before existing components), you must first insert the new components to a different location, and then change the order of the components in the flow manually after the learn process is finished.

---

5 In the Test Script tab toolbar, click the **Learn Flow** button.

If there are already business components in the flow, the Learn Flow dialog box opens.
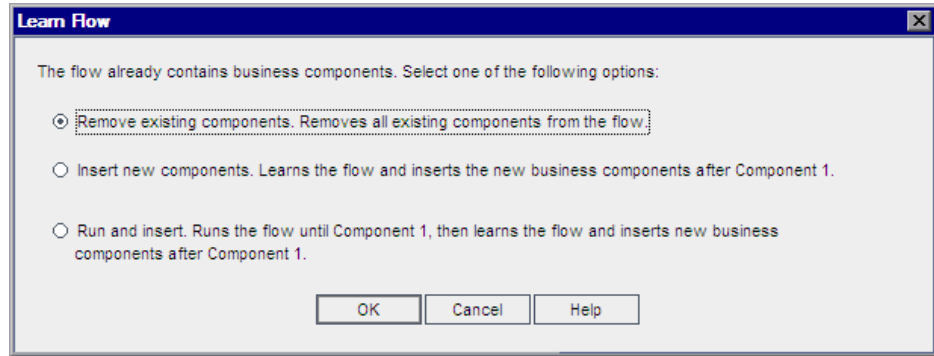
Select one of the following options for handling the existing components, and click **OK**. The Learn Flow dialog box closes.

Option	Description
Remove existing Components	Removes all the existing business components from the flow and learns the components in the emptied flow.
Insert new components.	Learns the flow and inserts the resulting components after the selected existing component.
Run and insert	Runs the existing components in the flow until the selected component, then learns the flow, and inserts the resulting components after the selected existing component.

A message box reminds you that you must open your SAP application. Click **Learn Flow** to continue.

6 The Learn Flow toolbar opens.
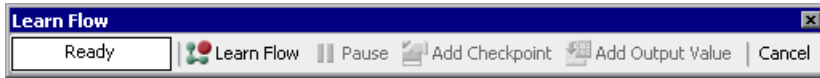
In the Learn Flow toolbar, click the **Learn Flow** button. The button changes to a **Stop Learn** button.

7 In your SAP application, perform the operations that you want to learn. While Business Process Testing for SAP Applications is learning the flow, you can control the learn flow process using the Learn Flow toolbar. For more information, see "Understanding the Learn Flow Toolbar" on page 56.

8 When you finish performing the operations that you want to learn, click the **Stop Learn** button in the Learn Flow toolbar. The Learn Flow Summary dialog box opens.
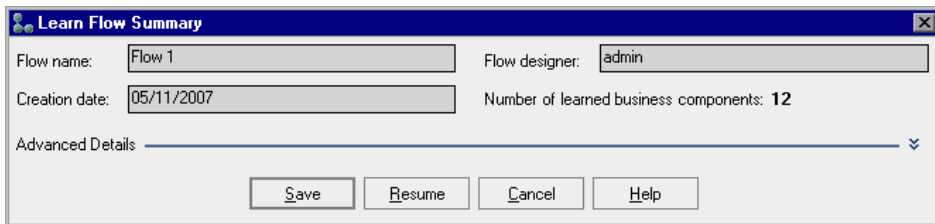
9 You can use the Learn Flow Summary dialog box to view details of the learned steps. For more information, see "Understanding the Learn Flow Summary Dialog Box" on page 59.

10 By default, the created components are added to the Business Components Tree in a folder with a path parallel to the path of the flow in the Test Plan Tree. For example, if the flow MyFlow is located in the folder Subject\MyFlows in the Test Plan Tree, the learned business components are, by default, created in the folder Components\MyFlows\MyFlow.

﹀ To change the default location, click the **Expand** button to expand the **Advanced Details** area and click the browse button. The Select Business Component Folder dialog box opens.
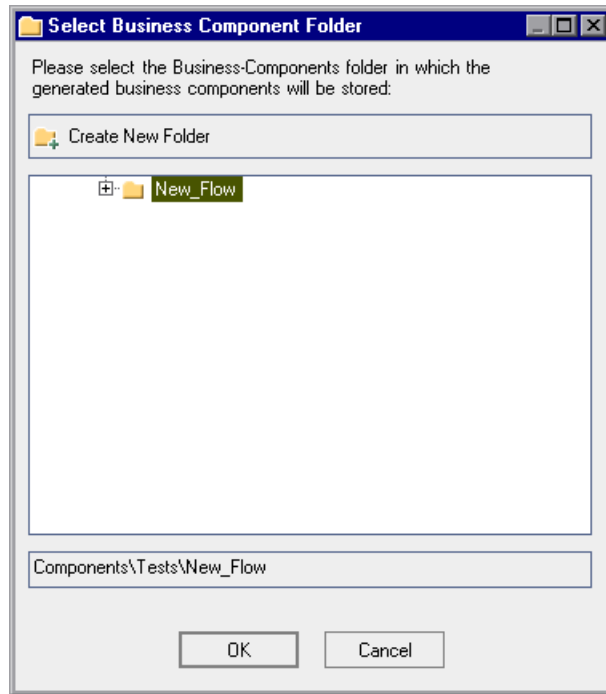
Select the folder in which to create the business components.

You can create a new folder in the Business Components Tree. To create a new folder, select the folder under which you want to create the new folder and click the **Create New Folder** button. In the Create New Folder dialog box that opens, type a name for the new folder. Click **OK**.

Click **OK**. The Select Business Component Folder dialog box closes.

11 Click **Save**. The Learn Flow Summary dialog box closes. The components created as a result of the learn flow process are added to the Business Components module, and these components are added to the flow. It may take some time to save the created components.
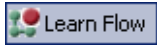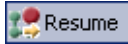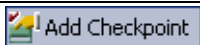
Note: Creation of business components for a learned flow may take some time.

Understanding the Learn Flow Toolbar

The following table describes the features of the Learn Flow toolbar, which enables you to control the learn flow process. For more information on learning flows, see "Learning Flows Automatically" on page 51.

Button	Description
Learn Flow	(Available only when Business Process Testing for SAP Applications is not learning a flow.) Starts learning a flow.
Stop Learn	(Available only when Business Process Testing for SAP Applications is learning a flow.) Stops learning a flow.
Pause	(Available only when Business Process Testing for SAP Applications is learning a flow.) Pauses learning a flow. When the learn flow process is paused, any actions you perform on your SAP application are not learned. To resume learning actions, click the **Resume** button.
Resume	(Available only when the learn flow process is paused) Resumes learning after a pause.
Add Checkpoint	Inserts a checkpoint into the automated component. A checkpoint is a verification point that compares a current value for a specified property with the expected value for that property. This enables you to identify whether your SAP application is functioning correctly. For more information, see the "Adding Checkpoints to Flows" on page 57.

Button	Description
Add Output Value	Enables you to add an output value to the automated component. An output value is a step in which one or more values are captured at a specific point in your test and stored for later use. For more information, see "Adding Output Values to Flows" on page 58.
Cancel	Cancels the current learn flow process. If you cancel the learn flow process, all flows learned during that session are not saved.

Adding Checkpoints to Flows

You can add object property checkpoints to a component during the Learn Flow process. Object property checkpoints enable you to check object property values during a test run to determine if they match expected values. The test results provide information about which object property checkpoints failed during a test run, and why.

To insert a checkpoint during the Learn Flow process:

**1** During the Learn Flow process, perform the operations you want to learn up to the point that you want to insert a checkpoint. Click the **Add Checkpoint** button on the Learn Flow toolbar. The cursor changes to a pointing hand and the Learn Flow toolbar is hidden.

2 Point to the object in your SAP application for which you want to create an object property checkpoint. The Checkpoint Properties dialog box opens.
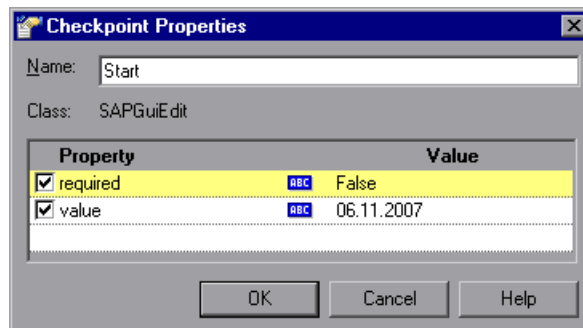
3 By default, all the properties in the dialog are selected for verification. Clear the check box of any values you do not want to check and click **OK**. The object property checkpoint is added to the component.

4 Continue performing operations in your SAP application to continue learning the flow.

Adding Output Values to Flows

You can add an object property output value step to a component during the Learn Flow process. Object property output value steps allow you to capture and store values during your test. These values can later be used as input at a different point in the run session.

To insert an object property output value during the Learn Flow process:

1 During the Learn Flow process, perform the operations you want to learn up to the point that you want to insert a checkpoint. Click the **Add Output Value** button on the Learn Flow toolbar. The cursor changes to a pointing hand and the Learn Flow toolbar is hidden.

2 Point to the object on the screen for which you want to create an output value. The Output Value Properties dialog box opens.
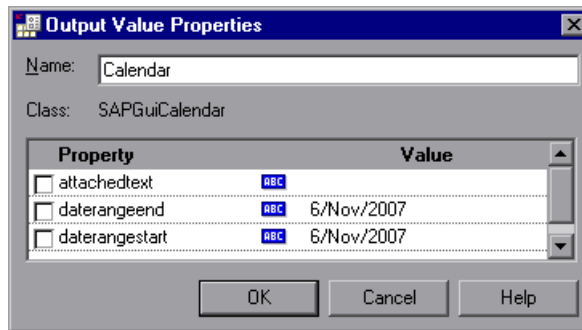
3 By default, none of the properties are selected for the Output. Select those properties whose values you want to output and click **OK**. The object property output value step is added to the component.

4 Continue performing operations in your SAP application to continue learning the flow.

Understanding the Learn Flow Summary Dialog Box

The Learn Flow Summary dialog box displays information about the steps performed during the learn process and the components created as a result. For more information on learning flows, see "Learning Flows Automatically" on page 51.
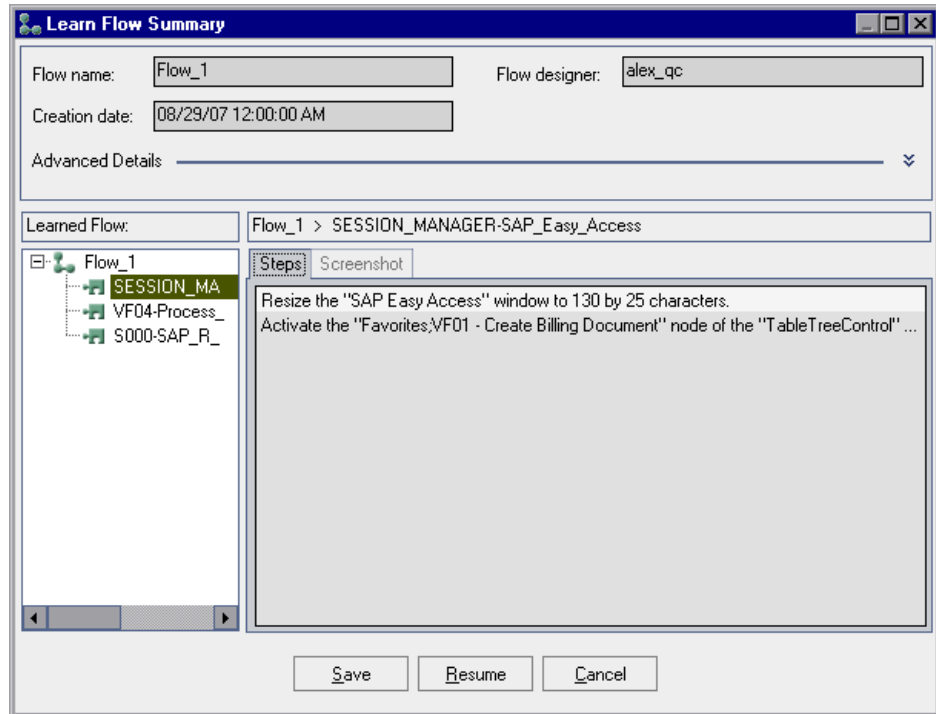
Note: When it opens, the Learn Flow Summary dialog box is displayed with the **Advanced Details** section collapsed. Click the double arrow to the right of **Advanced Details** to expand and display the full dialog box.

The Learn Flow Summary dialog contains the following elements:

Element	Description
Flow Details pane	The top section of the Learn Flow Summary dialog box displays details about the flow. The flow details pane contains the following information: ➤ **Flow Name.** The name of the flow. ➤ **Flow Designer.** The Quality Center user name of the user who designed the flow. ➤ **Creation Date.** The date and time on which the flow was created.
Advanced Details Area	Displays additional information about the learned flow. Click the arrows to expand and collapse this area.
Component Path	Displays the location where the learned components will be stored. You can change the path by clicking in the path and browsing to the new location.
Learned Flow	Displays the business components learned as part of the flow. You can select a component to display (in the **steps** tab) a breakdown of the steps in that component, and a screenshot of the application at the end of the component's execution (in the **Screenshot** tab).
Steps tab	Displays a description of the steps performed in the currently selected business component.
Screenshot tab	Displays a screenshot of your application at the selected step in the flow.
Save	Saves the components to the Business Components module and adds them to the flow.
Resume	Resumes learning the flow without saving the learned components.
Cancel	Cancels learning the flow. All the learned components are deleted.

5

Defining Run Conditions

This chapter describes how to define and work with run conditions for your flows.

This chapter includes:

About Defining Run Conditions

You can use run conditions to insert condition statements into your flows. A **run condition** checks the current value of a given parameter before running a component in a flow. It then determines whether to run the component, skip the component run, or end a run session completely, based on the parameter's value and the run condition's definition.

When you run business process tests containing flows with run conditions, the test run results displays the results of run conditions in the test, and which components were not run because a run condition was not met.

Run Condition Example

Suppose you want to test a shopping application that allows all customers to purchase items whose total value is less than USD $100, and allows only those customers with an acceptable credit rating to purchase items whose total value is equal to or greater than USD $100. You can apply run conditions to your components to determine whether to continue or end the component run or the entire business process test run based on the total value of the purchase and the customer's credit rating.

For this scenario, you might create three components and insert them in a PurchaseItems flow. (The end of this section includes a flowchart illustrating this example scenario.)

The first component, ConfirmOrder, confirms the order and contains an output parameter, TotalPrice, that stores the total purchase price. There is no need to add a run condition to this component.

The second component, CheckCreditRating, checks the customer's credit rating. This component receives as an input parameter the value of the TotalPrice output parameter from the previous component. This component also generates a Boolean output parameter, PurchaseApproval, whose value is set to **True** if the value of the TotalPrice parameter is less than **100**, or if the value of the TotalPrice parameter is greater than or equal to **100** and the credit rating has an acceptable value.

Since everyone can make purchases under $100, there is no need to run the CheckCreditRating component in these cases. You can create a run condition for this component that checks the value of the TotalPrice parameter and skips to the next component, PayForPurchases, if the value of the TotalPrice parameter is less than **100**, and continues to run the CheckCreditRating component if the value of the TotalPrice parameter is equal to or greater than **100**.

The third component, PayForPurchases, has an input parameter, PurchaseApproval, that receives the output value of the CheckCreditRating component. If the CheckCreditRating component was skipped (because the value was less than **100**), the default value, **True**, is automatically applied to this output value. If the CheckCreditRating component did run, then the value of the PurchaseApproval parameter is set to **True** or **False** depending on the customer's credit rating.

You can create a run condition for this component that checks the value of the PurchaseApproval parameter. If the value is set to **True**, it continues the component run and accepts the payment details. Otherwise, the component run session ends (and the run fails).

The following flowchart illustrates the above example.
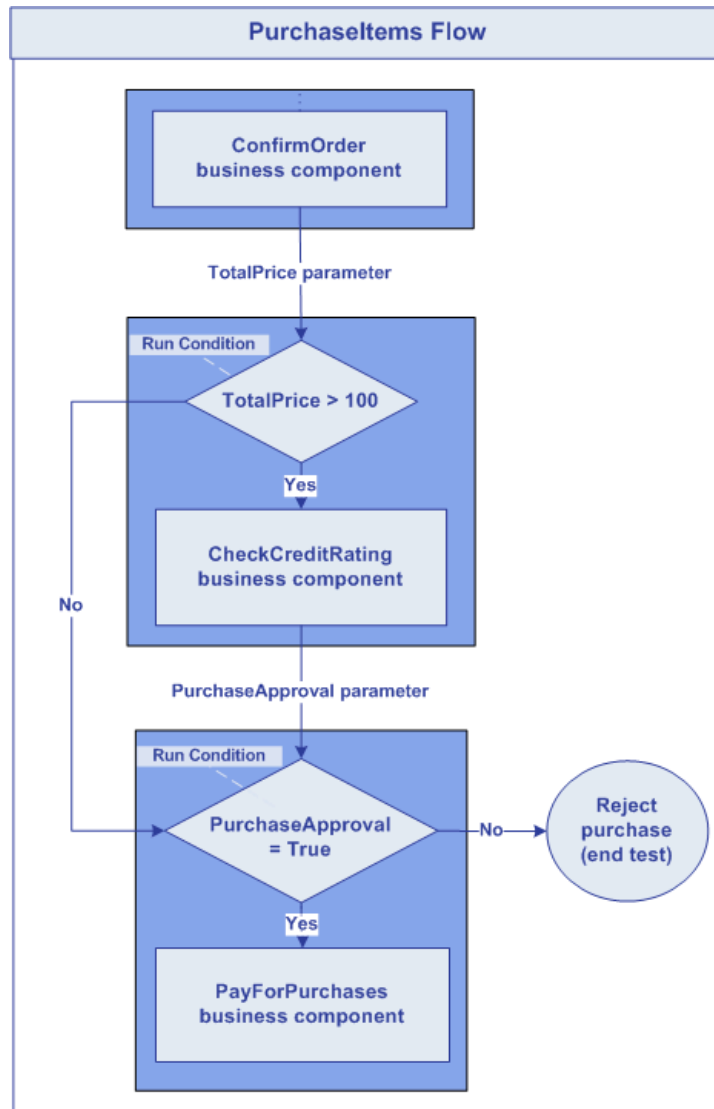
Adding Run Conditions

This section describes how to add run conditions. When you add a run condition, the condition is displayed in the **Run Condition** column of the Test Flow pane in the Test Script tab. For guidelines for working with run conditions, see "Guidelines for Working with Run Conditions" on page 67.
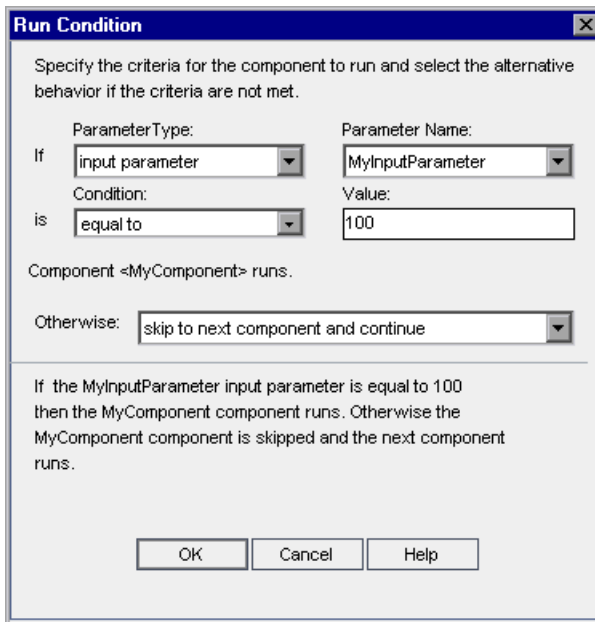
To add a run condition:

1 In the Test Script tab for a flow, do one of the following:

➤ Select the component for which you want to add the run condition and click the **Add Run Condition** button.

➤ Right-click the component for which you want to add the run condition and select **Run condition**.

The Run Condition dialog box opens.

2 In the **Parameter Type** box, select a parameter type. The following types are available:

➤ **Input Parameter.** Available only if one or more input parameters are defined for this component.

➤ **Output Parameter.** Available only if one or more output parameters are defined for one or more of the previous components in the flow.

➤ **Flow Parameter.** Available only if one or more flow input parameters are defined. For more information on flow input parameters, see "Understanding Flow Input Parameters" on page 32.

3 In the **Parameter Name** box, select a parameter from the list of available parameters.

4 In the **Condition** box, select a condition. The following conditions are available:

➤ **Equal to**

➤ **Not equal to**

➤ **Less than** (not available for table parameters)

➤ **Less than or equal to** (not available for table parameters)

➤ **Greater than** (not available for table parameters)

➤ **Greater than or equal to** (not available for table parameters)

Prior to a component run, the condition and value are checked. If the condition and value you select are met, the component run continues. If the condition and value you select are not met, then the component does not run, and the run session proceeds according to your selection in the **Otherwise** box.

5 In the **Value** box, type a valid value for the condition.

Note: If the parameter selected in the **Parameter Name** box is a table parameter, **[Table Data]** is displayed in the **Value** box. Click this link to open the Set Table Value dialog box and set the cell values required for your condition. For more information, see "Understanding Table Parameters" on page 43.

6 In the **Otherwise** box, specify what to do if the condition is not met. The following options are available:

➤ **Skip to next component and continue.** If the condition is not met, the component for which the run condition is set does not run, and the test run continues with the next component in the flow.

➤ **End component run and fail.** If the condition is not met, does not run the component for which the run condition is set, but instead sets the status of the component run as **Failed**. The flow either continues to the next component or ends, depending on the failure condition set for the component. For more information on defining failure conditions for components, see the *HP Business Process Testing User's Guide*.

Tip: Your selection in the **Otherwise** box applies only if the run condition is not met. To specify whether to continue or end the entire business process test run if a component run fails, set the failure condition for the component. You do this in the Test Script tab of the Test Plan module. For more information, see the *HP Business Process Testing User's Guide*.

7 Click **OK**. The Run Condition dialog box closes and the run condition is added to the flow.

Guidelines for Working with Run Conditions

➤ You can define only one run condition per business component.

➤ To set run conditions for a component the component or flow input or output parameter must contain at least one input parameter.

➤ In some cases, it may be preferable to define different flows, rather than using a large number of run conditions within a particular flow.

➤ If you set run conditions, and later add or remove a component or change the component order within a flow, the parameters may no longer be relevant and the run condition may not work. For example, if Component B uses an output parameter from Component A, and you change the order of the components so that Component B precedes Component A, then Component B cannot receive the output parameter from Component A and the run fails.

Managing Run Conditions

After you create a run condition, you can modify its settings. You can also remove a run condition from a flow. This section includes the following topics:

➤ Modifying Run Conditions

➤ Removing Run Conditions

Modifying Run Conditions

This section describes how to modify run conditions.

To modify a run condition:

1 In the Test Script tab for a flow, right-click the component and select **Run Condition**. The Run Condition dialog box opens.

2 In the Run Condition dialog box, modify the criteria and alternative behavior as needed. For more information on the available options, see "Adding Run Conditions" on page 64.

3 Click **OK**. The run condition is modified.

Removing Run Conditions

This section describes how to remove run conditions.

To remove a run condition:

1 In the Test Flow pane of the Test Script tab, do one of the following:

> ➤ Select the component and click the **Remove Run Condition** button.

> ➤ Right-click the component and select **Remove run condition**.

2 Click **Yes** in the confirmation box. The run condition is removed from the flow.

Running Tests with Run Conditions

You run a business process test containing flows with run conditions as you would for a regular business process test. For more information on running business process tests, refer to the *HP Business Process Testing User's Guide*.

As with regular business process tests, you can view test results in the Last Run Result pane in the Test Lab module.

➤ If you select **Skip to next component and continue** for a run condition, and the run condition you specify is not met, the test results list the run status for the component with the run condition as **Ignored**. The component will not be displayed in the run results.

➤ If you select **End component run and fail** for a run condition, and the run condition you specify is not met, the test results list the run status for the component with the run condition as **Failed**.

If a run condition was not met, the test results also provide details about the condition that was not met to help you understand why the component run failed or did not run.

6

Detecting and Resolving Changes

This chapter describes how to use the Business Process Testing for SAP Applications to automatically detect changes in your SAP application, and update the relevant business process tests accordingly.

This chapter includes:

About Detecting and Resolving Changes

You can run business process tests and flows in **change detection mode**. When a test or flow is run in change detection mode, Business Process Testing for SAP Applications checks for changes made in the SAP application since the test or flow was last updated. When the test or flow run is finished, you can view a report detailing these changes. This provides an indication of which modifications you should make to your test or flow to make sure that it is up-to-date.

For each change that is detected, Business Process Testing for SAP Applications offers possible resolutions. These enable you to make updates to your test or flow automatically. You can also choose to resolve a change manually, or to open a defect for handling a change. For a list of supported changes and resolutions, see "Changes and Resolutions" on page 85.

For example, suppose you are testing a screen for inputting contact information for new customers. The screen contains the fields Name, Address, and Phone Number. You create a test that verifies that information entered in these fields is correctly added to your customer database. Suppose you now add an E-mail Address field to the screen. If you run your test in regular mode, the test may pass and you may not notice that there is an additional field that should be tested. However, if you run the test in change detection mode, Business Process Testing for SAP Applications notices that the field was added to the screen and suggests adding a step to the test corresponding to the new field. You can then run an updated version of the test that includes verification of the additional field.

Note: Tests and flows that are run in Change Detection mode run only one iteration of any component, flow, or test even if multiple iterations are defined.

Detecting Changes

You can detect changes to an individual flow, test, or test set.

Notes:

➤ To detect changes, a user must belong to a user group that has permissions for the **Run** task, and permissions to modify tests and business components. For more information on configuring user group permission settings, see the *HP Quality Center Administrator's Guide*.

➤ Only business components created using the **Learn Flow** option can run in change detection mode. Other components always run in regular mode. For more information about the learn Flow option, see Chapter 4, "Learning Flows."

Detecting Changes for a Flow

You can detect changes for an individual flow from within the Test Plan and Test Lab modules.

To detect changes to a flow from within the Test Plan module:

1 In the Test Plan module, right-click the flow for which you want to detect changes and select **Detect Changes**. The Select Test Set dialog box opens.
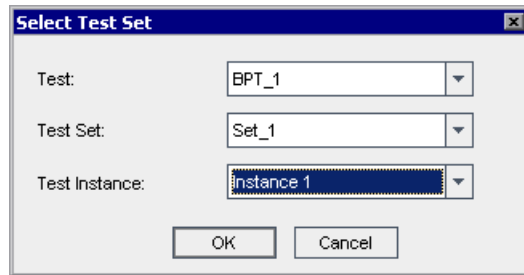

Notes:

➤ The **Test** list is displayed only if the flow is included in more than one test set in the Test Lab module.

➤ If the flow is included only once in one test set and it is included directly (not from within a test), the Select Test Set dialog box does not open.

➤ If the flow is not included in any test set, when you select **Detect Changes** it is automatically added directly to the **default** test set in the **Unattached** folder. The Select Test Set dialog box does not open and the Automatic Runner dialog box opens instead.

2 Select from the **Test**, **Test Set**, and **Test Instance** lists to define which instance of the flow you want to run. For more information, see "Understanding the Select Test Set Dialog Box" on page 82. Click **OK**. The Automatic Runner dialog box opens.
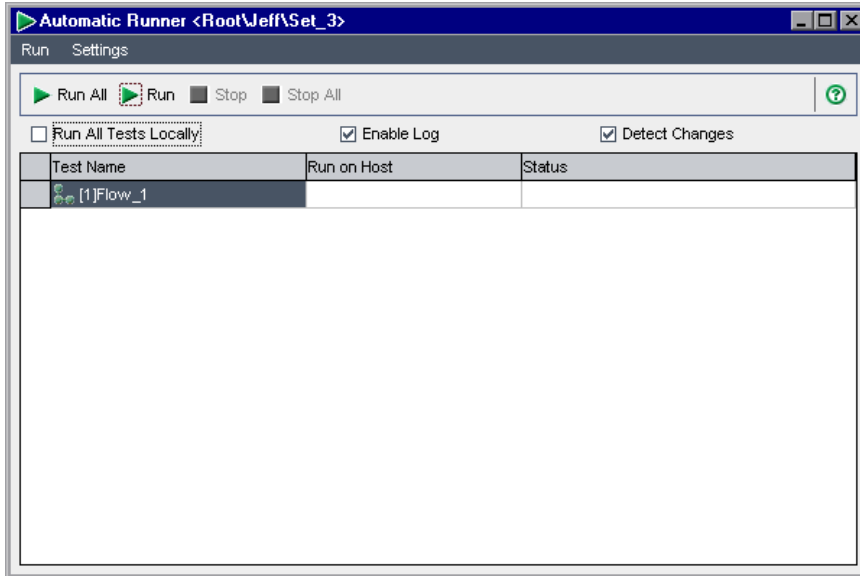
3 Select the flow you want to run and ensure that the **Detect Changes** check box is selected. Click **Run**. For more information on the Automatic Runner dialog box and running tests automatically, see the *HP Quality Center User's Guide*.

To detect changes for a flow from the Test Lab module:

1 In the Test Lab module select the test set that includes the flow for which you want to detect changes. Click the Run button. The Automatic Runner dialog box opens.
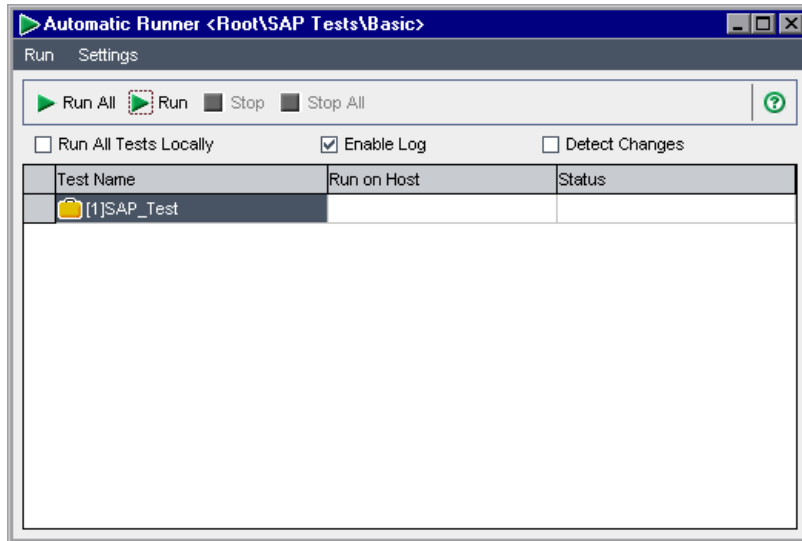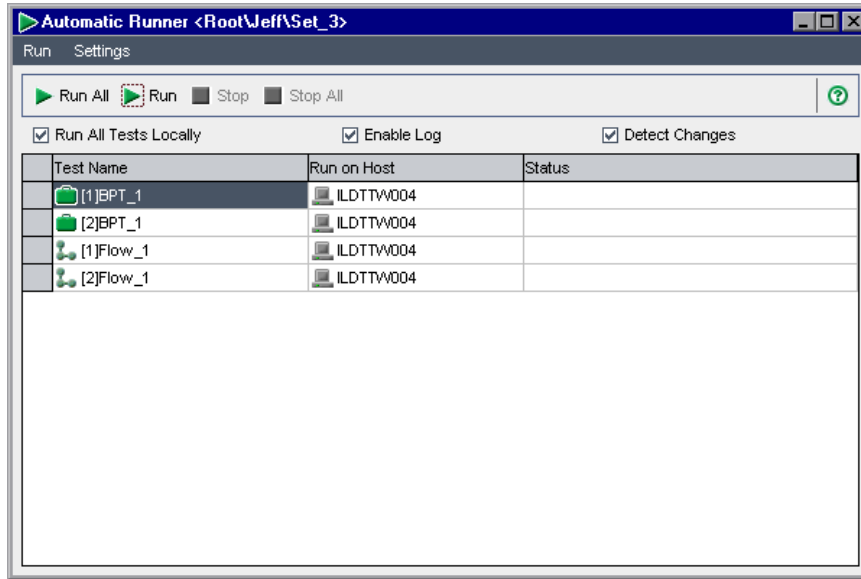

2 Select the **Detect Changes** check box. Click **Run**. For more information on the Automatic Runner dialog box and running tests automatically, see the *HP Quality Center User's Guide*.

Detecting Changes for a Business Process Test

You can detect changes for a business process test from the Test Plan and Test Lab modules.

To detect changes for a business process test from the Test Plan module:

1 In the Test Plan module, right-click the business process test for which you want to detect changes and select **Detect Changes**. The Select Test Set dialog box opens.
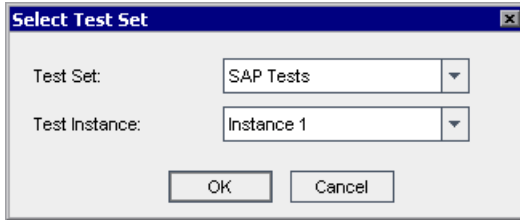
Note: If there is only one instance of the business process test, the Select Test Set dialog box does not open.

2 Select from the **Test Set** and **Test Instance** lists to define which instance of the test you want to run. For more information, see "Understanding the Select Test Set Dialog Box" on page 82. Click **OK**. The Automatic Runner dialog box opens.
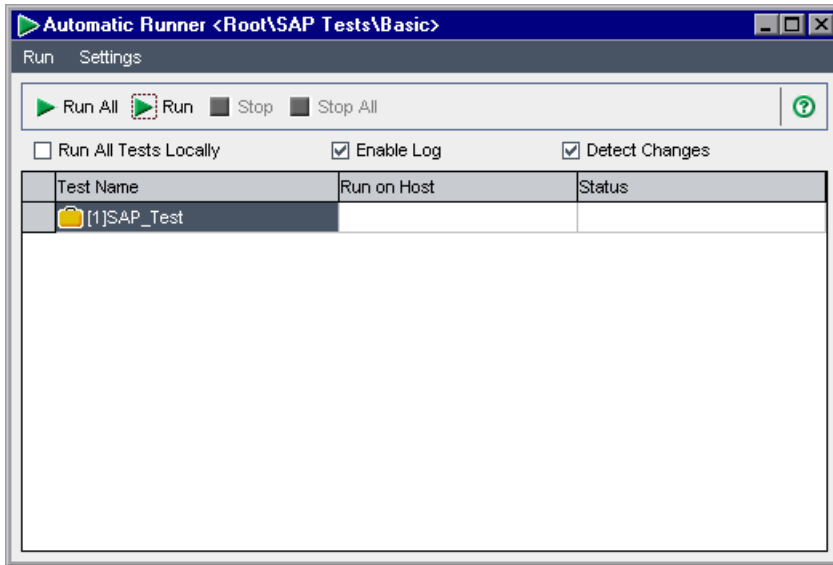
3 Select the business process test you want to run and ensure that the **Detect Changes** check box is selected. Click **Run**. For more information on the Automatic Runner dialog box and running tests automatically, see the *HP Quality Center User's Guide*.

To detect changes for a business process test from the Test Lab module:

1 In the Test Lab module, select the test set that includes the business process test for which you want to detect changes. Click the **Run** button. The Automatic Runner dialog box opens.
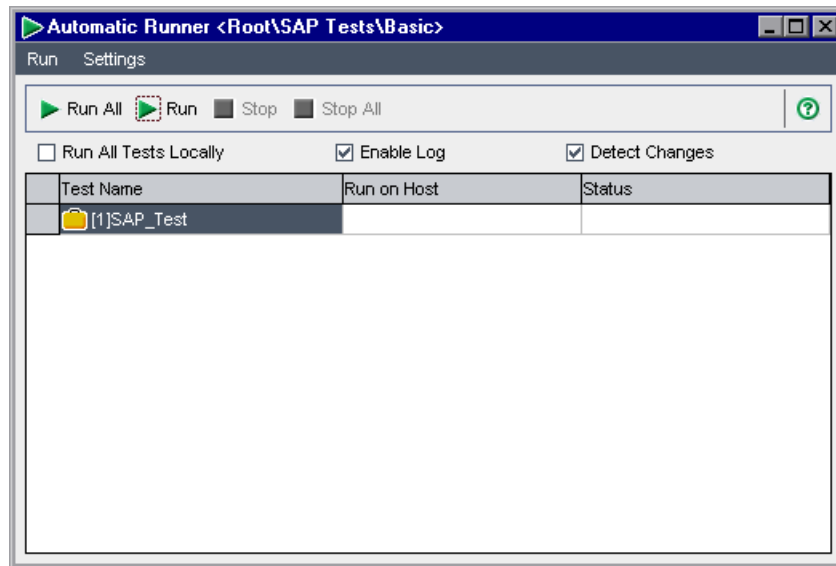
2 Select the business process test you want to run and select the **Detect Changes** check box. Click **Run**. For more information on the Automatic Runner dialog box and running tests automatically, see the *HP Quality Center User's Guide*.

Detecting Changes for a Test Set

You detect changes for a test set in the Test Lab module.

To detect changes for a test set:

1 In the Test Lab module select the test set for which you want to detect changes. Click the **Run Test Set** button. The Automatic Runner dialog box opens.

2 Ensure that the **Detect Changes** check box is selected and click **Run All**. For more information on the Automatic Runner dialog box and running tests automatically, see the *HP Quality Center User's Guide*.

Viewing Change Detection Results

This section describes how to view results of a test or flow run in change detection mode. The section includes the following topics:

➤ Viewing Change Detection Results

➤ Understanding the Change Detection Report

Viewing Change Detection Results

You view the results of a test or flow run in change detection mode in the Change Detection Report dialog box. You can open the Change Detection Report dialog box from the Test Plan module or the Test Lab module.

Note: If a test or flow was run in Change Detection mode, but no changes were detected, **Update Changes** will be disabled. You can view the Change Detection Report dialog box from the Test Lab module only.

To open the Change Detection Report dialog box from the Test Plan module:

1 In the Test Plan Tree, right-click the test or flow and select **Update Changes**. The Select Test Set dialog box opens.
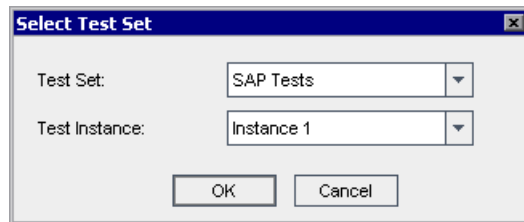
Note: If the flow or test has changes detected for only one test set, the Change Detection Report dialog box opens directly. If the flow or test appears in more than one test set, but was already resolved and rerun from one test set, the last results will open.

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2 Select from the **Test Set** and **Test Instance** lists to define which report you want to open. For more information, see "Understanding the Select Test Set Dialog Box" on page 82. Click **OK**. The Change Detection Report dialog box opens.

To open the Change Detection Report dialog box from the Test Lab module:

1 In the Test Sets Tree, select the test set containing the test for which you want to open the Change Detection Report dialog box.

2 Click the **Execution Grid** tab.

3 In the Execution Grid tab, select the test for which you want to open the Change Detection Report dialog box.

4 In the Last Run Result pane, click the link for the test in the **Status** column. The Change Detection Report dialog box opens.

Understanding the Change Detection Report

You view the results of a test run in change detection mode in the Change Detection Report dialog box. The Change Detection Report dialog box also enables you to resolve the detected changes.

The Change Detection Report dialog box contains the following elements:

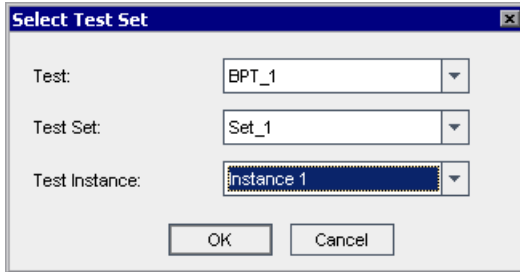| Element	Description
Details area	Located at the top of the Change Detection Report dialog box. Displays basic details about the test.
	The pane contains the following fields:
	➤ **Test Name.** The name of the test.
	➤ **Creation Date.** The date on which the test was created.
	➤ **Owner.** The user who is the current owner of the test.
	➤ **Test Status.** The status of the test run. The following statuses are possible:
	➤ **Passed.** The test run passed and no changes were detected.
	➤ **Failed.** The test run failed but no changes were detected.
	➤ **Passed with changes.** The test run passed but changes were detected.
	➤ **Failed with changes.** The test run failed changes were detected.
	➤ **Run started.** The date and time on which the test run was executed.
	➤ **Run ended**. The date and time on which the test run ended.
Status area	Located at the top of the Change Detection Report dialog box, under the Details pane.
	➤ **Business Components**. Graphically displays the number of business components in the test, and the breakdown of these components by their status. You can click a component status to filter the changes tree to show only components with that status.
	➤ **Resolved**. Displays the number of components that have been resolved from the total components in the test. Click the **Start Resolution** button to resolve components.

Element	Description
Changes tree	Located at the left of the **Entities** area. Displays a hierarchical representation of your test, flows, business components, and component steps.
	You can filter the **Status** or the **Resolved** column by clicking the **Set Filter** button 🔽 for the column and selecting the values you want to display. To clear the filters, click the **Clear Filter** button 🔽 .
	The following columns are displayed.
	➤ **Entity Name.** The name of the test, flow, business component, or step.
	➤ **Status.** The status of the entity. The following statuses are possible:
	➤ ✔ The entity passed and no changes were detected.
	➤ ✖ The entity failed but no changes were detected.
	➤ ✔ The entity passed, but changes were detected.
	➤ ✖ The entity failed, and changes were detected.
	➤ **Resolved.** For an entity in the changes tree with associated changes, displays **Y** if the changes were resolved and **N** if the changes were not resolved. If there are no changes associated with the node, --- is displayed.
Entity details	Located at the top right of the **Entities** area.
	Displays details of the entity selected in the changes tree.
Changes tab	Located at the bottom right of the **Entities** pane.
	Displays a description of any changes detected in selected component, flow, or step, and offers possible resolutions. For more information on resolving changes, see "Resolving Changes" on page 83.

Element	Description
Used by tab	Located at the bottom right of the Change Detection Report dialog box.
	For a flow, displays the tests in which the flow is used. For a component, displays the tests and flows in which the component is used.
Screenshot tab	Located at the bottom right of the Change Detection Report dialog box. Displayed only for components that have changes detected.
	Displays a screenshot of your application for the selected component in the flow before and after the change. For a step, displays the screenshots for the component containing the step.
Save	Closes the Change Detection Report dialog box and implements the change resolutions that you selected.
Cancel	Closes the Change Detection Report dialog box without implementing the change resolutions that you selected.

Understanding the Select Test Set Dialog Box

The Select Test Set dialog box enables you to specify a flow or business process test.

The Select Test Set dialog box contains the following lists:

List	Description
Test	The list of tests containing the flow. If the flow is included in a test set directly and not from within a test, **<directly>** appears is displayed as choice in the Test list. Displayed only if the flow is included in more than one test set in the Test Lab module.
Test Set	➤ **For flows.** The list of test sets containing the test selected in the **Test** list. If **<directly>** is selected in the Test list, the Test Set list includes only those test sets that include the flow directly and not from within a test. ➤ **For business process tests.** The list of test sets that include the test you selected.
Test Instance	The list of instances of the flow or business process test in the test set selected in the **Test Set** list.

Considerations for Working with the Select Test Set Dialog Box when Detecting Changes

When working with the Select Test Set dialog box when detecting changes, consider the following:

➤ If a flow is not contained in any test set it is added directly to the **default** test set in the **Unattached** folder and the Select Test Set Dialog box does not open and the Automatic Runner dialog box opens instead.

➤ If a flow is not contained directly in any test set but only as part of a test, it is automatically added directly to the **default** test set in the **Unattached** folder.

➤ If a flow is included only once in one test set and it is included directly and not from within a test, the Select Test Set dialog box does not open and the Automatic Runner dialog box opens instead.

Resolving Changes

You can resolve the changes detected by Business Process Testing for SAP Applications when running business process tests in change detection mode. The resolution options depend on the type of change detected, and may include opening a defect, and adding, removing, or modifying business components and flows in the test.

Note: To resolve changes, a user must belong to a user group that has permissions for the **Modify Test** and the **Modify Component** tasks. For more information on configuring user group permission settings, refer to the *HP Quality Center Administrator's Guide*.

To resolve changes:

1 Open the Change Detection Report dialog box. For more information on opening the Change Detection Report dialog box, see "Viewing Change Detection Results" on page 76.

2 Click the **Start Resolution** button. The first element in the changes tree with a detected change is selected.

3 In the Changes tab, under **Resolve**, select the change resolution you want to use. The following resolutions are available for all changes:

   ➤ **Ignore and mark as resolved.** Marks the change as resolved without taking any action to resolve it.

   ➤ **Open a defect.** Opens the New Defect dialog box, enabling you to open a defect for the change. Note that if you open a defect for a change, you can also select another resolution for the change. For more information on opening defects, see the *HP Quality Center User's Guide*.

   Note: If the change detected is that there are new objects in the screen or tab, when you select **Ignore and mark as resolved** or **Open a defect**, the new objects are inserted in the shared object repository for that screen or tab.

   In addition, there may be additional possible resolutions, depending on the type of change. For a list of available change resolutions for each type of change, see "Changes and Resolutions" on page 85.

4 Click the **Execute** button. The change is marked as resolved. Note that for change resolutions other than **Open a defect**, the resolution is not implemented until you click **Save**, as described in step 7.

5 Click the **Next Change** button to select the next node in the changes tree with a detected change that was not yet resolved.

6 Repeat steps 3 to 5 until all changes in the test are resolved. You can view the number of changes resolved and the total number of changes in the **Status** pane, next to the **Start Resolution** button.

7 Click the **Save** button. The Change Detection Results dialog box closes and your tests, flows, and business components are updated according to the resolutions you selected.

Changes and Resolutions

This section lists the possible changes detected for flows, business components, and component steps, and the resolutions offered by Business Process Testing for SAP Applications for each change type.

Note: In addition to the options described in this section, the resolutions **Ignore and mark as resolved** and **Open a defect** are always available. For more information on these resolutions, see "Resolving Changes" on page 83.

Changes and Resolutions for Flows

Change	Resolutions Offered
Unable to move to the screen corresponding to the component in the flow.	**Set the status of the component to Maintenance.** Changes the status of the previous component in the flow to **Maintenance**. This indicates that the component should be modified to reflect the change.
Unable to run any step of a business component, causing the entire component to fail.	**Set the status of the component to Maintenance.** Changes the status of the component to **Maintenance**. This indicates that the component should be modified to reflect the change.
A screen corresponding to a component was removed.	➤ **Remove the business component from the flow.** Removes the component representing the removed screen from the current test or flow only. ➤ **Remove the component from all flows.** Removes the component representing the removed screen from all tests or flows in which it is used.
A new screen was encountered during the test run that was not in the original flow.	**Set the status of the flow to Maintenance.** Changes the status of the flow to **Maintenance**. This indicates that the flow should be modified to reflect the change. You may want to relearn the flow to include the new screen.

Changes and Resolutions for Business Components

Change	Resolutions Offered
New controls were added to the screen corresponding to the component.	**Add the following selected steps.** Add new steps to the component for the new controls. You can select the check boxes corresponding to the controls for which you want to add steps to the component. Controls that require entering data, such as text boxes, are added before the last step of the component. Controls that do not require entering data, such as buttons, are added after the last step of the component. The steps are added with the default operations for the controls.

Changes and Resolutions for Steps

Change	Resolutions Offered
The control corresponding to the step was removed from the screen.	**Remove the step from the business component.** Removes the step from the component.
The type of the control corresponding to the step changed.	**Update the step.** Updates the step to reflect the new control type.

7

Working with Application Model Entities in Quality Center

The Application Model module enables you to manage a hierarchical representation of the entities in your SAP application. You can import entities from your SAP application, and add and modify application entities and folders. If your Quality Center server has a license for Business Process Testing and Business Process Testing for SAP Applications, you can associate application entities with flows or with business components, as well as tests.

This chapter includes:

➤ About Working with the Application Model Entities in Quality Center on page 90

➤ Viewing Application Entities on page 91

➤ Importing the SAP Application Hierarchy on page 93

➤ Adding Folders and Application Entities Manually on page 95

➤ Modifying Folders and Application Entities on page 97

➤ Associating Application Entities with Tests and Flows on page 99

➤ Associating Application Entities with Business Components on page 103

About Working with the Application Model Entities in Quality Center

You use the Application Model module to manage a representation of your SAP application components and entities. For example, if you link your SAP application components and application entities to tests or flows, you can see which tests or flows you need to run when changes affecting these components and entities are made in your application.

You can import SAP application components and application entities directly from your SAP application, or you can add and modify them manually.When you import directly from your SAP application, the hierarchy of the elements in the application and the basic data for each business entity are preserved. If you want to extend the scope at any stage, you can import the application hierarchy again, without overwriting existing entities in the Application Model module. If you choose to manually add and modify application entities, corresponding application entities in your SAP application are not affected.

After you develop your application model tree, you can associate each application entity with tests in the Test Plan module. You can also associate an application entity with a business component or flow. Each business process test containing that business component or flow is then associated with all of the application entities associated with that component or flow. When you learn a flow automatically, the components created are automatically associated with related application entities in the Application Model module.

Note: You can customize permission settings for the Application Model module. You can also customize application entities and application entity folders. For more information, refer to the *HP Business Process Testing for SAP Applications Installation Guide.*

Viewing Application Entities

You import, add, and modify application entities using the Application Model module. To open the Application Model module, click the **Application Model** button on the sidebar.

You can view your application entities in the Application Model tree or the Application Model Grid.

The Application Model Tree

You can view a hierarchical representation of your application entities in the application model tree. To view the application model tree, select **View > Application Model Tree**.
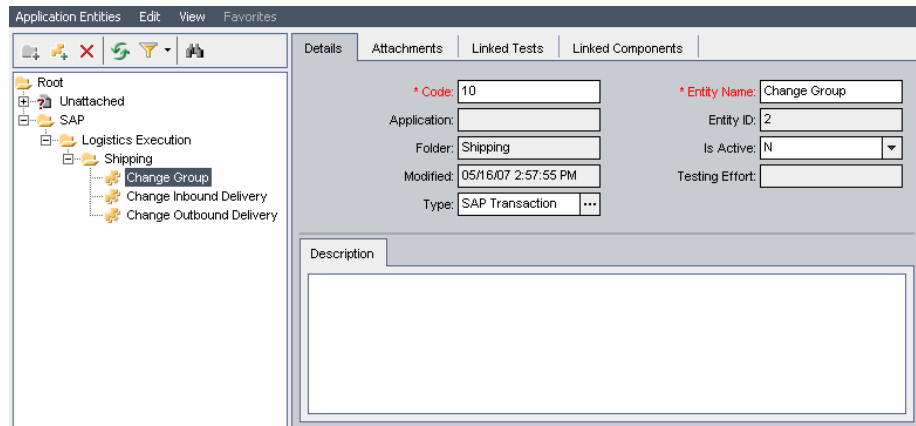
Each folder item 📁 in the application model tree represents an SAP application component in your SAP application. Each application entity item 🧩 represents an application entity in your SAP application.

The Application Model Grid

You can view all the application entities in a Quality Center project from the Application Model Grid. Each row displays a separate application entity. Each column represents a separate data item. To view the Application Model Grid, select **View** > **Application Model Grid**.
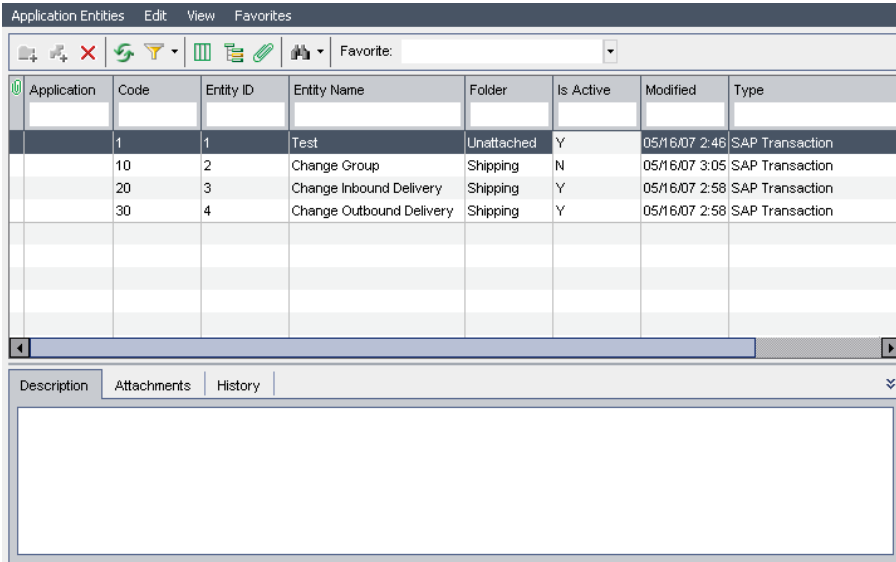
The following columns are displayed for each entity:

Column	Description
Application	The SAP application in which the application entity is located.
Code	The code of the entity in the SAP application.
Description	The description of the entity in the SAP application.
Entity ID	A unique numerical ID assigned by Quality Center to the application entity. This ID cannot be modified.
Entity Name	The name of the entity in the SAP application.
Folder	The folder in the application model tree in which the application entity is located. Each folder represents an SAP application element.

Column	Description
Is Active	This column is relevant only for Change Impact Testing module for SAP applications. For more information, see the *HP Change Impact Testing module for SAP applications User's Guide*.
Modified	The date and time when the application entity was last modified.
Type	The type of SAP application entity, for example, SAP Transaction.

Importing the SAP Application Hierarchy

You can import the application hierarchy to the Application Model module. This maps the entities in your SAP application to application entities in the Application Model module, reproducing the same hierarchical structure. Each SAP application element is represented as a folder. Each folder contains representations of the application entities that are included in the SAP application element in your SAP application.

You can import the application hierarchy more than once. For example, if you add new entities to your SAP application, you may want to include them in the application hierarchy, or you may decide to include application entities that were previously out of scope. When you import application entities that are already in the Application Model module, the data that you entered for each application entity is not overwritten. Any associations you created with tests, flows, and business components are also preserved.

To import the application hierarchy:

1 In the Application Model module, display the application model tree and select **Application Entities** > **Import Application Model**. The SAP Login Details dialog box opens.
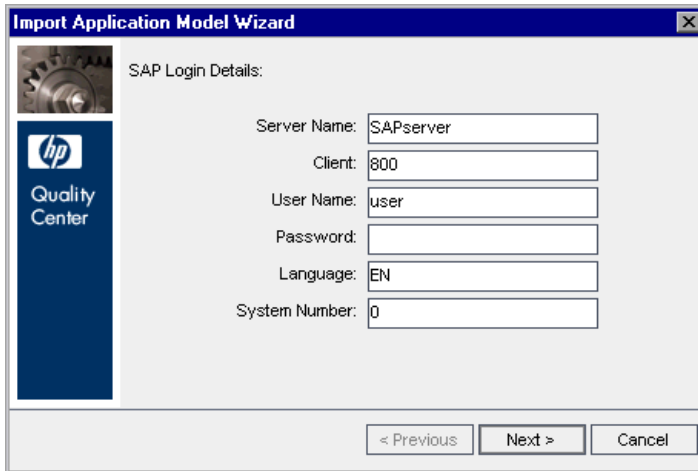
2 Type the login details for your SAP application and click **Next**. Quality Center connects to your SAP application and the Select Application Components dialog box opens, displaying the SAP components in your SAP application. (You can view the same hierarchy in your SAP application using the **SE81** transaction.)
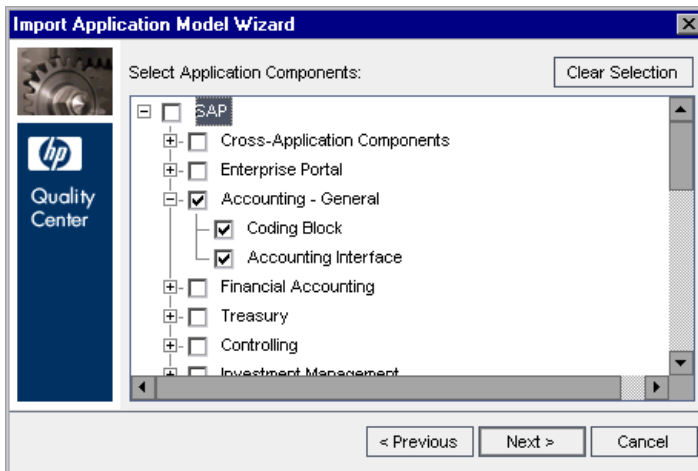
3 Select the SAP application elements you want to import to the Application Model module. When these application components are imported, all child application entities are also imported. Note that you can also import user transactions that are not assigned to any application element. To import these transactions, select the **User Transactions (Unassigned)** node in the Select Application Components dialog box. Click **Next**.

4 Click **Import** to import the SAP components and application entities to the Application Model module. Note that this process may take some time. When the import process is finished, a confirmation message displays. Click **OK**.

5 Click **Close** to close the Import Application Model Wizard.

The application components you selected are imported to the Application Model module. The hierarchical structure of the SAP application components is reproduced in the Application Model module, with the top-level components located under the **SAP** folder.

Adding Folders and Application Entities Manually

You can add folder and application entities manually.

Tip: You can also import folders and application entities using the SAP Import wizard. For more information, see "Importing the SAP Application Hierarchy" on page 93.

To add a folder:

1 In the application model tree, select a folder and click the **New Folder** button, or select **Application Entities** > **New Folder**. The New Folder dialog box opens.
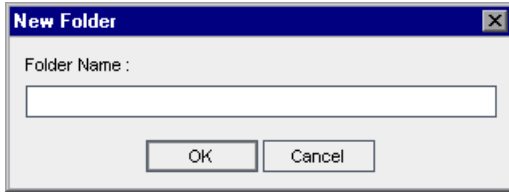
2 In the **Folder Name** box, type a name for the folder and click **OK**. The new folder is added to the application model tree under the folder you selected in step 1.

3 You can add a description for the new folder in the Description tab in the right pane.

4 You can add an attachment to the new folder in the Attachments tab. For more information on adding attachments, see the *HP Quality Center User's Guide*.

To add an application entity:

1 In the application model tree, select a folder and click the **New Entity** button, or select **Application Entities** > **New Entity**. The New Application Entity dialog box opens.
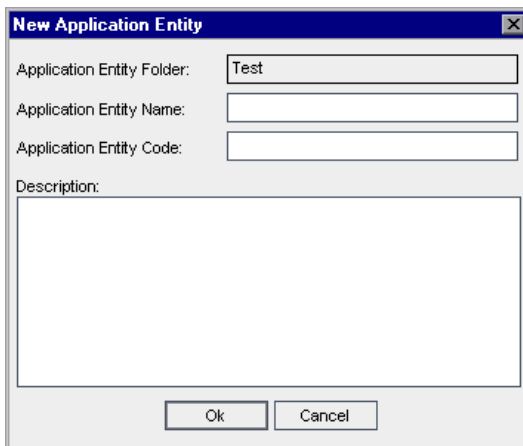
2 In the **Application Entity Name** box, type the name of the application entity. This is a required field.

3 In the **Application Entity Code** box, type the unique code of the application entity. This is a required field.

4 In the **Description** box, type a description of the application entity.

5 Click **OK**. The new application entity is added to the application model tree under the folder you selected in step 1.

Modifying Folders and Application Entities

You can rename and delete folders and application entities in the Application Model module.

Renaming Folders and Application Entities

You can rename a folder or application entity in the Application Model module.

To rename a folder or application entity:

➤ To rename a folder or application entity in the application model tree, select a folder or application entity and select **Edit** > **Rename**. Alternatively, right-click the folder or application entity and select **Rename**. Edit the name and press ENTER.

➤ To rename an application entity in the Application Model Grid, click the name of the application entity and type the new name.

Deleting Folders and Application Entities

You can delete a folder or application entity from the application model tree. When you delete a folder, you can choose to delete the folder and its subfolders, or you can choose to delete the folder, its subfolders, and application entities.

➤ If you delete a folder with its subfolders, all of the application entities are moved to the **Unattached** folder in the application model tree.

➤ If you delete a folder with its subfolders and application entities, all subfolders and application entities under the selected folder are deleted permanently.

To delete a folder:

1 Select a folder from the application model tree.

2 Click the **Delete** button, or select **Edit** > **Delete**. Alternatively, right-click the folder and select **Delete**. The Confirm Delete Folder dialog box opens.

Confirm Delete Folder   ☒
⊙ Delete folders only
Quality Center moves all application entities to the "Unattached" folder.
○ Delete folders and application entities
Quality Center permanently deletes all application entities under the selected folder and all subfolders.
Are you sure you want to delete < Test >?
[Yes   ]   [No   ]
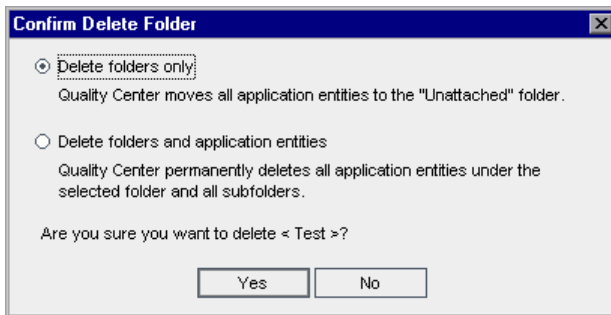
3 Select **Delete folders only** or **Delete folders and application entities.**

4 Click **Yes**.

To delete an application entity:

1 Select an application entity from the application model tree or Application Model Grid.

2 Click the **Delete** button, or select **Edit** > **Delete**. Alternatively, right-click the application entity and select **Delete**.

3 Click **Yes** to confirm.

Associating Application Entities with Tests and Flows

You can associate the application entities you created in the Application Model module with tests and flows from the Test Plan module. You can perform this task from the Application Model module or from the Test Plan module.

Associating Application Entities with Tests or Flows Using the Application Model Module

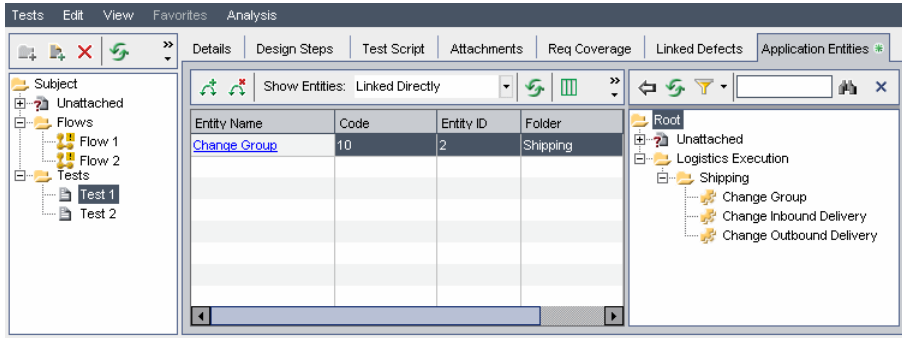You can associate application entities with tests or flows using the Application Model module.

To associate application entities with tests or flows using the Application Model module:

1 In the application model tree, select an application entity and click the **Linked Tests** tab. The Linked Tests tab displays the coverage grid for the selected application entity.
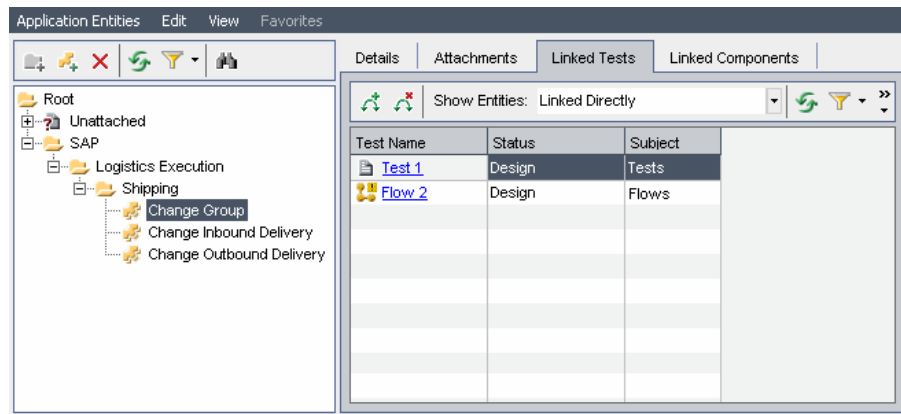
For information on the columns in the Linked Tests tab, see the *HP Quality Center User's Guide*.

2 In the Linked Tests tab, click the **Select Tests** button to show the test plan tree on the right.
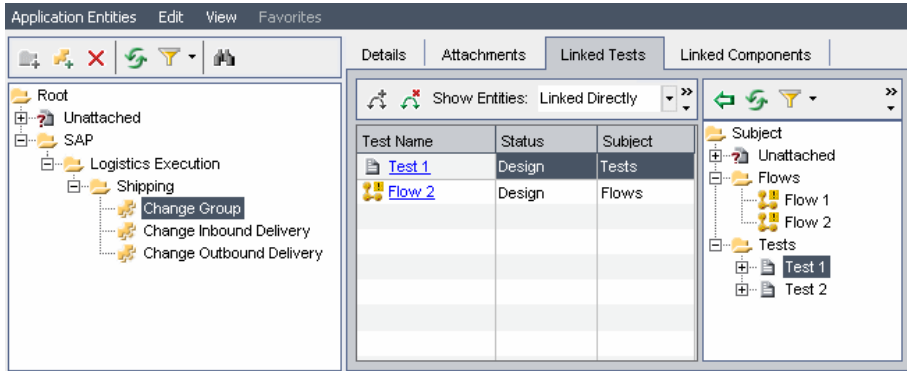
3 To search for a specific test or flow in the tree, type the name (or part of the name) of the test or flow in the **Find** box and click the **Find** button. If the search is successful, the test or flow is highlighted in the tree.

4 To refresh all of the tests and flows in the test plan tree, click the **Refresh All** button.

5 Select a test, test folder, or flow to add to the application entity's test coverage. Click the **Link Tests To Application Entity** button. The test or flow is added to the coverage grid.

6 To refresh the application entities in the coverage grid, click the **Refresh All** button.

7 To filter the application entities displayed in the coverage grid, choose one of the following options from the **Show Entities** box:

➤ **Linked Directly.** Displays only those tests or flows that are associated directly with the application entity.

➤ **Linked Through Other Assets.** Displays those tests that are associated with the application entity via business components or flows, and flows that are associated with the application entity via business components.

➤ **All.** Displays all of the application entities that are associated with the test or flow.

8 Click the **Close** button to hide the test plan tree.

Notes:

➤ To modify the data in the coverage grid columns or to remove tests or flows from the coverage grid, you must first select **Linked Directly** in the **Show Entities** box.

➤ To remove test or flow coverage from the Application Model module, verify that **Linked Directly** is displayed in the **Show Entities** box. Then select the test or flow you want to remove from coverage and click the **Remove Link** button. Click **Yes** to confirm.

Associating Application Entities with Tests or Flows Using the Test Plan Module

You can associate application entities with tests or flows using the Test Plan module.

To associate application entities with tests using the Test Plan module:

1 In the test plan tree, select the test or flow you want to associate with one or more entities, and click the **Application Entities** tab. The application entities associated with the selected test or flow are displayed.

2 In the Application Entities tab, click the **Select Application Entities** button to show the application model tree on the right.

3 To search for a specific application entity in the tree, type the name (or part of the name) of the application entity in the **Find** box and click the **Find** button. If the search is successful, the application entity is highlighted in the tree.

4 To refresh all of the application entities in the application model tree, click the **Refresh All** button.

5 Select an application entity or application folder to add to the application entity coverage for the test or flow. Click the **Add Entity to Linkage** button. The application entity is added to the coverage grid.

6 To refresh the application entities in the coverage grid, click the **Refresh All** button.

7 To filter the application entities displayed in the coverage grid, choose one of the following options from the **Show Entities** box:

➤ **Linked Directly.** Displays only those application entities that are associated directly with the test or flow.

➤ **Linked Through Other Assets.** Displays those application entities that are associated with business components via business process tests or flows, or are associated with flows via business process tests.

➤ **All.** Displays all of the application entities that are associated with the test or flow.

8 Click the **Close** button to hide the application model tree.

Notes:

➤ To modify the data in the coverage grid columns or to remove application entities from the coverage grid, you must first select **Linked Directly** in the **Show Entities** box.

➤ To remove application entity coverage from the Test Plan module, verify that **Linked Directly** is displayed in the **Show Entities** box. Then select the application entity you want to remove from coverage and click the **Remove Link** button. Click **Yes** to confirm.

Associating Application Entities with Business Components

In addition to associating application entities with tests and flows, you can associate application entities directly with a business component. This automatically associates the application entity with every business process test and flow containing that business component. For details on including business components in a business process test, see the *HP Business Process Testing User's Guide*.

You associate application entities with business components using the Business Components module. After they are associated, you can manage your associated application entities either from the Application Model module or from the Business Components module.

Note: When you learn a flow automatically, business components created are automatically associated with related application entities in the Application Model module.

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To associate application entities with business components:

1 In the component tree, select the component you want to associate with one or more application entities, and click the **Application Entities** tab. The application entities associated with the selected business component are displayed. For a description of each column displayed, see "The Application Model Grid" on page 92.

2 In the Application Entities tab, click the **Select Application Entities** button to show the application model tree on the right.

3 To search for a specific application entity in the tree, type the name (or part of the name) of the application entity in the **Find** box and click the **Find** button. If the search is successful, the application entity is highlighted in the tree.

4 To refresh all of the application entities in the application model tree, click the **Refresh All** button.

5 Select an application entity or application folder to add to the business component's application entity coverage. Click the **Add Entity to Linkage** button. The test is added to the coverage grid.

6 Click the **Close** button to hide the application model tree.

Note: To remove application entity associations from the Business Components module, select the application entity for which you want to remove an association, click the **Remove Link** button, and click **Yes** to confirm.

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