

Oracle® Fusion Middleware

Desktop Integration Developer's Guide for Oracle Application
Development Framework

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Oracle Fusion Middleware Desktop Integration Developer's Guide for Oracle Application Development Framework 11g Release 1 (11.1.1)

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Preface

Welcome to the *Desktop Integration Developer's Guide for Oracle Application Development Framework*.

Audience

This manual is intended for enterprise developers who configure desktop applications to integrate with the Oracle Fusion Middleware Application Development Framework (Oracle ADF).

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible to all users, including users that are disabled. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at <http://www.oracle.com/accessibility/>.

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Related Documents

For more information, see the following:

- *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*
- *Oracle Fusion Middleware Web User Interface Developer's Guide for Oracle Application Development Framework*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements (for example, menus and menu items, buttons, tabs, dialog controls), including options that you select.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates language and syntax elements, directory and file names, URLs, text that appears on the screen, or text that you enter.

Introduction to Oracle ADF Desktop Integration

This chapter provides an introduction to the Oracle ADF Desktop Integration module.

This chapter includes the following sections:

- [Section 1.1, "About the Oracle ADF Desktop Integration Module"](#)
- [Section 1.2, "About Oracle ADF Desktop Integration with Microsoft Excel"](#)

1.1 About the Oracle ADF Desktop Integration Module

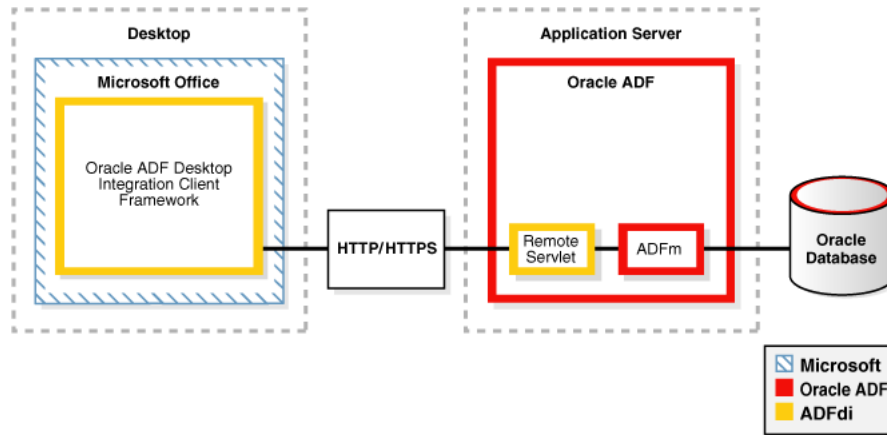
Many end users of Fusion web applications use desktop applications, such as Microsoft Excel, to manage information that they must also manage in their web application. The Oracle ADF Desktop Integration module provides a framework for Oracle ADF developers to extend the functionality provided by a Fusion web application to desktop applications. End users can avail themselves of Oracle ADF functionality when they are disconnected from their company network or because they prefer a user interface such as Excel which may be more familiar to them.

The Oracle ADF Desktop Integration module is part of the Oracle ADF architecture. More information about the Oracle ADF architecture can be found in the "Oracle ADF Architecture" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

[Figure 1-1](#) illustrates the architecture of the Oracle ADF Desktop Integration module. The module comprises of the following components:

- Oracle ADF Desktop Integration client framework
- Oracle ADF Desktop Integration remote servlet
- Oracle ADF Model layer (ADFm)

Figure 1–1 Oracle ADF Desktop Integration Module Architecture



1.2 About Oracle ADF Desktop Integration with Microsoft Excel

Currently, the Oracle ADF Desktop Integration module supports integration with Microsoft Office Excel 2007.

Note: This guide uses the term *integrated Excel workbook* to refer to Excel workbooks that you integrate with a Fusion web application and to distinguish these workbooks from workbooks that have not been integrated with a Fusion web application or configured with Oracle ADF functionality.

1.2.1 Overview of Creating an Integrated Excel Workbook

Creating an integrated Excel workbook involves the steps described in [Table 1–1](#).

Table 1–1 Steps to Create an Integrated Excel Workbook

Use	To
JDeveloper	<p>Create a secure Fusion web application.</p> <p>For information about creating a secure Fusion web application, see the <i>Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework</i>.</p> <p>Additional information about securing an integrated Excel workbook with a Fusion web application can be found in Chapter 11, "Securing Your Integrated Excel Workbook".</p> <p>Add data controls that expose the elements you require in Microsoft Excel.</p> <p>Create page definition files that expose the Oracle ADF bindings to use in Excel.</p> <p>For more information, see Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook".</p>

Table 1–1 (Cont.) Steps to Create an Integrated Excel Workbook

Use	To
Excel	<p>Create the Excel workbooks that you intend to configure with Oracle ADF functionality. Run the conversion utility that the Oracle ADF Desktop Integration module provides on the workbooks so that you can begin to create your integrated Excel workbook.</p> <p>For more information, see Section 4.4, "Preparing Your Workbook".</p> <p>Configure the Excel workbook using the Oracle ADF bindings that you exposed in the page definition files and the Oracle ADF components that the Oracle ADF Desktop Integration module provides.</p> <p>For more information, see the following sections and chapters:</p> <ul style="list-style-type: none"> ■ Chapter 5, "Getting Started with the Development Tools" This chapter provides an overview of the tools that the Oracle ADF Desktop Integration module provides so that you can configure an Excel workbook with Oracle ADF functionality. ■ Chapter 6, "Working with Oracle ADF Desktop Integration Form-type Components" This chapter describes how you insert Oracle ADF Desktop Integration form-type components into Excel worksheets and configure their properties to determine behavior at runtime. ■ Chapter 7, "Working with Oracle ADF Desktop Integration Table-type Components" This chapter describes how you can use the Oracle ADF Desktop Integration Table and Read-only Table components to provide end users with a means of displaying and editing data hosted by a Fusion web application. ■ Chapter 12, "Adding Validation to an Integrated Excel Workbook" This chapter describes how you provide validation for your integrated Excel workbook. <p>Test your integrated Excel workbook. For more information, see Chapter 13, "Testing Your Integrated Excel Workbook".</p> <p>Once you complete the integration of your Excel workbook with your Fusion web application, you deploy it to make it available to your end users. For information about this task, see Chapter 14, "Deploying Your Integrated Excel Workbook".</p>

1.2.2 The Advantages of Integrating Excel with a Fusion Web Application

Advantages that accrue from integrating Microsoft Excel workbooks with your Fusion web application include:

- Providing end users with access to data and functionality hosted by a Fusion web application through a desktop interface (Microsoft Excel) that may be more familiar to them.
- Users can access data hosted by a Fusion web application while not connected to the application. They must log on to the Fusion web application in order to download data. Once data is downloaded to an Excel workbook, they can modify it while disconnected from the Fusion web application.

- Bulk entry and update of data may be easier to accomplish through a spreadsheet-style interface.

Introduction to the Oracle ADF Desktop Integration Sample Application

This chapter provides an overview of the Master Price List module which is the Oracle ADF Desktop Integration module's sample application. The Master Price List module is a module in the Fusion Order Demo application. It contains a number of Microsoft Excel workbooks that are integrated with a Fusion web application.

This chapter includes the following sections:

- [Section 2.1, "Introduction to the Master Price List Module"](#)
- [Section 2.2, "Setting Up and Executing the Master Price List Module"](#)
- [Section 2.3, "Overview of the Integrated Excel Workbooks in the Master Price List Module"](#)

2.1 Introduction to the Master Price List Module

The Master Price List module allows end users to download information (product names, prices, and so on) about electronic devices that are sold through a storefront-type web application. End users can search the downloaded information, modify pricing information, and upload the modified information to the Fusion web application.

You need to set up your development environment before you can set up and run the Master Price List module. After you set up your development environment, you can download the Fusion Order Demo application, which includes the Master Price List module.

2.2 Setting Up and Executing the Master Price List Module

Set up your development environment as described in [Chapter 3, "Setting Up Your Development Environment"](#) so that you can run the Master Price List module.

Once you have set up your development environment, download the Fusion Order Demo application, which includes the Master Price List module. For information about how to download the Fusion Order Demo application, see the "How to Download the Application Resources" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

The Fusion Order Demo application that you download includes a directory named *Infrastructure*. This directory includes scripts that create the users and data that the Fusion Order Demo application and Master Price List module require. For information about how to run these scripts, see the "How to Install the Fusion Order

Demo Schema" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

To execute the Master Price List module:

1. Open the `MasterPriceList.jws` file in JDeveloper.
 This file is located in the `MasterPriceList` subdirectory of the directory into which you extracted the Fusion Order Demo application.
2. In the Application Navigator, click the Application Resources accordion title to expand the panel.
3. Right-click **FOD** connection and choose **Properties**.
4. In the Edit Database Connection dialog, modify the connection information shown in [Table 2-1](#) for your environment.

Table 2-1 Database Connection Properties for Master Price List Module

Property	Description
Host Name	The host name for your database. For example: localhost
JDBC Port	The port for your database. For example: 1521
SID	The SID of your database. For example: ORCL or XE

Do not modify the user name and password **fod/fusion**. These must remain unchanged. Click **OK**.

5. In the Application Navigator, right-click **Model** and choose **Rebuild Model.jpr**.
6. In the Application Navigator, right-click **ViewController** and choose **Rebuild ViewController.jpr**.
7. In the Application Navigator, expand the **ViewController** project, right-click **login.jspx** and choose **Run**.
 The `login.jspx` page runs and displays a login form.
8. Enter `sking` in the **User Name** field and `welcome1` in the **Password** field.
 You can now open and connect the integrated Excel workbooks described in [Section 2.3, "Overview of the Integrated Excel Workbooks in the Master Price List Module"](#) to the Fusion web application that the Master Price List module deploys.

2.3 Overview of the Integrated Excel Workbooks in the Master Price List Module

The Master Price List module provides the `EditPriceList.xlsx` and `ReadOnlyPriceList.xlsx` integrated Excel workbooks. Both workbooks allow end users to:

- Log on to the Fusion web application from the workbook
- Download rows of data about product pricing
- Search the workbook for information it contains about product pricing

In addition, the `EditPriceList.xlsx` workbook permits end users to:

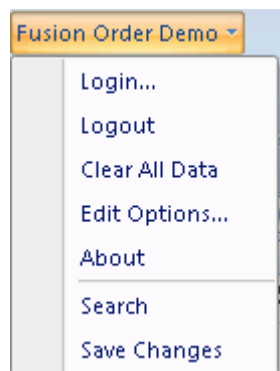
- Search the Master Price List module Fusion web application for information about products and product pricing
- Modify product pricing information in the workbook
- Use Excel formulas to perform calculations on values in an ADF Table component
- Upload modified product pricing information to the Master Price List module Fusion web application from the workbook

Subsequent sections in this chapter provide more information about the functionality in the workbooks along with cross-references to implementation details.

2.3.1 Log on to the Fusion Web Application from an Integrated Excel Workbook

At runtime, both workbooks in the Master Price List module render a menu that allows end users to log on to the Fusion web application. [Figure 2–1](#) shows the runtime menu in the `EditPriceList.xlsx` workbook.

Figure 2–1 Runtime Menu



The `EditPriceList.xlsx` workbook prompts the end user to log on to the Fusion web application when the end user clicks **Login** or invokes an action that requires a connection with the Fusion web application. Because the worksheet `Startup` event in the `EditPriceList.xlsx` workbook invokes the ADF Table component `Download` action, end users are prompted to log on immediately after starting up the `EditPriceList.xlsx` workbook.

The **Login** menu item is a workbook menu item that invokes the workbook `Login` action. For information about configuring the `Login` menu item (and other menu items in [Figure 2–1](#)), see [Section 8.3, "Creating Menu Items"](#).

The workbook `Login` action invokes the Fusion web application's authentication process. For more information about implementing this functionality, see [Chapter 11, "Securing Your Integrated Excel Workbook"](#).

2.3.2 Download Rows of Data About Product Pricing

The `EditPriceList.xlsx` workbook uses an ADF Table component to host information downloaded from the Fusion web application about product pricing. This component allows end users to edit rows and upload modified rows to the Fusion web application.

The following sections provide information about how to implement the download functionality:

- Each worksheet that you integrate with a Fusion web application requires an associated page definition file. The Price List worksheet in the `EditPriceList.xlsx` workbook is associated with the `ExcelPriceListPageDef.xml` page definition file. In the Application Navigator, expand the following nodes to view this file:
ViewController > Application Sources > oracle.foddemo.masterpricelist > view > pageDefs
 For information about how to configure a page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).
- The ADF Table component `Download` action downloads data from the Fusion web application to the worksheet. For information about how you invoke this action, see [Section 7.5, "Configuring a Worksheet to Download Data to an ADF Table Component"](#).
- In the `EditPriceList.xlsx` workbook, the worksheet `Startup` event invokes an action set that includes the ADF Table component `Download` action. For information about configuring worksheet events, see [Section 8.2.4, "How to Invoke an Action Set from a Worksheet Event"](#).

The `ReadOnlyPriceList.xlsx` workbook uses an ADF Read-only Table component to download data from the Fusion web application about product pricing. End users can view this data, but they cannot modify data or save changes to the Fusion web application.

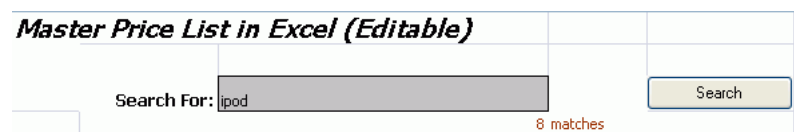
The following sections provide information about how to implement the download functionality of the `ReadOnlyPriceList.xlsx` workbook:

- For information about creating an ADF Read-only Table component, see [Section 7.12, "Creating an ADF Read-only Table Component"](#).
- An ADF Button component is configured to invoke an action set that includes the ADF Read-only Table component `Download` action. For information about creating an ADF Button component, see [Section 6.2, "Inserting an ADF Button Component"](#).

2.3.3 Simple Search for Products in the Workbooks

Both the `EditPriceList.xlsx` and the `ReadOnlyPriceList.xlsx` workbooks have ADF components configured to provide end users with a search form. End users can enter a search term in the form to invoke a query on the Fusion web application and download the results to the workbook. [Figure 2-2](#) shows a runtime view of these components in the `EditPriceList.xlsx` workbook.

Figure 2-2 Runtime View of a Simple Search Form in the `EditPriceList.xlsx` Workbook



The following sections provide information about how to implement a simple search form that you can use in the `EditPriceList.xlsx` workbook:

- For information about creating a search form, see [Section 8.6, "Creating ADF Databound Search Forms in an Integrated Excel Workbook"](#).

- For information about creating a form, [Section 8.7, "Adding a Form to an Integrated Excel Workbook"](#).

2.3.4 Advanced Search for Products in the Edit Price List Workbook

The `EditPriceList.xlsx` workbook has search functionality configured that allows an end user to invoke a page from the Fusion web application, specify search criteria, and download the results to the ADF Table component in the workbook. [Figure 2–3](#) shows the page from the Fusion web application that end users invoke by clicking the **Advanced Search** button.

Figure 2–3 *Advanced Search Dialog in the EditPriceList.xlsx Workbook*



For more information about how to implement the advanced search functionality in the `EditPriceList.xlsx` workbook, see [Section 8.6, "Creating ADF Databound Search Forms in an Integrated Excel Workbook"](#).

2.3.5 Modify Product Pricing Information in the Edit Price List Workbook

End users of the `EditPriceList.xlsx` workbook can edit product pricing information that the ADF Table component downloads from the Fusion web application. Columns in the runtime ADF Table component that have an `UpdateComponent` property configured permit end users to modify values and upload the changes to the Fusion web application. For example, end users can modify the values that appear in the **ProductId**, **ProductName**, and **CostPrice** columns.

End users can enter or modify the values that appear in the cells of other columns. However, the ADF Table component does not upload these changes to the Fusion web application because some of these columns display the results of evaluating Excel formulas using values downloaded from the Fusion web application. For example, the **Difference** column displays the result of an Excel formula that subtracts the cost price from the list price.

Other columns, such as **Status** and **Changed**, appear in the ADF Table component to provide status information about upload operations and changed columns.

The following sections provide information about how to implement this functionality:

- For information about inserting an ADF Table component, see [Section 7.3, "Inserting an ADF Table Component into an Excel Worksheet"](#).

- For information about using Excel formulas, see [Section 8.12, "Using Calculated Cells in an Integrated Excel Workbook"](#).
- For information about special columns, such as **Status** and **Changed**, see [Section 7.10, "Special Columns in the ADF Table Component"](#).

2.3.6 Upload Modified Product Information to the Fusion Web Application

The `EditPriceList.xlsx` workbook allows end users to upload modified data in the ADF Table component to the Fusion web application. An action set is configured for the runtime **Save Changes** button that invokes the ADF Table component's `Upload` action. For information about implementing this functionality, see [Section 7.7, "Configuring a Worksheet to Upload Changes From an ADF Table Component"](#).

Setting Up Your Development Environment

This chapter describes how you set up your development environment so that you can integrate an Excel workbook with a Fusion web application.

This chapter includes the following sections:

- [Section 3.1, "Introduction to Setting Up Your Development Environment"](#)
- [Section 3.2, "Required Oracle ADF Modules and Third-Party Software"](#)
- [Section 3.3, "Enabling Microsoft .NET Programmability Support"](#)
- [Section 3.4, "Allowing Excel to Run an Integrated Excel Workbook"](#)
- [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#)
- [Section 3.6, "Removing the Oracle ADF Desktop Integration Client Framework"](#)
- [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#)
- [Section 3.8, "Localizing the Setup of the Oracle ADF Desktop Integration Client Framework"](#)

3.1 Introduction to Setting Up Your Development Environment

Setting up your development environment involves making sure that you have the correct versions of JDeveloper, Microsoft Office, and Microsoft Internet Explorer installed. You must also enable support for Microsoft .NET programmability, if it is not already enabled. Once you verify that you have the required software and enabled Microsoft .NET programmability, complete the setup of your development environment by:

- Allowing Excel to run an integrated Excel workbook
- Setting up the Oracle ADF Desktop Integration client framework

The chapter concludes by describing how you can remove the Oracle ADF Desktop Integration client framework and use the Oracle ADF Desktop Integration module on a machine where you have multiple instances of JDeveloper. These latter sections provide information that is useful if you want to move the Oracle ADF Desktop Integration client framework to a directory that is independent of your JDeveloper installation.

3.2 Required Oracle ADF Modules and Third-Party Software

Before you begin to integrate your desktop application with a Fusion web application, make sure that you have the required Oracle ADF modules and third-party software installed and configured:

- JDeveloper

Install the current release of JDeveloper. The Oracle ADF Desktop Integration module is located in the `adfdi` directory under `JDEV_HOME\jdeveloper`, where `JDEV_HOME` is the directory into which you installed JDeveloper. The following subdirectory of `adfdi`:

```
bin\excel\client
```

contains a setup tool (`setup.exe`) that installs the Oracle ADF Desktop Integration client framework on the machine where you run this tool. [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#) describes how to use this tool.

- Microsoft Windows

Microsoft Windows XP and Vista are the only operating systems that support the development and deployment of Excel workbooks that integrate with Fusion web applications.

- Microsoft Office Excel 2007

The Oracle ADF Desktop Integration module supports the integration of Fusion web applications with the following types of Excel workbook:

- Excel Workbook

The default file format for Excel 2007 workbooks is the Excel 2007 XML-based file format (`.xlsx`).

- Excel Macro-Enabled Workbook

Workbooks in this format (`.xlsm`) use the Excel 2007 XML-based file format and can store VBA macro code.

The Oracle ADF Desktop Integration module does not support the use of other Excel file formats.

- Web browser

Parts of the Oracle ADF Desktop Integration module use a browser control that is hosted in a Microsoft .NET Framework web browser control. Internet Explorer 7 is the only web browser that supports this feature.

- Application server

For information about the application servers that you can use to deploy an application developed using the Oracle ADF Desktop Integration module, see the certification information website at:

<http://www.oracle.com/technology/documentation/jdev.html>

3.3 Enabling Microsoft .NET Programmability Support

Microsoft Office Excel 2007 must have Microsoft .NET programmability support enabled before you can set up the Oracle ADF Desktop Integration module and start development of an Excel workbook that integrates with a Fusion web application. If

you enabled Microsoft .NET programmability support during installation of Microsoft Office Excel 2007, no further action is required.

To enable Microsoft .NET programmability support:

1. Click the Windows **Start** button, click **Settings > Control Panel**.
2. In the Control Panel, select and open **Add or Remove Programs**.
3. Select the entry in the Add or Remove Programs dialog box for Microsoft Office 2007 and click **Change**.
4. Follow the instructions on the wizard that appears to enable Microsoft .NET programmability support for Microsoft Office Excel.

3.4 Allowing Excel to Run an Integrated Excel Workbook

You must configure security settings for the Excel application so that you can successfully run an integrated Excel workbook in design mode, test mode and when published post-development. To do this, you select the checkbox for **Trust access to the VBA project object model** in the following procedure. Carry out this procedure once.

To allow Excel to run an integrated Excel workbook:

1. Open Excel.
2. Click the **Microsoft Office** button and then click **Excel Options**.
3. Click the **Trust Center** tab and then click **Trust Center Settings**.
4. Click the **Macro Settings** tab and then click the **Trust access to the VBA project object model** checkbox.
5. Click **OK**.

For more information about securing an Excel workbook that is integrated with a Fusion web application, see [Chapter 11, "Securing Your Integrated Excel Workbook"](#).

3.5 Setting Up the Oracle ADF Desktop Integration Client Framework

The Oracle ADF Desktop Integration module includes a setup tool (`setup.exe`) that verifies if software in the following list is installed on the machine where you run the setup tool. If one or more of these pieces of software is not installed, the setup tool installs it in the order specified.

1. Windows Installer 3.1
2. Microsoft .NET Framework

The Microsoft .NET Framework 3.5 Service Pack 1 provides the runtime and associated files required to run applications developed to target the Microsoft .NET Framework.

Note: Installation of Microsoft .NET Framework may require you to restart the machine where you install it. After you restart, the setup tool automatically recommences to finalize installation.

3. Microsoft Visual Studio Tools for Microsoft Office

The Microsoft Visual Studio Tools for the Microsoft Office system (version 3.0 Runtime) Service Pack 1 (x86) is required to run VSTO solutions for the 2007 Microsoft Office system.

4. Oracle ADF Desktop Integration client framework

This appears as **Oracle ADF 11g Desktop Integration** in the Microsoft Windows Add or Remove Programs dialog box.

The following folder stores the `setup.exe` tool:

```
JDEV_HOME\jdeveloper\adfdi\bin\excel\client
```

where `JDEV_HOME` is the folder into which you installed JDeveloper.

Although you do not require administrator privileges to execute the `setup.exe` tool, administrator privileges may be required to execute the installers for the software that `setup.exe` attempts to download and install. You should also make sure that the proxy settings for Internet Explorer are configured to allow access to `*.microsoft.com` because the `setup.exe` tool attempts to automatically download missing prerequisite software from Microsoft's web site.

If you use multiple instances of JDeveloper or if you have an existing instance of the Oracle ADF Desktop Integration client framework on the machine where you plan to invoke the `setup.exe` tool, review the information in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#) before you carry out the following procedure.

By default, the `setup.exe` tool executes in English. You can change the language that appears when the `setup.exe` tool executes by following the instructions in [Section 3.8, "Localizing the Setup of the Oracle ADF Desktop Integration Client Framework"](#).

To set up the Oracle ADF Desktop Integration client framework:

1. Execute the `setup.exe` file located in the following folder:

```
JDEV_HOME\jdeveloper\adfdi\bin\excel\client
```
2. Follow the instructions that appear in the dialog boxes launched by `setup.exe` to successfully install the required components.
3. Click **Yes** to reboot the machine and complete the setup of the Oracle ADF Desktop Integration module.

3.6 Removing the Oracle ADF Desktop Integration Client Framework

You use the Microsoft Windows Control Panel to remove the Oracle ADF Desktop Integration client framework from the machine where you set it up. After you remove the Oracle ADF Desktop Integration client framework, you can no longer use integrated Excel workbooks on this machine unless you reinstall the framework.

To remove the Oracle ADF Desktop Integration client framework:

1. Click the Windows **Start** button and then click **Settings > Control Panel**.
2. In the Control Panel, select and open **Add or Remove Programs**.
3. In the Add or Remove Programs dialog box, select **Oracle ADF 11g Desktop Integration** and then click **Remove**.

3.7 Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper

You can have only one active installation of the Oracle ADF Desktop Integration module on a given machine. By default, the Oracle ADF Desktop Integration module is extracted to the following location:

```
JDEV_HOME\jdeveloper\adfdi
```

where JDEV_HOME is the directory into which you installed JDeveloper. If you decide to move to another version of JDeveloper in a different directory, you must remove the old version of the Oracle ADF Desktop Integration module, as described in [Section 3.6, "Removing the Oracle ADF Desktop Integration Client Framework"](#). You must then set up the Oracle ADF Desktop Integration module provided with the new version of JDeveloper that you are moving to, as described in [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#).

Alternatively, set up the Oracle ADF Desktop Integration module in a directory that is independent of your JDeveloper installation. This approach means that you do not have to remove the Oracle ADF Desktop Integration module before moving to a newer version.

To set up the Oracle ADF Desktop Integration module in an independent directory:

1. After you install JDeveloper, copy the adfdi directory to a directory independent of the JDeveloper installation directory. For example, you may copy the adfdi directory to the following location:

```
D:\adfdiclient\adfdi
```

2. When you move to a newer version of JDeveloper, copy the contents of the following directory:

```
JDEV_HOME\jdeveloper\adfdi\bin\excel
```

to:

```
D:\adfdiclient\adfdi\bin\excel
```

where JDEV_HOME is the directory into which you installed the new version of JDeveloper.

3. Execute the setup.exe file located in the following folder:


```
D:\adfdiclient\adfdi\bin\excel\client
```
4. Follow the instructions that appear in the dialog boxes launched by setup.exe to set up the new version of the Oracle ADF Desktop Integration module.
5. Click **Yes** to reboot the machine and complete the setup of the Oracle ADF Desktop Integration module.

3.8 Localizing the Setup of the Oracle ADF Desktop Integration Client Framework

Follow the instructions in this section to localize the setup of the Oracle ADF Desktop Integration client framework. By default, the setup tool described in [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#) executes in English. You download and install a language pack from the Microsoft Download Centre for the language that you want to appear when the setup tool executes.

This section assumes that no instance of the Oracle ADF Desktop Integration client framework is present on your machine and that your machine uses a non-English version of the operating system. If the Oracle ADF Desktop Integration client framework is present, remove it as described in [Section 3.6, "Removing the Oracle ADF Desktop Integration Client Framework"](#).

For information about supported operating systems, see [Section 3.2, "Required Oracle ADF Modules and Third-Party Software"](#).

To localize the setup of the Oracle ADF Desktop Integration client framework:

1. Download the appropriate language pack (for example, French) for Microsoft Visual Studio Tools for the Microsoft Office from the Microsoft Download Centre at:

<http://www.microsoft.com/downloads/>

2. Install the language pack that you downloaded in Step 1.
3. Set up the Oracle ADF Desktop Integration client framework as described in [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#).

The installers invoked by the `setup.exe` tool appear in the language of the language pack you installed.

Preparing Your Integrated Excel Workbook

This chapter describes preparatory tasks that you must carry out in developing your Fusion web application so that you can integrate an Excel workbook with the finalized application. This chapter also describes how you configure an Excel workbook before you add Oracle ADF functionality, using the tools provided in the Oracle ADF Desktop Integration module.

This chapter includes the following sections:

- [Section 4.1, "Introduction to Preparing Your Integrated Excel Workbooks"](#)
- [Section 4.2, "Adding Oracle ADF Desktop Integration to a Fusion Web Application"](#)
- [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#)
- [Section 4.4, "Preparing Your Workbook"](#)

4.1 Introduction to Preparing Your Integrated Excel Workbooks

This chapter, and this guide as a whole, assumes that you have developed a functioning Fusion web application as described in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

Having developed your Fusion web application, you carry out the tasks described in this chapter and elsewhere in this guide to configure an integrated Excel workbook with your Fusion web application. These tasks include adding the bindings that you require at runtime in the Excel workbook, preparing the Excel workbook for configuration with Oracle ADF functionality, and configuring the workbook by adding the Oracle ADF components that provide the functionality you require at runtime.

4.2 Adding Oracle ADF Desktop Integration to a Fusion Web Application

You enable a Fusion web application so that you can integrate an Excel workbook with it by adding Oracle ADF Desktop Integration and ADF Library Web Application Support to the technology scope of the JDeveloper project where you develop the Fusion web application.

4.2.1 How to Add Desktop Integration to Your JDeveloper Project

Use the Project Properties dialog box in JDeveloper to add Oracle ADF Desktop Integration to the technology scope of your project.

To add Oracle ADF Desktop Integration to your project:

1. In the Application Navigator, right-click the project to which you want to add the Oracle ADF Desktop Integration module and choose **Project Properties** from the context menu.

If your application uses the Fusion Web Application (ADF) application template, you select the **ViewController** project. If your application uses another application template, select the project that corresponds to the web application.

2. In the Project Properties dialog, select **Technology Scope** to view the list of available technologies.
3. Choose the **ADF Desktop Integration** and **ADF Library Web Application Support** project technologies and add them to the **Selected Technologies** list.
4. Click **OK**.

4.2.2 What Happens When You Add Desktop Integration to Your JDeveloper Project

When you add the Oracle ADF Desktop Integration module to the technology scope of your project, the following events occur:

- The project adds the Oracle ADF Desktop Integration runtime library. This library references the following `.jar` files in its class path:
 - `wsclient.jar`
 - `adf-desktop-integration.jar`
 - `resourcebundle.jar`
- The project adds an ADF bindings filter (`adfBindings`).
- The project's deployment descriptor (`web.xml`) is modified to include the following entries:
 - A servlet named `adfdiRemote`

Note: The value for the `url-pattern` attribute of the `servlet-mapping` element for `adfdiRemote` must match the value of the `RemoteServletPath` workbook property described in [Table A-17](#).

- A filter named `adfdiExcelDownload`
- A MIME mapping for Excel files (`.xlsx` and `.xlsm`)

The previous list is not exhaustive. Adding Oracle ADF Desktop Integration to a project makes other changes to `web.xml`. Note that some of the entries in `web.xml` will be added only if they do not already exist.

When you add ADF Library Web Application Support to the technology scope of your project, the project's `web.xml` file is modified to include the following entries:

```
<filter>
  <filter-name>ADFLibraryFilter</filter-name>
  <filter-class>oracle.adf.library.webapp.LibraryFilter</filter-class>
</filter>
<filter-mapping>
  <filter-name>ADFLibraryFilter</filter-name>
  <url-pattern>/*</url-pattern>
  <dispatcher>FORWARD</dispatcher>
```



```

        <dispatcher>REQUEST</dispatcher>
    </filter-mapping>
    <servlet>
        <servlet-name>adflibResources</servlet-name>
        <servlet-class>oracle.adf.library.webapp.ResourceServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>adflibResources</servlet-name>
        <url-pattern>/adflib/*</url-pattern>
    </servlet-mapping>

```

Make sure that the filter for ADF Library Web Application Support (`<filter-name>ADFLibraryFilter</filter-name>`) appears below the `adfdiExcelDownload` filter entries in `web.xml`, as in the following example, so that integrated Excel workbooks can be downloaded from the Fusion web application:

```

<filter>
    <filter-name>adfdiExcelDownload</filter-name>
    <filter-class>oracle.adf.desktopintegration.filter.DIExcelDownloadFilter</filter-class>
</filter>
<filter>
    <filter-name>ADFLibraryFilter</filter-name>
    <filter-class>oracle.adf.library.webapp.LibraryFilter</filter-class>
</filter>
...
<filter-mapping>
    <filter-name>adfdiExcelDownload</filter-name>
    <url-pattern>*.xlsx</url-pattern>
</filter-mapping>
<filter-mapping>
    <filter-name>adfdiExcelDownload</filter-name>
    <url-pattern>*.xlsm</url-pattern>
</filter-mapping>
...
<filter-mapping>
    <filter-name>ADFLibraryFilter</filter-name>
    <url-pattern>/*</url-pattern>
    <dispatcher>FORWARD</dispatcher>
    <dispatcher>REQUEST</dispatcher>
</filter-mapping>

```

For more information about `web.xml`, see [Appendix E, "Desktop Integration Settings in the Web Application Deployment Descriptor"](#).

4.3 Working with Page Definition Files for an Integrated Excel Workbook

Page definition files define the bindings that populate the data in the Oracle ADF components at runtime. Page definition files also reference the action bindings and method action bindings that define the operations or actions to use on this data. You must define a separate page definition file for each Excel worksheet that you are going to integrate with a Fusion web application. The integrated Excel workbook can include worksheets that do not reference page definition files. However, these worksheets cannot integrate with the Fusion web application.

The Oracle ADF Desktop Integration Designer only displays the bindings that the Oracle ADF Desktop Integration module supports in the bindings palette. If a page definition file references a binding that the Oracle ADF Desktop Integration module does not support, for example a table binding, it is ignored.

Table 4–1 lists and describes the binding types that the Oracle ADF Desktop Integration module supports.

Table 4–1 Binding Requirements for Oracle ADF Desktop Integration Components

Oracle ADF Desktop Integration component	Supported Binding	Additional comments
ADF Input Text	Attribute binding	
ADF Output Text	Attribute binding	
ADF Label	Attribute and list bindings	This Oracle ADF Desktop Integration component uses the label property of a control binding.
ADF Desktop Integration List of Values	List binding	
ADF Desktop Integration Tree Node List	Tree binding attributes and list binding	Tree binding attributes must be associated with a model-driven list.
ADF Button	Various	The ADF Button component in the Oracle ADF Desktop Integration module can invoke action sets. Action sets can reference action bindings, method action bindings, or actions exposed by components in the Oracle ADF Desktop Integration module. For more information about action sets, see Section 8.2, "Using Action Sets" .
ADF Read-only Table	Tree binding	
ADF Table	Tree binding	

For information about the bindings that components in the Oracle ADF Desktop Integration module use, see [Appendix A, "Oracle ADF Desktop Integration Component Properties and Actions"](#).

More information about the elements and attributes in page definition files can be found in the "*pageNamePageDef.xml*" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

For information about ADF data binding and page definition files in a Fusion web application, see the "Using Oracle ADF Model in a Fusion Web Application" chapter in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

4.3.1 How to Create a Page Definition File for an Integrated Excel Workbook

You create and configure a page definition file that determines the Oracle ADF bindings to expose in your JDeveloper project.

To create a page definition file for an integrated Excel workbook:

1. In JDeveloper, create a new JSF page in your Oracle ADF Desktop Integration application's project.

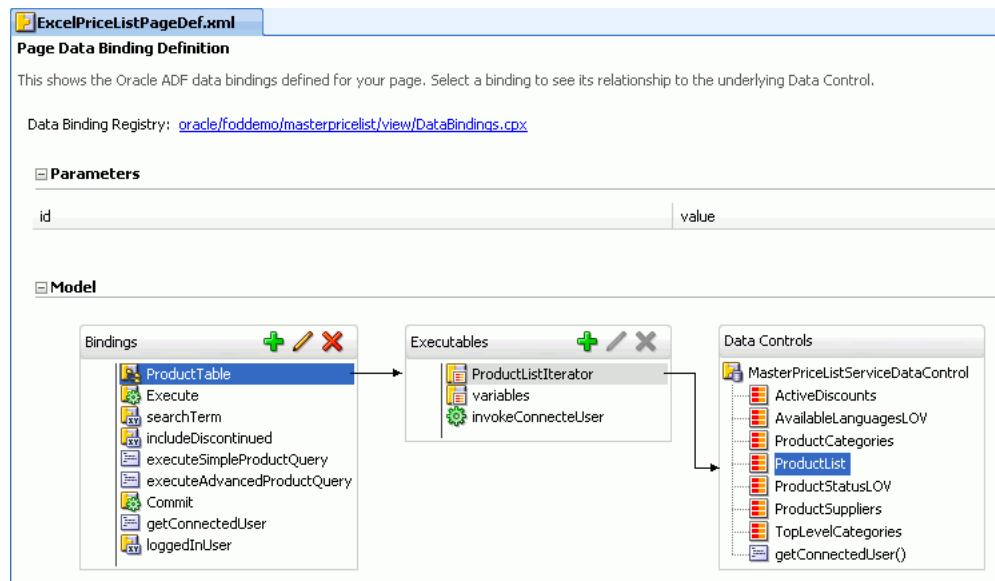
Tip: Add an ADF Faces `Table` component to the JSF page. JDeveloper generates the tree bindings in the JSF page that the Oracle ADF Desktop Integration table-type components use in the page definition file.

Note: JDeveloper creates a page definition file's name based on the name of the JSF page you choose. If you want a page definition file's name to indicate an association with a particular workbook or worksheet, choose this name when creating the JSF page.

2. Select the page you created in Step 1 in the Application Navigator, right-click it and select **Go to Page Definition** from the context menu.
3. Click **Yes** on the dialog box that asks if you want to create a page definition file.
4. Add the bindings that you require for your integrated Excel workbook to the page definition file.
5. Save the page definition file.

Figure 4–1 shows the `ExcelPriceListPageDef.xml` page definition file that the Price List worksheet in the `EditPriceList.xlsx` workbook references.

Figure 4–1 Page Definition File with Bindings for an Integrated Excel Workbook



For information about working with page definition files, see the "Working with Page Definition Files" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

6. Make and run your Fusion web application if you plan to run the integrated Excel workbook in test mode or publish it.

4.3.2 What Happens When You Create a Page Definition File

JDeveloper creates the `DataBindings.cpx` file the first time that you add a page definition file in your JDeveloper project using the procedure described in Section 4.3.1, "How to Create a Page Definition File for an Integrated Excel Workbook".

The `DataBindings.cpx` file defines the binding context for the Fusion web application and provides the metadata from which the Oracle ADF bindings are created at runtime. Information about working with this file can be found in the "Working with the DataBindings.cpx File" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. Information about the elements and attributes in the file can be found the "DataBindings.cpx" section of the same guide.

4.3.3 Reloading a Page Definition File in an Excel Workbook

If you make changes in your JDeveloper desktop integration project to a page definition file that is already associated with an Excel worksheet, rebuild the JDeveloper desktop integration project and reload the page definition file in the Excel worksheet to make sure that the changes appear in the Oracle ADF Desktop Integration Designer. You associate a page definition file with an Excel worksheet when you choose the page definition file, as described in [Section 4.4.2, "How to Open an Excel Workbook for the First Time"](#).

The Oracle ADF Desktop Integration Designer toolbar provides a button that reloads all page definition files in an Excel workbook.

Errors may occur when you switch an integrated Excel workbook from design mode to runtime if you do not rebuild the JDeveloper desktop integration project and restart the application after making changes to a page definition file. For example, if you:

- Remove an element in a page definition file
- Do not rebuild and restart the Fusion web application
- Or do not reload the page definition file in the integrated Excel workbook

an error message such as the following may appear when you attempt to switch a workbook to test mode:

```
[ADFDI-05530] unable to initialize worksheet: MyWorksheet  
[ADFDI-05517] unable to find control MyBindingThatWasRemoved
```

To reload page definition files in an Excel workbook:

1. Rebuild and run the Fusion web application that the Excel workbook is integrated with.
2. In the Excel workbook, click the Reload button on the Oracle ADF Desktop Integration Designer toolbar.

For information about the Reload button, see [Section 5.1, "Introduction to the Development Tools"](#).

4.3.4 What You May Need to Know About Page Definition Files in an Integrated Excel Workbook

Note the following points about page definition files in an Oracle ADF Desktop Integration project.

Integrating Multiple Excel Worksheets

You can integrate more than one worksheet in an Excel workbook with a Fusion web application. You associate a page definition file with each worksheet as described in [Section 4.4.3, "How to Add Additional Worksheets to an Integrated Excel Workbook"](#).

EL Expressions in a Page Definition File

Use the following syntax to write EL expressions in a page definition file:

```
${}
```

Do not use the following syntax to write EL expressions:

```
#{} 
```

EL expressions using this syntax generate errors as they attempt to access the Oracle ADF Faces context which is not available.

Note: EL expressions that you write for Oracle ADF Desktop Integration components in the integrated Excel workbook, such as ADF Input Text, must use the `#{}` syntax.

4.4 Preparing Your Workbook

Before you can configure an Excel workbook with Oracle ADF functionality, you need to prepare the workbook by:

- Running the conversion utility so that it can execute the Oracle ADF Desktop Integration client framework
- Setting a number of properties when you open the workbook for the first time
- (Optional) adding additional worksheets

Once you complete these steps, you can add Oracle ADF functionality using the tools provided by the Oracle ADF Desktop Integration module.

Although you can store the Excel workbooks that you integrate with Fusion web applications anywhere you choose, there are a number of advantages to storing them with the other files in your Oracle ADF Desktop Integration project. These advantages include source control of the workbooks, facilitating the download of workbooks from web pages, and the fact that the file system folder picker that appears the first time a workbook is opened defaults to the location where you store the workbook. For example, the Master Price List module of the Fusion Order Demo stores the Excel workbooks it integrates in the following subdirectory:

```
FOD_HOME\MasterPriceList\ViewController\public_html\excel
```

where `FOD_HOME` is the root directory that stores the source files for the Fusion Order Demo application.

4.4.1 How to Run the Conversion Utility

The conversion utility is a command-line executable (`convert-adfdi-excel-solution.exe`) provided with the Oracle ADF Desktop Integration module that prepares the specified Excel workbook so that you can integrate it with a Fusion web application by configuring it with Oracle ADF functionality. For information about the file formats of Excel workbooks that you can convert for integration with a Fusion web application, see [Section 3.2, "Required Oracle ADF Modules and Third-Party Software"](#).

The Oracle ADF Desktop Integration module stores `convert-adfdi-excel-solution.exe` in the following directory:

```
ADFDI_CLIENT\adfdi\bin\excel\convert
```

where `ADFDI_CLIENT` is the folder in which you set up the Oracle ADF Desktop Integration module, as described in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#).

To run the conversion utility to convert an Excel workbook:

1. Open a command window and navigate to the following directory location:

```
ADFDI_CLIENT\adfdi\bin\excel\convert
```

where `ADFDI_CLIENT` refers to the directory in which you set up the Oracle ADF Desktop Integration module.

2. Execute the following command to convert the Excel workbook:

```
convert-adfdi-excel-solution.exe directory\workbook.xlsx -attach
```

where `directory` refers to the directory that stores your Excel workbook and `workbook.xlsx` is the file name of the Excel workbook.

If the command executes successfully, a message similar to the following appears in the command window:

```
Solution id is: fb43e1d8-0595-4c3f-8926-0de0494c37d3
Deployment manifest full path is: file:///C:/jdev/JDEVADF_MAIN_GENERIC_
4773/adfdi/bin/excel/client/adfdi-excel-client.vsto
Attaching customization...
Using relative path: adfdi-excel-client.vsto
VSTO manifest attached successfully
```

You can now open the Excel workbook and set a number of properties that allow you to start configuring the workbook with Oracle ADF functionality. For more information about the supported arguments of the conversion utility, see [Appendix D, "Using Workbook Management Tools"](#).

4.4.2 How to Open an Excel Workbook for the First Time

After you convert your workbook using the conversion utility, you can open it. When you open a workbook for the first time, you need to set a number of properties, as described in the following procedure.

Note: The procedure assumes that you store the workbook in a folder external to the Oracle ADF Desktop Integration project. If you store the workbook in a subfolder of the Oracle ADF Desktop Integration project, a number of properties (for example, the `ApplicationHomeFolder` workbook property) get populated automatically.

To open an Excel workbook for the first time:

1. Navigate to the directory that stores your Excel workbook and open it.
2. Use the dialog box that appears to select the JDeveloper application home folder.
In a typical JDeveloper project, the JDeveloper application home folder stores the `application_name.jws` file. The value you select is assigned to the `ApplicationHomeFolder` workbook property.
3. In the Oracle ADF Desktop Integration Designer, click **Workbook Properties** to display the Edit Workbook Properties dialog box.

4. Set or verify the values for the following properties so that you can switch between design mode and test mode as you configure your workbook:
 - `ApplicationHomeFolder`
The value for this property corresponds to the absolute path for the root folder of the JDeveloper application workspace (.jws). You specified this value in Step 2.
 - `Login.ProtectedWebPage`
Set the value for this property to a protected page with a directory path that is relative to the value of `WebAppRoot`. For example, in the Master Price List module's `EditPriceList.xlsx` workbook, the value of `WebAppRoot` is `http://127.0.0.1:8099/FODMasterPriceList` and the value of `ProtectedWebPage` is `/faces/secured/LandingPad.jspx`.
Create a blank protected page that you specify as the value for this property. Apply a security constraint to this protected page. For more information about securing an integrated Excel workbook, see [Chapter 11, "Securing Your Integrated Excel Workbook"](#).
 - `Project`
Specify the folder that contains a JDeveloper project (.jpr) in the JDeveloper application workspace. Typically the folder name is `ViewController` in a Fusion web application that uses the model-view-controller architecture. The Oracle ADF Desktop Integration module loads the names of the available projects from the `application_name.jws` specified as a value for `ApplicationHomeFolder`. The folder path specified as a value for `Project` should be relative to the value of `ApplicationHomeFolder`.
 - `WebAppRoot`
Set the value for this property to the fully qualified URL for the web application that you want to integrate your desktop application with. The fully qualified URL has the following format:
`http://hostname:portnumber/application`
Note that the fully qualified URL is similar to the following if you set up a test environment on your machine using the Master Price List module:
`http://127.0.0.1:7101/FODMasterPriceList`
For information about how to verify that the Fusion web application is online and supports Oracle ADF Desktop Integration, see [Section C.1, "Verifying That Your Fusion Web Application Supports Desktop Integration"](#).
 - `WebPagesFolder`
Set the value for this property to the folder that contains web pages for the Fusion web application. The folder path should be relative to the value of `ApplicationHomeFolder`. You need to set a value for this property before you can set a value for `Login.ProtectedWebPage`.
5. Click **OK**.
6. In the Oracle ADF Desktop Integration Designer, click **Worksheet Properties** to display the Edit Worksheet Properties dialog box.
7. Click the ellipsis button (...) beside the **Page Definition** input field and select a page definition file from the dialog box that appears.
8. Click **OK**.

The Excel worksheet appears with the Oracle ADF Desktop Integration Designer in Excel's Document Actions. The bindings in the page definition file you selected in Step 7 appear in the Bindings view tab.

9. Save the Excel workbook.

4.4.3 How to Add Additional Worksheets to an Integrated Excel Workbook

Each worksheet that you want to use Oracle ADF functionality must have a page definition file associated with it. You associate a page definition file with a worksheet when you add a worksheet to the integrated Excel workbook. You can integrate more than one worksheet in an integrated Excel workbook with a Fusion web application. Use a different page definition file for each worksheet in the integrated Excel workbook.

To associate a page definition file with an Excel worksheet:

1. While the Excel workbook is in design mode, click **Home**, and then click **Insert > Insert Sheet** in the **Cells** group.
2. Select the page definition file from the Choose Page Definition dialog box that appears.

This populates the bindings palette in the Oracle ADF Desktop Integration Designer with the bindings contained in the page definition file. You can now configure the worksheet with Oracle ADF functionality.

Getting Started with the Development Tools

This chapter describes how to use the development tools provided by the Oracle ADF Desktop Integration module. It provides an overview of the authoring environment that Oracle ADF exposes within Excel and goes on to describe how you display and use the different elements of this environment.

This chapter includes the following sections:

- [Section 5.1, "Introduction to the Development Tools"](#)
- [Section 5.2, "Using the Bindings Palette"](#)
- [Section 5.3, "Using the Components Palette"](#)
- [Section 5.4, "Using the Property Inspector"](#)
- [Section 5.5, "Using the Binding ID Picker"](#)
- [Section 5.6, "Using the Expression Builder"](#)
- [Section 5.7, "Using the Web Page Picker"](#)
- [Section 5.8, "Using the File System Folder Picker"](#)
- [Section 5.9, "Using the Page Definition Picker"](#)
- [Section 5.10, "Using the Collection Editors"](#)

5.1 Introduction to the Development Tools

The Oracle ADF Desktop Integration module provides a number of tools that you use to configure Excel workbooks so that they can access Oracle ADF functionality. Before you use these tools, you need to know that there are two modes in which you can work while you configure the Excel workbook that you integrate with a Fusion web application. The first mode is design and the second mode is test. In *design mode*, you use the tools provided by Oracle ADF in Excel to design and configure your integrated Excel workbook. In *test mode*, you can view and test the changes you make in design mode in the same way that an end user views the published integrated Excel workbook: the difference is that you can switch back to design mode using a button on the Oracle ADF Desktop Integration Designer toolbar.







[Figure 5–1](#) shows the Oracle ADF Desktop Integration Designer toolbar in design mode.

Figure 5–1 Oracle ADF Desktop Integration Designer Toolbar in Design Mode

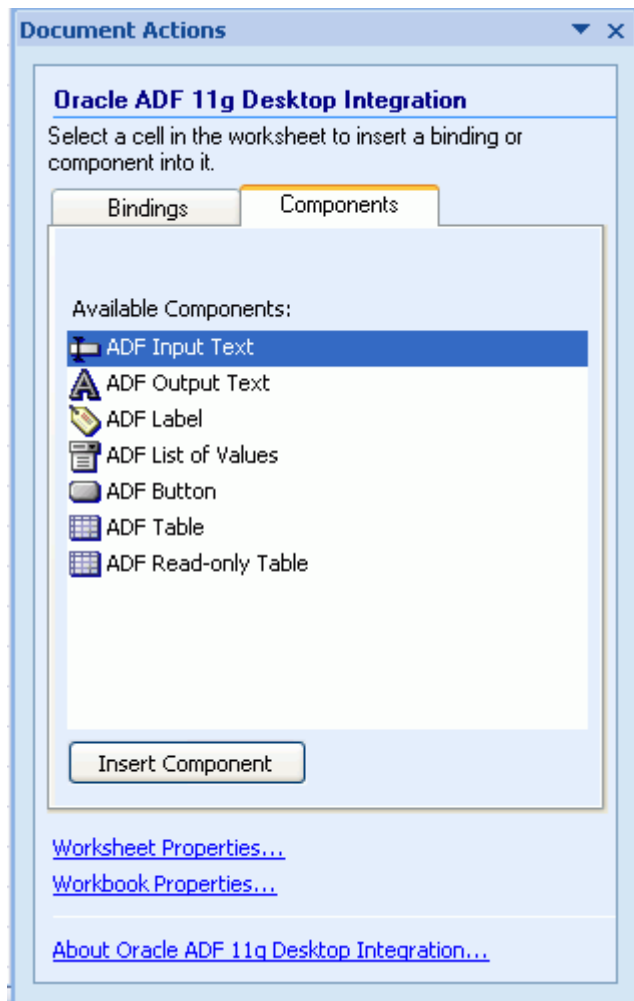


The Oracle ADF Desktop Integration Designer toolbar provides menu buttons that let you invoke the actions that are described in [Table 5-1](#).

Table 5-1 Oracle ADF Desktop Integration Designer Toolbar Menu Options

Click this button...	To...
	Display the property inspector window to view and edit component properties.
	Delete a component from the Excel worksheet.
	Switch the Excel workbook from design mode to test mode.
	Switch the Excel workbook from test mode to design mode. This button is active only when you are in test mode. For more information about switching between design mode and test mode, see Section 13.3, "Testing Your Integrated Excel Workbook" .
	Publish the Excel Workbook once you complete the integration between the Excel workbook and the Fusion web application. For more information about publishing an integrated Excel workbook, see Chapter 14, "Deploying Your Integrated Excel Workbook" .
	<ul style="list-style-type: none"> ■ Reload the application workspace file (.jws) and project file (.jpr) referenced by the workbook properties of the integrated Excel workbook ■ Refresh the list of IDs for page definition files that the integrated Excel workbook uses <p>Any modifications that you made to the page definition files in the JDeveloper project now become available in the Excel workbook. For more information, see Section 4.3.3, "Reloading a Page Definition File in an Excel Workbook".</p>
Tools	Use Tools > Reset Workbook ID to reset the value of the <code>WorkbookID</code> workbook property. The value of this property is unique to each workbook and cannot be modified by you. For more information, see Section 11.3.1, "How to Reset the Workbook ID" .

[Table 5-2](#) displays the Oracle ADF Desktop Integration Designer.

Figure 5–2 Oracle ADF Desktop Integration Designer

The Oracle ADF Desktop Integration Designer appears in Excel’s Document Actions. Use the **View > Document Actions** options on the Excel Ribbon to control the display of the Oracle ADF Desktop Integration Designer. [Table 5–2](#) lists the view tabs and links that appear in the designer, provides a brief description of each item, and provides a cross-reference to a section that gives more detailed information.

Table 5–2 Overview of the Oracle ADF Desktop Integration Designer

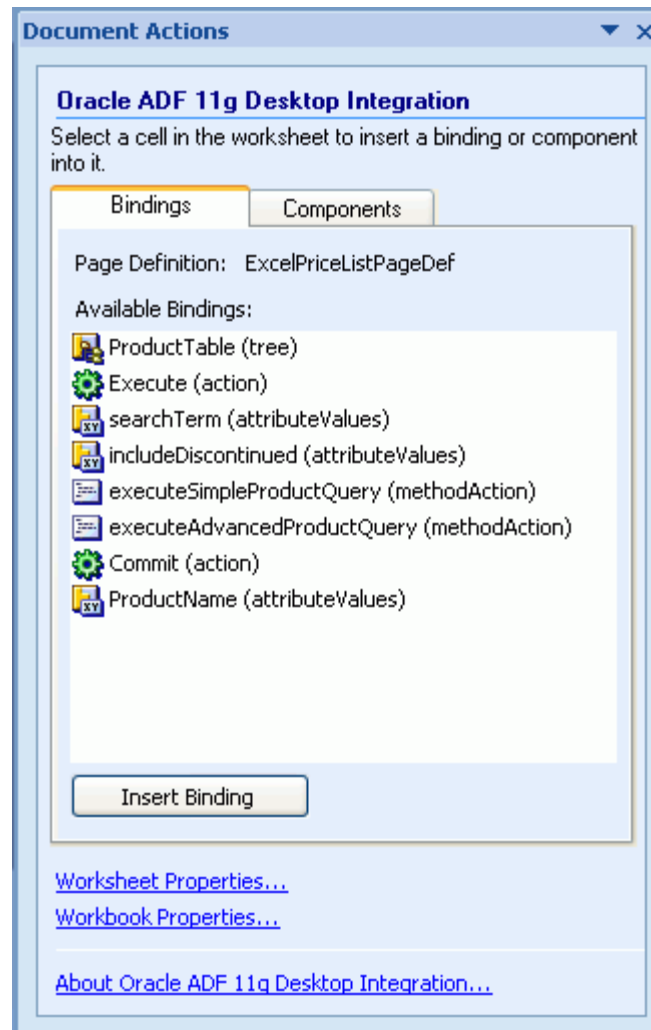
Designer UI Element	Description
Workbook Properties	Click to display the Edit Workbook Properties dialog box. This dialog box allows you to view and edit properties that affect the whole workbook. Examples include properties that reference the directory paths to page definition files, the URL for your Fusion web application, and so on.
Worksheet Properties	Click to display the Edit Worksheet Properties dialog box. This dialog box allows you to view and edit properties specific to the active worksheet. An example is the file name of the page definition file that you associate with the worksheet.

Table 5–2 (Cont.) Overview of the Oracle ADF Desktop Integration Designer

Designer UI Element	Description
About Oracle ADF 11g Desktop Integration	Click to display the About Oracle ADF 11g Desktop Integration dialog box. This dialog box provides a variety of version and property information that can be useful when troubleshooting an integrated Excel workbook. For example, it provides information about the underlying Microsoft .NET and Oracle ADF frameworks that support an integrated Excel workbook.
Bindings	The bindings palette displays the list of Oracle ADF bindings that you can insert into an Excel worksheet. For information on how to use this palette, see Section 5.2, "Using the Bindings Palette" .
Components	The components palette displays the list of Oracle ADF components that you can insert into an Excel worksheet. For information on how to use this palette, see Section 5.3, "Using the Components Palette" .

5.2 Using the Bindings Palette

The bindings palette presents the available Oracle ADF bindings that you can insert into the Excel worksheet. The page definition file for the current Excel worksheet determines what Oracle ADF bindings appear in the bindings palette. [Figure 5–3](#) shows a bindings palette populated with Oracle ADF bindings in the Oracle ADF Desktop Integration Designer. Note that the bindings palette does not display bindings that an integrated Excel workbook cannot use, so the bindings that appear may differ from those that appear in the page definition file viewed in JDeveloper.

Figure 5–3 Oracle ADF Bindings Palette in the Oracle ADF Desktop Integration Designer

You use the bindings palette in design mode to insert a binding. When you attempt to insert a binding, the Oracle ADF Desktop Integration module inserts an Oracle ADF component that references the binding you selected. The Oracle ADF Desktop Integration module also prepopulates the properties of the Oracle ADF component with appropriate values. For example, if you insert a binding, such as the **Commit (action)** binding illustrated in Figure 5–3, the property inspector for an Oracle ADF Button component appears. This Oracle ADF Button component has values specified for its `ClickActionSet` that include invoking the `Commit` action binding.

To insert an Oracle ADF binding, you first select the cell that you want to anchor the Oracle ADF component that is going to reference the binding in the Excel worksheet, and then insert the binding in one of the following ways:

- Double-click the Oracle ADF control binding you want to insert.
- Select the control binding and click **Insert Binding** in the Oracle ADF Desktop Integration Designer.

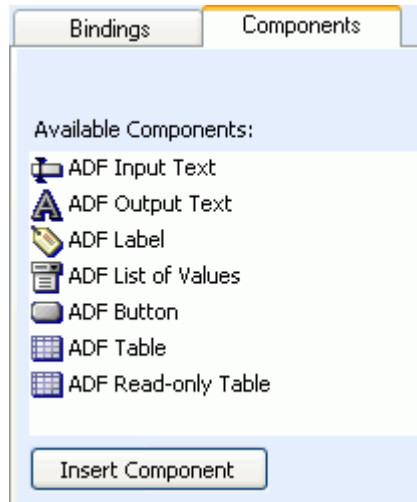
A property inspector for the Oracle ADF component that is associated with the binding you attempt to insert appears. In some instances, you may be prompted to select one Oracle ADF component from a list of Oracle ADF components where

more than one Oracle ADF component can be associated with the binding. Once you select an Oracle ADF component from the list, a property inspector appears.

5.3 Using the Components Palette

The components palette displays the available Oracle ADF Desktop Integration module components that you can insert into an Excel worksheet. [Figure 5-4](#) shows the components palette as it appears in the Oracle ADF Desktop Integration Designer.

Figure 5-4 Oracle ADF Components Palette in the Oracle ADF Desktop Integration Designer



You use the components palette in design mode to insert an Oracle ADF component. First, select the cell that you want to anchor the Oracle ADF component in the Excel worksheet, and then insert the Oracle ADF component in one of the following ways:

- Double-click the Oracle ADF component you want to insert.
- Select the component and click **Insert Component** in the Oracle ADF Desktop Integration Designer.

In both cases, the Oracle ADF component's property inspector appears. Use the property inspector to specify values for the component before you complete its insertion into the Excel worksheet.

5.4 Using the Property Inspector

The property inspector is a dialog box that allows you to view and edit the properties of Oracle ADF bindings, Oracle ADF components, Excel worksheets, or the Excel workbook. The component properties icon in the Oracle ADF Desktop Integration Designer toolbar controls the display of the property inspector dialog box. The property inspector dialog box also appears automatically after you insert an Oracle ADF binding or component into an Excel worksheet. [Figure 5-5](#) shows a property inspector window where you can view and edit the properties of an Oracle ADF Button component.

Note: The property inspector does not validate that values you enter for a property or combinations of properties are valid. Invalid values may cause runtime errors. To avoid runtime errors, make sure you specify valid values for properties in the property inspector.

You can display the properties in an alphabetical list or in a list where the properties are grouped by categories such as Behavior, Data, and so on. The following table describes the buttons that you can use to change how properties display in the property inspector.



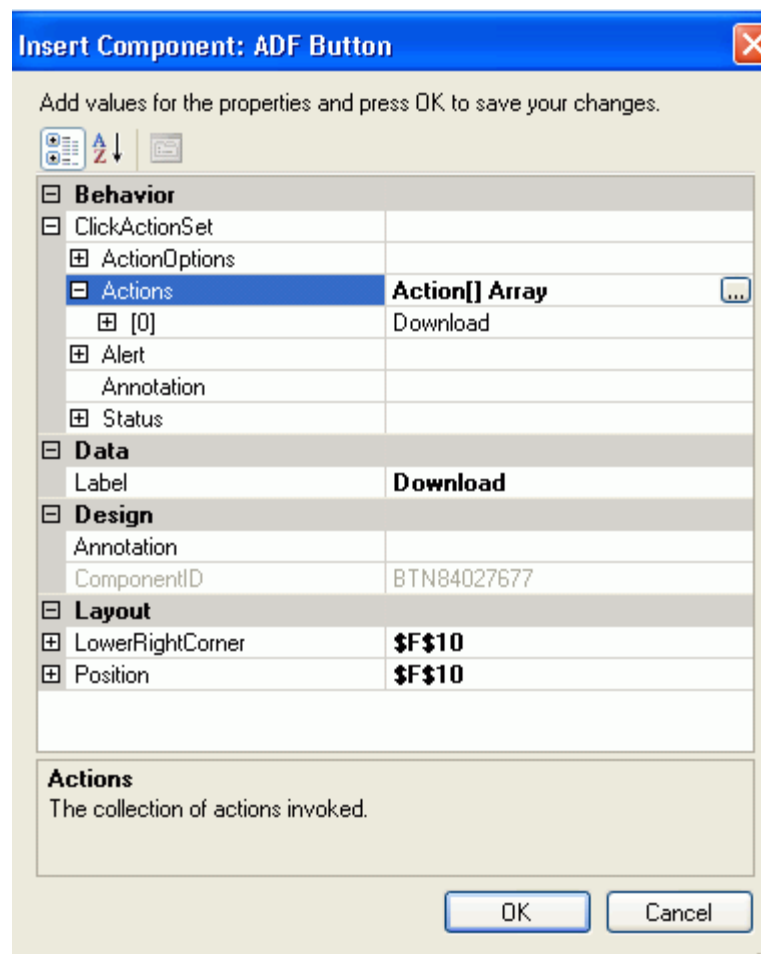
Use this button to display the properties according to category.



Use this button to display the properties in an alphabetical list.

In [Figure 5-5](#), the property inspector displays the properties grouped by category.

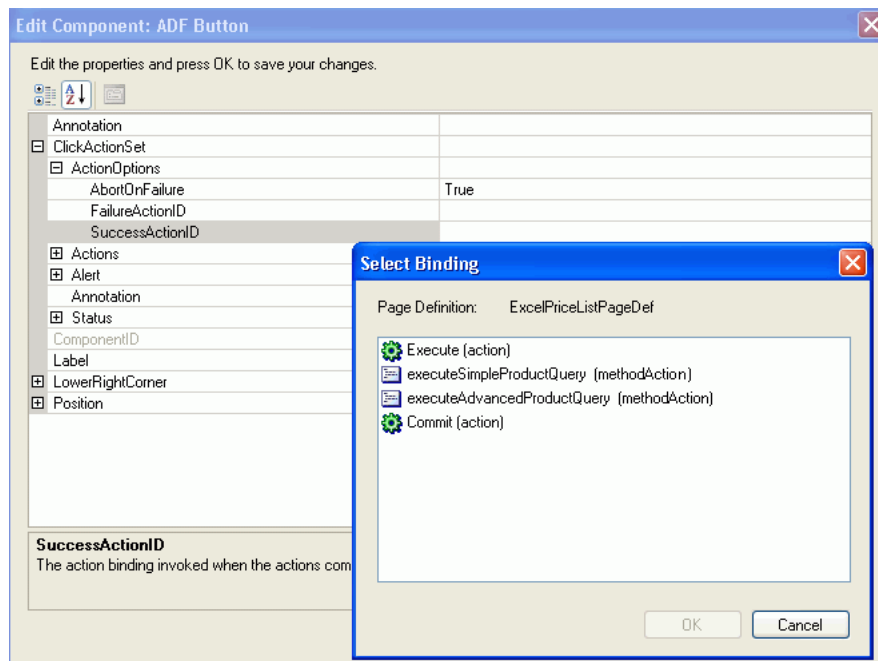
Figure 5-5 *Property Inspector Window for an Oracle ADF Component*



5.5 Using the Binding ID Picker

The binding ID picker is a dialog box that allows you to select Oracle ADF bindings at design time to configure the behavior of Oracle ADF components at runtime. You invoke the binding ID picker from the property inspector. The binding ID picker filters the Oracle ADF bindings that appear, based on the type of binding that the Oracle ADF component property accepts. For example, the `SuccessActionID` property for an ADF Button component supports only action bindings. As a result, the binding ID picker filters the bindings from the page definition file so that only action bindings appear, as illustrated in [Figure 5-6](#).

Figure 5-6 Binding ID Picker

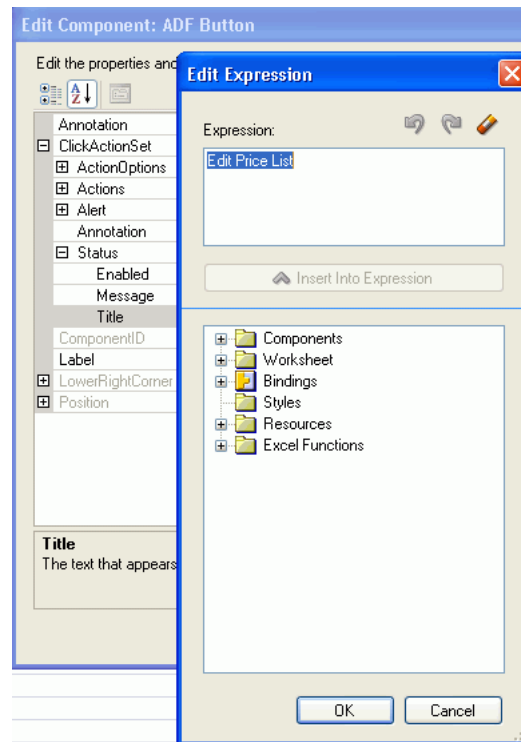


For more information about Oracle ADF Desktop Integration component properties and the bindings they support, see [Appendix A, "Oracle ADF Desktop Integration Component Properties and Actions"](#).

5.6 Using the Expression Builder

You use the expression builder to write EL expressions that configure the behavior of components at runtime in the Excel workbook. You invoke the expression builder from the property inspector of component properties that support EL expressions. For example, the `Title` property in [Figure 5-7](#) supports EL expressions and, as a result, you can invoke the expression builder to set a value for this property.

You can reference bindings in the EL expressions that you write. Note that the expression builder does not filter bindings. It displays all bindings that the page definition file exposes. See [Table 4-1](#) to identify the types of bindings that each Oracle ADF Desktop Integration component supports.

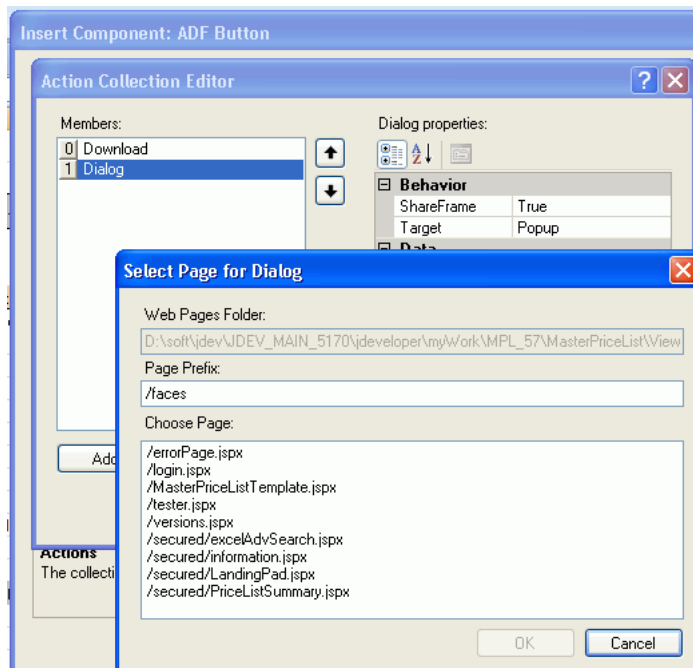
Figure 5–7 Expression Builder

For more information about using the expression builder, see [Section 9.3, "Applying Styles Dynamically Using EL Expressions"](#). For information about the syntax of EL expressions in the Oracle ADF Desktop Integration module and guidelines on how you write these expressions, see [Appendix B, "Oracle ADF Desktop Integration EL Expressions"](#).

5.7 Using the Web Page Picker

Use the web page picker to select a web page from your Fusion web application. At runtime, an Oracle ADF component, for example an Oracle ADF Button component, can invoke the web page that you associate with the Oracle ADF component.

You can invoke the web page picker when you add a `Dialog` action to an action set in the Action Collector Editor. You use the web page picker to specify a web page for the `Page` property of the `Dialog` action, as illustrated in [Figure 5–8](#). You can also invoke the web page picker when you set a value for the `ProtectedWebPage` workbook property.

Figure 5–8 Web Page Picker Dialog Box

For more information about displaying web pages in your integrated Excel workbook, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#).

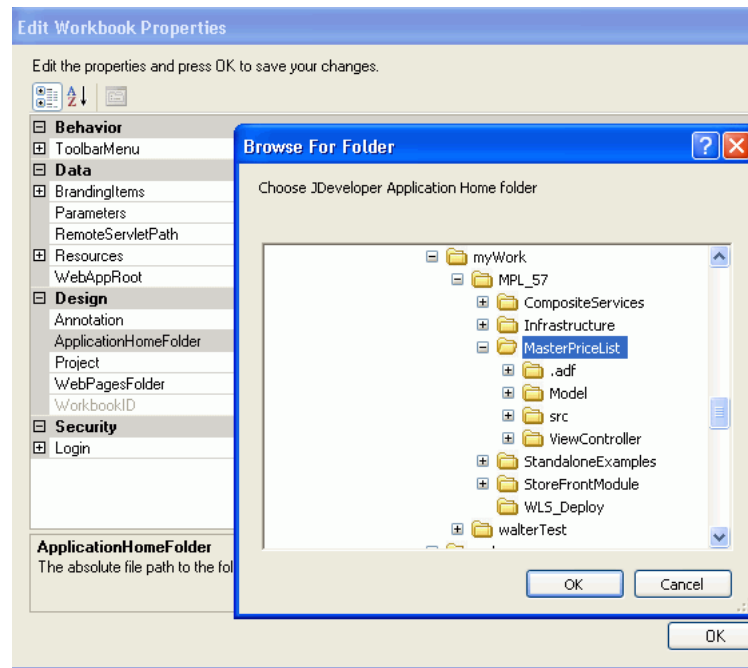
5.8 Using the File System Folder Picker

Use the file system folder picker to navigate over the Windows file system and select folders. You use this picker to specify values for the following workbook properties:

- `ApplicationHomeFolder`
- `WebPagesFolder`

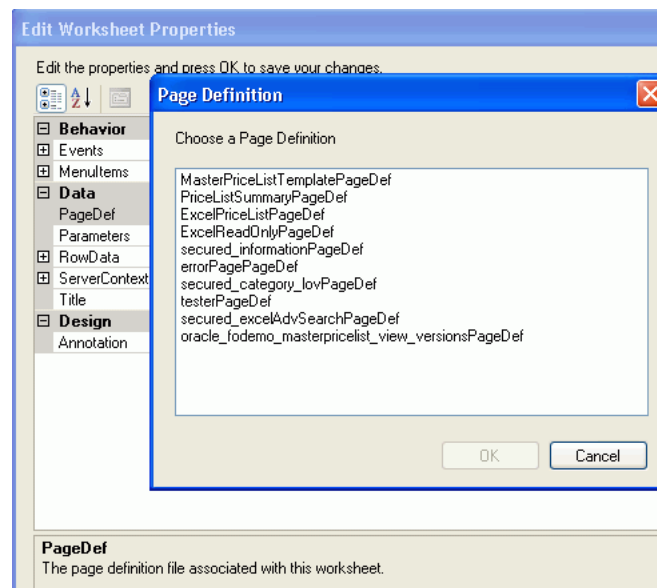
The first time you open an Excel workbook the picker appears so that you can set values for the previously listed properties. For more information about opening an Excel workbook for the first time and the properties you set, see [Section 4.4.2, "How to Open an Excel Workbook for the First Time"](#).

[Figure 5–9](#) shows the file system folder picker selecting a value for the `ApplicationHomeFolder` workbook property.

Figure 5–9 File System Folder Picker

5.9 Using the Page Definition Picker

Use the page definition picker to select the page definition ID of a page definition file and associate the file with a worksheet. The picker appears the first time that you activate a worksheet in an integrated Excel workbook. It can also be invoked when you attempt to set a value for the worksheet property, `PageDefinition`, as illustrated in [Figure 5–10](#).

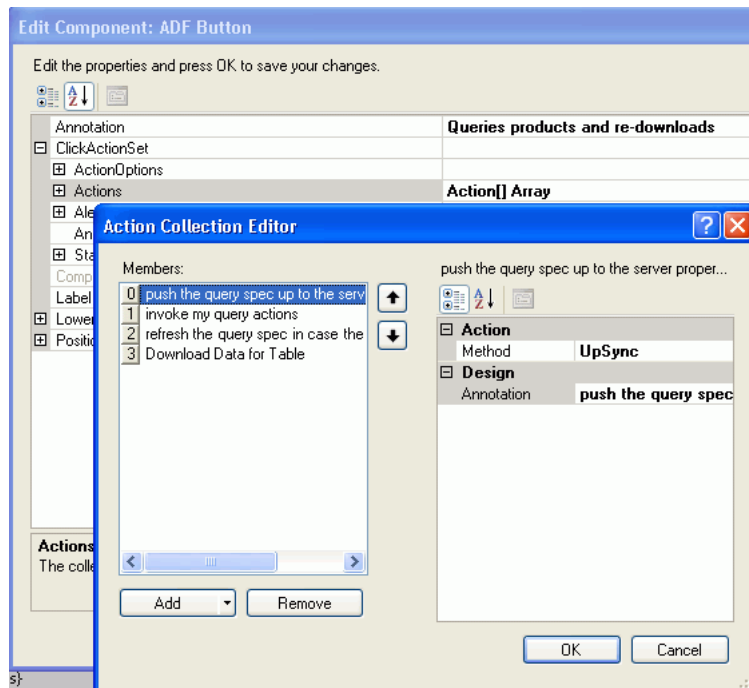
Figure 5–10 Page Definition Picker

For more information about page definition files, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

5.10 Using the Collection Editors

The Oracle ADF Desktop Integration module uses collection editors to manage the properties of elements in a collection. The title that appears in a collection editor's title bar describes what the collection editor allows you to configure. Examples of titles for collection editors include **CacheDataContext Collection Editor**, **TableColumn Collection Editor**, and the **Action Collection Editor**. These collection editors allow you to configure collections of cached data, table columns in the ADF Table component, and actions in an action set. [Figure 5–11](#) shows the collection editor that configures an action set for the **Search** button that appears at runtime in the Master Price List module's `EditPriceList.xlsx` workbook.

Figure 5–11 *Collection Editor*



Tip: Write a description in the Annotation field for each element that you add to the Action Collection Editor. The description you write appears in the **Members** list view and, depending on the description you write, may be more meaningful than the default entry that the Oracle ADF Desktop Integration module generates.

Working with Oracle ADF Desktop Integration Form-type Components

This chapter describes how you can insert and configure components that the Oracle ADF Desktop Integration module provides to allow end users to manage data retrieved from a Fusion web application.

This chapter includes the following sections:

- [Section 6.1, "Introduction to Oracle ADF Desktop Integration Form-type Components"](#)
- [Section 6.2, "Inserting an ADF Button Component"](#)
- [Section 6.3, "Inserting an ADF Label Component"](#)
- [Section 6.4, "Inserting an ADF Input Text Component"](#)
- [Section 6.5, "Inserting an ADF Output Text Component"](#)
- [Section 6.6, "Inserting an ADF Desktop Integration List of Values Component"](#)
- [Section 6.7, "Displaying Output from a Managed Bean in an ADF Component"](#)

6.1 Introduction to Oracle ADF Desktop Integration Form-type Components

Rather than expose an ADF Form component in the components palette described in [Section 5.3, "Using the Components Palette"](#), the Oracle ADF Desktop Integration module uses the following components to create form-type functionality in an integrated Excel workbook:

- ADF Input Text
- ADF Output Text
- ADF Label
- ADF Desktop Integration List of Values
- ADF Button

These components, along with those described in [Chapter 7, "Working with Oracle ADF Desktop Integration Table-type Components"](#), allow end users to manage data retrieved from the Fusion web application in the integrated Excel workbook.

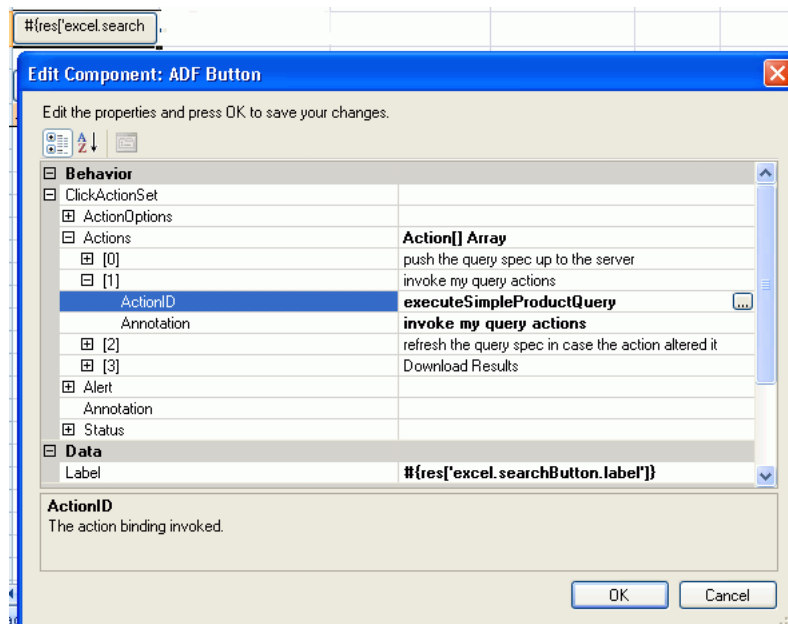
6.2 Inserting an ADF Button Component

The ADF Button component renders a button in the Excel worksheet at runtime. End users click this button to invoke one or more actions specified by the `ClickActionSet` group of properties.

The `LowerRightCorner` and `Position` properties determine the area that the button occupies on the Excel worksheet at runtime.

Figure 6–1 shows a button in an Excel worksheet in design mode. The property inspector for the button is in the foreground. When a user clicks the button at runtime, it invokes the array of actions specified by `ClickActionSet`.

Figure 6–1 ADF Button Component



For more information about the properties of the ADF Button component, see [Appendix A.7, "ADF Button Component Properties"](#).

To insert an ADF Button component:

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the components palette, select **ADF Button** and click **Insert Component**.
3. Configure properties in the property inspector to determine the actions the component invokes at runtime in addition to the appearance, design, and layout of the component. The following table outlines some properties you need to specify values for and provides links to additional information.

For this property...	Specify...
Label	<p>A string or an EL expression that resolves to a label at runtime to indicate the purpose of the ADF Button component. For example, the <code>Label</code> property for the Advanced Search button in the runtime <code>EditPriceList.xlsx</code> workbook of the Master Price List module has the following value in design mode:</p> <pre><code>{res['excel.advSearchButton.label']}</code></pre> <p>This EL expression references a string key in the <code>res</code> resource bundle. For more information about resource bundles, see Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook". For more information about using labels in integrated Excel workbooks, see Section 9.4, "Using Labels in an Integrated Excel Workbook".</p>
ClickActionSet	<p>Specify one or more actions in the <code>Actions</code> array of the <code>ClickActionSet</code> that the end user invokes when he or she clicks the ADF Button component. For more information about action sets, see Section 8.2, "Using Action Sets".</p>

4. Click OK.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

6.3 Inserting an ADF Label Component

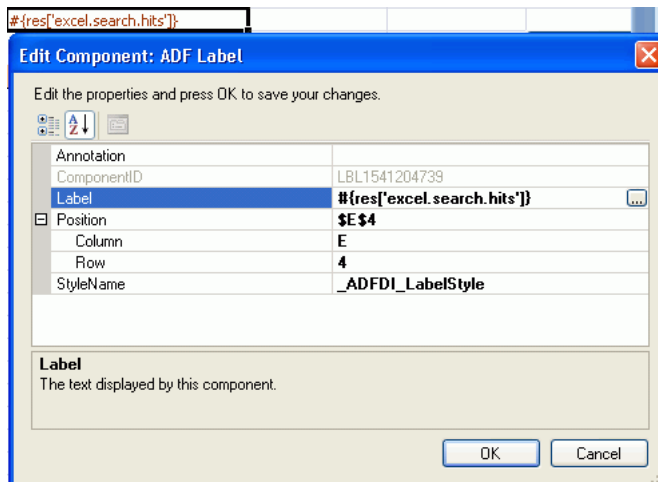
The ADF Label component is a component that you can insert into the active worksheet to display a static string value. You specify a value in the input field for `Label` in the property inspector or alternatively you invoke the expression builder to write an EL expression that resolves to a string at runtime. The retrieved string can be defined in a resource bundle or in an attribute control hint for an entity or view object. For example, the following EL expression resolves to the value of a string key defined in a resource bundle at runtime:

```
{bindings.ProductList.label}
```

The value that you specify for the `Label` property in an ADF Label component or other Oracle ADF components is evaluated once when the worksheet that hosts the Oracle ADF component is initialized (opened for the first time).

You can configure a number of properties for the component, such as style and position, in the worksheet using the property inspector.

[Figure 6–2](#) shows an ADF Label component with its property inspector in the foreground. The ADF Label component references an EL expression that resolves to the value of a string key defined in the `res` resource bundle at runtime.

Figure 6–2 ADF Label Component**To insert an ADF Label component:**

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the components palette, select **ADF Label** and click **Insert Component**.
3. Configure properties in the property inspector to determine the appearance, design, and layout of the component.
4. Click **OK**.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

For more information about using labels in an integrated Excel workbook, see [Section 9.4, "Using Labels in an Integrated Excel Workbook"](#).

6.4 Inserting an ADF Input Text Component

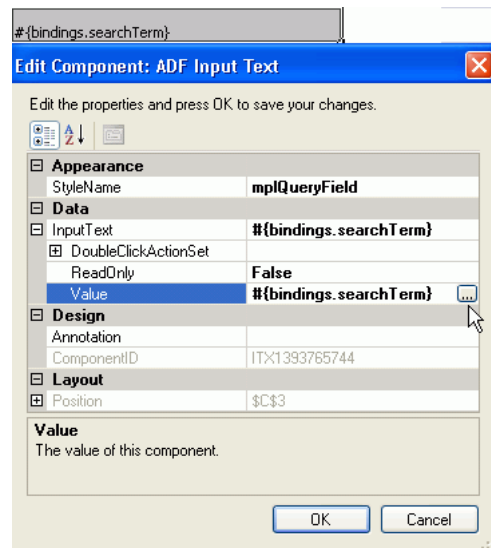
The ADF Input Text component is a component that you can insert into the active worksheet using the components palette. The active cell in the worksheet when you insert the component displays the current value from the component's binding after the worksheet `DownSync` action is invoked. End users can edit this value at runtime. You configure the worksheet `UpSync` action to transfer changes end users make to the value back to the Fusion web application and a `Commit` action binding to commit the changes in the Fusion web application.

You can configure a number of properties for the component such as style, behavior when a user double-clicks the cell (`DoubleClickActionSet` properties), and position, in the worksheet using the property inspector.

The ADF Table component can invoke this component as a subcomponent when you set values for the ADF Table component column's `InsertComponent` or `UpdateComponent` properties. In this context, the ADF Input Text component allows an end user to input data into the ADF Table component. For more information, see [Section 7.4, "Configuring an ADF Table Component to Insert Data"](#).

Figure 6–3 shows an ADF Input Text component with its property inspector in the foreground. The ADF Input Text component binds to the `searchTerm` attribute binding in the Master Price List module of the Fusion Order Demo application. An end user enters a search term in this component and then uses an ADF Button component to invoke a search.

Figure 6–3 ADF Input Text Component



To insert an ADF Input Text component:

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the components palette, select **ADF Input Text** and click **Insert Component**.
3. Configure properties in the property inspector to determine the appearance, layout, and behavior of the component. The following table outlines some properties that you need to specify values for. For information about the component’s other properties, see [Appendix A.2, "ADF Input Text Component Properties"](#).

For this property...	Specify...
<code>InputText.Value</code>	An EL expression for the <code>Value</code> property to determine what binding the component references.
<code>InputText.ReadOnly</code>	An EL expression that resolves to <code>False</code> so that changes an end user makes are uploaded. Write an EL expression that resolves to <code>True</code> if you want the component to ignore changes. <code>False</code> is the default value.

4. Click **OK**.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

6.5 Inserting an ADF Output Text Component

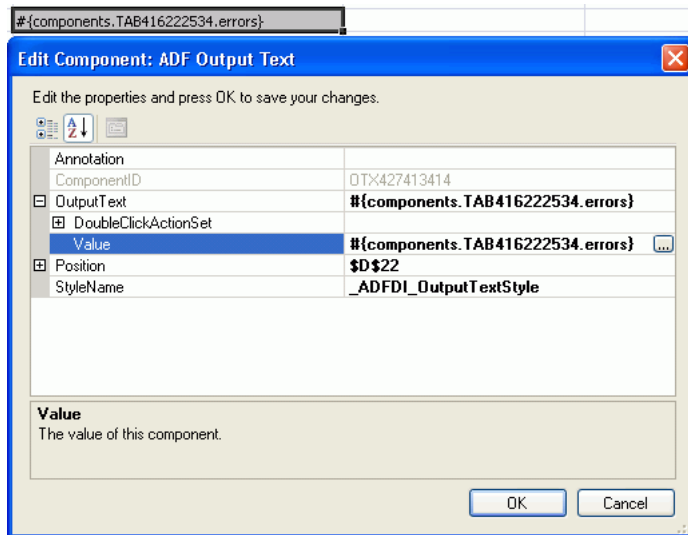
The ADF Output Text component is a component that you can insert into the active worksheet using the components palette. The active cell in the worksheet when you insert the component displays the current value from the component's binding after you invoke the worksheet `DownSync` action. The value the component displays is read-only. Changes that an end user makes to the value in the cell that anchors the component are ignored when changes are sent to the Fusion web application.

This component can also serve as a subcomponent for the ADF Table and ADF Read-only Table components. Columns in the ADF Table and ADF Read-only Table components can be configured to use the ADF Output Text component.

You can configure a number of properties for the component such as style, behavior when a user double-clicks the cell (`DoubleClickActionSet` properties), and position, in the worksheet using the property inspector.

Figure 6–4 shows an ADF Output Text component with its property inspector in the foreground. The ADF Output Text component references an ADF Table component in the Master Price List module of the Fusion Order Demo application. At runtime, the cell that anchors the ADF Output Text component displays any errors returned by the ADF Table component.

Figure 6–4 ADF Output Text Component



To insert an ADF Output Text component:

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the components palette, select **ADF Output Text** then click **Insert Component**.
3. Configure properties in the property inspector to determine the appearance, layout, and behavior of the component.

For example, you must write or specify an EL expression for the `Value` property to determine what binding the ADF Output Text component references. For more information about the values that you specify for the properties of the ADF Output Text component, see [Appendix A.3, "ADF Output Text Component Properties"](#).

4. Click **OK**.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

6.6 Inserting an ADF Desktop Integration List of Values Component

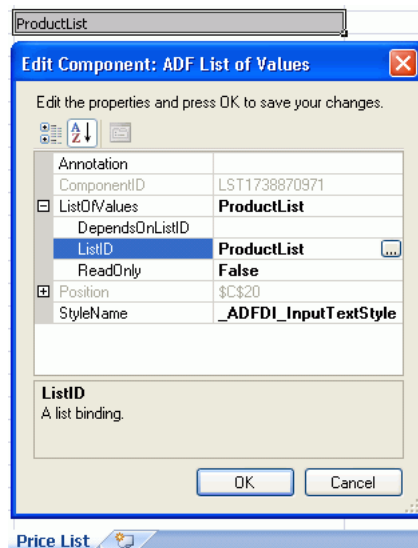
The ADF Desktop Integration List of Values component is a component that displays a dropdown menu in the Excel worksheet cell at runtime. It displays a maximum of two hundred and fifty values at runtime. You can insert the List of Values component into a cell in the Excel worksheet.

You must specify a value for the `ListID` property. The `ListID` property references the list binding which populates the dropdown menu with a list of values at runtime after you invoke the worksheet `DownSync` action.

Figure 6–5 shows an ADF Desktop Integration List of Values component with its property inspector in the foreground. The ADF Desktop Integration List of Values component references a list binding (`ProductList`) that populates a dropdown menu in the Excel worksheet at runtime.

Note: You can display a dropdown menu in an ADF Table component's column by selecting `TreeNodeList` as the subcomponent to create when you specify a value for the `TableColumn` array's `InsertComponent` property. For more information, see Section 8.8, "Creating a List of Values in an ADF Table Component Column".

Figure 6–5 ADF Desktop Integration List of Values Component



To insert an ADF Desktop Integration List of Values component:

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the components palette, select **ADF List of Values** and click **Insert Component**.

3. Invoke the binding ID picker by clicking the ellipsis button (...) beside the input field for the **ListID** property and select a list binding that the page definition file exposes.
4. Configure other properties in the property inspector to determine the appearance, design, and layout of the component. For information about ADF Desktop Integration List of Values component properties, see [Appendix A.5, "ADF Desktop Integration List of Values Component Properties"](#).
5. Click **OK**.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

6.7 Displaying Output from a Managed Bean in an ADF Component

You can configure an ADF component to display output from a managed bean in your Fusion web application. Information about how to use managed beans in a Fusion web application can be found in the "Using a Managed Bean in a Fusion Web Application" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. You reference a managed bean in an integrated Excel workbook through an EL expression. Add a method action binding to the page definition file you associate with the Excel worksheet to retrieve the value of the managed bean and assign it to an attribute binding. Use an EL expression to retrieve the value of the attribute binding at runtime.

6.7.1 How to Display Output from a Managed Bean

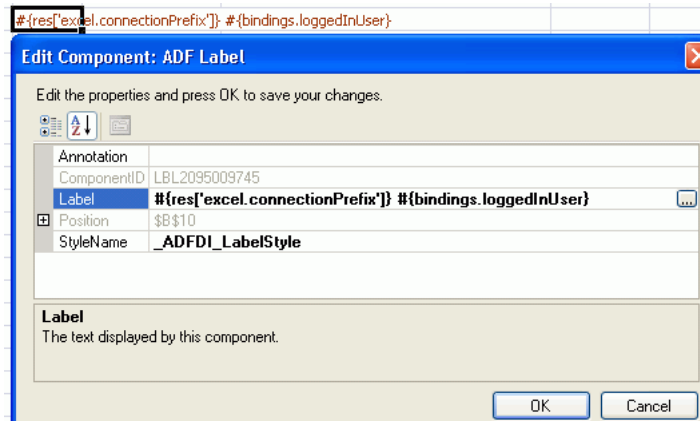
You write an EL expression for a property that supports EL expressions (for example, the `Label` property).

To display output from a managed bean:

1. Select the ADF component that you want to configure to display output from the managed bean, and display its property inspector.

[Figure 6–6](#) shows an example from the `EditPriceList.xlsx` workbook in the Master Price List module where an ADF Label component is configured to display the output from an attribute binding that has its value populated by an action binding.

Figure 6–6 ADF Label Component That Displays Output from a Managed Bean at Runtime



2. Write an EL expression that gets the output from a managed bean at runtime.

The example in Figure 6–6 shows an EL expression that retrieves the value of a string key (`excel.connectionPrefix`) from the `res` resource bundle and the value of the `loggedInUser` attribute binding. This attribute binding references the output from the managed bean.

3. Click OK.

6.7.2 What Happens at Runtime When an ADF Component Displays Output from a Managed Bean

The method action binding retrieves values from the managed bean and populates the attribute binding. The EL expression that you write retrieves the value from the attribute binding and displays it to the end user through the ADF component that you configured to display output. For example, the ADF Label component shown in design mode in Figure 6–6 displays a string similar to the following at runtime:

```
Connected as sking
```

where `sking` is the user name of the user that is logged on to the Fusion web application through the integrated Excel workbook.

Working with Oracle ADF Desktop Integration Table-type Components

This chapter describes how you work with the table-type components that the Oracle ADF Desktop Integration module provides.

This chapter includes the following sections:

- [Section 7.1, "Introduction to Oracle ADF Desktop Integration Table-type Components"](#)
- [Section 7.2, "Page Definition Requirements for an ADF Table Component"](#)
- [Section 7.3, "Inserting an ADF Table Component into an Excel Worksheet"](#)
- [Section 7.4, "Configuring an ADF Table Component to Insert Data"](#)
- [Section 7.5, "Configuring a Worksheet to Download Data to an ADF Table Component"](#)
- [Section 7.6, "Configuring a Worksheet to Download Pre-Insert Data to an ADF Table Component"](#)
- [Section 7.7, "Configuring a Worksheet to Upload Changes From an ADF Table Component"](#)
- [Section 7.8, "Configuring an ADF Table Component to Delete Rows in the Fusion Web Application"](#)
- [Section 7.9, "Batch Processing in an ADF Table Component"](#)
- [Section 7.10, "Special Columns in the ADF Table Component"](#)
- [Section 7.11, "Adding a Dynamic Column to Your ADF Table Component"](#)
- [Section 7.12, "Creating an ADF Read-only Table Component"](#)
- [Section 7.13, "Limiting the Number of Rows Your Table-type Component Downloads"](#)
- [Section 7.14, "Clearing the Values of Cached Attributes in an ADF Table Component"](#)
- [Section 7.15, "Tracking Changes in an ADF Table Component"](#)
- [Section 7.16, "Importing Data into a Runtime ADF Table Component"](#)

7.1 Introduction to Oracle ADF Desktop Integration Table-type Components

The Oracle ADF Desktop Integration module provides the following table-type components:

- ADF Table component
- ADF Read-only Table component

The ADF Table and ADF Read-only Table components provide end users with the functionality to download rows of data. The ADF Table component provides additional functionality that allows end users to edit downloaded data or to insert new rows of data. The ADF Table component's `Upload` action can upload the resulting data. Note that a full Excel row must be inserted for this functionality to work correctly.

The number of rows that an ADF Table or ADF Read-only Table component contains expands or contracts based on the number of rows to download from a Fusion web application. You should not place anything to the left or right of a table-type component unless you want to replicate it when Excel inserts rows to accommodate the data that one of the table-type components downloads. You can place other components above or below a table-type component as they maintain their position relative to the table-type component at runtime. End users who want to insert new rows of data into an ADF Table component at runtime must insert full rows into the Excel worksheet that hosts the ADF Table component.

The other Oracle ADF Desktop Integration module components that you can use in conjunction with these table-type components are described in [Chapter 6, "Working with Oracle ADF Desktop Integration Form-type Components"](#).

7.2 Page Definition Requirements for an ADF Table Component

The ADF Table component is one of the Oracle ADF components that the Oracle ADF Desktop Integration module exposes. It appears in the components palette of the Oracle ADF Desktop Integration Designer and, once inserted into an Excel worksheet, allows the following operations:

- Read-only
- Insert-only
- Update-only
- Insert and update

Review the following sections for information about page definition file requirements specific to an ADF Table component.

Before you can configure an ADF Table component to provide data-entry functionality to your end users, you must configure the underlying page definition file for the Excel worksheet with ADF bindings. For general information about the page definition file requirements for an integrated Excel workbook, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

Expose the following control bindings when you create a page definition file for authoring an ADF Table component:

- Tree binding that exposes desired attribute bindings and a tree binding attribute that uniquely identifies each row in the table.

- Method action bindings and action bindings if you intend to configure values for the ADF Table component's `RowActions` and `BatchOptions` groups of properties. Examples of procedures where you set values for these groups of properties include:
 - Section 7.3, "Inserting an ADF Table Component into an Excel Worksheet"
 - Section 7.4, "Configuring an ADF Table Component to Insert Data"
 - Section 7.6, "Configuring a Worksheet to Download Pre-Insert Data to an ADF Table Component"

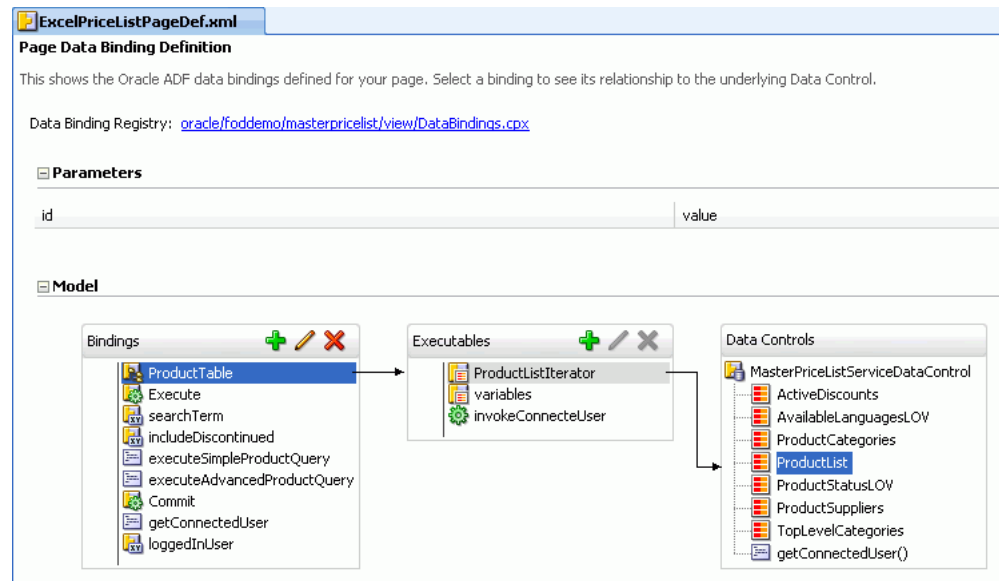
Note: The previous list is not exhaustive.

- (Optional) Update record action binding.

Note: Use descriptive names for the attributes of different iterators. Excel displays a flat list of bindings, so you will not see the iterators.

Figure 7–1 shows the bindings that the `ExcelPriceListPageDef.xml` page definition file includes. This page definition file can support the use of an ADF Table component in the Excel worksheet that it is associated with.

Figure 7–1 ADF Bindings Supporting Use of an ADF Table Component



7.3 Inserting an ADF Table Component into an Excel Worksheet

Once you have configured a page definition file correctly, you can insert the ADF Table component into the worksheet and configure its properties to achieve the functionality you want.

To insert an ADF Table component into an Excel worksheet:

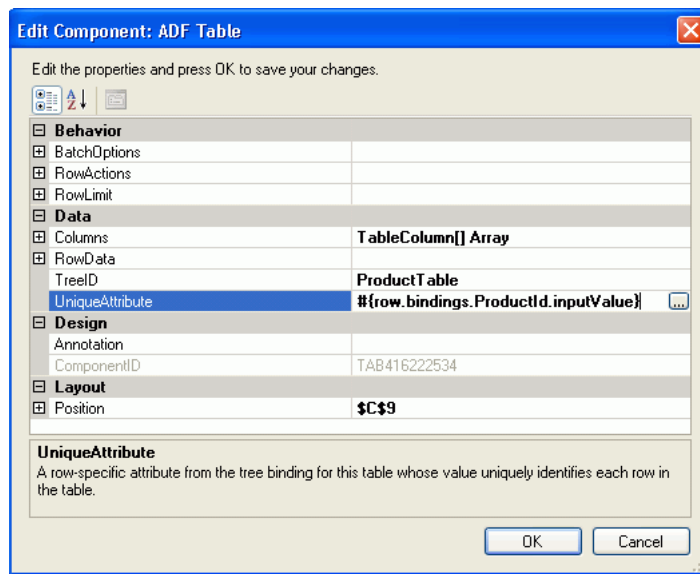
1. Select the cell in the Excel worksheet where you want to insert the ADF Table component.

2. In the bindings palette of the Oracle ADF Desktop Integration Designer, select the tree binding that you want to use and click **Insert Binding**.
3. In the dialog box that appears, select **ADF Table** and click **OK**.

Note: You can also insert an ADF Table component by using the components palette. Select **ADF Table** and click **Insert Component**. If you use the components palette to create the component, you have to add each column that you want to appear in the component at runtime.

4. Configure properties for the ADF Table component using the property inspector shown in [Figure 7-2](#).

Figure 7-2 ADF Table Property Inspector



5. Write an EL expression for the UniqueAttribute property to retrieve the value of the tree binding attribute.
6. Configure the RowActions properties of the ADF Table component as described in the following table.

Set this property to...	This value...
InsertRowEnabled	True
InsertBeforeRowActionID	The action binding that the page definition file exposes. For more information, see Section 7.4, "Configuring an ADF Table Component to Insert Data" .

7. Configure the BatchOptions properties of the ADF Table component as described in the following table.

Set this property to...	This value...
CommitBatchActionID	The Commit action binding that the page definition file exposes.

8. Optionally, configure the `RowLimit` group of properties to determine what number of rows the ADF Table component can download.

For more information, see [Section 7.13, "Limiting the Number of Rows Your Table-type Component Downloads"](#).

9. Click OK.

For more information about the properties that you can set for the ADF Table component, see [Appendix A.8, "ADF Table Component Properties and Actions"](#).

7.4 Configuring an ADF Table Component to Insert Data

The primary purpose of an ADF Table component is to provide end users with an interface where they can input or edit data which can then be uploaded to the database that serves your Fusion web application. For this to happen, you must expose methods on data controls, create action bindings in your page definition file, and set properties for the ADF Table component that an Excel worksheet hosts.

7.4.1 How to Configure an ADF Table Component to Insert Data Using a View Object's Operations

If you want the changes that an end user makes in an ADF Table component to be committed once he or she invokes the ADF Table component's `Upload` action, you need to configure a number of the ADF Table component's properties.

To configure an ADF Table component to insert data using a view object's operations:

1. If not already present, add a `CreateInsert` and a `Commit` action binding to the page definition file that is associated with the Excel worksheet that hosts the ADF Table component.

For more information, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#) and [Section 7.2, "Page Definition Requirements for an ADF Table Component"](#).

2. Select the cell in the Excel worksheet that references the ADF Table component and click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar to display the Edit Component: ADF Table dialog box.
3. Configure the `RowActions` properties of the ADF Table component as described in the following table.

Set this property to...	This value...
<code>InsertRowEnabled</code>	True
<code>InsertBeforeRowActionID</code>	The <code>CreateInsert</code> action binding that the page definition file exposes.

4. Configure the `BatchOptions` properties of the ADF Table component as described in the following table.

Set this property to...	This value...
<code>CommitBatchActionID</code>	The <code>Commit</code> action binding that the page definition file exposes.

- Configure the `Columns` property of the ADF Table component as described in the following table.

Set this property to...	This value...
<code>InsertUsesUpdate</code>	<code>True</code>
<code>UpdateComponent</code>	<ul style="list-style-type: none"> Set the Value field of the <code>UpdateComponent</code> property to the update attribute from the page definition file. For example, <code>#{row.bindings.ProductId.inputValue}</code>. Verify that <code>ReadOnly</code> property of <code>UpdateComponent</code> is set appropriately. <p>This property only appears if you selected <code>InputText</code> or <code>TreeNodeList</code> as the subcomponent to associate with the column. Set <code>ReadOnly</code> to <code>False</code> if you do want users to edit the values in the column, set to <code>True</code> otherwise.</p> <p>For more information about the components that you can use as a subcomponent, see Chapter 6, "Working with Oracle ADF Desktop Integration Form-type Components".</p>
<code>ID</code>	Set a value in this field that uniquely identifies the column in the ADF Table component's list of columns. A value for this property is required. The ADF Table component generates an initial value that you do not need to modify.
<code>CellStyleName</code>	Set this property to a style defined in the workbook or to an EL expression that applies a style to the cells in the column at runtime. For more information about styles, see Chapter 9, "Configuring the Appearance of an Integrated Excel Workbook" .
<code>HeaderLabel</code>	Set this property to a label or to an EL expression that evaluates to a label which is rendered in the column header at runtime. For more information about labels, see Section 9.4, "Using Labels in an Integrated Excel Workbook" .
<code>HeaderStyleName</code>	Set this property to a style defined in the workbook or to an EL expression that applies a style to the column's header cell at runtime. For more information about styles, see Chapter 9, "Configuring the Appearance of an Integrated Excel Workbook" .

- Repeat Step 5 for each column that contains data that you want to commit during invocation of the `Upload` action.

For information about ADF Table component properties, see [Appendix A.8, "ADF Table Component Properties and Actions"](#).

7.4.2 What Happens at Runtime When an ADF Table Component Inserts Data Using a View Object's Operations

During invocation of the ADF Table component's `Upload` action, the Oracle ADF Desktop Integration module does the following for each newly inserted row:

- Invokes the action binding specified by the ADF Table component's `RowActions.InsertBeforeRowActionID` property if an action binding is specified for this property.

For example, the procedure in [Section 7.4.1, "How to Configure an ADF Table Component to Insert Data Using a View Object's Operations"](#) specifies the `CreateInsert` action binding as the value for the `RowActions.InsertBeforeRowActionID` property.

- Sets values for each attribute binding according to the specified action binding.

3. Invokes the action binding specified by the ADF Table component's `RowActions.InsertAfterRowActionID` property if an action binding is specified for this property.

The procedure in [Section 7.4.1, "How to Configure an ADF Table Component to Insert Data Using a View Object's Operations"](#) does not specify a value for the `RowActions.InsertAfterRowActionID` property.

For more information about built-in operations, see the "What Happens When You Use Built-in Operations to Change Data" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

7.5 Configuring a Worksheet to Download Data to an ADF Table Component

Once you add an ADF Table component to a worksheet, you configure it and the worksheet that hosts it so that the ADF Table component downloads data from the Fusion web application. To achieve this, you configure an Oracle ADF component, such as ADF Button, a worksheet menu item, or a worksheet event to invoke an action set. The action set that is invoked must include the ADF Table component `Download` action among the actions that it invokes.

7.5.1 How to Configure a Worksheet to Download Data to an ADF Table Component

Configure an Oracle ADF component, a worksheet menu item, or a worksheet event to invoke an action set that, in turn, invokes the ADF Table component `Download` action.

To configure a worksheet to download data to an ADF Table component:

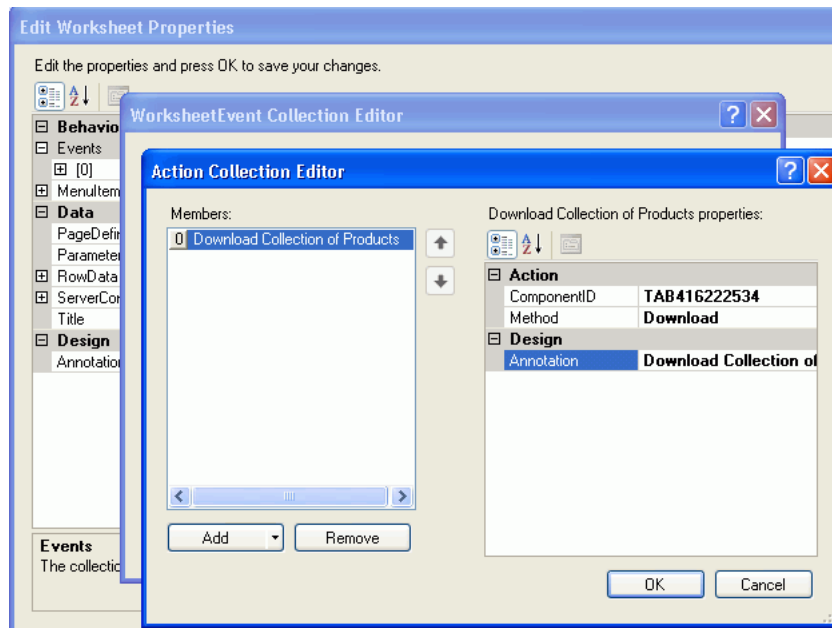
1. Open the Action Collection Editor to configure an action set for the worksheet event, worksheet menu item, or Oracle ADF component that is going to invoke the action set at runtime.

For more information about invoking action sets, see [Section 8.2, "Using Action Sets"](#).

2. Add the ADF Table component `Download` action to the list of actions that the action set invokes at runtime.

The ADF Table component `Download` action downloads the current state of the binding referenced by the ADF Table component `TreeID` property. To make sure that the state of this binding is up to date prior to download, add a query action that refreshes the binding before the action set invokes the ADF Table component `Download` action.

[Figure 7-3](#) shows the Action Collection Editor in the `EditPriceList.xlsx` workbook where the action set invoked by the worksheet event `Startup` is configured.

Figure 7-3 Action Set Downloading Data to an ADF Table Component

3. Click OK.

7.5.2 What Happens at Runtime When an ADF Table Component Downloads Data

The end user invokes the action set that you configured. The action set invokes the list of actions specified in order. These include an action that invokes the `Download` action of the ADF Table component. This action downloads the current state of the binding referenced by the ADF Table component `TreeID` property. If the tree binding referenced by the `TreeID` property contains data with a master-detail relationship (for example, a product category with multiple products), the ADF Table component shows the first record in the detail result set (for example, the first product). How you configured the tree binding in the Fusion web application determines which of the detail records is defined as the first record. For more information about using tree bindings to display master-detail data, see the "Using Trees to Display Master-Detail Objects" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

The number of rows that the action downloads depends on the values set for the `RowLimit` group of properties in the ADF Table component. For more information, see [Section 7.13, "Limiting the Number of Rows Your Table-type Component Downloads"](#).

7.6 Configuring a Worksheet to Download Pre-Insert Data to an ADF Table Component

Pre-insert data is data contained in one or more rows of data that you configure an iterator in a Fusion web application to reference. These rows of data have not yet been committed to the Fusion web application's database. You can configure the iterator to populate values for some or all of its attributes.

At design time in the integrated Excel workbook, you can configure an ADF Table component and the worksheet that hosts it so that the ADF Table component downloads pre-insert data from the Fusion web application. To achieve this, you

configure an Oracle ADF component, such as an ADF Button component, a worksheet menu item, or a worksheet event to invoke an action set. The action set that is invoked must include the ADF Table component `DownloadForInsert` action among the actions that it invokes.

The `DownloadForInsert` action differs from the `Download` action as follows:

- `DownloadForInsert` populates table cell data with the value of the EL expression for the insert component that is associated with each column in the ADF Table component. `Download` populates the table cell data with the EL expression for the update component that is associated with each column in the ADF Table component.
- The EL expression `#{components.componentID.currentRowMode}` returns `Insert` when evaluated by the `DownloadForInsert` action. In contrast, the same EL expression evaluated by the `Download` action returns `Update`. The `componentID` part of the EL expression references the ID of the ADF Table component.

Note the following points if you decide to invoke the `DownloadForInsert` action:

- An action set that includes the `DownloadForInsert` action does not execute this action if an ADF Table component's `RowActions.InsertRowEnabled` property is set to `False`.
- It serves no purpose to include both the `DownloadForInsert` and `Download` actions in the same action set as the last executed action determines what data appears in the ADF Table component.
- The ADF Table component does not invoke the `DownloadForInsert` action when no value is defined for the ADF Table component's `TreeID` property and the ADF Table component is insert only.

7.6.1 How to Configure a Worksheet to Download Pre-Insert Data to an ADF Table Component

Configure an Oracle ADF component, a worksheet menu item, or a worksheet event to invoke an action set that, in turn, invokes the ADF Table component `DownloadForInsert` action.

To configure a worksheet to download pre-insert data to an ADF Table component:

1. Open the Action Collection Editor to configure an action set for the worksheet event, worksheet menu item, or Oracle ADF component that is going to invoke the action set at runtime.
For more information about invoking action sets, see [Section 8.2, "Using Action Sets"](#).
2. Add the ADF Table component `DownloadForInsert` action to the list of actions that the action set invokes at runtime.
3. Click **OK**.

7.6.2 What Happens at Runtime When an ADF Table Component Downloads Pre-Insert Data

The end user invokes the action set that you configured. The action set invokes the list of actions specified in order. These include an action that invokes the

`DownloadForInsert` action of the ADF Table component. This action downloads pre-insert data from the Fusion web application and inserts it in rows of the ADF Table component in the Excel worksheet. The `InsertComponent` property is configured for the ADF Table component columns associated with the rows inserted to host the pre-insert data. End users can invoke the ADF Table component's `Upload` action to commit the pre-insert data to the Fusion web application's database.

7.7 Configuring a Worksheet to Upload Changes From an ADF Table Component

You configure the ADF Table component and the worksheet that hosts it so an end user can upload changes he or she makes to data in the ADF Table component to the Fusion web application. To configure this functionality, you decide what user gesture or worksheet event invokes the action set that invokes the ADF Table component's `Upload` action.

If you want to present end users with upload options in a web page from the Fusion web application that differ from the default upload dialog box, you specify a `Dialog` action in the action set before the action that invokes the ADF Table Component's `Upload` action. For more information, see [Section 7.7.3, "How to Create a Custom Upload Dialog"](#).

7.7.1 How to Configure a Worksheet to Upload Data from an ADF Table Component

Configure an Oracle ADF component, a worksheet menu item, or a worksheet event to invoke an action set that, in turn, invokes the ADF Table component `Upload` action.

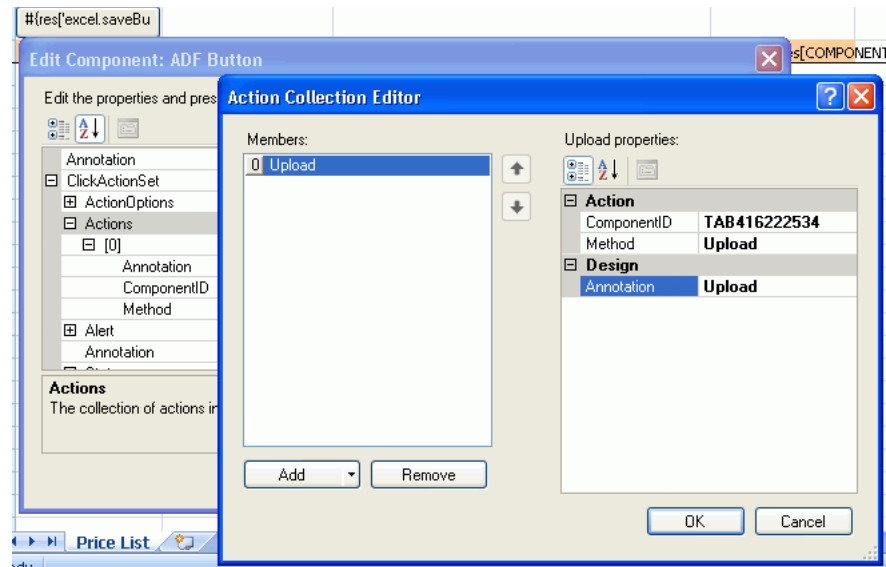
To configure a worksheet to upload changed data from an ADF Table component:

1. Open the Action Collection Editor to configure the action set that invokes the ADF Table component `Upload` action.

For more information about action sets, see [Section 8.2, "Using Action Sets"](#).

2. Add the ADF Table component `Upload` action to the list of actions that the action set invokes at runtime.

[Figure 7-4](#) shows the Action Collection Editor in the `EditPriceList.xlsx` workbook where the action set invoked by the ADF Button labeled **Save Changes** at runtime is configured.

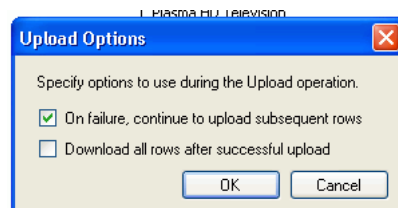
Figure 7-4 Action Set Uploading Data from an ADF Table Component

3. Click **OK**.

7.7.2 What Happens at Runtime When an ADF Table Component Uploads Data

At runtime, the end user invokes the action set through whatever mechanism you configured (ADF component, worksheet menu item, worksheet event). This triggers the following sequence of events:

1. If the ADF Table component contains dynamic columns, the Oracle ADF Desktop Integration module checks that dynamic columns expanded the last time the ADF Table component's `Download` action was invoked are still present in the Fusion web application. If they are not present in the Fusion web application, the Oracle ADF Desktop Integration module prompts the end user to determine if the end user wants to continue to upload. If the end user decides not to continue, the Oracle ADF Desktop Integration module returns a failure code to the executing action set.
2. If the ADF Table component contains no pending changes to upload, the ADF Table component's `Upload` action returns a success code.
3. If you did not configure a custom upload dialog for the action set, as described in [Section 7.7.3, "How to Create a Custom Upload Dialog"](#), the Oracle ADF Desktop Integration module presents a default upload dialog box shown in [Figure 7-5](#).

Figure 7-5 Default Upload Dialog Box

4. If the end user clicks **Cancel**, the Oracle ADF Desktop Integration module returns a failure code to the executing action set. If the end user clicks **OK**, the action set

continues executing with the options specified in the dialog for the upload operation.

5. The ADF Table component uploads data based on the values specified for the `BatchOptions` group of properties. For more information about batch options for the ADF Table component, see [Section 7.9, "Batch Processing in an ADF Table Component"](#).
6. If the ADF Table component uploads all batches successfully, the ADF Table component then downloads all rows from the Fusion web application if the end user selected this option in Step 4.
7. If the ADF Table component did not upload all batches successfully, the action set invokes the action specified by the `RowActions.FailureActionID` property if an action is specified for this property. The Oracle ADF Desktop Integration module returns a failure code to the action set.
8. If an error occurs during execution of the action set, the Oracle ADF Desktop Integration module returns an error code to the action set.

If you configured a status message as described in [Section 8.2.5, "How to Display a Status Message While an Action Set Executes"](#), a status message appears while the action set executes. Once the action set completes execution, an alert message appears if you configured one as described in [Section 8.2.7, "How to Provide an Alert After the Invocation of an Action Set"](#).

Note: If an ADF Table component column's `ReadOnly` property evaluates to `True`, the ADF Table component's `Upload` action ignores changes in the column's cells.

For more information about an ADF Table component column's properties, see [Table A-9](#).

7.7.3 How to Create a Custom Upload Dialog

You display a page from Fusion web application that offers end users different options to those presented in the default upload dialog box. You add a `Dialog` action before the action that invokes the ADF Table component's `Upload` action in the action set.

To create a custom upload dialog:

1. Create a page in the JDeveloper project where you develop the Fusion web application. For information on how to create this page, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#).
2. In addition to the `ADFdi_CloseWindow` span element described in [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#), the page that you create in Step 1 must include the span elements described in the following table:

Name	Description
<code>ADFdi_AbortUploadOnFailure</code>	If you set this span element to <code>True</code> , the action set stops uploading if it encounters a failure. If the span element references <code>False</code> , the action set attempts to upload all rows and indicates if each row succeeded or failed to upload. The default value for this span element is <code>True</code> .

Name	Description
ADFDi_DownloadAfterUpload	Set this span element to <code>True</code> so the action set downloads data from the Fusion web application to the ADF Table component after the action set uploads modified data. The default value for this span element is <code>False</code> .

Note: The page you create must include both span elements if you want to prevent the Oracle ADF Desktop Integration module presenting the default upload dialog box to end users.

3. Add a `Dialog` action to invoke the page you created in Step 1 before the action in the action set that invokes the ADF Table component's `Upload` action.

For more information about displaying pages from a Fusion web application, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#).

7.7.4 What Happens at Runtime When a Custom Upload Dialog Appears

The page from the Fusion web application that you configure the `Dialog` action in the action set to display appears instead of the default upload dialog box. For more information about displaying a page from the Fusion web application, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#). Otherwise, the runtime behavior of the action set that you configure to upload data is as described in [Section 7.7.2, "What Happens at Runtime When an ADF Table Component Uploads Data"](#).

7.8 Configuring an ADF Table Component to Delete Rows in the Fusion Web Application

The ADF Table component exposes an action (`DeleteFlaggedRows`) that, when invoked, deletes the rows in the Fusion web application that correspond to the flagged rows in the ADF Table component. A *flagged row* in an ADF Table component is a row where an end user has double-clicked or typed a character in the cell of the `_ADF_FlagColumn` column as described in [Section 7.9, "Batch Processing in an ADF Table Component"](#). The `_ADF_FlagColumn` column must be present in the ADF Table component if you want to configure it to delete rows in the Fusion web application.

In addition, the page definition file that you associate with the worksheet that hosts the ADF Table component must expose a `Delete` action binding.

7.8.1 How to Configure an ADF Table Component to Delete Rows in the Fusion Web Application

Configure an action set to invoke a `Delete` action binding in the page definition file that is associated with the worksheet that hosts the ADF Table component and set values for a number of `RowActions` properties.

To configure an ADF Table component to delete rows in a Fusion web application:

1. If not already present, add a `Delete` action binding to the page definition file that is associated with the Excel worksheet that hosts the ADF Table component.

For more information, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

- Open the property inspector for the ADF Table component and set values for the `RowActions` group of properties as described in the following table.

Set this property...	To...
<code>DeleteRowActionID</code>	The <code>Delete</code> action binding that the page definition file exposes.
<code>DeleteRowEnabled</code>	<p><code>True</code> to enable the ADF Table component to delete rows in the Fusion web application.</p> <p><code>False</code> is the default value.</p>

For more information about ADF Table component properties, see [Section A.8, "ADF Table Component Properties and Actions"](#).

- Click **OK**.
- Open the Action Collection Editor to configure an action set for the Oracle ADF component, worksheet menu item, or worksheet event that the end user uses to invoke the action set at runtime.
- Add the ADF Table component's `DeleteFlaggedRows` action to the list of actions that the action set invokes at runtime.

For more information about invoking action sets, see [Section 8.2, "Using Action Sets"](#).

- Click **OK**.

7.8.2 What Happen at Runtime When an ADF Table Component Deletes Rows in a Fusion Web Application

The end user flags rows to delete as described in [Section 7.9.2, "Row Flagging in an ADF Table Component"](#). He or she then invokes the action set. The following sequence of events occur:

- If specified, the action binding referenced by the `BatchOptions.StartBatchActionID` property is invoked.

Failures from this step are treated as errors. An error stops the action set invoking. It also returns the error condition to the action set. If an action binding is specified for the `ActionSet.FailureActionID` property, the action set invokes the specified action binding.

For more information about configuring batch options, see [Section 7.9, "Batch Processing in an ADF Table Component"](#).

- The action set invokes the `Delete` action binding specified by `RowActions.DeleteRowActionID`.

Note: Rows inserted since the last invocation of the ADF Table component's `Download` action but not uploaded to the Fusion web application are ignored even if flagged for deletion.

- If no errors occur during the invocation of the `Delete` action binding, a success message entry appears in the `_ADF_StatusColumn` column. If a failure occurs,

the ADF Table component stops invocation of the `Delete` action binding and continues to Step 4.

4. If an action binding is specified for the `BatchOptions.CommitBatchActionID` property, the action set invokes it. If this step fails, the action set stops processing batches. If no failures occur, the action set processes the next batch by invoking the action binding specified by the `BatchOptions.StartBatchActionID` property, and so on until the action set processes all batches.
5. If the action set processes all batches successfully, it invokes the action binding specified by its `ActionOptions.SuccessActionID` property if an action binding is specified for this property. It then removes the rows deleted in the Fusion web application by invocation of the `Delete` action binding specified by `RowActions.DeleteRowActionID` from the worksheet and returns a success code to the action set.

If failures occur while the action set processes the batches, the action set invokes the action binding specified by its `ActionOptions.FailureActionID` property if an action binding is specified for this property. This action binding returns a failure code to the action set.

6. If an unexpected exception occurs while the action set invokes its actions, an error code is returned to the action set.

7.9 Batch Processing in an ADF Table Component

The ADF Table component uploads modified rows from the Excel workbook in batches rather than row by row. You can configure a number of batch option properties that determine the size of batches and what actions the ADF Table component invokes when it uploads a batch.

7.9.1 Configuring Batch Options for an ADF Table Component

The ADF Table component has a group of properties (`BatchOptions`) that allow you to configure how the ADF Table component manages batches of rows. Information about these properties can be found in [Appendix A.8, "ADF Table Component Properties and Actions"](#).

To configure batch options for an ADF Table component:

1. Select the cell in the Excel worksheet that references the ADF Table component and then click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar.
2. Set values for the `BatchOptions` group of properties in the property inspector that appears.

Set this property...	To...
<code>BatchSize</code>	Specify how many rows to process before an ADF Table component action (<code>Upload</code> or <code>DeleteFlaggedRows</code>) invokes the action binding specified by <code>CommitBatchActionID</code> . Any value other than a positive integer results in all rows being processed in a single batch. The default value is 100 rows.
<code>CommitBatchActionID</code>	The action binding to invoke once the ADF Table component processes each batch. Typically, this is the <code>Commit</code> action binding.

Set this property...	To...
LimitBatchSize	True When True, the ADF Table component processes rows in batches determined by the value of BatchSize. When False, the ADF Table component uploads all modified rows in a single batch. True is the default value.
StartBatchActionID	Specify the action binding to invoke at the beginning of each batch.

3. Click OK.

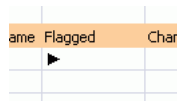
7.9.2 Row Flagging in an ADF Table Component

By default, the ADF Table component includes a column, `_ADF_FlagColumn`, that facilitates the selection of rows for flagged-row processing. One of the following actions by an end user in a cell of the `_ADF_FlagColumn` column flags the corresponding row for processing by actions invoked by a component action:

- Double-click a cell
- Type a character in a cell

When an end user carries out one of the previously listed actions, an arrow that points to the right appears (or is cleared if already flagged) in the cell to indicate that the row is flagged. [Figure 7-6](#) shows an example.

Figure 7-6 *Flagged Column in an ADF Table Component*



Note: By default, the arrow character indicates a row flagged for flagged-row processing. However, any non-empty cell in a `_ADF_FlagColumn` column flags the corresponding row for flagged-row processing.

The following component actions can be invoked on flagged rows:

- DeleteFlaggedRows
- DownloadFlaggedRows
- FlagAllRows
- UnflagAllRows

Use of these component actions is dependent on the appearance of the `_ADF_FlagColumn` column in the ADF Table component. If you remove the `_ADF_FlagColumn` column from the ADF Table component, you cannot invoke any of these component actions. For more information about these component actions, see [Appendix A.8.3, "ADF Table Component Actions"](#).

At runtime, an end user can invoke one of the previously listed component actions from an action set. The invoked component action processes all flagged rows. For example, it downloads or deletes all flagged rows. For more information about

configuring an action set to invoke a component action, see [Section 8.2.2, "How to Invoke Component Actions in an Action Set"](#).

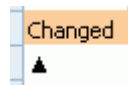
7.10 Special Columns in the ADF Table Component

By default, the ADF Table component includes a number of columns when you insert an ADF Table component in a worksheet. You can retain or remove these columns. The following list describes the columns and the purpose they serve:

- `_ADF_ChangedColumn`

The cells in this column track changes to the rows in the ADF Table component. If a change has been made to data in a row of the ADF Table component since download or the last successful upload, a character that resembles an upward pointing arrow appears in the corresponding cell of the `_ADF_ChangedColumn` column. This character also appears when a user double-clicks a cell in this column. [Figure 7-7](#) shows an example.

Figure 7-7 *Changed Column in an ADF Table Component*



Note: If an end user does not want the ADF Table component's `Upload` action to upload changes in the rows flagged by this column, he or she must clear the entry that appears in the corresponding cell.

A confirmation dialog appears to end users when the ADF Table component's `Download` action is invoked and one or more rows in this column are flagged as changed. The end user clicks **OK** to allow the `Download` action execute or **Cancel** to stop the execution of the `Download` action.

- `_ADF_FlagColumn`

When a user double-clicks a cell or types a character in this column, the corresponding row is flagged for flagged-row processing. An arrow character appears to indicate the row is flagged for flagged-row processing. For more information about the use of this column, see [Section 7.9.2, "Row Flagging in an ADF Table Component"](#).

A confirmation dialog appears to end users when the ADF Table component's `DownloadFlaggedRows` action is invoked and one or more rows in `_ADFChangedColumn` and `_ADF_FlagColumn` are flagged. The end user clicks **OK** to allow the action execute or **Cancel** to stop the execution of the action.

Note: By default, the arrow character indicates a row flagged for flagged-row processing. However, any non-empty cell in a `_ADF_FlagColumn` flags the corresponding row for flagged-row processing.

- `_ADF_StatusColumn`

This column reports the results of invocation of the following ADF Table component actions:

- `DeleteFlaggedRows`

- DisplayRowErrors

By default, `_ADF_StatusColumn` has an action set configured that invokes the ADF Table component's `DisplayRowErrors` action and displays error details (if any) in the corresponding row of `_ADF_StatusColumn`. The configured action set's `Status.Enabled` property is set to `False`.

- Upload

A message appears in the cell of the `_ADF_StatusColumn` to indicate the result of the invocation for the corresponding row. [Figure 7-8](#) shows an example.

Figure 7-8 Status Column in an ADF Table Component



The ADF Table component treats the properties of the `_ADF_ChangedColumn`, `_ADF_FlagColumn`, and `_ADF_StatusColumn` columns differently to the properties of other columns that it references. It ignores the values set for properties such as `InsertComponent`, `InsertUsesUpdate`, and `UpdateComponent` except when it invokes the `DisplayRowErrors` action described in [Table A-10](#). It reads the values for properties related to style and appearance, for example `CellStyleName` and `HeaderStyleName`.

7.11 Adding a Dynamic Column to Your ADF Table Component

You can add dynamic columns to an ADF Table component so that the ADF Table component expands or contracts at runtime depending on the number of columns returned by the view object. The `DynamicColumn` property in the `TableColumn` array controls this behavior. To make a column dynamic, set the `TableColumn` array's `DynamicColumn` property to `True`. A dynamic column in the `TableColumn` array is a column that is bound to a tree binding or tree node binding whose attribute names are not known at design time. A dynamic column can expand to more than a single worksheet column at runtime.

You create a dynamic column by specifying an EL expression with the following format for the `Value` property of the ADF Input Text or ADF Output Text component specified by the ADF Table component column's `InsertComponent` property as a subcomponent:

```
#{bindings.TreeID.[TreeNodeID].AttributeNamePrefix*.inputValue}
```

or:

```
#{bindings.TreeID.AttributeNamePrefix*.inputValue}
```

where:

- `TreeID` is the ID of the tree binding used by the ADF Table component
- `TreeNodeID` is an optional value that specifies the tree node binding ID. If you omit this value, all matching attributes from the tree binding display regardless of which tree node binding the attribute belongs to.
- `AttributeNamePrefix` identifies a subset of attributes that exist within the tree binding's underlying iterator. If you do not specify a value for `AttributeNamePrefix`, all attributes for the tree binding or tree binding node are returned. Always use the `*` character.

The following example returns all attributes that begin with the name "period" in the `model.EmpView` node of the `EmpTree` binding:

```
#{bindings.EmpTree.[model.EmpView].period*.inputValue}
```

If attributes changed in the tree binding since the last download, the ADF Table component updates the dynamic columns so that they contain up-to-date values.

When the ADF Table component's `Upload` action is invoked, the workbook prompts the end user to determine if the end user wants to continue to upload data in cases where the previously downloaded attributes no longer exist in the tree binding.

If a dynamic column supports both `Insert` and `Update` operations, you should specify the same EL expression for the `Value` properties of the dynamic column's `InsertComponent` and `UpdateComponent` subcomponents. At runtime, the ADF Table component expands to include a dynamic column that displays the value of the attribute binding returned by the EL expression.

Use the following syntax to write EL expressions for the `HeaderLabel` property of a dynamic column:

```
#{bindings.TreeID.[TreeNodeID].hints.AttributeNamePrefix*.label}
```

or:

```
#{bindings.TreeID.hints.AttributeNamePrefix*.label}
```

Specify the same tree binding ID, tree node binding ID, and attribute name prefix values in the `HeaderLabel` property of the dynamic column as the values you specify for the `Value` properties of the dynamic column's `InsertComponent` and `UpdateComponent` if the dynamic column supports `Insert` and `Update` operations.

Note: The ADF Table component ignores the value of a column's `Visible` property when you configure a column to be dynamic. For more information about ADF Table component column properties, see [Table A-9](#).

7.12 Creating an ADF Read-only Table Component

At runtime, the ADF Read-only Table component renders a table across a continuous range of cells that displays data from the tree binding that the ADF Read-only Table component references. Use this component to display data that you do not want the end user to edit.

This component supports a number of properties, such as `RowLimit`, that determine how many rows the component downloads when it invokes its `Download` action. It also includes a group of properties (`Columns`) that determine what columns from the tree binding appear at runtime in the Excel worksheet. The `TreeID` property specifies the tree binding that the component references. More information about these properties and others that the ADF Read-only Table component supports can be found in [Section A.9, "ADF Read-only Table Component Properties and Actions"](#).

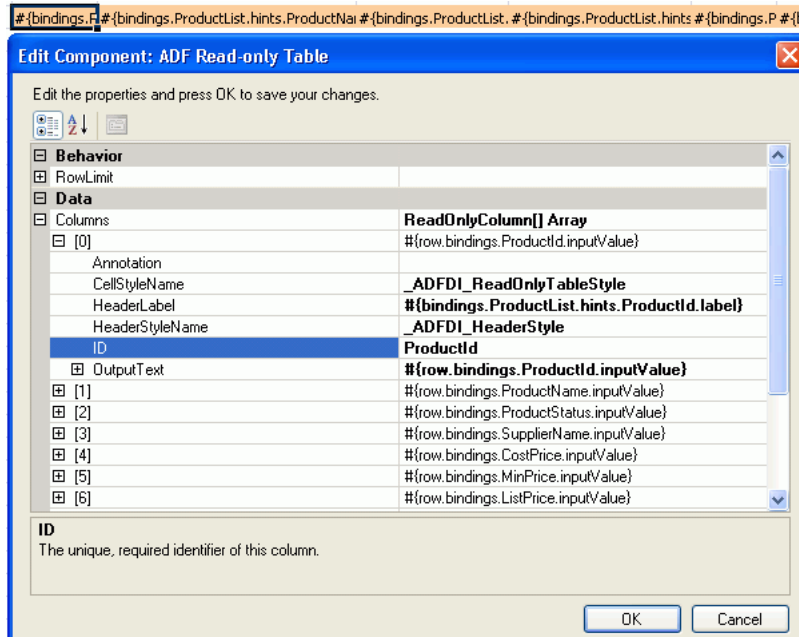
[Figure 7-9](#) shows the columns that an ADF Read-only Table component which references the `ProductList` tree binding in the `ExcelReadOnlyPageDef.xml` page definition file of the Master Price List module renders at runtime.

Figure 7–9 Columns in an ADF Read-only Table Component at Runtime

ProductId	ProductName	ProductStatus	SupplierName	CostPrice	MinPrice	ListPrice	Margin
19	Ipod Video 30Gb	AVAILABLE	Great Gadgets	130	227.95	249.99	119.99
20	Ipod Video 60Gb	AVAILABLE	Electronic and More	175	270.00	290.00	135.00

Figure 7–10 shows the corresponding view of the same ADF Read-only Table component at design time with the property inspector in the foreground.

Figure 7–10 ADF Read-only Table Component at Design Time



7.12.1 How to Insert an ADF Read-only Table Component

You use the Oracle ADF Desktop Integration Designer to insert an ADF Read-only Table component into a worksheet.

To insert an ADF Read-only Table component:

1. Select the cell in the Excel worksheet where you want to anchor the component.
2. In the bindings palette, select the binding that you want to use to create the ADF Read-only Table component.
3. In the dialog box that appears, select **ADF Read-only Table**.

Note: You can also insert an ADF Read-only Table component by using the components palette. Select **ADF Read-only Table** and click **Insert Component**. If you use the components palette to create the component, you have to add each column that you want to appear in the component at runtime.

4. Configure properties in the property inspector that appears to determine the columns to appear and the actions the component invokes at runtime.
5. Click **OK**.

Note: You can modify the properties of the component at a later time by selecting the cell in the worksheet that anchors the component and then displaying the property inspector.

7.12.2 How to Manually Add a Column to the ADF Read-only Table Component

You can manually add additional columns to an ADF Read-only Table component or re-add columns that you previously removed.

To manually add a column to the ADF Read-only Table component:

1. Select the cell in the worksheet that hosts the ADF Read-only Table component and click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar to display the Edit Component: ADF Read-only Table dialog box.
2. Click the ellipsis button (...) beside the input field for **Columns** to invoke the ReadOnlyColumn Collection Editor.
3. Click **Add** to add a new column to the ADF Read-only Table component.
4. Set values for the properties of the new column.

For information about the properties of an ADF Read-only Table component column, see [Table A-12](#).

5. Click **OK**.

7.13 Limiting the Number of Rows Your Table-type Component Downloads

You can configure the number of rows that an ADF Table or ADF Read-only Table component downloads by setting values for the component's `RowLimit` group of properties. You can also display a warning message, if desired, that alerts the end user when the number of rows available to download exceeds the number of rows specified for download.

7.13.1 How to Limit the Number of Rows a Component Downloads

Specify the number of rows that you want the component to download when it invokes its `Download` action as a value for the `RowLimit.MaxRows` property. Optionally, write an EL expression for the `RowLimit.WarningMessage` property so that the end user receives a message if the number of rows available to download exceeds the number specified by `RowLimit.MaxRows`.

To limit the number of rows a table-type component downloads:

1. Select the cell in the Excel worksheet that references the table-type component and click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar.
For more information, see [Section 8.2, "Using Action Sets"](#).
2. Configure properties for the `RowLimit` group of properties as described in the following table. For more information about these properties, see [Section A.1, "Frequently Used Properties in the Oracle ADF Desktop Integration Module"](#).

Set this property to...	This value...
<code>RowLimit.Enabled</code>	Set to <code>True</code> to limit the number of rows downloaded to the value specified by <code>RowLimit.MaxRows</code> .
<code>RowLimit.MaxRows</code>	Specify an EL expression that evaluates to the maximum number of rows to download.
<code>RowLimit.WarningMessage</code>	Write an EL expression for this property if you want to generate a message to display to the end user if the number of rows available to download exceeds the number specified by <code>RowLimit.MaxRows</code> . The default value also generates a message: <code>#{_ADFDIRes['ROWLIMIT_WARNINGS_MESSAGE_1']}</code> If the value for this property is null, the <code>Download</code> action downloads the number of rows specified by <code>RowLimit.MaxRows</code> without displaying a message to the end user.

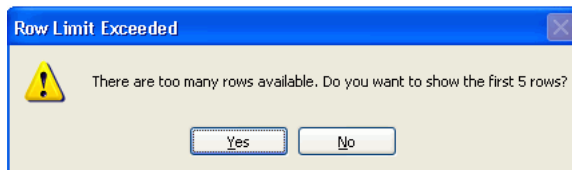
3. Click **OK**.

7.13.2 What Happens at Runtime When You Limit the Number of Rows a Component Downloads

When invoked, the Table-type component's `Download` action downloads the number of rows that you specified as the value for `RowLimit.MaxRows` from the Fusion web application. A message dialog similar to the one in [Figure 7-11](#) appears if you specify an EL expression for `RowLimit.MaxRows` or do not modify its default value:

```
#{_ADFDIRes['ROWLIMIT_WARNINGS_MESSAGE_1']}
```

Figure 7-11 Row Limit Exceeded Warning Message



7.14 Clearing the Values of Cached Attributes in an ADF Table Component

The `RowData` group of properties described in [Table A-8](#) allow you to specify data to cache in the ADF Table component. How you use this functionality is described in the following section and chapter:

- [Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook"](#)
- [Chapter 15, "Using an Integrated Excel Workbook Across Multiple Web Sessions and in Disconnected Mode"](#)

The ADF Table component exposes an action (`ClearCachedRowAttributes`) that, when invoked, clears the values of cached attributes for the current row of the ADF Table component.

7.14.1 How to Clear the Values of Cached Attributes in an ADF Table Component

Configure a `DoubleClickActionSet` that includes an action to invoke the ADF Table component's `ClearCachedRowAttributes` action.

To clear the values of cached attributes in an ADF Table component:

1. Open the Action Collection Editor for the Oracle ADF component that is going to invoke the `DoubleClickActionSet` at runtime.

For more information about invoking action sets, see [Chapter 8.2, "Using Action Sets"](#).
2. Add an action to the `DoubleClickActionSet` that invokes the ADF Table component's `ClearCachedRowAttributes` action.
3. Click **OK**.

7.14.2 What Happens at Runtime When the ADF Table Component Clears Cached Values

The action set invokes the ADF Table component's `ClearCachedRowAttributes` action. This action clears the cached values specified by the `RowData.CachedAttributes` property for the current row of the ADF Table component.

7.15 Tracking Changes in an ADF Table Component

End users can create or modify data in the cells of an integrated Excel workbook that host an ADF Table component. Each ADF Table component column specifies one of the following components for the `InsertComponent` or `UpdateComponent` properties:

- ADF Input Text component
- ADF Desktop Integration Tree Node List component
- ADF Output Text component

Depending on the component that you configure for an ADF Table component column's `InsertComponent` or `UpdateComponent` properties, end users can make the following changes:

- Edit cell values
- Insert or delete cell values
- Paste values to cells in the ADF Table component column that they copied elsewhere

A character that resembles an upward pointing arrow appears in a row of the `_ADF_ChangedColumn` column if an end user makes a change to data in a corresponding row.

This character appears if the end user makes a change to data hosted by a component where the component's `ReadOnly` property value is `False`. The ADF Input Text and ADF Desktop Integration Tree Node List components both have a `ReadOnly` property. You can write an EL expression or a static string for this `ReadOnly` property that evaluates to `True` or `False`. If you write a static string or an EL expression that evaluates to `True`, no character appears in the `_ADF_ChangedColumn` column.

If you write an EL expression for this `ReadOnly` property, the Oracle ADF Desktop Integration module evaluates it differently to other EL expressions during change tracking. This is because it is not desirable to invoke a connection to the Fusion web application if the end user makes changes to data in an ADF Table component while working in disconnected mode. Instead, the Oracle ADF Desktop Integration module substitutes an empty string value for any part of an EL expression that requires a connection to the Fusion web application. This behavior also applies to the ADF Table component column's `CellStyleName` property.

For example, an end user in disconnected mode makes a change to a data value hosted by the ADF Input Text component in an ADF Table component column. During change tracking, the Oracle ADF Desktop Integration module substitutes an empty string value in the parts of the EL expression for the ADF Input Text component's `ReadOnly` property and the ADF Table component column's `CellStyleName` property that require a connection to the Fusion web application. For this reason, write EL expression for these properties that evaluate as you intend if an empty string value is substituted for a part of the expression that requires a connection to the Fusion web application to retrieve a runtime value.

The ADF Output Text component does not have a `ReadOnly` property. Changes that you make to a value hosted by this component or the ADF Input Text and ADF Desktop Integration Tree Node List components as described in [Section 8.5, "Inserting Values in an ADF Table Component from a Web Page Pick Dialog"](#) do not result in a change to the `_ADF_ChangedColumn` column.

7.16 Importing Data into a Runtime ADF Table Component

End users who use the ADF Table component in an integrated Excel workbook to upload large batches of data rows to the Fusion web application can prepare these rows of data in a non-integrated Excel worksheet. They can then insert the data into the ADF Table component prior to invoking the ADF Table component's `Upload` action.

To prepare data in a non-integrated Excel workbook:

1. End users arrange the layout of data in a non-integrated Excel worksheet to match the layout of the ADF Table component in the integrated Excel workbook.

For example, if an ADF Table component contains columns such as `Product`, `Price`, and `Description`, reproduce this layout in the non-integrated Excel worksheet.

Tip: Copy the column headers from the ADF Table component to the non-integrated Excel worksheet.

2. End users use Excel's functionality to import the rows of data into the non-integrated Excel worksheet in rows under the columns arranged in Step 1.
3. Row values that will be inserted into ADF Table component columns that use the ADF Desktop Integration Tree Node List component must match a choice from the list of values.

Tip: Copy an ADF Table component row from the integrated Excel workbook to the non-integrated Excel worksheet as the proper constraints will be defined for such a row and can be reproduced in the non-integrated Excel worksheet.

To insert data into the ADF Table component from a non-integrated Excel workbook:

1. In the ADF Table component, end users highlight N existing downloaded rows or new rows at the end of the ADF Table component where N is the number of rows to insert.
2. End users right-click and select **Insert** from Excel's context menu.
3. In the non-integrated Excel worksheet, end users select the cells that they want to insert into the rows of the ADF Table component created in Step 2.

WARNING: Select the cells in the non-integrated Excel worksheet and not the rows or columns.

4. In Excel's menu, click **Home > Copy**.
5. In the ADF Table component, select the upper left corner cell of the rows inserted in Step 2.

Alternatively, select all rows inserted in Step 2.

6. In Excel's menu, click **Home > Paste**.

Note: Integrated Excel worksheets that contain an ADF Table component hide column A.

7. End users can now invoke the ADF Table component's `Upload` action using whatever functionality you configured for them as described in [Section 7.7, "Configuring a Worksheet to Upload Changes From an ADF Table Component"](#).

Adding Interactivity to Your Integrated Excel Workbook

This chapter describes how to add interactivity options to your integrated Excel workbook.

This chapter includes the following sections:

- [Section 8.1, "Introduction to Adding Interactivity to an Integrated Excel Workbook"](#)
- [Section 8.2, "Using Action Sets"](#)
- [Section 8.3, "Creating Menu Items"](#)
- [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#)
- [Section 8.5, "Inserting Values in an ADF Table Component from a Web Page Pick Dialog"](#)
- [Section 8.6, "Creating ADF Databound Search Forms in an Integrated Excel Workbook"](#)
- [Section 8.7, "Adding a Form to an Integrated Excel Workbook"](#)
- [Section 8.8, "Creating a List of Values in an ADF Table Component Column"](#)
- [Section 8.9, "Creating Dependent Lists of Values in an Integrated Excel Workbook"](#)
- [Section 8.10, "Configuring a Cell to Display a Dynamically Generated Hyperlink"](#)
- [Section 8.11, "Passing Server Data Context from a Fusion Web Application Page to a Workbook"](#)
- [Section 8.12, "Using Calculated Cells in an Integrated Excel Workbook"](#)
- [Section 8.13, "Using Macros in an Integrated Excel Workbook"](#)

8.1 Introduction to Adding Interactivity to an Integrated Excel Workbook

Adding interactivity to an integrated Excel workbook permits end users to execute action sets that invoke Oracle ADF functionality in the workbook. It also provides status messages, alert messages, and error handling in the integrated Excel workbook while these action sets execute. In addition to end-user gestures (double-click, click, select) on the Oracle ADF Desktop Integration components that invoke action sets, you can configure workbook and worksheet menu items that end users use at runtime to invoke action sets.

The action sets that end users invoke can make use of functionality defined in the Excel workbook and in pages of the Fusion web application with which you integrate

the Excel workbook. For example, the `EditPriceList.xlsx` workbook in the Master Price List module renders an ADF Button component that, at runtime, invokes a page from the Fusion web application. The invoked page allows end users to specify additional search criteria to what can be specified in the workbook's search form which is rendered using ADF Button, ADF Input Text, and ADF Label components.

In addition to action sets, you can configure Excel functionality, such as macros and Excel formulas, to manage the data that you want to download from or upload to your Fusion web application.

8.2 Using Action Sets

An *action set* is an ordered list of one or more of the following actions that execute in a specified order:

- `ADFmAction`
- `ComponentAction`
- `WorksheetMethod`
- `Confirmation`
- `Dialog`

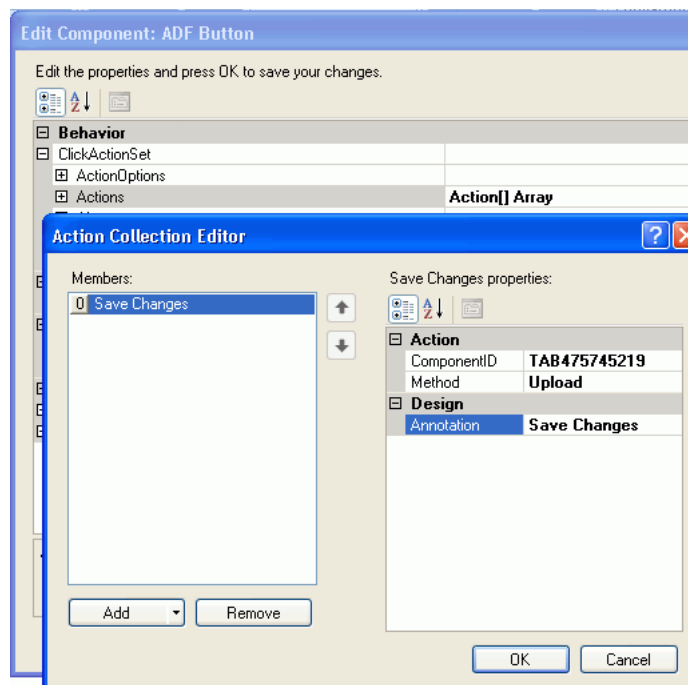
Invoking Action Sets

An action set can be invoked by an end-user's gesture (for example, clicking an ADF Button) or an Excel worksheet event. Where an end-user gesture invokes an action set, the name of the action set property in the ADF component's property inspector is prefaced by the name of the gesture required. The following list describes the property names that the Oracle ADF Desktop Integration module displays in property inspectors and what user gesture can invoke an action set:

- `ClickActionSet` for an ADF Button component, as an end user clicks the button to invoke the associated action set
- `DoubleClickActionSet` for an ADF InputText or ADF Output Text component, as an end user double-clicks these components to invoke the associated action set
- `SelectActionSet` for a worksheet menu item, as an end user selects a menu item to invoke the associated action set
- `ActionSet` for a worksheet event, as no explicit end-user gesture is required to invoke the action set

You invoke the Action Collection Editor from an ADF component, worksheet menu item, or worksheet event to define or configure an action set. In addition to defining the actions that an action set invokes, you can configure the action set's `Alert` properties to provide feedback on the result of invocation of an action set. You configure the `Status` properties for an action set to display a status message to end users while an action set executes the actions you define. For information about opening the Action Collection Editor, see [Section 5.10, "Using the Collection Editors"](#).

The Master Price List module provides many examples of action sets in use. One example is the ADF Button component labeled **Save Changes** at runtime in the `EditPriceList.xlsx` workbook. An action set has been configured for this ADF Button component that invokes the ADF Table component's `Upload` action illustrated by [Figure 8-1](#) which shows the Action Collection Editor in design mode.

Figure 8–1 Action Set for Save Changes Button in the EditPriceList.xlsx Workbook

Tip: Write a description in the **Annotation** field for each action that you add to the Action Collection Editor. The description you write appears in the **Members** list view and, depending on how you write it, may be more meaningful than the default entry that the Oracle ADF Desktop Integration module generates.

Execution Sequence for an Action Set

The Oracle ADF Desktop Integration module invokes the actions in an action set in the order that you specify in the **Members** list view.

8.2.1 How to Invoke an ADFm Action in an Action Set

You can invoke one or more ADFm actions in an action set. An ADFm action is also known as an action binding in the JDeveloper project where you develop your Fusion web application. Page definition files define what action bindings are available to invoke in a worksheet that you integrate with your Fusion web application. For more information about page definition files and action bindings in an integrated Excel workbook, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

You use the Action Collection Editor to specify an ADFm action to invoke.

To invoke an ADFm action in an action set:

1. Open the Action Collection Editor and invoke the dropdown list from the **Add** button illustrated here.



2. Select **ADFmAction** and configure its properties as described in the following list:

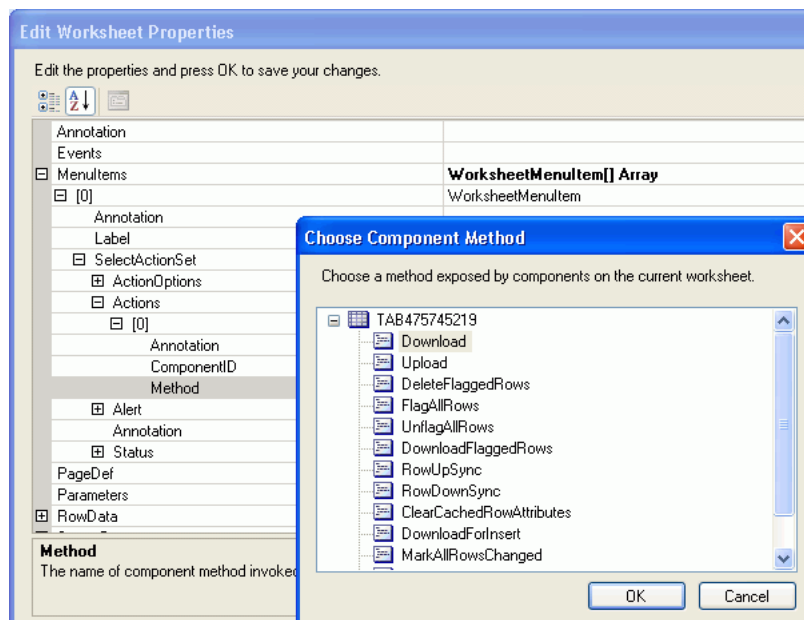
- `ActionID`
Click the ellipsis button (...) beside the input field for `ActionID` to invoke the Binding ID picker and select the ADFm action that the action set invokes at runtime.
 - `Annotation`
Optionally, enter a comment about the purpose of the action that you are configuring. The value you set for this property has no functional impact.
3. Click **OK**.

8.2.2 How to Invoke Component Actions in an Action Set

The ADF Table and the ADF Read-only Table components in the Oracle ADF Desktop Integration module expose actions that can be used to manage the transfer of data between Excel worksheets that you integrate with a Fusion web application. The ADF Read-only Table component exposes one component action, `Download`, while the ADF Table component exposes a number of other actions. More information about the actions for both components can be found in [Appendix A, "Oracle ADF Desktop Integration Component Properties and Actions"](#).

You configure action sets to invoke one or more component actions by referencing the component action in the array of actions. For example, [Figure 8–2](#) shows the Choose Component Method dialog box where the actions exposed by the ADF Table and ADF Read-only Table components present in a worksheet can be invoked by a `SelectActionSet` action set.

Figure 8–2 Choose Component Method Dialog Box



Note: An Excel worksheet must include an ADF Table or ADF Read-only Table component before one or more of these components' actions can be invoked by an action set.

To invoke a component action from an action set:

1. Open the Action Collection Editor and invoke the dropdown list from the **Add** button illustrated here.



2. Select **ComponentAction** and configure its properties as described in the following list:

- `ComponentID`

Click the ellipsis button (...) beside the input field for `ComponentID` to invoke the Choose Component Method dialog box and select the component action that the action set invokes at runtime. This populates the `ComponentID` and `Method` input fields.

- `Method`

The component's action that the action set invokes at runtime.

- `Annotation`

Optionally, enter a comment about the purpose of the action that you are configuring. The value you set for this property has no functional impact.

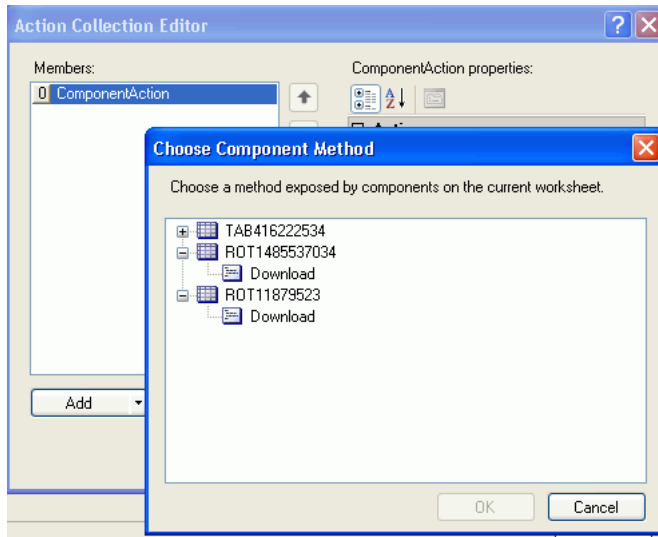
3. Click **OK**.

8.2.3 What You May Need to Know About an Action Set Invoking a Component Action

Note the following pieces of information about the behavior of action sets in integrated Excel workbooks.

Verifying an Action Set Invokes the Correct Component Action

When creating an action set, make sure that you invoke the component action from the correct instance of a component when a worksheet includes more than one instance of an ADF Read-only Table or ADF Table component. [Figure 8-3](#) shows the Choose Component Method dialog box displaying two instances of the ADF Read-only Table component. Use the value of the `ComponentID` property described in [Table A-1](#) to correctly identify the instance of a component on which you want to invoke a component action.

Figure 8–3 Choose Component Method Dialog Box**Invoking Action Sets in a Disconnected Workbook**

End users can use integrated Excel workbooks while disconnected from a Fusion web application, as described in [Chapter 15, "Using an Integrated Excel Workbook Across Multiple Web Sessions and in Disconnected Mode"](#). Some component actions, such as the `Download` action of the ADF Table component, require a connection to the Fusion web application to complete successfully. If an end user invokes an action set that includes such a component action, the integrated Excel workbook attempts to connect to the Fusion web application and, if necessary, invokes the authentication process described in [Section 11.2, "Authenticating the Excel Workbook User"](#).

8.2.4 How to Invoke an Action Set from a Worksheet Event

The Oracle ADF Desktop Integration module provides a number of worksheet events that, when triggered, can invoke an action set. The following worksheet events can invoke an action set:

- Startup
- Shutdown
 - Do not invoke a `Dialog` action from this event if the `Dialog` action's `Target` property is set to `TaskPane`.
- Activate
- Deactivate

You add an element to the array of events (`WorksheetEvent [] Array`) referenced by the `Events` worksheet property. You specify an event and the action set that it invokes in the element that you add. For more information about the `Events` worksheet property and the worksheet events that can invoke an action set, see [Table A–18](#). See [Table A–13](#) for more information about action sets.

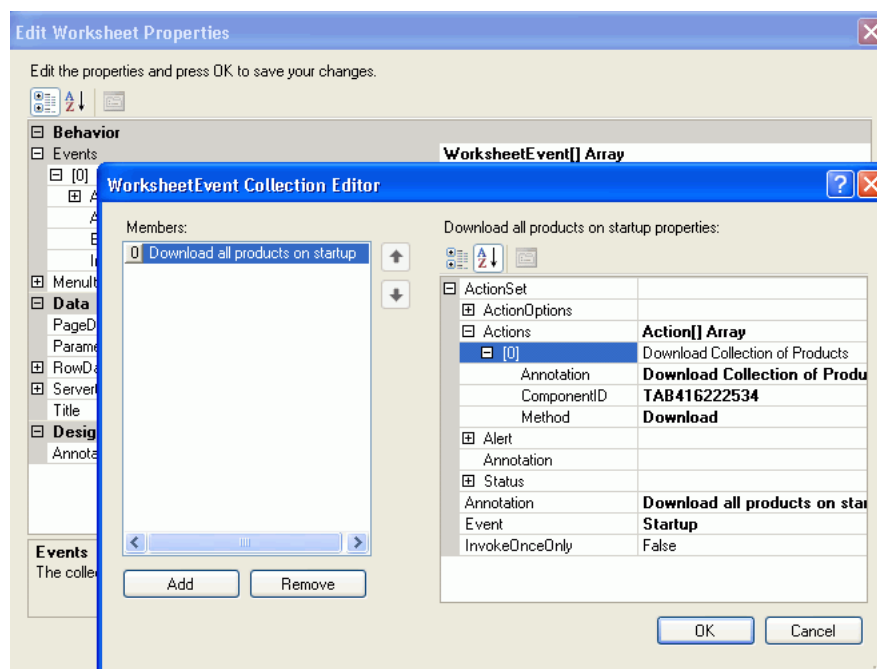
Use the `WorksheetEvent` Collection Editor to specify an action set to be invoked by a worksheet event.

To invoke an action set from a worksheet event:

1. In the Oracle ADF Desktop Integration Designer, click **Worksheet Properties** to display the Edit Worksheet Properties dialog box.
2. Click the ellipsis button (...) beside the input field for the **Events** property to display the WorksheetEvent Collection Editor.
3. Click **Add** to add a new element that specifies an event and a corresponding action set that the event invokes.

Figure 8–4 shows an example from the `EditPriceList.xlsx` file in the Master Price List module where the worksheet event, `Startup`, invokes an action set that invokes the ADF Table component's `Download` action.

Figure 8–4 Worksheet Startup Event Invokes an Action Set



4. Click **OK**.

8.2.5 How to Display a Status Message While an Action Set Executes

You can display a status message to end users while an action set executes by specifying values for the `Status` properties in an action set.

Some of the default values for properties in the `ActionSet.Status` group are EL expressions that resolve to strings defined in the reserved resource bundle at runtime. You can replace these default values with EL expressions that refer to your custom resource bundles. For more information, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

You use the Action Collection Editor to configure values for the `ActionSet.Status` properties.

To display a status message:

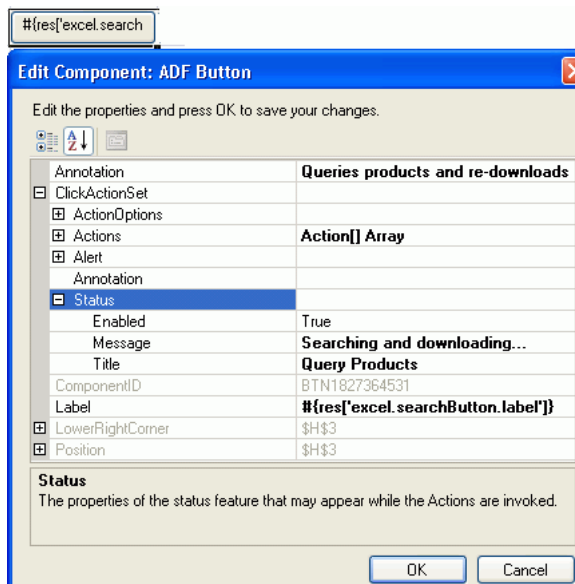
1. Open the Action Collection Editor.

- Set values for the properties in the `ActionSet.Status` group of properties as described in the following table.

For this property...	Enter or select this value...
Enabled	True to display a status message. True is the default value.
Message	An EL expression or string that resolves to the status message to display at runtime. For example, the Search button in the Master Price List module's <code>EditPriceList.xlsx</code> file has the following value configured for the <code>Message</code> property: <code>Searching and downloading...</code>
Title	An EL expression or string that resolves to the title of the status message to display at runtime. For example, the Search button in the Master Price List module's <code>EditPriceList.xlsx</code> file has the following value configured for the <code>Title</code> property: <code>Query Products</code>

Figure 8–5 shows the values configured for the `ActionSet.Status` group of properties of the ADF Button component in the `EditPriceList.xlsx` workbook of the Master Price List module that is labeled **Search** at runtime.

Figure 8–5 Status Message Properties in an Action Set



For more information about the `ActionSet.Status` group of properties, see the entry for `Status` in [Table A–13](#).

- Click **OK**.

8.2.6 What Happens at Runtime When an Action Set Displays a Status Message

Once an action set is invoked, a status message appears if the `ActionSet.Status` properties are configured to display a status message. [Figure 8–6](#) shows the status message that appears at runtime when the action set configured for the **Search** button in the `EditPriceList.xlsx` workbook commences execution.

Figure 8–6 Runtime View of Status Message

Cost Price	Site Price	Difference	Current Margin
			.43%
			0.00%
			2.20%
			9.99%
			3.57%
			6.61%
\$ 100.00	\$ 199.95	\$ 99.95	99.95%
\$ 150.00	\$ 249.95	\$ 99.95	66.63%

8.2.7 How to Provide an Alert After the Invocation of an Action Set

You can display an alert message to end users that notifies them when an action set operation completes successfully or fails. For example, you can display a message when all actions in an action set succeed or when there was at least one failure. The `ActionSet.Alert` group of properties configures this behavior.

Note: An alert message does not appear if an end user cancels the execution of an action set. For example, you configure an alert message to appear after an action set that invokes a web page in a popup dialog completes execution. At runtime, the end user cancels execution of the action set by closing the popup dialog using the close button of the Excel web browser control that hosts the popup dialog. In this scenario, no alert message appears if configured. For more information about displaying web pages, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#).

Many of the default values for properties in the `ActionSet.Alert` group are EL expressions that resolve to strings defined in the reserved resource bundle at runtime. You can replace these default values with EL expressions that refer to your custom resource bundles. For more information, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

You use the Action Collection Editor to configure values for the `ActionSet.Alert` group of properties.

To add an alert to an action set:

1. Open the Action Collection Editor.
2. Set values for the properties in the `ActionSet.Alert` group of properties as described in the following table.

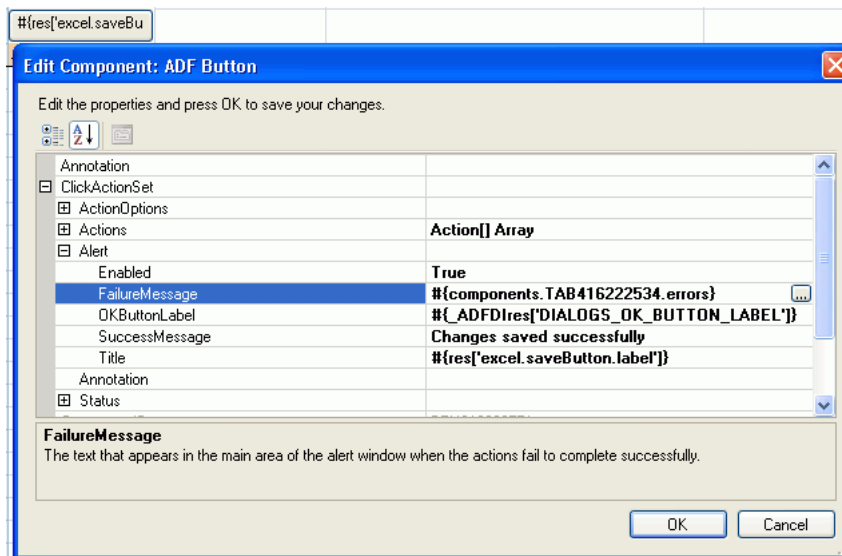
For this property... Enter or select this value...

Enabled	Select <code>True</code> from the dropdown list to display an alert message once the action set completes. The default value is <code>False</code> .
---------	------------------------------------------------------------------------------------------------------------------------------------------------------

For this property...	Enter or select this value...
FailureMessage	<p>Specify an EL expression or string that evaluates to a message to appear in the dialog box if errors occur during execution of the action set. For example, the Save Changes button in the Master Price List module's <code>EditPriceList.xlsx</code> workbook has the following value configured for the <code>FailureMessage</code> property:</p> <pre>#{components.TAB442758137.errors}</pre> <p>The Save Changes button invokes an action set that, in turn, invokes the ADF Table component's <code>Upload</code> action. The EL expression specified for <code>FailureMessage</code> retrieves error messages if the <code>Upload</code> action encounters errors. For more information about error handling, see Section 12.4, "Error-Reporting in an Integrated Excel Workbook".</p>
OKButtonLabel	<p>Specify an EL expression that evaluates to a message to appear in the OK button of the dialog box. The default EL expression is:</p> <pre>#{_ADFDIres['DIALOGS_OK_BUTTON_LABEL']}</pre>
SuccessMessage	<p>Specify an EL expression that evaluates to a message to appear in the dialog box if no errors occur during the execution of the action set. For example, the Save Changes button in the Master Price List module's <code>EditPriceList.xlsx</code> workbook has the following value configured for the <code>SuccessMessage</code> property:</p> <pre>Changes saved successfully</pre>
Title	<p>Specify an EL expression that evaluates to a message to appear in the title area of the dialog box. The default EL expression is:</p> <pre>#{_ADFDIres['DIALOGS_ACTION_TITLE']}</pre>

Figure 8–7 shows the values configured for an ADF Button component's `ActionSet.Alert` group of properties in the `EditPriceList.xlsx` workbook of the Master Price List module. This ADF Button component is labeled **Save Changes** at runtime.

Figure 8–7 Alert Message Properties in an Action Set

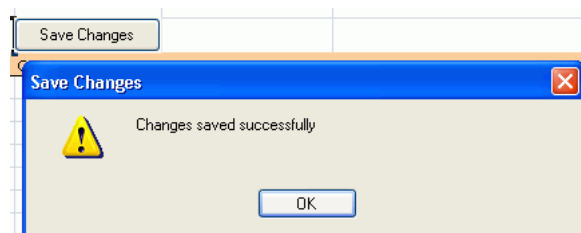


3. Click **OK**.

8.2.8 What Happens at Runtime When an Action Set Provides an Alert

Figure 8–8 shows the alert message that appears at runtime when the action set invoked by the ADF Button component labeled **Save Changes** successfully completes execution.

Figure 8–8 Runtime View of an Alert Message



8.2.9 How to Configure Error Handling for an Action Set

You specify values for an action set's `ActionOptions` properties to determine what an action set does if one of the following events occurs:

- An action in the action set fails
- All actions in the action set complete successfully

Where you configure an action set's `ActionOptions` properties depends on whether an ADF component, worksheet event, or worksheet menu item invokes the action set. Configure the `ActionOptions` properties from the:

- ADF component's property inspector, if an ADF component invokes the action set
- `WorksheetMenuItem` Collection Editor, if a worksheet menu item invokes the action set
- `WorksheetEvent` Collection Editor, if a worksheet event invokes the action set

For information about how to invoke these editors or an ADF component's property inspector, see [Chapter 5, "Getting Started with the Development Tools"](#). More information about action set properties can be found in [Table A.10](#).

To configure error handling for an action set:

1. Open the appropriate editor or property inspector and configure values for the action set's `ActionOptions` properties as described in the following table.

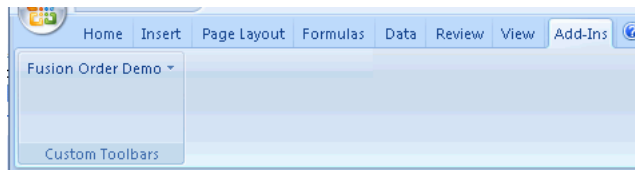
Set this property...	To...
<code>AbortOnFailure</code>	True (default value) so that the action set does not any execute any further actions if the current action fails. When set to <code>False</code> , the action set executes all actions regardless of the success or failure of previous actions.
<code>FailureActionID</code>	Specify an ADFm action to invoke if an action set does not complete successfully. For example, you could specify an ADFm action that rolls back changes made during the unsuccessful invocation of the action set.
<code>SuccessActionID</code>	Specify an ADFm action to invoke if an action set completes successfully. For example, you could specify an action binding that executes a <code>commit</code> action. A value for this property is optional and you can specify a final action, such as an action binding that executes a <code>commit</code> action, in the action set itself.

2. Click OK.

8.3 Creating Menu Items

You can create a menu with items that invoke Oracle ADF functionality in your integrated Excel workbook. Setting the `ToolBarMenu.Enabled` workbook property to `True` makes this menu appear. The `ToolBarMenu.Title` property determines the title of the menu that the end user sees at runtime. At runtime, end users must click Excel's **Add-Ins** tab to view any menu that you configure using the `ToolBarMenu` properties. Any menu that you configure appears in the **Custom Toolbar** section of the **Add-Ins** tab illustrated by [Figure 8–9](#).

Figure 8–9 Runtime View of Toolbar Menu in Excel's Add-Ins Tab

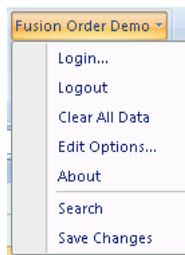


Two groups of items can appear in the menu at runtime: items that invoke commands on the workbook and items that invoke commands on the current worksheet. You configure the `WorkbookMenuItem[]` array in the properties of the workbook so that the menu contains items allowing an end user to invoke workbook actions such as `Login` and `Logout`. You configure the `WorksheetMenuItem[]` array in the properties of the worksheet so that the menu contains items allowing a user to invoke an action set.

A menu separator appears between the workbook menu items and the worksheet menu items. If a worksheet has no items defined for the menu, no menu separator appears. Worksheet menu items appear only if the worksheet is in focus.

[Figure 8–10](#) shows a menu at runtime where the workbook actions appear first, followed by a menu separator, and finally the worksheet menu items that invoke `SelectActionSet` action sets.

Figure 8–10 Runtime Toolbar Menu

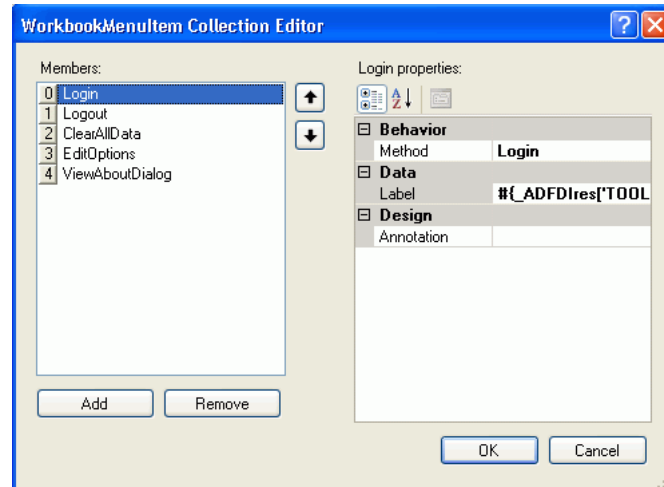


8.3.1 How to Configure a Workbook Menu Item

To define a workbook menu item, you configure a number of workbook properties. By default, menu items for all workbook actions are defined in the workbook toolbar. The following procedure shows how to create or remove an item in the menu by using the workbook action, `Login`, as an example.

To define a workbook menu item:

1. Click **Workbook Properties** in the Oracle ADF Desktop Integration Designer.
2. Click **ToolBarMenu** and then click the ellipsis button (...) beside the `WorkbookMenuItem[]` array to display the `WorkbookMenuItem` Collection Editor illustrated in [Figure 8–11](#).

Figure 8–11 *WorkbookMenuItem Collection Editor*

3. Click **Add** and specify values for the properties of the workbook menu item as follows:
 - Method
Specify the workbook action that you want the menu item to invoke.
 - Label
Enter a value in the input field that appears as the label at runtime. Alternatively, invoke the expression builder by clicking the ellipsis button (...) and write an EL expression that resolves to a string value in a resource bundle. Note that the runtime value that appears in the label cannot exceed 255 characters. A runtime value that exceeds 255 characters is truncated so that only 255 characters appear.

For more information about using resource bundles, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

For more information about labels, see [Section 9.4, "Using Labels in an Integrated Excel Workbook"](#).

Tip: Use the arrow controls to determine the order in which menu items appear at runtime.
4. Click **OK**.

8.3.2 How to Configure a Worksheet Menu Item

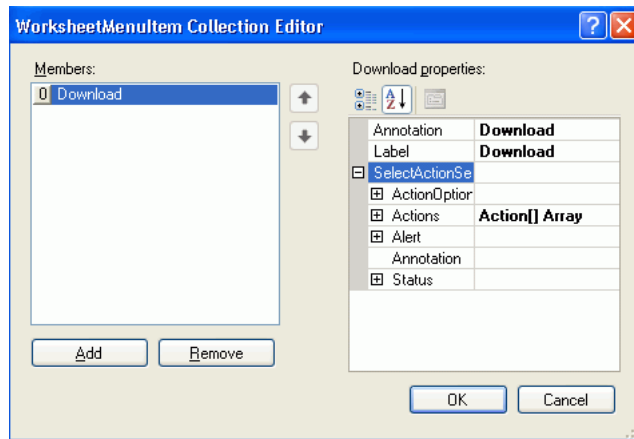
To define a worksheet menu item, you configure properties for the worksheet using the property inspector. By default, no menu items are defined for the toolbar in the worksheet properties. You add members to the array that is referenced by the `MenuItems` property in the properties of the worksheet.

WARNING: Set the `ToolBarMenu.Enabled` workbook property to `TRUE` to display menu items. If `ToolBarMenu.Enabled` is set to `FALSE`, no menu items appear. For more information about workbook properties, see [Table A-17](#).

To define a worksheet menu item:

1. Click **Worksheet Properties** in the Oracle ADF Desktop Integration Designer.
2. Click the ellipsis button (...) beside the input field for the `MenuItem`s property to invoke the `WorksheetMenuItem` Collection Editor illustrated in [Figure 8-12](#).

Figure 8-12 *WorksheetMenuItem Collection Editor*



3. Click **Add** to add a new menu item in the **Members** list of the collection editor.
4. Configure the properties of `SelectActionSet` to specify the type of action(s) that the menu item invokes.
5. Click **OK**.

8.4 Displaying Web Pages from a Fusion Web Application

You configure a `Dialog` action in an action set to display pages from the Fusion web application with which you integrate your Excel workbook. These pages provide additional functionality for your integrated Excel workbook. Examples of additional functionality that you can provide include search dialogs and display pick dialogs that interact with your Fusion web application. You can also configure upload options.

The `Dialog` action in an action set can be configured to display in one of the following two types of dialog:

- Popup dialog
- Excel’s Document Actions

The value for the `Dialog.Target` property (`Popup` or `TaskPane`) of the component’s action set determines where a web page is rendered.

The value for the `Dialog.Page` property specifies the web page to display when the action is invoked. Valid values include a URL relative to the value of the `WebAppRoot` property or an absolute URL. For example, the `EditPriceList.xlsx` workbook in

the Master Price List module specifies the following relative URL as a value for the page to invoke when a user clicks the **Advanced Search** button at runtime:

```
/faces/secured/excelAdvSearch.jspx
```

Absolute URLs such as the following are also valid:

```
http://www.oracle.com/technology/products/middleware/index.html
```

Note: The `Dialog.Page` property does not accept EL expressions

8.4.1 How to Display a Web Page in a Popup Dialog

You can configure a `Dialog` action in an action set to invoke a web page from your Fusion web application in a modal popup dialog hosted by Excel's web browser control. This feature provides end users with functionality that allows them to, for example, input values displayed by a page from the Fusion web application into the integrated Excel workbook.

The web page that the action set invokes must contain a reserved HTML Document Object Model (DOM) span element that has an ID attribute set to `ADFdi_CloseWindow`. [Example 8-1](#) shows how you can automatically set the value of the span element in the `excelAdvSearch.jspx` page of the Master Price List module using the `rendered` property of the `f:verbatim` tag.

Example 8-1 Use of HTML Document Object Model Span Element

```
<f:verbatim rendered="#{requestScope.searchAction eq 'search'}">
<span id="ADFdi_CloseWindow">Continue</span>
</f:verbatim>
<f:verbatim rendered="#{requestScope.searchAction eq 'cancel'}">
<span id="ADFdi_CloseWindow">Abort</span>
</f:verbatim>
```

[Figure 8-13](#) shows the `excelAdvSearch.jspx` page hosted by the `EditPriceList.xlsx` workbook's browser control.

Figure 8-13 Advanced Search Popup Dialog



In scenarios where you cannot use the `rendered` property of the `f:verbatim` tag as outlined in [Example 8-1](#), you may need to:

1. Create a backing bean that exposes the `Dialog` action's result value as a property
2. Use an action listener to invoke the backing bean and an EL expression in the span element to set the value `ADFdi_CloseWindow`

Whatever approach you take, the Oracle ADF Desktop Integration module monitors the value of `ADFdi_CloseWindow` to determine when to close the popup dialog. If `ADFdi_CloseWindow` references:

- An empty string or is not present, the popup dialog cannot close
- "Continue", the popup dialog closes and the action set invokes its next action

The following example shows `ADFdi_CloseWindow` referencing "Continue":

```
var closeWindowSpan = document.getElementById("ADFdi_CloseWindow");
closeWindowSpan.innerHTML = "Continue";
```

- Some other string value, the popup dialog closes and the action set ceases execution

You set the `Dialog.Target` property for a `Dialog` action to `Popup` to display a web page from the Fusion web application in a modal popup dialog hosted by Excel's web browser control. Displaying a web page in a modal popup dialog differs from displaying a web page in Excel's Document Actions, as the `Dialog` action that the action set invokes cannot continue execution until it receives user input. While the popup dialog is open, the end user cannot interact with any other part of the integrated Excel workbook, as the popup dialog retains focus.

End users can navigate between multiple web pages from the Fusion web application within the browser control until they or the Oracle ADF Desktop Integration module close the browser control.

To immediately synchronize the changes that an end user makes to a data control through a popup dialog, specify the next action in the action set after the `Dialog` action to download all modified bindings to the worksheet (use the `DownSync` worksheet action) or ADF Table component (use the `Download` action). This scenario assumes that you specify "Continue" as the value for `ADFdi_CloseWindow`.

Note: If you configure the web page that appears in the popup dialog so that an end user can download an integrated Excel workbook, the Oracle ADF functionality in the integrated Excel workbook is disabled when the end user opens the workbook after download.

8.4.2 How to Display a Web Page in Excel's Document Actions

You set the `Dialog.Target` property for an action to `TaskPane` to display a web page specified by the `Dialog.Page` property in Excel's Document Actions. In contrast to displaying a web page in a popup dialog, displaying a web page in Excel's Document Actions allows an action set to continue executing actions while the web page displays. End users can access and interact with other parts of the integrated Excel workbook while the web page displays.

Note the following if you set the `Target` property of a `Dialog` action to `TaskPane`:

- The Oracle ADF Desktop Integration module ignores the value of `ADFdi_CloseWindow` (and other span elements).

- You cannot configure the worksheet Shutdown event to invoke the Dialog action.

8.4.3 What You May Need to Know About Displaying Pages from a Fusion Web Application

You can keep the data an integrated Excel workbook contains synchronized with a Fusion web application by specifying additional actions in the action set that invokes the Dialog action. You can make sure that the Fusion web application page and the integrated Excel worksheet both use the same data control frame by setting the ShareFrame property of the Dialog action.

Keeping an Integrated Excel Workbook and a Fusion Web Application Synchronized

To make sure that data in the integrated Excel workbook and the Fusion web application remains synchronized while end users use pages from the Fusion web application, configure the action set that invokes the Dialog action to:

- Upload changes from the integrated Excel workbook to the Fusion web application before invoking the Dialog action

Invoke the UpSync worksheet action to synchronize changes from the ADF Input Text and ADF Desktop Integration List of Values components in the worksheet. Invoke the ADF Table component's Upload action to upload changes from the ADF Table component.

- Download changes from the Fusion web application to the integrated Excel workbook after invoking the Dialog action

Invoke the DownSync worksheet action to download changes from the Fusion web application to ADF Input Text and ADF Desktop Integration List of Values components in the worksheet. Invoke the ADF Table component's Download action to download changes from the Fusion web application to the ADF Table component.

For more information about synchronizing data between an integrated Excel workbook and a Fusion web application, see [Chapter 15, "Using an Integrated Excel Workbook Across Multiple Web Sessions and in Disconnected Mode"](#). For information about worksheet actions and ADF Table component actions, see [Chapter A, "Oracle ADF Desktop Integration Component Properties and Actions"](#).

Sharing Data Control Frames Between Integrated Excel Worksheets and Fusion Web Application Pages

Fusion web applications and integrated Excel workbooks both use data control frames to manage the transactions and state of view objects and, by extension, the bindings exposed in a page definition file. When you invoke a Fusion web application's page from an integrated Excel worksheet, you can make sure that the page and the integrated Excel worksheet both use the same data control frame by setting the ShareFrame property of the Dialog action that invokes the page to True.

The Page property in the Dialog action specifies the page that the Dialog action invokes. If the Dialog action invokes an absolute URL or a page that is not part of your Fusion web application, the Oracle ADF Desktop Integration module ignores the value of ShareFrame if ShareFrame is set to True.

Set ShareFrame to False in the following scenarios:

- The `Dialog.Page` property in the action set references an absolute URL or a page that is not part of your Fusion web application.
- The `Dialog.Page` property in the action set references a page that is part of your Fusion web application, but that does not need to share information with the integrated Excel worksheet. For example, a page that displays online help information.

For more information about data control frames in a Fusion web application, see the "Sharing Data Control Instances" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

8.5 Inserting Values in an ADF Table Component from a Web Page Pick Dialog

You can configure the `DoubleClickActionSet` of an ADF Table component's column to invoke a Fusion web application page that renders a pick dialog where an end user selects a value to insert in the ADF Table component column.

This functionality is useful when you want to constrain the values that end users can enter in an ADF Table component. For example, you may want a runtime ADF Table component column to be read-only in the Excel worksheet so that end users cannot manually modify values to prevent them from introducing errors. Invoking a pick dialog rendered by a Fusion web application page allows the end user to change values in the ADF Table component without entering incorrect data.

In addition to configuring the `DoubleClickActionSet`, you configure the ADF Table component's `RowData.CachedAttributes` property to reference attribute binding values if you want:

- End users to modify values in the Fusion web application's page that you do not want to appear in the ADF Table component of the integrated Excel workbook
- An ADF Table component's column to be read-only in the integrated Excel workbook
- Cache data in an ADF Table component over one or more user sessions that is not visible to end users but is modified by a pick dialog

For example, an ADF Table component displays a list of product names to end users. A pick dialog is invoked that refreshes the list of product names in the ADF Table component and, as part of the process, sets the value of product IDs. In this scenario, you specify the attribute binding value for the product ID in the ADF Table component's `RowData.CachedAttributes` property. After the action set executes, the ADF Table component displays the refreshed list of product names in the rows of the Excel worksheet and references the associated product IDs in its `RowData.CachedAttributes` property.

For information about populating values in the pick dialog, see the "Creating Databound Selection Lists and Shuttles" chapter in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

To invoke a pick dialog from an ADF Table component:

1. Select the cell in the Excel worksheet that anchors the ADF Table component and click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar to display the property inspector.
2. Configure the ADF Table component's `RowData.CachedAttributes` property to reference attribute binding values.

3. Click the ellipsis button (...) beside the input field for **Columns** to display the TableColumn Collection Editor.
4. In the **Members** list select the column from which an end user will invoke the pick dialog at runtime.
5. Configure the `DoubleClickActionSet` of the `UpdateComponent` property as described in the following table.

Add this action...	To...
ADFMAction	(Optional) Invoke the <code>CreateInsert</code> action binding if the end user invokes the <code>DoubleClickActionSet</code> from a newly created row in the Excel worksheet's ADF Table component. In this scenario, the ADF Table component's <code>RowUpSync</code> action (invoked in the next action) fails if the Fusion web application does not contain a placeholder row.
Component	Invoke the ADF Table component's <code>RowUpSync</code> action to synchronize any pending changes in the current row of the ADF Table component to the Fusion web application.
Dialog	Configure the <code>Dialog</code> action to invoke the pick dialog page from the Fusion web application. Set the <code>Dialog</code> action's <code>ShareFrame</code> property to <code>True</code> . For more information, see Section 8.4, "Displaying Web Pages from a Fusion Web Application" .
Component	Invoke the ADF Table component's <code>RowDownSync</code> action to synchronize data from the row in the ADF Table component's iterator in the Fusion web application that corresponds to the current ADF Table component row in the worksheet.

6. Click **OK**.

8.6 Creating ADF Databound Search Forms in an Integrated Excel Workbook

You can create forms in your integrated Excel workbooks using ADF Input Text and ADF Button components. End users can use the forms you create to insert data or query for information. This section uses the latter example to demonstrate how you create forms.

End users can enter a search term in the ADF Input Text component and retrieve matching results by clicking an ADF Button component. If you want to present a more sophisticated user interface to end users for a search operation, you can invoke search forms from your Fusion web application. Results from these search operations can be downloaded to the ADF Table or ADF Read-only Table components in your integrated Excel workbook.

[Figure 8–14](#) shows a design time view of the Oracle ADF components that the `EditPriceList.xlsx` workbook in the Master Price List module uses to configure search options where:

1. ADF Label component is used in a simple search form
2. ADF Input Text component is used in a simple search form
3. ADF Button component is used in a simple search form
4. ADF Button component is used to invoke an advanced search form

Figure 8–14 Oracle ADF Components Used for Search in the EditPriceList.xlsx Workbook



Note: The Oracle ADF Desktop Integration module does not support usage of the `FindMode` attribute in page definition files. For more information about the `FindMode` attribute, see the "pageNamePageDef.xml" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

8.6.1 How to Create a Simple Search Form in an Integrated Excel Workbook

You insert an ADF Input Text component and configure it so that an end user can enter a search term. Insert an ADF Button component and configure its action set to:

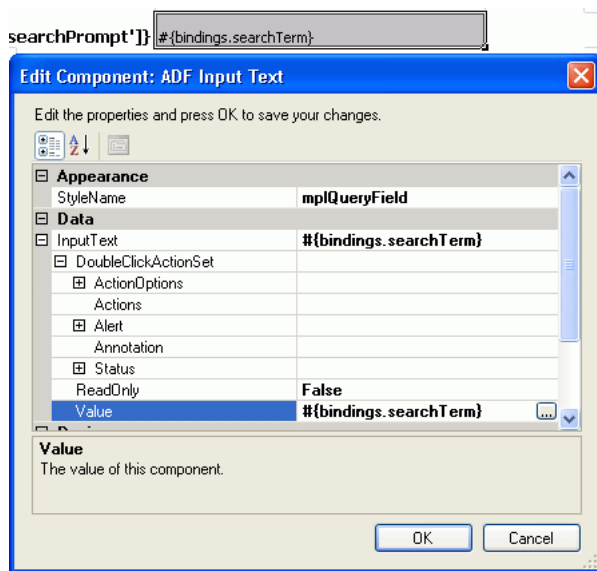
1. Take the value the end user enters in the ADF Input Text component.
2. Query for the value.
3. Download the results to an ADF Table or ADF Read-only Table component in the integrated Excel workbook.

To create a simple search form in an integrated Excel workbook:

1. Insert an ADF Input Text component in the Excel worksheet cell where you want the end user to enter the search criteria.
2. Configure the ADF Input Text component so that it assigns the search term a user enters to an attribute binding.

Figure 8–15 shows an example from the `EditPriceList.xlsx` workbook in the Master Price List module where an ADF Input Text component assigns the value the end user enters to the `searchTerm` attribute binding.

Figure 8–15 ADF Input Text Component for a Simple Search Form



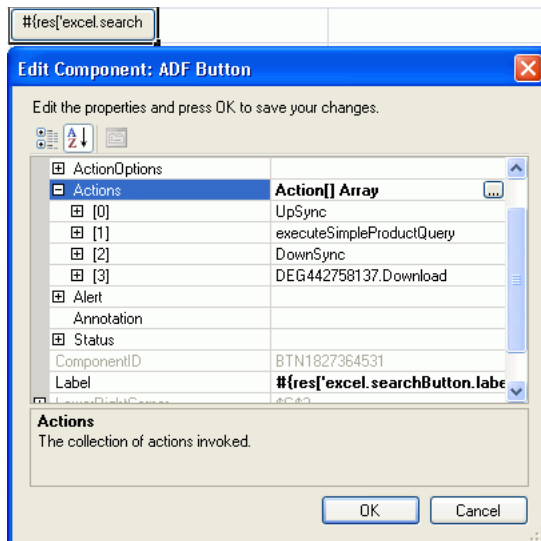
3. Optionally, apply a style to the ADF Input Text component to indicate to end users that they can enter a search term in the cell.
4. Optionally, create an ADF Label component in an adjoining cell to indicate to end users that they can enter a search term in the ADF Input Text component you created in Step 1.
5. Create an ADF Button component in the Excel worksheet.
6. Set the `Label` property of the ADF Button component so that it displays a string at runtime to indicate to end users that they can start a search operation by clicking the button.
7. Open the Action Collection Editor to configure the array of actions (`Action[] Array`) in the `ClickActionSet` properties of the ADF Button component. The following table describes the actions to invoke in sequence.

Add this action...	To...
Worksheet	Invoke the <code>UpSync</code> worksheet action to copy the value entered in the cell that hosts an ADF Input Text or ADF Desktop Integration List of Values component to the Fusion web application. For more information about worksheet actions, see Section A.12, "Worksheet Actions and Properties" .
ADFmAction	Invoke an ADFm action that is bound to the attribute binding you specified in Step 2. The ADFm action queries for the end user's search term value referenced by the attribute binding. The corresponding example in the <code>EditPriceList.xlsx</code> workbook is the <code>executeSimpleProductQuery</code> action binding, which is bound to the <code>searchTerm</code> attribute binding.
Worksheet	Invoke the <code>DownSync</code> worksheet action to synchronize any pending changes from the Fusion web application to the ADF Input Text, ADF Output Text, and ADF Desktop Integration List of Values components in the worksheet. For more information about worksheet actions, see Section A.12, "Worksheet Actions and Properties" .
Component	Invoke a <code>Download</code> action from the ADF Table or ADF Read-only Table components to download the results that the ADFm action retrieved.

8. Click **OK**.

[Figure 8-16](#) shows an example from the `EditPriceList.xlsx` workbook in the Master Price List module where an ADF Button component invokes the `executeSimpleProductQuery` action binding using the search term an end user entered in the ADF Input Text component.

Figure 8–16 ADF Button Component for Simple Search Form



8.6.2 How to Create an Advanced Search Form in an Integrated Excel Workbook

You use the ADF Button component to invoke a page from the Fusion web application that displays a search form to the end user. Configure the action set for the ADF Button component to invoke the `Download` action for the ADF Table or ADF Read-only Table component so that the search results from the search operation are downloaded to the integrated Excel workbook.

For information about creating a search form in a Fusion web application, see the "Creating ADF Databound Search Forms" chapter in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

To invoke an advanced search form in an integrated Excel workbook:

1. Create an ADF Button component in the Excel worksheet.
2. Set the `Label` property of the ADF Button component so that it displays a string at runtime to indicate to end users that they can start a search operation by clicking the button.
3. Use the Action Collection Editor to configure the array of actions (`Action[]Array`) in the `ClickActionSet` properties of the ADF Button component. [Table 8–1](#) describes the actions to invoke in sequence.

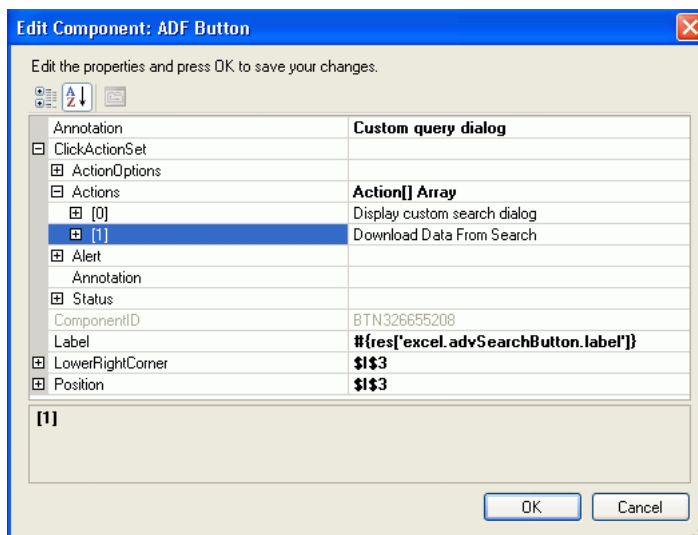
Table 8–1 Actions to Invoke an Advanced Search Form

Add this action...	To...
Dialog	Display the page from your Fusion web application that contains the search form. For more information about displaying pages from a Fusion web application, see Section 8.4, "Displaying Web Pages from a Fusion Web Application" .
ADFmAction	Invoke an ADFm action to query for the values that the end user entered in the search form.
Component	Invoke a <code>Download</code> action from the ADF Table or ADF Read-only Table components to download the results that the ADFm action retrieved.

4. Click **OK**.

Figure 8–17 shows an example from the `EditPriceList.xlsx` workbook in the Master Price List module where an ADF Button component invokes the `Execute` action binding to retrieve the values specified by the end user in the Master Price List's module Search page (`excelAdvSearch.jspx`). The ADF Table component's `Download` action downloads the returned values to the integrated Excel workbook.

Figure 8–17 ADF Button Component for an Advanced Search Form



8.7 Adding a Form to an Integrated Excel Workbook

The Oracle ADF Desktop Integration components described in [Chapter 6, "Working with Oracle ADF Desktop Integration Form-type Components"](#) can be used to create forms in your integrated Excel workbook. These components can be useful when you want to provide end users with functionality that allows them to view and edit individual fields rather than use the functionality provided by the table-type components to download rows of data from the Fusion web application. Use one or more of the following components to create a form:

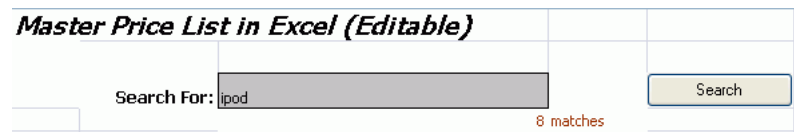
- **ADF Button**
Use this component to provide end users with a button that can invoke a `ClickActionSet`. [Figure 8–18](#) shows an ADF Button labeled **Search** that invokes a search operation using the search term entered by the end user in the ADF Input Text component.
- **ADF Input Text**
Use this component to provide end users with a read/write field where the current value of a binding appears. This component can also be used to input a value, as in the example illustrated in [Figure 8–18](#), where users enter a search term in the ADF Input Text component.
- **ADF Output Text**
Use this component to provide end users with a read-only field where the current value of a binding appears.
- **ADF Desktop Integration List of Values**

Use this component to provide end users with a dropdown menu from which a user can select a value from a list binding.

- ADF Label

Use this component to provide end users with instructions or other information on how to use the form you create. For example, the Master Price List module's `EditPriceList.xlsx` workbook uses ADF Label components to display an instruction to end users (**Search For:**) and the number of matches for a search term. [Figure 8–18](#) shows the runtime values of these components (`Search For:` and `8 matches`).

Figure 8–18 Runtime View of a Form in an Integrated Excel Workbook



You use the Oracle ADF Desktop Integration Designer to insert the components you require into a worksheet.

To create a form in an integrated Excel workbook:

1. Decide which ADF form components you require for the finalized form and insert them in the Excel worksheet.

For more information about these components, see [Chapter 6, "Working with Oracle ADF Desktop Integration Form-type Components"](#).

2. Configure the layout and appearance of the components you insert.

For more information about configuring the appearance of components, see [Chapter 9, "Configuring the Appearance of an Integrated Excel Workbook"](#).

3. Test your form.

For more information about testing an integrated Excel workbook, see [Chapter 13, "Testing Your Integrated Excel Workbook"](#).

8.8 Creating a List of Values in an ADF Table Component Column

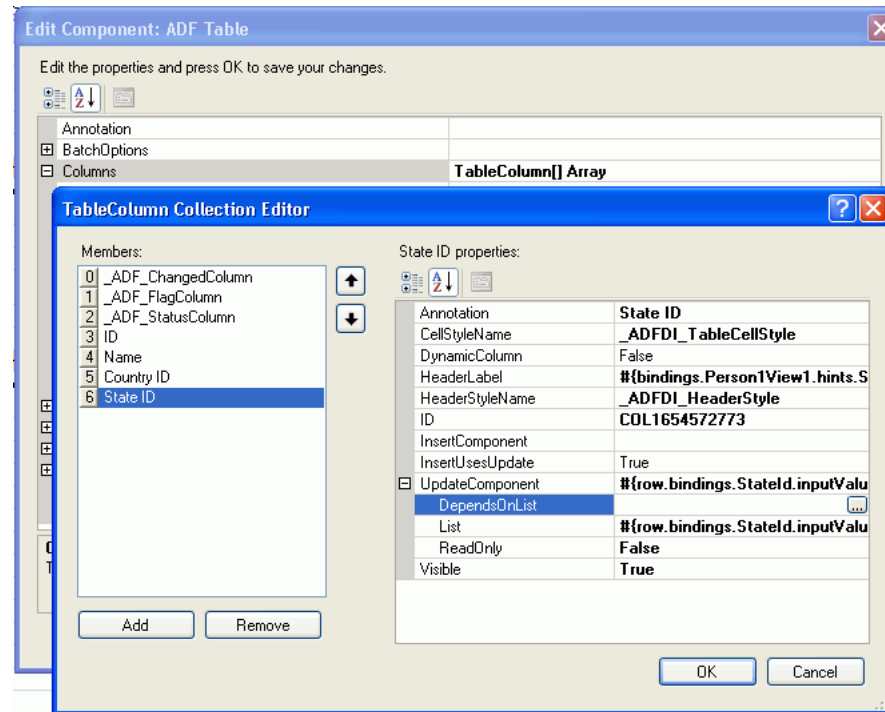
Use the ADF Desktop Integration Tree Node List component when you want to render a dropdown list of values in an ADF Table component column. The list of values can display a maximum of two hundred and fifty values at runtime. Unlike other Oracle ADF Desktop Integration module components, the ADF Desktop Integration Tree Node List component does not appear in the components palette described in [Section 5.3, "Using the Components Palette"](#). Instead, you invoke it as a subcomponent when you specify values for the `InsertComponent` or `UpdateComponent` properties of an ADF Table component column. For information about the properties of an ADF Table component column, see [Section A.8.2, "ADF Table Component Column Properties"](#).

Once you invoke the ADF Desktop Integration Tree Node List component as a subcomponent, you must specify a tree binding attribute associated with a model-driven list as a value for the ADF Desktop Integration Tree Node List component's `List` property. The tree binding attribute associated with a model-driven list populates the dropdown menu in the Table component's column with a list of values after invocation of the Table component's `Download` action.

For more information about creating a model-driven list, see the "How to Create a Model-Driven List" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. For information about the properties of an ADF Desktop Integration Tree Node List component, see [Section A.6, "ADF Desktop Integration Tree Node List Component Properties"](#).

Figure 8–19 shows the property inspector for an ADF Table component column after `TreeNodeList` was selected as the subcomponent for the column's `UpdateComponent` property.

Figure 8–19 ADF Table Component Column Configured to Display a List of Values



8.8.1 How to Create a List of Values in an ADF Table Component Column

You add a column to the ADF Table component column and select `TreeNodeList` as the subcomponent. You then specify a tree binding attribute as the value for the `TreeNodeList` subcomponent's `List` property. A model-driven list must be associated with the tree binding attribute that you specify.

To create a list of values in an ADF Table component column:

1. Select the cell in the Excel worksheet that references the ADF Table component and click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar to display the Edit Component: ADF Table dialog box.
2. Click the ellipsis button (...) beside the input field for **Columns** to invoke the TableColumn Collection Editor.
3. Click **Add** to add a new column.
4. Choose the appropriate option for the newly created column:
 - Click the ellipsis button (...) beside the input field for **InsertComponent** if you want to configure the runtime list of values for insert operations.

- Click the ellipsis button (...) beside the input field for **UpdateComponent** if you want to configure the runtime list of values for update and download operations.

In both options, the Select subcomponent to create dialog appears.

5. Select **TreeNodeList** and click **OK**.
6. Expand the property that you selected in Step 4 and configure values as follows:
 - Select a tree binding attribute associated with a model-driven list for the `List` property.
 - Select a value for `DependsOnList` only if you intend to create a dependent list of values as described in [Section 8.9, "Creating Dependent Lists of Values in an Integrated Excel Workbook"](#). The tree binding attribute or list binding you select for `DependsOnList` serves as the parent list of values in a dependent list of values.
 - Configure the `ReadOnly` property as desired.
For information about these properties, see [Section A.6, "ADF Desktop Integration Tree Node List Component Properties"](#).
7. Click **OK**.

8.8.2 What Happens at Runtime When a Column Renders a List of Values

At runtime, the ADF Table component invokes the `Download` action and populates each column. This action also populates the list of values in the column that you configure to render a list of values. [Figure 8–20](#) shows an example where `StateId` is the column configured to display a list of values.

Figure 8–20 Runtime View of an ADF Table Component Column Displaying a List of Values

Id	Name	CountryId	StateId
1	SIREESHA	INDIA	Andhra Pradesh
2	ARUN	INDIA	Tamil Nadu
3	PRASANNA	INDIA	Karnataka
4	ALEX	USA	California
5	SHAUN	USA	Colorado
6	BRIAN	USA	Connecticut

8.9 Creating Dependent Lists of Values in an Integrated Excel Workbook

The Oracle ADF Desktop Integration module provides the following components that you use to create lists of values in an integrated Excel workbook:

- **ADF Desktop Integration List of Values**
You configure properties for this component when you want to create a list of values in the Excel worksheet.
- **ADF Desktop Integration Tree Node List component**
You configure properties for this component when you want to create a list of values in an ADF Table component column.

Using the previously listed components, you can create a dependent list of values in your integrated Excel workbook. A *dependent list of values* is where the value selected in one of the previously listed components (referred to here as a *parent list of values*) determines the values that appear in a second list of values component (referred to here as a *child list of values*).

[Table 8–2](#) describes the dependent list of values implementations you can create using the previously listed components and the requirements to achieve each implementation.

Some of the implementations described in [Table 8–2](#) require model-driven lists. For information about creating a model-driven list, see the "How to Create a Model-Driven List" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

Table 8–2 Dependent List of Values Configuration Options

Configuration	Requirements
Render both the parent and child list of values in the Excel worksheet using ADF Desktop Integration List of Values components.	<p>Both instances of the ADF Desktop Integration List of Values component must reference a list binding. One or both of the list bindings that you reference can be model-driven lists.</p> <p>Both list bindings can reference model-driven lists only if the underlying iterator has at least one row of data. At runtime, if the underlying iterator has zero rows of data and an end user selects a value from the parent list of values (list binding referenced by the ADF Desktop Integration List of Values component's <code>DependsOnListID</code> property), the child list of values (list binding referenced by the ADF Desktop Integration List of Values component's <code>ListID</code> property) does not get filtered based on the value the end user selects.</p> <p>To work around this scenario, choose one of the following options:</p> <ul style="list-style-type: none"> ■ Make sure that the underlying iterator has at least one row of data ■ Use an alternative list binding configuration where you expose more than one iterator and all necessary iterators get refreshed <p>For more information, see Section 8.9.1, "How to Create a Dependent List of Values in an Excel Worksheet".</p>
Render both the parent and child list of values in ADF Table component columns using ADF Desktop Integration Tree Node List components.	<p>Both the parent and child list of values (ADF Desktop Integration Tree Node List components) must reference tree binding attributes associated with model-driven lists.</p> <p>For more information, see Section 8.9.3, "How to Create a Dependent List of Values in an ADF Table Component's Columns".</p>
Render the parent list of values in an ADF Desktop Integration List of Values component and the child list of values in an ADF Table component column using the ADF Desktop Integration Tree Node List component.	<p>The child list of values (ADF Desktop Integration Tree Node List component) must reference a tree binding attribute associated with a model-driven list. The parent list of values (ADF Desktop Integration List of Values component) must reference a list binding.</p> <p>For more information, see Section 8.9.5, "Creating a Dependent List of Values in an Excel Worksheet and an ADF Table Component Column".</p>

Note the following points if you plan to create a dependent list of values:

- When the cell value referenced by `DependsOnList` or `DependsOnListID` is changed, the Oracle ADF Desktop Integration module overrides any previous changes to the child component list of values without warning the end user.
- The dependent list of values will not work if either the `DependsOnList` or `DependsOnListID` properties reference a component not present in the Excel worksheet.

- If a circular dependency is defined (List A depends on List B, and List B depends on List A), the first dependency (List A depends on List B) triggers the expected behavior. The Oracle ADF Desktop Integration module considers other dependencies to be misconfigurations.
- You can create a chain of dependencies as follows:
 - List A depends on List B
 - List B depends on List C

In this scenario, a change to List C updates both Lists A and B.

- Caching in a dependent list of values is discussed in [Section 15.4, "Caching Lists of Values for Use in Disconnected Mode"](#).

8.9.1 How to Create a Dependent List of Values in an Excel Worksheet

Use two instances of the ADF Desktop Integration List of Values component to create a dependent list of values in an Excel worksheet.

Specify the list binding referenced by the parent ADF Desktop Integration List of Values component as a value for the child ADF Desktop Integration List of Values component's `ListOfValues.DependsOnListID` property.

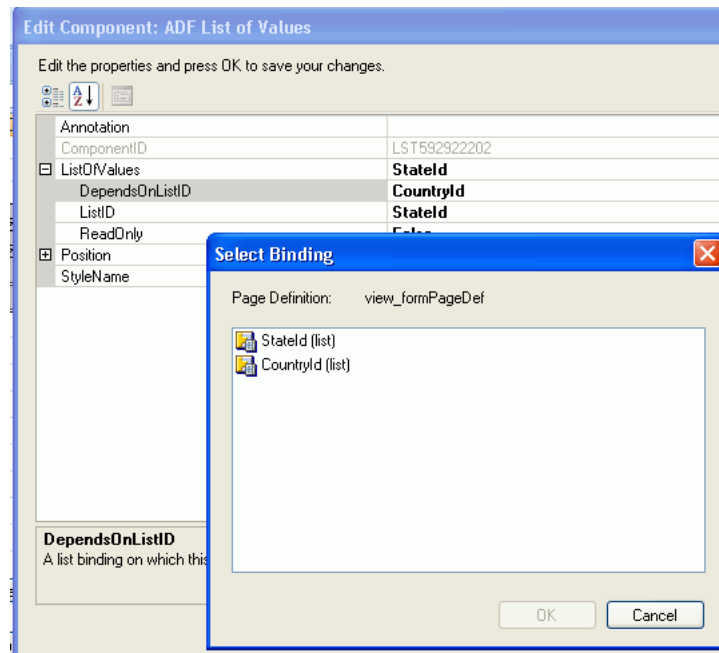
For more information about ADF Desktop Integration List of Values, see [Section A.5, "ADF Desktop Integration List of Values Component Properties"](#).

To create a dependent list of values in an Excel worksheet:

1. If not already present, add the required list bindings to your page definition file.
For more information about adding bindings to page definition files, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).
2. Insert two ADF Desktop Integration List of Values components into your integrated Excel workbook, as described in [Section 6.6, "Inserting an ADF Desktop Integration List of Values Component"](#).
3. Display the property inspector for the ADF Desktop Integration List of Values component that is to serve as the parent in the dependent list of values and set the value of the `ListOfValues.ListID` property to the list binding that is the parent.
4. Display the property inspector for the ADF Desktop Integration List of Values component that is to serve as the child in the dependent list of values and set its values as follows:
 - `ListOfValues.ListID`
Specify the list binding that is the child in the dependent list of values.
 - `ListOfValues.DependsOnListID`
Select the list binding that you specified for the ADF Desktop Integration List of Values component that serves as a parent in Step 3.

[Figure 8–21](#) shows the property inspector for the child ADF Desktop Integration List of Values where the `CountryId` list binding is specified as the parent list of values.

Figure 8–21 Design Time Dependent List of Values in an Excel Worksheet



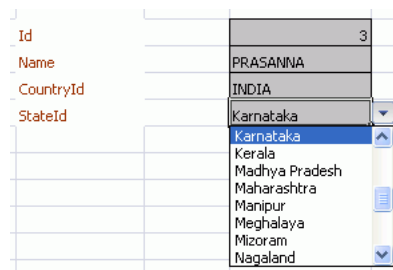
5. Click OK.

8.9.2 What Happens at Runtime When a Dependent List of Values Renders in an Excel Worksheet

At runtime, the Oracle ADF Desktop Integration module renders both instances of the ADF Desktop Integration List of Values component. When an end user selects a value from the parent list of values, it filters the list of values that appears in the child list of values.

Figure 8–22 shows an example where the value that an end user selects in the **CountryId** list of values results in the matching state names appearing in the **StateId** list of values.

Figure 8–22 Runtime Dependent List of Values in an Excel Worksheet



8.9.3 How to Create a Dependent List of Values in an ADF Table Component's Columns

Use instances of the ADF Desktop Integration Tree Node List component to render both lists of values in a dependent list of values in ADF Table component columns at runtime.

Specify a tree binding attribute as a value for the parent ADF Desktop Integration Tree Node List component's `List` property. You also specify a tree binding attribute as a value for the child ADF Desktop Integration Tree Node List component's `List` property and the same tree binding attribute referenced by the parent ADF Desktop Integration Tree Node List component as a value for its `DependsOnList` property.

Make sure that both tree binding attributes are associated with model-driven lists before you add the tree binding to your page definition file. For information about creating a model-driven list, see the "How to Create a Model-Driven List" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. For information about adding a tree binding to your page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

For information about the ADF Desktop Integration Tree Node List component, see [Section A.6, "ADF Desktop Integration Tree Node List Component Properties"](#).

To create a dependent list of values in an ADF Table component:

1. If not already present, insert an ADF Table component into your integrated Excel workbook.

For more information, see [Section 7.3, "Inserting an ADF Table Component into an Excel Worksheet"](#).

2. Display the property inspector for the ADF Table component and invoke the TableColumn Collection Editor by clicking the ellipsis button (...) beside the input field for **TableColumn[] Array**.
3. Click **Add** to add a new column to the ADF Table component to serve as the parent list of values in the runtime dependent list of values.
4. Choose the appropriate option for the newly created column:
 - Click the ellipsis button (...) beside the input field for **InsertComponent** if you want to configure the runtime list of values for insert operations.
 - Click the ellipsis button (...) beside the input field for **UpdateComponent** if you want to configure the runtime list of values for update and download operations.

In both options, the Select subcomponent to create dialog appears.

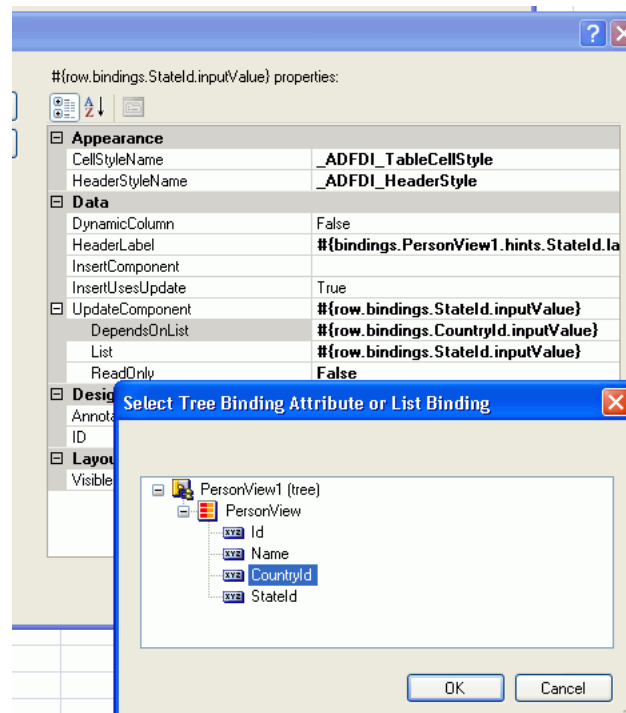
5. Select **TreeNodeList** and click **OK**.
6. Expand the property that you selected in Step 4 and configure values as follows:
 - Select a tree binding attribute associated with a model-driven list for the `List` property.
 - Configure the `ReadOnly` property as desired.
7. Click **Add** to add a new column to the ADF Table component to serve as the child list of values in the runtime dependent list of values.
8. Choose the appropriate option for the newly created column:
 - Click the ellipsis button (...) beside the input field for **InsertComponent** if you want to configure the runtime list of values for insert operations.
 - Click the ellipsis button (...) beside the input field for **UpdateComponent** if you want to configure the runtime list of values for update and download operations.

In both options, the Select subcomponent to create dialog appears.

9. Select **TreeNodeList** and click **OK**.
10. Expand the property that you selected in Step 8 and configure values as follows:
 - Select the same tree binding attribute that you selected in Step 6 as a value for the `DependsOnList` property.
 - Select a tree binding attribute associated with a model-driven list for the `List` property.
 - Configure the `ReadOnly` property as desired.

Figure 8–23 shows the property inspector for a child ADF Desktop Integration Tree Node component where the `CountryId` tree binding attribute is specified as the parent list of values.

Figure 8–23 Design Time Dependent List of Values in an ADF Table Component's Columns



11. Click **OK**.

8.9.4 What Happens at Runtime When a Dependent List of Values Renders in an ADF Table Component's Columns

At runtime, the ADF Table component renders both instances of the ADF Desktop Integration Tree Node List component in the columns that you configured to display these instances. When an end user selects a value in the column that is configured as the parent list of values, it filters the list of values that appears in the column that is configured as the child list of values.

Figure 8–24 shows an example where the value that an end user selects in the `CountryId` column list of values results in the corresponding values for state appearing in the `StateId` column list of values.

Figure 8–24 Runtime Dependent List of Values in an ADF Table Component's Columns

Changed	Flagged	Status	Id	Name	CountryId	StateId
▲			1	SIREESHA	USA	Alabama
			2	ARUN	INDIA	Alabama
			3	PRASANNA	INDIA	Alaska
			4	ALEX	USA	Arizona
			5	SHAUN	USA	Arkansas
			6	BRIAN	USA	California
						Colorado
						Connecticut
						Delaware

8.9.5 Creating a Dependent List of Values in an Excel Worksheet and an ADF Table Component Column

Use an instance of the ADF Desktop Integration List of Values component and an instance of the ADF Desktop Integration Tree Node List component to create a dependent list of values where you render the

- Parent list of values in the Excel worksheet
 - An instance of the ADF Desktop Integration List of Values component renders the parent list of values in the Excel worksheet.
- Child list of values in an ADF Table component column
 - An instance of the ADF Desktop Integration Tree Node List component renders the child list of values in the ADF Table component column.

Specify a list binding as a value for the parent ADF Desktop Integration List of Values component's `ListID` property. You specify a tree binding attribute as a value for the child ADF Desktop Integration Tree Node List component's `List` property and the same list binding referenced by the parent ADF Desktop Integration List of Values component as a value for its `DependsOnList` property.

Make sure that the tree binding attribute is associated with a model-driven list before you add the tree binding to your page definition file. For information about creating a model-driven list, see the "How to Create a Model-Driven List" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. For information about adding a list and tree binding to your page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

For more information about the ADF Desktop Integration List of Values, see [Section A.5, "ADF Desktop Integration List of Values Component Properties"](#) and for information about the ADF Desktop Integration Tree Node List component, see [Section A.6, "ADF Desktop Integration Tree Node List Component Properties"](#).

To create a dependent list of values in an Excel worksheet and an ADF Table component column:

1. Insert an ADF Desktop Integration List of Values component into your integrated Excel workbook, as described in [Section 6.6, "Inserting an ADF Desktop Integration List of Values Component"](#).
2. Display the property inspector for the ADF Desktop Integration List of Values component and set the value of the `ListID` property to the list binding that is to serve as the parent list of values in the dependent list of values.
3. Click **OK**.

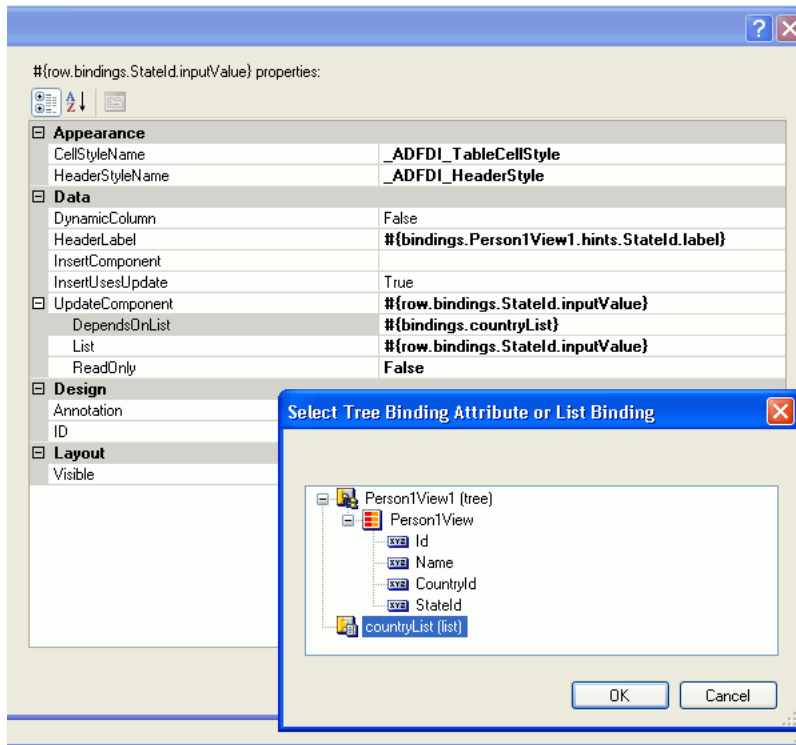
4. Display the property inspector for the ADF Table component and invoke the TableColumn Collection Editor by clicking the ellipsis button (...) beside the input field for **TableColumn[] Array**.
5. Click **Add** to add a new column to the ADF Table component to serve as the child list of values in the runtime dependent list of values.
6. Choose the appropriate option for the newly created column:
 - Click the ellipsis button (...) beside the input field for **InsertComponent** if you want to configure the runtime list of values for insert operations.
 - Click the ellipsis button (...) beside the input field for **UpdateComponent** if you want to configure the runtime list of values for update and download operations.

In both options, the Select subcomponent to create dialog appears.

7. Select **TreeNodeList** and click **OK**.
8. Expand the property that you selected in Step 6 and configure values as follows:
 - Select the same list binding that you specified as a value for the ADF Desktop Integration List of Values component's `ListID` property in Step 2 as a value for the `DependsOnList` property.
 - Select a tree binding attribute associated with a model-driven list for the `List` property.
 - Configure the `ReadOnly` property as desired.
9. Click **OK**.

[Figure 8–25](#) shows the property inspector for a child ADF Desktop Integration Tree Node component where the `countryList` list binding is specified as the parent list of values.

Figure 8–25 Design Time Dependent List of Values in an Excel Worksheet and an ADF Table Component's Column



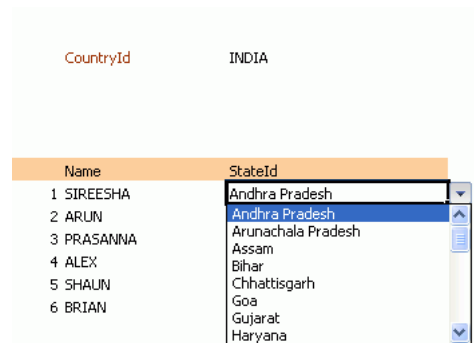
8.9.6 What Happens at Runtime When a Dependent List of Values Renders in an Excel Worksheet and an ADF Table Component Column

At runtime, the ADF Table component invokes the `Download` action and populates each column in the ADF Table component. This includes the column that references the ADF Desktop Integration Tree Node List component. The ADF Desktop Integration List of Values component renders the parent list of values.

The value that an end user selects in the parent list of values (rendered by the ADF Desktop Integration List of Values component) determines what values appear in the child list of values (rendered by the ADF Tree Node List component referenced by the ADF Table component column).

Figure 8–26 shows an example where the value that an end user selects in the **CountryId** list of values determines the list of values that appears the **StateId** column of the ADF Table component.

Figure 8–26 Runtime Dependent List of Values in an Excel Worksheet and an ADF Table Component's Column



8.10 Configuring a Cell to Display a Dynamically Generated Hyperlink

If you use the Excel `HYPERLINK` function in an EL expression, you must enclose the `HYPERLINK` function within an Excel `T` function if you want an Oracle ADF component, such as an ADF Output Text component, to display a hyperlink at runtime. You enclose the `HYPERLINK` function because the Oracle ADF Desktop Integration module interprets Excel formula. To work around this, you wrap the `T` function around the `HYPERLINK` function so that the value of the `HYPERLINK` function is evaluated by the `T` function. The resulting value is inserted into the Excel cell that the ADF component references.

8.10.1 How to Configure a Cell to Display a Dynamically Generated Hyperlink

You write an EL expression that uses the Excel `T` function to evaluate the output of the Excel `HYPERLINK` function. The following task illustrates how you configure an ADF Output Text component to display a hyperlink that, when clicked, invokes a search operation on the Oracle OTN Discussion Forum for Developer Tools using the value of the `ProductName` binding as the search term.

To configure a cell to display a dynamically generated hyperlink:

1. Insert an ADF Output Text component into the Excel worksheet.
2. Write an EL expression for the `Value` property of the ADF Output Text component.

The EL expression that you write invokes the Excel `HYPERLINK` function and uses the Excel `T` function to evaluate the output. In our example, we entered the following EL expression for the `Value` property:

```
=T("=HYPERLINK(" "http://forums.oracle.com/forums/search.jspa?objID=c19&q=#{bindings.ProductName}"" , ""#{bindings.ProductName}"" )")
```

Note: Excel requires that you write double quotes (for example, `""#{bindings.ProductName}""`) in the EL expression so that it can evaluate the expression correctly.

3. Click **OK**.

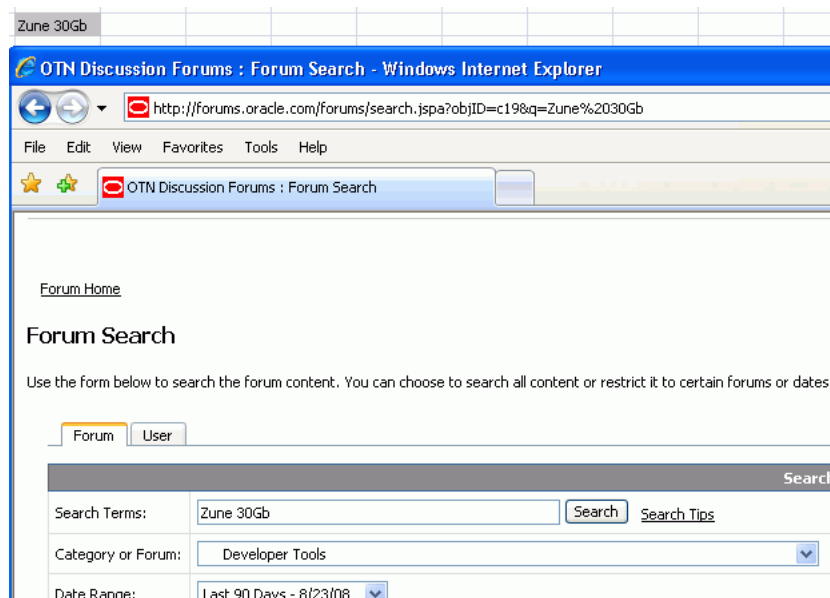
8.10.2 What Happens at Runtime When a Cell Displays Dynamically Generated Hyperlink

The Oracle ADF Desktop Integration module evaluates the EL expression that you write at runtime. In the following example, the Oracle ADF Desktop Integration module:

- Retrieves the value of the `productName` binding
- Inserts the value of the `productName` binding into a URL
- Inserts the result into a hyperlinked cell that a user can click to invoke a search

Figure 8–27 shows the runtime view of the example configured in Section 8.10.1, "How to Configure a Cell to Display a Dynamically Generated Hyperlink", where `Zune 30GB` is the retrieved value of the `productName` binding. When an end user clicks the cell that hosts the ADF Output Text component, he or she invokes a search operation for `Zune 30GB` on the Oracle OTN Discussion Forum for Developer Tools.

Figure 8–27 ADF Output Text Component Configured to Display a Hyperlink



8.11 Passing Server Data Context from a Fusion Web Application Page to a Workbook

You can configure a page in your Fusion web application to pass its current server data context to an integrated Excel workbook when an end user downloads the workbook from the page. For example, if an end user attempts to download a workbook from a page that displays a list of products, the list of products that appears in the workbook will correspond to the list of products displayed in the page when the end user invoked the download. Subsequent changes that the end user makes to data in one location (the worksheet or the Fusion web application's page) do not affect data in the other location.

To configure this functionality, you must:

- Verify that the HTTP filter is configured to allow end users to download integrated Excel workbooks from the Fusion web application. By default, JDeveloper configures the HTTP filter with appropriate values when you add Oracle ADF

Desktop Integration to the technology scope of your Oracle ADF Desktop Integration project. To verify the parameter values of the HTTP filter, see [Section E.2, "Configuring HTTP Filter Parameters"](#).

- Configure the page in your Fusion web application from which the end user downloads the integrated Excel workbook so that it passes its current server data context through URL arguments to the integrated Excel workbook when the end user downloads it.
- Configure the page definition file associated with the worksheet in the integrated Excel workbook so that the worksheet is initialized with the server data context of the page in the Fusion web application from which the end user downloads the workbook.
- Configure workbook and worksheet properties in the integrated Excel workbook that end users will download so that the workbook contains the server data context of the page in the Fusion web application from which the end invokes download.

8.11.1 How to Configure the Fusion Web Application's Page to Pass Server Data Context

You insert an `<af:goLink>` tag and specify property values for it that reference the integrated Excel workbook the end user downloads and the values to download. You also specify the commands on the page that, when invoked, require the Fusion web application to refresh the values referenced by the `<af:goLink>` tag and its property values.

To configure the page in the Fusion web application:

1. In JDeveloper, insert the `af:goLink` tag into the page from which the end user downloads the integrated Excel workbook.
2. In the Structure window, right-click the `af:goLink` node and choose **Go to Properties**.
3. Expand the **Common** section and set values for the properties described in the following table.

Property	Value
Text	Write the text that appears to end users at runtime. For example, write text such as the following to appear at runtime: Download to Excel
Destination	Invoke the expression builder to write an EL expression that specifies the integrated Excel workbook and the values to download as a URL argument: For example, write an EL expression such as the following: "/excel/workbook.xlsx?productName=#{bindings.productName.attributeValue}" Note that the runtime URL-encoded value of the EL expression to the right of ? must be less than 2048 bytes. If the runtime value exceeds 2048 bytes, the integrated Excel workbook downloads the URL arguments in the first 2048 bytes. Subsequent URL arguments do not get downloaded to the integrated Excel workbook. Instead, the Fusion web application writes log entries for these URL arguments identifying them as having not been downloaded. For example, the runtime URL-encoded value of productName=#{bindings.productName.attributeValue} must be less than 2048 bytes.

- Optionally, expand the **Behavior** section and specify component IDs for the `partialTriggers` property that, when invoked, update the values of the `af:goLink` tag and its `Destination` property.

For example, if you have navigation buttons with the IDs `NextButton`, `PreviousButton`, `FirstButton`, and `LastButton`, specify them as follows:

```
:NextButton :PreviousButton :FirstButton :LastButton
```

- Save the page.

The following example shows the entries that JDeveloper generates in a JSF page using the examples in this procedure:

```
<af:goLink text="Download to Excel"
destination="/excel/workbook.xlsx?productName=#{bindings.productName.attributeV
alue}"
partialTriggers=":NextButton :PreviousButton :FirstButton :LastButton"/>
```

8.11.2 How to Configure the Page Definition File for the Worksheet to Receive Server Data Context

You configure the page definition file associated with the worksheet in the integrated Excel workbook as follows:

- Add one or more `parameter` elements that initialize the worksheet with the values specified by the workbook `Parameters` property that you configure in [Section 8.11.3, "How to Configure Properties in the Integrated Excel Workbook to Receive Server Data Context"](#).

The following example shows a parameter element in a page definition file that is associated with a worksheet in an integrated Excel workbook:

```
<parameters>
  <parameter id="ProductNameParam" />
</parameters>
```

- Add an `invokeAction` and a method action binding so that the page definition file associated with the worksheet initializes correctly.

The following example shows the `initializeProductTable` `invokeAction` invoking the `filterByProductName` method action binding. The `invokeAction` is refreshed only when a value for `ProductNameParam` is supplied.

```
<executables>
  <invokeAction binds="filterByProductName" id="initializeProductTable"
    Refresh="deferred"
    RefreshCondition="{bindings.ProductNameParam != null}"/>
  ...
</executables>
```

The method action binding invokes a view object method (`filterByProductName`). The view object method takes a single `String` argument (`ProductNameArg`) that references the value of `ProductNameParam`.

```
<bindings>
  <methodAction id="filterByProductName" RequiresUpdateModel="true"
    Action="invokeMethod" MethodName="filterByProductName"
    IsViewObjectMethod="true" DataControl="AppModuleDataControl"
    InstanceName="AppModuleDataControl.ProductV01">
```

```

        <NamedData NDName="ProductNameArg" NDValue="{bindings.ProductNameParam}"
            NDType="java.lang.String"/>
    </methodAction>
    . . .
</bindings>
    
```

For more information about configuring a page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

8.11.3 How to Configure Properties in the Integrated Excel Workbook to Receive Server Data Context

You configure the workbook `Parameters` property and the worksheet `Parameters` property so that the integrated Excel workbook the end user downloads from the Fusion web application receives the current server data context of the page in the Fusion web application.

To configure the workbook `Parameters` property:

1. Click **Workbook Properties** in the Oracle ADF Desktop Integration Designer.
2. Click the ellipsis button (...) beside the input field for **Parameters** to invoke the WorkbookParameter Collection Editor.
3. Click **Add** to add a new workbook initialization parameter and configure its properties as follows:
 - (Optional) In the **Annotation** field, enter a description of the workbook initialization parameter.
 - In the **Parameter** field, specify the name of the URL argument that you configured for the `af:goLink` tag's `Destination` property as described in [Section 8.11.1, "How to Configure the Fusion Web Application's Page to Pass Server Data Context"](#). For example, `productName` is the value of the URL argument in [Section 8.11.1](#).
4. Repeat Step 3 as necessary to add other workbook initialization parameters.
5. Click **OK**.

For more information about the workbook `Parameters` property, see [Table A-17](#).

To configure the worksheet `Parameters` property:

1. Click **Worksheet Properties** in the Oracle ADF Desktop Integration Designer.
2. Click the ellipsis button (...) beside the input field for **Parameters** to invoke the WorksheetParameter Collection Editor.
3. Click **Add** to add a new worksheet parameter and configure it as follows:
 - (Optional) In the **Annotation** field, enter a description of the worksheet parameter.
 - In the **Parameter** field, specify a parameter element that you added to the page definition file associated with the worksheet, as described in [Section 8.11.2, "How to Configure the Page Definition File for the Worksheet to Receive Server Data Context"](#).
 - In the **Value** field, write an EL expression that references the value of the `Parameter` property you specified for the workbook initialization parameter (workbook `Parameters` array). Use the following syntax when writing the EL expression:

```
#{workbook.params.productName}
```

where *productName* references the value of the `Parameter` property you specified for the workbook initialization parameter.

4. Repeat Step 3 as necessary to add other workbook initialization parameters.
5. Click **OK**.

For more information about the worksheet `Parameters` property, see [Table A-18](#).

8.12 Using Calculated Cells in an Integrated Excel Workbook

You can write Excel formulas that perform calculations on values in an integrated Excel workbook. Before you write an Excel formula that calculates values in an integrated Excel workbook, note the following points:

- Formulas can be entered in cells that reference Oracle ADF bindings and cells that do not reference Oracle ADF bindings
- End users of an integrated Excel workbook can enter formulas at runtime
- You (author of an integrated Excel workbook) can enter formulas at design time
- During invocation, the ADF Table component actions `Upload` and `RowUpSync` send the results of a formula calculation to the Fusion web application and not the formula itself
- Excel recalculates formulas in cells that reference Oracle ADF bindings when these cells are modified by:
 - Invocation of the ADF Table component `RowDownSync` and `Download` actions
 - Rendering of Oracle ADF components
- The ADF Table and ADF Read-only Table components insert or remove rows as they expand or contract to accommodate data downloaded from the Fusion web application. Formulas are replicated according to Excel's own rules.
- You can enter formulas above or below a cell that references an ADF Table or ADF Read-only Table component. A formula that you enter below one of these components maintains its position relative to the component as the component expands or contracts to accommodate the number of rows displayed.

For more information about Excel functions, see the Function reference section in Excel's online help documentation.

8.12.1 How to Create a Column That Displays Values Generated by an Excel Formula

You insert a column that displays values calculated by an Excel formula directly into a worksheet using the menu options on Excel's Ribbon. You cannot add a column that displays calculated values using the collection editor that manages columns for an ADF Table or ADF Read-only Table component.

To create a column that displays values generated by an Excel formula:

1. In design mode in the Excel worksheet, select the cell in which you want the column that displays the values generated by the Excel formula to appear at runtime.

In this example, the workbook author inserted the following formula into the Excel worksheet cell G7:

Note the following points:

- Macros triggered by an Excel event do not get triggered if the Excel event is invoked by the Oracle ADF Desktop Integration module.
- Oracle ADF Desktop Integration module code invoked by an Excel event is executed when the Excel event is triggered by a macro.

Configuring the Appearance of an Integrated Excel Workbook

This chapter describes how you configure the appearance of an integrated Excel workbook using styles that the Oracle ADF Desktop Integration module defined and that you define in Excel. The chapter also discusses how you can use EL expressions to dynamically apply styles to Oracle ADF components in a workbook at runtime.

This chapter includes the following sections:

- [Section 9.1, "Introduction to Configuring the Appearance of an Integrated Excel Workbook"](#)
- [Section 9.2, "Working with Styles"](#)
- [Section 9.3, "Applying Styles Dynamically Using EL Expressions"](#)
- [Section 9.4, "Using Labels in an Integrated Excel Workbook"](#)
- [Section 9.5, "Using Styles to Make Integrated Excel Workbooks Usable"](#)
- [Section 9.6, "Branding Your Integrated Excel Workbook"](#)
- [Section 9.7, "Changing an Integrated Excel Workbook at Runtime"](#)

9.1 Introduction to Configuring the Appearance of an Integrated Excel Workbook

You can configure the appearance of an integrated Excel workbook using both Excel functionality and Oracle ADF functionality. Configuring the appearance of a workbook may make the workbook more usable for end users. For example, applying a particular style to cells that render ADF Output Text components at runtime may indicate to end users that the cell is read-only. You may also want to configure the appearance of an integrated Excel workbook so that it aligns with your company's style sheet or the color scheme of the Fusion web application that the Excel workbook integrates with.

The Oracle ADF Desktop Integration module provides a number of predefined Excel styles to apply to the Oracle ADF Desktop Integration components you configure in a workbook. You may want to define additional styles to meet the needs of your desktop integration project. If you do, familiarize yourself with the formats in an Excel workbook that render differently depending on the locale, region, and language.

Once you have decided what styles to apply to the Oracle ADF Desktop Integration components at runtime, you write EL expressions to associate a style with a component. The Oracle ADF Desktop Integration component properties that include *StyleName* in their name take an EL expression as a value. The ADF Label component

and the `Label` property of other ADF components also support EL expressions. These EL expressions can retrieve the values of string keys defined in resource bundles or the values of attribute control hints defined in your Fusion web application.

Finally, in addition to styles that allow you to configure the appearance of an integrated Excel workbook, the Oracle ADF Desktop Integration module provides a collection of properties (`BrandingItems`) that enable you to brand your integrated Excel workbook with application name, application version details, and copyright information.

9.2 Working with Styles

The Oracle ADF Desktop Integration module provides a mechanism to apply Excel-defined styles to some of the Oracle ADF components at runtime. The Oracle ADF components that support the application of styles have properties with *StyleName* in their name. For example, the column properties of the ADF Table and ADF Read-only Table components both support the properties `HeaderStyleName` and `CellStyleName` that determine styles to apply at runtime.

Predefined Styles in the Oracle ADF Desktop Integration Module

Many properties have default values that are drawn from a predefined list of Oracle ADF Desktop Integration module styles. For example, the `HeaderStyleName` property's default value is `_ADF_DI_HeaderStyle`. The EL expression `_ADF_DI_HeaderStyle` is one of the predefined styles in the Oracle ADF Desktop Integration module. The Oracle ADF Desktop Integration module automatically adds these predefined styles to a converted Excel workbook at design time.

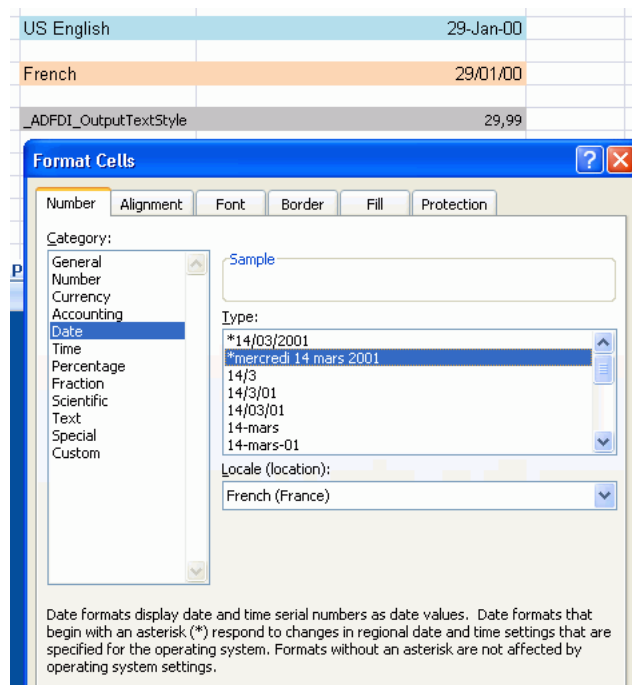
The following is the list of predefined styles:

- `_ADF_DI_LabelStyle`
- `_ADF_DI_OutputTextStyle`
- `_ADF_DI_InputTextStyle`
- `_ADF_DI_HeaderStyle`
- `_ADF_DI_ReadOnlyTableStyle`
- `_ADF_DI_TableCellStyle`

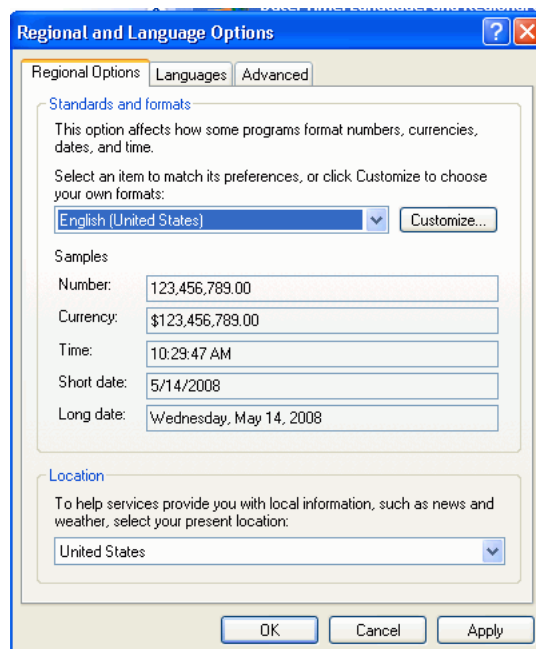
You can merge these styles and other styles that you define yourself from an integrated Excel workbook into another Excel workbook that you intend to integrate with a Fusion web application. You may need to create additional styles for use in your Excel workbook, as the predefined list of styles provided with the Oracle ADF Desktop Integration module may prove insufficient for many projects. For more information about creating new styles and merging styles into a workbook, see Excel's documentation.

Excel's Date Formats and Microsoft Windows' Regional and Language Options

A number of formats in the **Date** category of **Number** styles that Excel can apply to cells change if a user changes the locale of the local machine using the Regional and Language Options dialog box that is accessible from the Microsoft Windows Control Panel. The * character precedes these formats in the **Type** list. [Figure 9-1](#) shows an example of a Date type that formats dates in a cell using French (France) conventions.

Figure 9–1 Date Formats in Excel

If an end user changes the regional options of a machine to use **English (United States)**, as illustrated in [Figure 9–2](#), the cells that are formatted with the style in [Figure 9–1](#) use the **English (United States)** conventions.

Figure 9–2 Regional and Language Options in Excel

9.2.1 How to Apply a Style to an Oracle ADF Component

To apply a style to an Oracle ADF component, use the property inspector to set values for properties with *StyleName* in their name.

To apply a style:

1. Select the cell that references the Oracle ADF component you want to modify and then click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar.

For example, select a cell that references an ADF Table component.

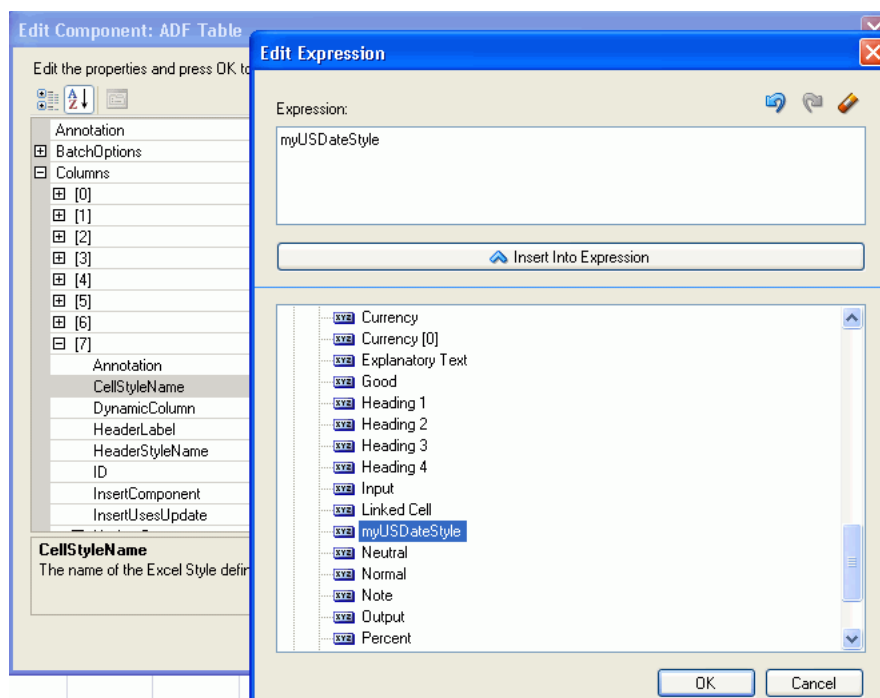
2. Click **Columns** and then the value for the column in the array of columns where you want to modify the format of cells at runtime.
3. Expand the **Styles** node and select the style that you want to apply to cells in the column at runtime.

For example, apply a custom date-based style that you define (`myUSDateStyle` style) to databound columns of Date type. Applying a date-based style rather than a general style to a databound column of Date type results in runtime data (dates) appearing as a date rather than a serial number

4. Click **Insert Into Expression** to insert `myUSDateStyle` into the Expression field.

Figure 9–3 shows the Edit Expression dialog box.

Figure 9–3 Edit Expression Dialog Box Applying a Style



5. Click **OK**.

9.2.2 What Happens at Runtime When a Style Is Applied to an Oracle ADF Component

The EL expression that you entered as a value for the property with *StyleName* in its name is evaluated at runtime. If it corresponds to one of the predefined styles or one that you defined, the style is applied to the Oracle ADF component that you set the property for.

If a cell that references an Oracle ADF component has a style applied to it that differs from the style defined in the properties of the Oracle ADF component, the Oracle ADF

component overwrites the existing style at runtime and applies the style defined by its properties.

9.3 Applying Styles Dynamically Using EL Expressions

Oracle ADF component properties that include *StyleName* in their name can take an EL expression as a value. The EL expressions that you write can resolve to a named Excel style at runtime that is applied to the Oracle ADF component. The EL expressions that you write are Excel formulas that may include Oracle ADF data binding expressions. The Oracle ADF Desktop Integration module does not evaluate or apply results when a user navigates between cells or during upload.

The following examples show different contexts where you can use EL expressions to determine the behavior and appearance of Oracle ADF components at runtime.

[Example 9-1](#) applies a style dynamically during download. If the status value for binding is `Closed`, apply a read-only style (`MyReadOnlyStyle`). Otherwise apply another style (`MyReadWriteStyle`):

Example 9-1 Applying a Style Dynamically During Download

```
=IF("#{bindings.Status}" = "Closed", "MyReadOnlyStyle", "MyReadWriteStyle")
```

[Example 9-2](#) uses a mixture of Excel formulas and ADF binding expressions to handle errors and type conversion:

Example 9-2 EL Expressions to Handle Errors and Type Conversion

```
=IF(ISERROR(VALUE("#{bindings.DealSize}")), "BlackStyle",  
IF(VALUE("#{bindings.DealSize}") > 300, "RedStyle", "BlackStyle"))
```

When evaluating EL expressions at runtime, the Oracle ADF Desktop Integration module determines the value that the EL expression references. It then replaces the EL expression in the Excel formula with the value. In [Example 9-1](#), the Oracle ADF Desktop Integration module first determines the value of the EL expression, `#{bindings.Status}`, in the following Excel formula:

```
=IF("#{bindings.Status}" = "Closed", "MyReadOnlyStyle", "MyReadWriteStyle")
```

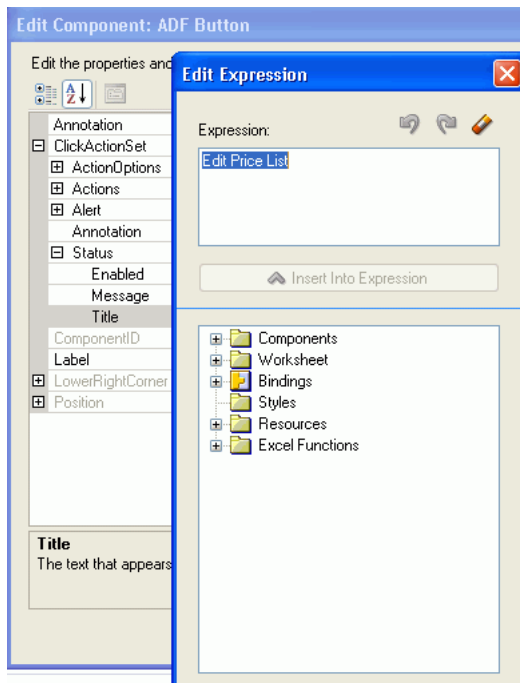
It then replaces the EL expression with the runtime value, as in the following example, where the expression evaluated to `Closed`:

```
=IF("Closed" = "Closed", "MyReadOnlyStyle", "MyReadWriteStyle")
```

Excel evaluates the above formula and, in this example, applies the `MyReadOnlyStyle` style.

9.3.1 How to Write an EL Expression That Applies a Style at Runtime

You write EL expressions for the Oracle ADF component properties that support EL expressions in the Edit Expression dialog box that is accessible from the Oracle ADF component's property inspector. [Figure 9-4](#) displays an Edit Expression dialog box launched from the property inspector window of an ADF Button component.

Figure 9–4 Edit Expression Dialog Box**To write an EL expression that applies a style at runtime:**

1. Select a cell in the Excel worksheet that references the Oracle ADF component for which you want to write an EL expression.
2. Click the property inspector button in the Oracle ADF Desktop Integration Designer toolbar to display the property inspector.
3. Select the property in the property inspector with which you want to associate an EL expression and click the ellipsis button (...) to display the Edit Expression dialog box.

Note: The Edit Expression dialog box appears only if the Oracle ADF component that you selected in Step 1 supports EL expressions. Depending on the context, the ellipsis button (...) can launch other editors such as the Action Collection Editor.

The Edit Expression dialog box, as illustrated in [Figure 9–4](#), displays a hierarchical list of the Oracle ADF components, bindings, styles, resources, and Excel functions that you can reference in EL expressions. For more information about the syntax of EL expressions that you enter in this dialog box, see [Appendix B, "Oracle ADF Desktop Integration EL Expressions"](#).

9.3.2 What You May Need to Know About EL Expressions That Apply Styles

Note the following points when writing EL expressions that apply styles at runtime.

How the Oracle ADF Desktop Integration Module Applies Styles

EL expressions that evaluate to styles are applied when:

- An ADF Table component invokes its `Download` or `DownloadForInsert` actions

- Rows are inserted into an ADF Table component
- A worksheet invokes its `DownSync` action

EL expressions that evaluate to styles are not applied when:

- An ADF Table component invokes its `RowDownSync` action
- An end user edits the format properties of a cell

Note also that an EL expression that evaluates to a style is not reevaluated when an end user edits a cell's value.

- The runtime value of an EL expression does not match a style defined in the end user's integrated Excel workbook

In this scenario the style formats of the targeted cells do not change. Instead, they retain their existing style formats. If you configured client-side logging, the Oracle ADF Desktop Integration module generates an entry in the log file when an EL expression evaluates to a style that is not defined in the end user's integrated Excel workbook. For more information about client-side logging, see [Section C.3, "Generating Log Files for an Integrated Excel Workbook"](#).

EL Expression Syntax When Invoking the HYPERLINK Excel Function

Use the following syntax when writing an EL expression that invokes the `HYPERLINK` Excel function:

```
=T( "=HYPERLINK( "link_location", "friendly_name" )" )
```

If you write an EL expression using the `HYPERLINK` function, as in the following example, it is recommended that you select the **Locked** checkbox in the **Protection** tab of the Format Cells dialog box for the custom style that you apply to prevent error messages appearing:

```
=T( "=HYPERLINK( "http://www.oracle.com",  
"#{bindings.ProductId.inputValue}" )" )
```

For more information about the `HYPERLINK` Excel function, see [Section 8.10, "Configuring a Cell to Display a Dynamically Generated Hyperlink"](#) and Microsoft Excel's documentation. For more information about the use of EL expressions in an integrated Excel workbook, see [Appendix B, "Oracle ADF Desktop Integration EL Expressions"](#).

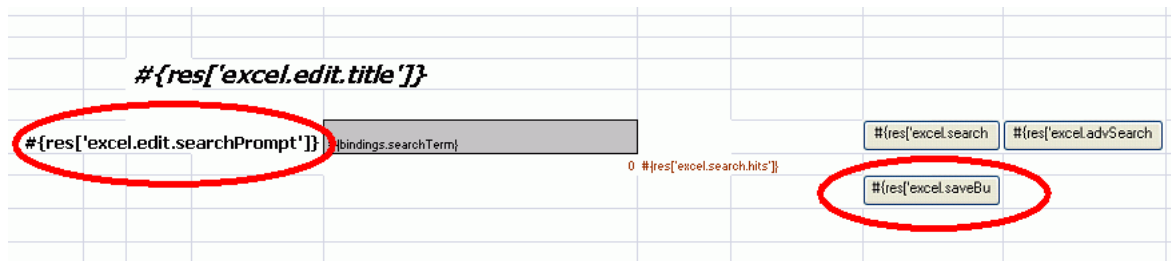
9.4 Using Labels in an Integrated Excel Workbook

Use labels to provide end users with information about how they use the functionality in an integrated Excel workbook. You can write EL expressions that retrieve the value of string keys defined in a resource bundle or that retrieve the values of attribute control hints. An integrated Excel workbook evaluates the value of a `Label` property only when the workbook is initialized.

Retrieving the Values of String Keys from a Resource Bundle

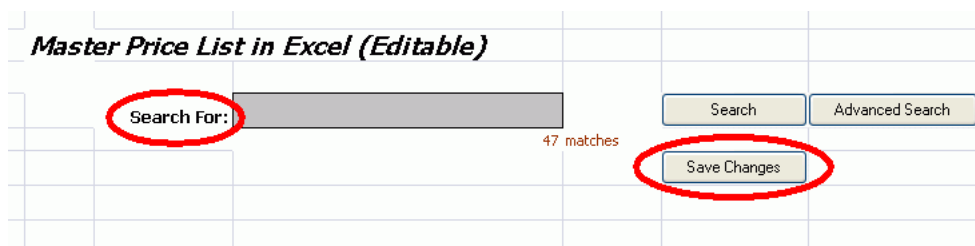
[Figure 9-5](#) shows a portion of the design time view of the `EditPriceList.xlsx` workbook in the Master Price List module. It shows examples of ADF Label components and ADF Button components that have EL expressions specified for their `Label` properties.

Figure 9–5 Design Time View of an ADF Label Component and an ADF Button Component with Label Property



At runtime, these EL expressions resolve to string keys defined in the `res` resource bundle that is registered with the Master Price List module. Figure 9–6 shows the corresponding runtime view of the ADF Label component and ADF Button component illustrated in design mode in Figure 9–5.

Figure 9–6 Runtime View of an ADF Label Component and an ADF Button Component with Label Property

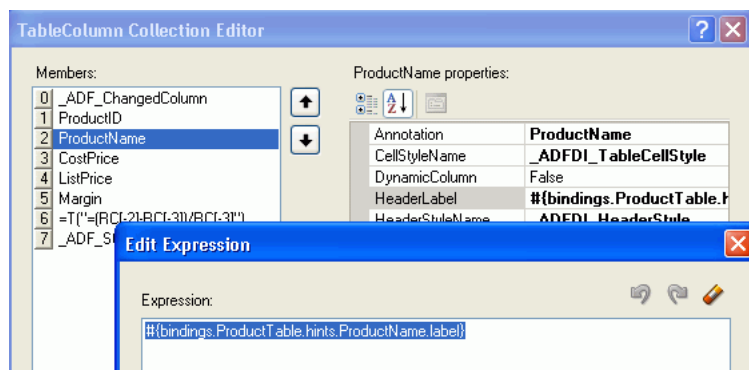


For information about referencing string keys from a resource bundle, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

Retrieving the Values of Attribute Control Hints

In addition to string keys from resource bundles, the ADF Label component and the Label property of other ADF components can reference attribute control hints that you define for entity objects and view objects in your JDeveloper project. Figure 9–7 shows the expression builder for the `Product Name` column in the `EditPriceList.xlsx` workbook's ADF Table component. The expression builder contains an EL expression for the `HeaderLabel` property of the `ProductName` column that retrieves the value (`Product Name`) defined for an attribute control hint at runtime.

Figure 9–7 EL Expression That Retrieves the Value of an Attribute Control Hint for a Label Property



Attribute control hints can be configured for both view objects and entity objects. Information about how to add an attribute control hint to an entity object can be found in the "Defining Attribute Control Hints for Entity Objects" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. Information about how to add an attribute control hint to a view object can be found in the "Defining Attribute Control Hints for View Objects" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

How an Integrated Excel Workbook Evaluates a Label Property

An integrated Excel workbook evaluates the `Label` properties of ADF components when the workbook is initialized after you or an end user open the workbook for the first time. The integrated Excel workbook saves the retrieved values for the `Label` properties when the workbook itself is saved to a directory on the machine.

The retrieved values for the `Label` properties do not get refreshed during invocation of actions such as the worksheet's `DownSync` action or the ADF Table component's `Download` action. You indirectly refresh the retrieved values of the `Label` properties if you invoke the workbook actions `ClearAllData` or `EditOptions` described in [Table A-16](#).

9.5 Using Styles to Make Integrated Excel Workbooks Usable

It is good practice to provide end users of integrated Excel workbooks with information that helps them understand how to use the ADF components that you provide to integrate with a Fusion web application. You can do this by:

- Providing end users with instructions on how to use Oracle ADF components such as ADF Button and ADF Input Text components.

The ADF Label component and the `Label` property of other ADF components is useful for this task, as you can write labels that instruct an end user on how to use the component.

- Apply styles that indicate if an ADF component is read-only or read-write.

Using ADF Label Components to Make an Integrated Excel Workbook Usable

You can use ADF Label components to provide end users of an integrated Excel workbook information about how to use other ADF components in the workbook. For example, many forms, by convention, use an `*` to indicate to end users that they must enter a value in an input field. [Figure 9-8](#) shows three ADF Input Text components with ADF Label components in adjoining cells. Each ADF Label component references an EL expression that retrieves the value of a string key from a resource bundle at runtime. Each string key includes the `*` character to indicate to end users that they must supply a value.

Figure 9-8 ADF Label Components Providing End-User Instruction

* Enter your first name:	<input type="text"/>
* Enter your last name:	<input type="text"/>
* Enter your email address:	<input type="text"/>

For information about using resource bundles, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

About the Read-only Property in an Integrated Excel Workbook

Note the following points about the read-only property in an integrated Excel workbook:

- The ADF Output Text and ADF Label components do not have read-only properties. However, both components have implied read-only behavior. In addition, end users can enter values in the cells that host ADF Output Text components and temporarily change the values that appear in these cells. The Oracle ADF Desktop Integration module ignores these changes when uploading from the worksheet and overwrites them when it downloads data from the Fusion web application.
- The ADF Input Text, ADF Desktop Integration List of Values, and ADF Desktop Integration Tree Node List components each have a read-only property (`ReadOnly`).

Note: If you specify an EL expression in the `Value` property of an ADF Input Text component, the component behaves as if its `ReadOnly` property were `True`. The component ignores the actual value of the `ReadOnly` property.

To prevent end-user confusion, apply styles to components, such as the ADF Output Text component, that indicate to end users whether a component is read-only or can be edited. By default, the ADF Output Text component uses the predefined style, `_ADFDI_OutputTextStyle`. You can define your own styles and apply them to components as described in this chapter.

For more information about the properties that Oracle ADF Desktop Integration module components support, see [Appendix A, "Oracle ADF Desktop Integration Component Properties and Actions"](#).

9.6 Branding Your Integrated Excel Workbook

The Oracle ADF Desktop Integration module provides a number of features that you can configure to brand your integrated Excel workbook with information such as application name, version information, and copyright information. You can use the workbook `BrandingItems` group of properties to associate this information with an integrated Excel workbook. You must configure a toolbar menu as described in [Section 8.3, "Creating Menu Items"](#) so that an end user can view this branding information by clicking a menu item that invokes the `ViewAboutDialog` workbook action at runtime. For more information about workbook actions, see [Table A-16](#).

You can also define string keys in a resource bundle to define information, such as titles, in one location that can then be used in multiple locations in an integrated Excel workbook at runtime when EL expressions retrieve the values of these string keys. For information about defining string keys, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

9.6.1 How to Brand an Integrated Excel Workbook

You define values for the workbook `BrandingItems` group of properties.

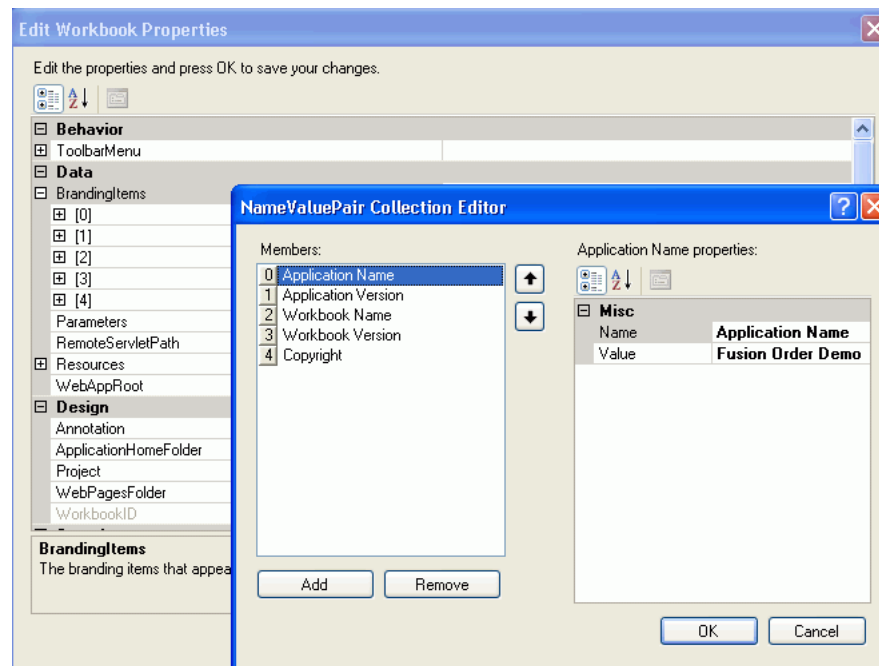
To brand an integrated Excel workbook:

1. In the Oracle ADF Desktop Integration Designer, click **Workbook Properties** to display the Edit Workbook Properties dialog box.
2. Click the ellipsis button (...) beside the input field for **BrandingItems** to invoke the NameValuePair Collection Editor.
3. Click **Add** and specify values for the new element as follows:
 - **Name**
Specify the name of the branding item that you want to define.
 - **Value**
Specify a literal string or click the ellipsis button (...) to invoke the expression builder and write an EL expression that retrieves a value at runtime.

Note: `BrandingItems` is a workbook property, so you cannot specify an EL expression to retrieve a value associated with a specific worksheet or to retrieve a binding from a specific page definition file.

Figure 9–9 shows the design time view of branding items in the Master Price List module.

Figure 9–9 Design Time View of Branding Items in the Master Price List Module



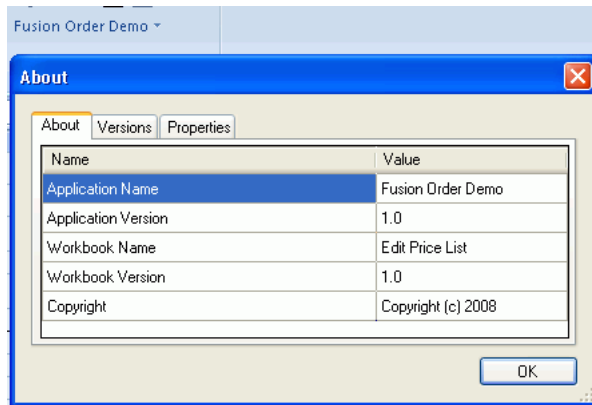
4. Click **OK**.

9.6.2 What Happens at Runtime to the Branding Items in an Integrated Excel Workbook

At runtime, the name/value pairs that you define for the `BrandingItems` group of properties appear in a dialog box that the end user invokes from the **About** menu item of the Oracle ADF toolbar that you configure to appear as described in [Section 8.3](#),

"Creating Menu Items". Figure 9–10 shows the runtime view of branding items in the Master Price List module's `EditPriceList.xlsx` workbook.

Figure 9–10 Runtime View of Branding Items in the Master Price List Module



9.7 Changing an Integrated Excel Workbook at Runtime

Once you publish and deploy a finalized integrated Excel workbook, as described in [Chapter 14, "Deploying Your Integrated Excel Workbook"](#), end users can make the following changes to a workbook at runtime:

- Delete a column from an ADF Table or ADF Read-only Table component
- Drag and drop cells to move ADF components other than an ADF Button component
- Insert new rows into an ADF Table component

Internationalizing Your Integrated Excel Workbook

This chapter describes internationalization issues to consider when developing an integrated Excel workbook.

This chapter includes the following sections:

- [Section 10.1, "Introduction to Internationalizing Your Integrated Excel Workbook"](#)
- [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#)

10.1 Introduction to Internationalizing Your Integrated Excel Workbook

The Oracle ADF Desktop Integration module provides a number of features that allow you to deliver integrated Excel workbooks as part of an internationalized Fusion web application. One of the principal features is the use of resource bundles to manage the localization of user-visible strings that appear in Oracle ADF components at design time. It also uses resource bundles to manage the user-visible strings that appear in these components at runtime. The use of resource bundles is described in more detail later in this chapter.

Note the following points about internationalization and localization in an integrated Excel workbook:

- Internationalized Data

The Oracle ADF Desktop Integration module supports both single- and double-byte character sets. It marshals data transmitted between an Excel worksheet and a Fusion web application into XML payloads. These XML payloads use UTF-8 encoding with dates, times, and numbers in canonical formats.

- Locale

The locale of the machine where the Excel workbook is used determines the format for dates, times, and numbers. These settings (formats and the locale of the machine) may differ from the settings used by the Fusion web application. The Oracle ADF Desktop Integration module does not attempt to synchronize these settings, but does make sure that data retains its integrity. The Oracle ADF Desktop Integration module does not provide a mechanism for end users to change the language or display settings of the Oracle ADF components in an integrated Excel workbook at runtime.

When configuring or applying styles to ADF components in an integrated Excel workbook, configure or choose styles that are locale-sensitive. For more information, see [Section 9.2, "Working with Styles"](#).

For information about internationalizing Fusion web applications, see the "Internationalizing and Localizing Pages" chapter in the *Oracle Fusion Middleware Web User Interface Developer's Guide for Oracle Application Development Framework*.

10.2 Using Resource Bundles in an Integrated Excel Workbook

The Oracle ADF Desktop Integration module uses resource bundles to manage user-visible strings that appear in the ADF components of an integrated Excel workbook at design time and runtime. JDeveloper stores resource bundles in the Oracle ADF Desktop Integration project.

You can register up to twenty resource bundles containing string values you define with an integrated Excel workbook. A resource bundle must not exceed 1 MB in size. If you attempt to register:

- More than twenty resource bundles
- A resource bundle that exceeds 1 MB in size

the Oracle ADF Desktop Integration module writes a warning to the client-side log file and stops registration of additional resource bundles or resource bundle data after the 1 MB limit is reached. For example, if resource bundle *A* measures 2 MB and resource bundle *B* measures 1 MB, the Oracle ADF Desktop Integration module registers the first megabyte of data in resource bundle *A* and all of the data in resource bundle *B*. For information about client-side logging, see [Section C.3.2, "About Client-Side Logging"](#).

The `Resources` workbook property specifies what resource bundles an integrated Excel workbook can use. This property specifies an array of resource bundles (`ResourceBundle[] Array`) in the integrated Excel workbook. Each element in the array has a property that uniquely identifies a resource bundle (`Alias`) and a property that identifies the path to the resource bundle in the JDeveloper desktop integration project (`Class`). For example, `EditPriceList.xlsx` in the Master Price List module references the `res` resource bundle that has the following value for the `Class` property:

```
oracle.fodemo.masterpricelist.resources.UIStrings
```

More information about the `Resources` workbook property can be found in [Section A.11, "Workbook Actions and Properties"](#).

By default, the Oracle ADF Desktop Integration module provides a *reserved resource bundle* that supplies string key values used by many component properties at runtime. When you convert an Excel workbook to integrate it with a Fusion web application, the reserved resource bundle is registered by default with the workbook. The Oracle ADF Desktop Integration module uses the value `_ADFDIRes` to uniquely identify this resource bundle. Many EL expressions reference string values in this resource bundle. For example, the following EL expression is the default value of the `Label` property for the `Login` menu item in `WorkbookMenuItems`:

```
{_ADFDIRes['TOOLBAR_MENU_CMD_LOGIN']}
```

where `_ADFDIRes` identifies the reserved resource bundle and `TOOLBAR_MENU_CMD_LOGIN` is the key that identifies the string (`Login...`) in the resource bundle to use at runtime for the `Login` menu item.

If you register another resource bundle, you can replace default string key values assigned from the `_ADFDIRes` resource bundle to many of the ADF component properties.

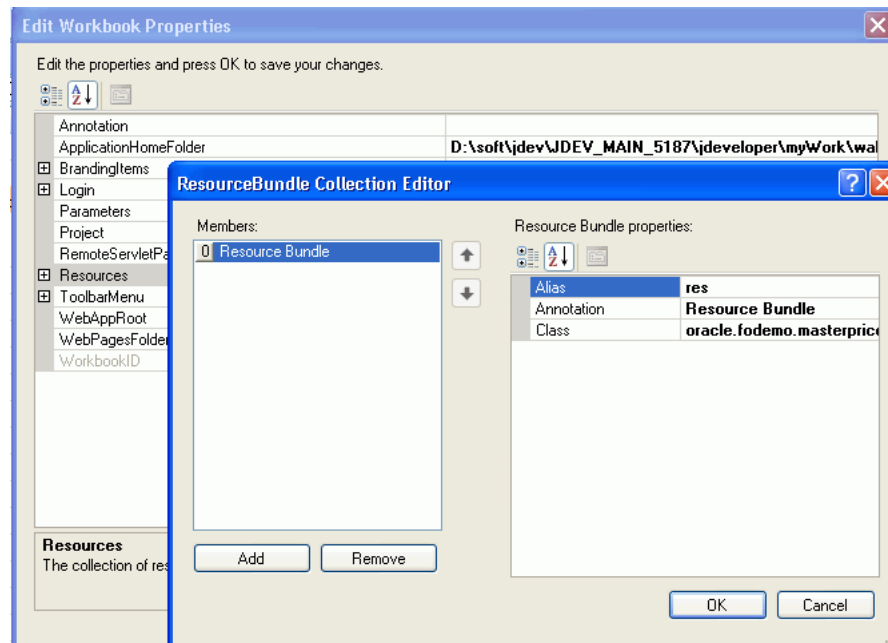
10.2.1 How to Register a Resource Bundle in an Integrated Excel Workbook

You register a resource bundle by adding an element to the `ResourceBundle[]` Array using the ResourceBundle Collection Editor.

To register a resource bundle:

1. In the Excel workbook, click **Workbook Properties** in the Oracle ADF Desktop Integration Designer to display the Edit Workbook Properties dialog box.
2. Click the ellipsis button (...) beside the input field for **Resources** to display the ResourceBundle Collection Editor shown in [Figure 10-1](#).

Figure 10-1 ResourceBundle Collection Editor



3. Specify values for the resource bundle and then click **OK**.

For information about the values to specify for a resource bundle, see the entry for Resources in [Table A-17](#).

10.2.2 How to Replace String Key Values from the Reserved Resource Bundle

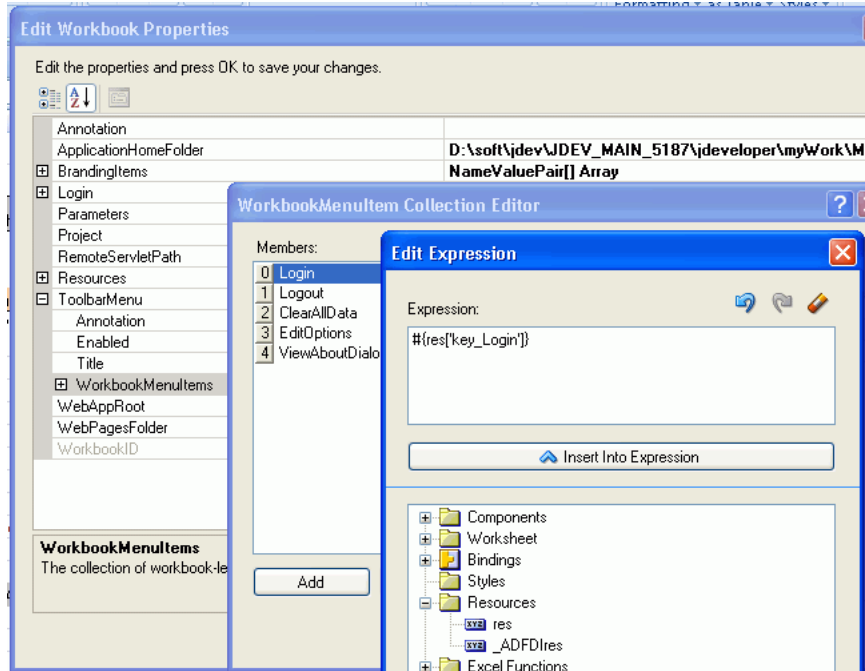
You can replace a string key from the reserved resource bundle by specifying a string key from a resource bundle that you registered with the integrated Excel workbook.

To replace a string key value from the reserved resource bundle:

1. Click **Workbook Properties** in the Oracle ADF Desktop Integration Designer.
2. Click **ToolBarMenu** and click the ellipsis button (...) beside the input field for `WorkbookMenuItem[]` Array.
3. Click the ellipsis button (...) beside the input field for the `Label` property to display the expression builder.
4. Write an EL expression to retrieve the string key value you want to display at runtime.

Figure 10–2 shows an example where the EL expression references a string key (`key_Login`) defined in a resource bundle (`res`). This EL expression replaces the default EL expression that references a string key in the `_ADFDIRes` resource bundle.

Figure 10–2 Expression Builder Replacing a Key String Value



5. Click OK.

10.2.3 How to Override the Reserved Resource Bundle

The reserved resource bundle contains a number of user-visible runtime strings that you cannot replace by configuring the properties of the Oracle ADF Desktop Integration module components. Examples include the strings that appear in the default upload dialog box illustrated in Figure 7–5.

To replace these user-visible runtime strings, you create a resource bundle in your Fusion web application that contains the string keys from the reserved resource bundle that the Oracle ADF Desktop Integration module supports for override. [Appendix F, "String Keys in the Reserved Resource Bundle"](#) lists these string keys. You define values for the string keys listed in [Appendix F](#) that you want to override in the resource bundle you create.

To override the reserved resource bundle:

1. Create a resource bundle in your Fusion web application.

For information about creating a resource bundle, see the "Defining Locales and Resource Bundles" section in the *Oracle Fusion Middleware Web User Interface Developer's Guide for Oracle Application Development Framework*.
2. Define the string key values you want to appear at runtime in the resource bundle for the string keys listed in [Appendix F, "String Keys in the Reserved Resource Bundle"](#).

3. Set `_ADFDIRes` as the value of the **Alias** property when you register the resource bundle you created in Step 1.

For information about how to register a resource bundle, see [Section 10.2.1, "How to Register a Resource Bundle in an Integrated Excel Workbook"](#).

[Table F-1](#) describes the string keys in the reserved resource bundle that the Oracle ADF Desktop Integration module supports for override. Supply an alternative value to the value listed in the English value column for each string key in the reserved resource bundle that you want to override.

10.2.4 What Happens at Runtime When You Override the Reserved Resource Bundle

The Oracle ADF Desktop Integration module retrieves the values of string keys listed in [Table F-1](#) that you defined in the resource bundle you created. It retrieves the values of other string keys that you did not define in the resource bundle you created from the reserved resource bundle.

10.2.5 What You May Need to Know About Resource Bundles

See the following sections for additional information about resource bundles in an integrated Excel workbook.

Resource Bundle Types

The Oracle ADF Desktop Integration module supports use of the following types of resource bundle:

- Properties bundle (`.properties`)
- List resource bundle (`.rts`)
- Xliff resource bundle (`.xlf`)

For more information about resource bundles, see the "Defining Locales and Resource Bundles" section in the *Oracle Fusion Middleware Web User Interface Developer's Guide for Oracle Application Development Framework*.

Caching of Resource Bundles in an Integrated Excel Workbook

The Oracle ADF Desktop Integration module caches the values of string keys from the resource bundles that an integrated Excel workbook retrieves when it first connects to the Fusion web application. If you change a string key value in a resource bundle after an integrated Excel workbook has cached the previous value, the modified value does not appear in the workbook unless the `ClearAllData` workbook action is invoked and the end user closes and reopens the workbook so that it retrieves the modified value from the Fusion web application. For more information about the `ClearAllData` workbook action, see [Table A-16](#).

EL Expression Syntax for Resource Bundles

The Oracle ADF Desktop Integration module requires that you enclose the string key name in EL expressions using the `[]` characters, as in the following example:

```
{res['StringKey']}
```

The Oracle ADF Desktop Integration module does not support the following syntax:

```
{res.StringKey}
```

Securing Your Integrated Excel Workbook

This chapter provides information on how to secure your integrated Excel workbook with a Fusion web application by providing authentication and authorization capabilities. It also describes a number of issues that you should be aware of so that you can secure your Excel workbook and its data.

This chapter includes the following sections:

- [Section 11.1, "Introduction to Securing Your Integrated Excel Workbook"](#)
- [Section 11.2, "Authenticating the Excel Workbook User"](#)
- [Section 11.3, "Checking the Integrity of an Integrated Excel Workbook's Metadata"](#)
- [Section 11.4, "What You May Need to Know About Securing an Integrated Excel Workbook"](#)

11.1 Introduction to Securing Your Integrated Excel Workbook

Configure Oracle ADF Security for the Fusion web application before you test or deploy an integrated Excel workbook. An integrated Excel workbook must use a cookie-based web session ID to determine if the client (Excel workbook) has established a valid session with the server that hosts the Fusion web application. After you configure security for the Fusion web application in JDeveloper, you configure a number of properties, such as `ProtectedWebPage`, in the Excel workbook so that the Excel workbook user can be authenticated by the server hosting the Fusion web application.

For information about Oracle ADF Security, see the "Enabling ADF Security in a Fusion Web Application" chapter in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

11.2 Authenticating the Excel Workbook User

An integration of an Excel workbook with a Fusion web application requires an authenticated cookie-based web session ID from the server that hosts the Fusion web application. Oracle ADF Security determines the mechanism used to authenticate the user.

If a user opens an Excel workbook without a valid authenticated cookie-based web session ID, a login mechanism to authenticate the end user is invoked when one of the following events occur:

- Invocation of the workbook `Login` action

- Invocation of a server request that requires a valid cookie-based web session ID before the request can be served

11.2.1 How a Fusion Web Application Determines If an Excel Workbook Has a Web Session ID

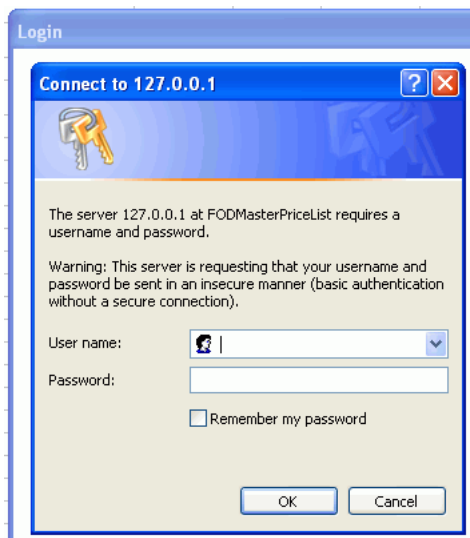
The server that hosts the Fusion web application determines whether the client has an authenticated cookie-based web session ID by locating and validating the web session ID in the request header from the client. If the client already has a valid cookie-based web session ID, all subsequent requests sent to the server hosting the Fusion web application include the web session ID attached to the request header. If the cookie-based web session ID is expired, the server responds with the login mechanism specified by the Fusion web application. If the client does not have a cookie-based web session ID, the client sends a request to the server for the page referenced by the `ProtectedWebPage` workbook property. The server responds with the login mechanism. In both instances (cookie-based web session ID expired and no cookie-based web session ID), the login mechanism to authenticate the user appears in the browser control hosted by the Excel workbook.

The value of `ProtectedWebPage` is a URL that references a protected web page. You specify a value for `ProtectedWebPage` when you want to run the integrated Excel workbook in test mode. For information about how to specify a value for `ProtectedWebPage`, see [Section 4.4.2, "How to Open an Excel Workbook for the First Time"](#).

11.2.2 What Happens at Runtime When the Login Mechanism Is Invoked

Once the login mechanism is invoked, a modal dialog box appears that contains a web browser control. This web browser control displays whatever login mechanism the Fusion web application uses. For example, if the Fusion web application uses HTTP Basic Authentication, the web browser control displays the simple dialog box shown in [Figure 11-1](#).

Figure 11-1 *Dialog Box That Appears When a Fusion Web Application Uses Basic Authentication*



The user enters user credentials and, assuming these are valid, a cookie-based web session ID is created and assigned to the client (the web browser control hosted by the Excel workbook).

11.3 Checking the Integrity of an Integrated Excel Workbook's Metadata

The Oracle ADF Desktop Integration module provides a mechanism to check that the metadata it uses to integrate an Excel workbook with a Fusion web application is not tampered with after you publish the Excel workbook for end users. It generates a hash code value and inserts the value into the Oracle ADF Desktop Integration module client registry file (`adfdi-client-registry.xml`) that it also creates when you publish the integrated Excel workbook as described in [Section 14.4, "Publishing Your Integrated Excel Workbook"](#). The Fusion web application stores the `adfdi-client-registry.xml` file in the `WEB-INF` directory.

If you republish the integrated Excel workbook, the Oracle ADF Desktop Integration module generates a new hash code value and replaces the value in the `adfdi-client-registry.xml` file. The Oracle ADF Desktop Integration module generates an error message if the `adfdi-client-registry.xml` file does not exist.

The `ApplicationHomeFolder` and `WebPagesFolder` workbook properties allow the integrated Excel workbook to identify the location of the Fusion web application's `WEB-INF` directory. You must set valid values for these properties before you can publish the integrated Excel workbook and the Oracle ADF Desktop Integration module can generate a hash code value.

The Oracle ADF Desktop Integration module generates the hash code value using some of the elements in the metadata for the workbook and the value of the `WorkbookID` workbook property. The `WorkbookID` workbook property is read-only and uniquely identifies the integrated Excel workbook. You must reset the `WorkbookID` workbook property if you create a new integrated Excel workbook by copying an existing integrated Excel workbook. The elements in the metadata used to generate the hash code value include the entries for columns in rows 2 to N where N is the last used row. The Oracle ADF Desktop Integration module does not use the metadata entries for the `WebAppRoot`, `Project`, `ApplicationHomeFolder` and `WebPagesFolder` workbook properties when generating the hash code value.

For more information about the workbook properties discussed here, see [Table A-17](#).

11.3.1 How to Reset the Workbook ID

The value of the `WorkbookID` workbook property is unique to each workbook and cannot be modified by you. You can, however, reset the `WorkbookID` workbook property. You must do this when you create a new integrated Excel workbook by copying an existing integrated Excel workbook.

To reset a workbook ID:

1. Click **Tools** > **Reset WorkbookID** in the Oracle ADF Desktop Integration Designer toolbar.
2. Click **Yes** to confirm that you want to reset the `WorkbookID` workbook property in the dialog box that appears.
3. Click **OK**.

11.3.2 How to Disable the Metadata Tamper-Check in the Fusion Web Application

By default, the Oracle ADF Desktop Integration module checks that the metadata it uses to integrate an Excel workbook with a Fusion web application is not tampered with after you publish the Excel workbook for end users. You can disable the metadata tamper-check by configuring a parameter in the deployment descriptor file (`web.xml`) of the Fusion web application, although this is not recommended.

To disable the metadata tamper-check in the Fusion web application:

1. Stop your Fusion web application.
2. Open the `web.xml` file of your Fusion web application.
3. Add an initialization parameter to the `adfdiRemote` servlet to disable the metadata tamper-check, as described in the following table.

Property	Value
Name	Enter the name of the initialization parameter as follows: <code>TamperingCheck.Enabled</code>
Value	Set the value of <code>TamperingCheck.Enabled</code> to <code>False</code> .

4. Save the `web.xml` file.

The `web.xml` file of your Fusion web application has the following entries:

```
<servlet>
  <servlet-name>adfdiRemote</servlet-name>
  <servlet-class>...</servlet-class>
  <init-param>
    <param-name>TamperingCheck.Enabled</param-name>
    <param-value>False</param-value>
  </init-param>
</servlet>
```

5. Rebuild and restart your Fusion web application.

For more information about the `web.xml` file, see [Appendix E, "Desktop Integration Settings in the Web Application Deployment Descriptor"](#).

11.3.3 How to Allow Missing Entries in the Oracle ADF Desktop Integration Client Registry

You can configure the metadata tamper-check so that a missing entry for the `WorkbookID` workbook property is allowed in the `adfdi-client-registry.xml` file. To do this, you configure a parameter in the deployment descriptor file (`web.xml`) of the Fusion web application, although this is not recommended.

To allow missing entries in the metadata of the Fusion web application:

1. Stop your Fusion web application.
2. Open the `web.xml` file of your Fusion web application.
3. Add an initialization parameter to the `adfdiRemote` servlet to allow missing entries in the metadata as described in the following table.

Property	Value
Name	Enter the name of the initialization parameter as follows: TamperingCheck.AllowMissingEntries
Value	Set the value of TamperingCheck.AllowMissingEntries to True.

4. Save the `web.xml` file.

The `web.xml` file of your Fusion web application has the following entries:

```
<servlet>
  <servlet-name>adfdiRemote</servlet-name>
  <servlet-class>...</servlet-class>
  <init-param>
    <param-name>TamperingCheck.AllowMissingEntries</param-name>
    <param-value>True</param-value>
  </init-param>
</servlet>
```

5. Rebuild and restart your Fusion web application.

For more information about the `web.xml` file, see [Appendix E, "Desktop Integration Settings in the Web Application Deployment Descriptor"](#).

11.3.4 What Happens at Runtime When the Fusion Web Application Checks the Hash Code

The Oracle ADF Desktop Integration module regenerates a hash code using the `WorkbookID` workbook property and the metadata in the instance of the published integrated Excel workbook that the end user accesses. The Oracle ADF Desktop Integration module regenerates this hash code when the end user executes an action that requires a connection to the Fusion web application. After the Fusion web application authenticates the end user, it compares the hash code it stores in the `adfdi-client-registry.xml` file of the `WEB-INF` directory (created when you published the workbook) with the newly regenerated hash code sent by the workbook the end user accesses.

If the values match, the Fusion web application performs the action that the end user requested. If the values do not match, the Fusion web application terminates the session created for the integrated Excel workbook as it considers the workbook untrustworthy.

11.4 What You May Need to Know About Securing an Integrated Excel Workbook

Note the following points about securing an integrated Excel workbook with a Fusion web application:

- Data security

If you save an Excel workbook containing data downloaded from a Fusion web application to a location, such as a network directory, where other users can access the Excel workbook, the data stored in the Excel workbook is accessible to other users.

- Security and protection in Microsoft Excel

Certain security and protection features that Microsoft Excel provides do not work for workbooks or worksheets that are integrated with a Fusion web application. For example, you cannot use the worksheet protection feature for a worksheet that you integrate with a Fusion web application. You can, however, use Excel's functionality to set a password on an integrated Excel workbook to prevent unauthorized users from opening or modifying it. For more information about Excel security features, see Excel's documentation.

- Integrated Excel workbooks can be configured to cache data, as described in [Section 15.3, "Reestablishing Server Data Context Between Sessions"](#). Make sure that you do not cache sensitive data in the integrated Excel workbook.

- Personally Identifying Information

If the Fusion web application that you integrate an Excel workbook with uses a security mechanism, such as single sign-on, personally identifying information may be stored in cookies on the machine where an end user accesses the integrated Excel workbook. End users can remove this information using Microsoft Internet Explorer. End users must log out from and close all integrated Excel workbooks to invalidate all active cookie-based web session IDs.

For information on removing personal information, see Microsoft Internet Explorer's documentation.

Adding Validation to an Integrated Excel Workbook

This chapter describes how to provide validation for your integrated Excel workbook

This chapter includes the following sections:

- [Section 12.1, "Introduction to Adding Validation to an Integrated Excel Workbook"](#)
- [Section 12.2, "Providing Server-Side Validation for an Integrated Excel Workbook"](#)
- [Section 12.3, "Providing Client-Side Validation for an Integrated Excel Workbook"](#)
- [Section 12.4, "Error-Reporting in an Integrated Excel Workbook"](#)
- [Section 12.5, "Providing a Row-by-Row Status on an ADF Table Component"](#)
- [Section 12.6, "Adding Detail to Error Messages in an Integrated Excel Workbook"](#)
- [Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook"](#)

12.1 Introduction to Adding Validation to an Integrated Excel Workbook

You configure server-side and client-side validation for the Fusion web application and the integrated Excel workbook to make use of the validation options offered by the Oracle ADF Model Layer and Microsoft Excel. In addition to these validation options, you can make use of components in the Oracle ADF Desktop Integration module to return error messages from the Fusion web application, to provide status on the results of component actions, and to manage errors that may occur when data changes in an integrated Excel workbook conflict with data hosted by the Fusion web application.

12.2 Providing Server-Side Validation for an Integrated Excel Workbook

The Oracle ADF Desktop Integration module makes use of the validation rules that the Oracle ADF Model Layer sets for a binding's attributes. This means that data a user enters or edits in one of the Oracle ADF Desktop Integration components, such as the ADF Table component, can be validated against set rules and conditions in the Fusion web application. For general information about defining validation rules in Oracle ADF, see the "Defining Validation and Business Rules Declaratively" chapter in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

For information about adding ADF Model layer validation, see the "Adding ADF Model Layer Validation" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

To make sure that validation errors are reported correctly at runtime:

- Make sure that the `ApplyValidation` attribute is set to `True` for any control bindings in your page definition file when you want to validate the data entered for these bindings.

More information about the `ApplyValidation` attribute in page definition files can be found in the "*pageNamePageDef.xml*" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

12.3 Providing Client-Side Validation for an Integrated Excel Workbook

The Oracle ADF Desktop Integration module does not provide client-side validation. However, you can use Excel's data validation features to control the type of data or the values that end users enter into a cell. These features allow you to restrict data entry to a certain range of dates, limit choices by using a list, or make sure that only positive whole numbers are entered in a cell. For example, you could configure the `Product Number` column in the `EditPriceList.xlsx` workbook so that users can enter only whole numbers in the cells of this column.

If you apply custom validation to columns within an ADF Table component, the validation is propagated when the ADF Table component's columns are populated at runtime. Note, however, that the Oracle ADF Desktop Integration module overwrites at runtime any custom validation applied to columns that reference the `TreeNodeList` subcomponent at design time. This is because the Oracle ADF Desktop Integration module applies its own list-constraint validation, which is invoked at runtime.

Note: Excel displays error messages when a validation fails; these error messages cannot be localized.

For more information about data validation in Excel, see Excel's documentation.

12.4 Error-Reporting in an Integrated Excel Workbook

The server that hosts the Fusion web application you integrate your Excel workbook with can return error messages to end users that provide feedback on the results of operations. The error messages returned can be one of a number of types: validation failures, conflict errors, deleted records, and so on.

Error-Reporting Using EL Expressions

To return messages to end users, you set an EL expression for the `Value` property of an ADF Output Text component. At runtime, the ADF Output Text component displays the error message to the end user if an error occurs.

The type of EL expression that you set for the `Value` property of the ADF Output Text component depends on whether you want to return error messages generated by action sets invoked on a worksheet or actions invoked by other components such as the ADF Table and ADF Read-only Table components. The following EL expression displays error messages which are returned during the invocation of an action set on a worksheet:

```
#{worksheet.errors}
```

At runtime, the previous error message is cleared (if one existed) when the action set starts invocation. If no errors occur during invocation, it remains blank. If an error occurs, the ADF Output Text component displays the error message.

An alternative approach to returning error messages generated by action sets invoked on a worksheet is to set `#{worksheet.errors}` as the value for an action set's `Alert.FailureMessage` property. This approach displays the generated error message in a dialog box.

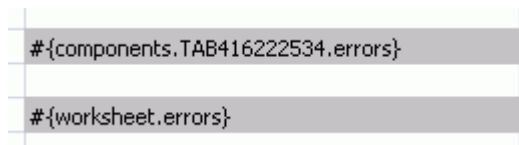
Components such as the ADF Table and ADF Read-only Table components that have actions which interact with the Fusion web application can return error messages. Write the following EL expression for the `Value` property of the ADF Output Text component or for an action set's `Alert.FailureMessage` property:

```
#{components.componentID.errors}
```

where `componentID` refers to the ID of the component (ADF Table or ADF Read-only Table component) that invokes the action.

The `EditPriceList.xlsx` file in the Master Price List module of the Fusion Order Demo application demonstrates how to return error messages generated by action sets invoked on a worksheet and by the actions of an ADF Table component. [Figure 12-1](#) shows these EL expressions in design mode.

Figure 12-1 EL Expressions to Return Error Messages in an ADF Output Text Component



Error-Reporting Using Component Actions

The Oracle ADF Desktop Integration module provides actions that return errors generated by an ADF Table component or an integrated Excel worksheet. The action set in which you invoke one of these actions must include only one action. In general, action sets clear error labels and message lists when invoked. An action set that invokes one of the following actions returns error labels and message lists to the end user:

- Worksheet's `DisplayWorksheetErrors` action

You can configure a worksheet menu item to invoke this action. If you configure an ADF component (for example, ADF Output Text component) to invoke the `DisplayWorksheetErrors` action, there is no requirement to configure the same component's `Value` property to display the result of evaluating the `#{worksheet.errors}` expression described in the previous section on error-reporting using EL expressions.

For more information about the Worksheet's `DisplayWorksheetErrors` action, see [Section A.12, "Worksheet Actions and Properties"](#).

- ADF Table component's `DisplayRowErrors` action

Invoke this action to return row-level failures to end users that occur in an ADF Table component when the ADF Table component invokes the following:

- Upload
- DeleteFlaggedRows

- `DoubleClickActionSet` invoked from an ADF Table component column
For more information about using this action, see [Section 12.5, "Providing a Row-by-Row Status on an ADF Table Component"](#).
- ADF Table component's `DisplayTableErrors` action
It is not intended that an ADF Table component column's `DoubleClickActionSet` invoke this action. Instead add this action to an action set that returns error messages to end users when failures occur during invocation of the action binding specified by an ADF Table component's `BatchOptions.CommitBatchActionID` property.
For more information about ADF Table component actions, see [Section A.8, "ADF Table Component Properties and Actions"](#).

12.5 Providing a Row-by-Row Status on an ADF Table Component

The ADF Table component provides a mechanism to indicate to end users whether rows from the ADF Table component have been processed successfully or not after invocation of following ADF Table component actions:

- `DeleteFlaggedRows`
- `Upload`
- `DoubleClickActionSet` invoked from an ADF Table component's column

The ADF Table component populates the `_ADF_StatusColumn` column with the status for each row following the invocation of the ADF Table component action. For example, it populates the `_ADF_StatusColumn` column with the upload status for each row following the invocation of the ADF Table component's `Upload` action.

[Figure 12-2](#) shows a number of rows in an ADF Table component where values in rows have been changed as indicated by the upward pointing arrows in the **Changed** column. In the **CostPrice** column, a string value has been entered where a number value is expected.

Figure 12-2 ADF Table Component with Changed Rows Prior to Upload

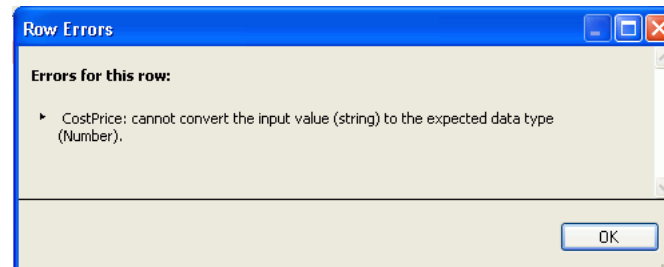
Changed	ProductId	ProductName	CostPrice	ListPrice	Current Margin	New Margin	Status
▲	19	Ipod Video 30Gb	string	249.99	0.923	#VALUE!	
▲	20	Ipod Video 60Gb	185	399.99	1.285657	1.162108108	
▲	21	Ipod Nano 1Gb	90	149.95	0.666111	0.666111111	

[Figure 12-3](#) shows the same rows in the ADF Table component after invocation of the ADF Table component's `Upload` action. The ADF Table component populates the `_ADF_StatusColumn` column (labeled **Status** in this example at runtime) with the a message indicating whether the row updated successfully or not.

Figure 12–3 ADF Table Component with Changed Rows After Upload

Changed	ProductId	ProductName	CostPrice	ListPrice	Current Margin	New Margin	Status
▲	19	Ipod Video 30Gb	string	249.99	0.923	#VALUE!	Update failed
	20	Ipod Video 60Gb	185	399.99	1.285657	1.162108108	Row updated successfully
	21	Ipod Nano 1Gb	90	149.95	0.666111	0.666111111	

By default, the `_ADF_StatusColumn` column's `DoubleClickActionSet` is configured to invoke the ADF Table component's `DisplayRowErrors` action. When end users double-click a row in this column at runtime, the ADF Table component invokes the `DisplayRowErrors` action. This action displays a dialog box with a list of errors for that row if errors exist. If no errors exist, the dialog box displays a message to indicate that no errors occurred. Figure 12–4 shows the dialog box that appears if an end user double-clicks the cell in Figure 12–3 that displays Update failed in the `Status` column.

Figure 12–4 Dialog Displaying Row Error Message

For more information about the `_ADF_StatusColumn` column, see [Section 7.10, "Special Columns in the ADF Table Component"](#).

12.6 Adding Detail to Error Messages in an Integrated Excel Workbook

You can configure your Fusion web application to report errors using a custom error handler if you want to provide more detail to the error messages displayed to end users in an integrated Excel workbook.

To implement this functionality, the custom error handler must override the `getDetailedDisplayMessage` method to return a `DCErrorMessage` object. At runtime, the Oracle ADF Desktop Integration module detects the custom error handler and invokes the `getHtmlText` method on the `DCErrorMessage` object. The Oracle ADF Desktop Integration module includes the HTML returned by the `getHtmlText` method in the error message list as detail.

For more information about creating a custom error handler, see the "Customizing Error Handling" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

12.7 Handling Data Conflicts When Uploading Data from a Workbook

If one of your end users (John) makes changes to a row of data that he downloaded from a Fusion web application to an Excel workbook and another end user (Jane) in a different session modifies the same row in the Fusion web application after John downloads the row, John may encounter an error when he attempts to upload the

modified row, as his changes conflict with those that Jane made. Depending on the configuration of your Fusion web application, John may receive `RowInconsistentException` type error messages. For information about how to configure your Fusion web application, see the "How to Protect Against Losing Simultaneously Updated Data" section in the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

To resolve this conflict in the integrated Excel workbook, John needs to download the most recent version of data from the Fusion web application. However, invoking the ADF Table component's `Download` action causes the component to refresh all data that the component hosts in the Excel workbook. This may overwrite other changes that John made that do not generate conflict error messages. To resolve this scenario, you can expose the ADF Table component's `DownloadFlaggedRows` action. When invoked, this action downloads data only for the rows that the end user flags for download. Using this action, John can resolve the conflict issues and upload his modified data.

[Chapter 15, "Using an Integrated Excel Workbook Across Multiple Web Sessions and in Disconnected Mode"](#) provides information about using an integrated Excel workbook across multiple sessions. For information about flagging rows, see [Section 7.9.2, "Row Flagging in an ADF Table Component"](#). For information about invoking component actions, see [Section 8.2.2, "How to Invoke Component Actions in an Action Set"](#). For more information about the components that the ADF Table component supports, see [Section A.8, "ADF Table Component Properties and Actions"](#).

12.7.1 How to Configure a Workbook to Handle Data Conflicts When Uploading Data

You specify a row-specific attribute of the tree binding for the `RowData.ChangeIndicatorAttribute` property so as to determine whether a row has been modified by another user since the row was last downloaded by the ADF Table component.

To configure a workbook to handle data conflicts:

1. Select the cell in the Excel worksheet that references the ADF Table component and click the property inspector button in the Oracle ADF Desktop Integration Designer to display the Edit Component: ADF Table dialog box.
2. For the `RowData.ChangeIndicatorAttribute` property, specify the row-specific attribute of the tree binding that you use to determine whether a row has been modified by another user since the row was last downloaded by the ADF Table component in your integrated Excel workbook.
3. Click **OK**.

12.7.2 What Happens at Runtime When You Configure a Workbook to Handle Data Conflicts

The ADF Table component caches the original value of the row-specific attribute of the tree binding that you specified as a value for `RowData.ChangeIndicatorAttribute` when it invokes the `RowDownSync` action. When the ADF Table component invokes the `RowUpSync` action, it checks if the value of the binding hosted by the Fusion web application and the original value cached by the ADF Table component differ. If they differ, it indicates data conflict, as changes have been made to the value of the binding hosted by the Fusion web application since the ADF Table component downloaded the value of the binding.

Testing Your Integrated Excel Workbook

This chapter describes features in the Oracle ADF Desktop Integration module that help you test your integrated Excel workbook as you configure it. It includes the following sections:

- [Section 13.1, "Introduction to Testing Your Integrated Excel Workbook"](#)
- [Section 13.2, "Testing Your Fusion Web Application"](#)
- [Section 13.3, "Testing Your Integrated Excel Workbook"](#)

13.1 Introduction to Testing Your Integrated Excel Workbook

Testing an integrated Excel workbook before you publish it and deploy it to your end users enables you to verify that the functionality you configure behaves as you intend. Before you test your integrated Excel workbook, test the Fusion web application with which you integrate the Excel workbook. Once your Fusion web application functions as you intend, use the test mode provided by the Oracle ADF Desktop Integration mode to test the functionality in your integrated Excel workbook.

13.2 Testing Your Fusion Web Application

Test the Fusion web application that you integrate your Excel workbook with before you start testing the integrated Excel workbook. For information about testing a Fusion web application, see the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. Verify that the Fusion web application you want to integrate an Excel workbook with supports the Oracle ADF Desktop Integration module by carrying out the procedure described in [Section C.1, "Verifying That Your Fusion Web Application Supports Desktop Integration"](#).

If you make changes to the Fusion web application to resolve problems identified by testing the application, you need to:

- Rebuild the JDeveloper project where you develop the Fusion web application
- Rerun the Fusion web application
- Reload the page definition files that you associate with the integrated Excel workbook

This makes sure the changes in the Fusion web application are available to the integrated Excel workbook. For information about how to reload a page definition file, see [Section 4.3.3, "Reloading a Page Definition File in an Excel Workbook"](#).

13.3 Testing Your Integrated Excel Workbook

As you configure your Excel workbook to integrate with a Fusion web application, you can switch to test mode from design mode to test the functionality that you add to the workbook. You use the Oracle ADF Desktop Integration Designer toolbar to switch to test mode from design mode and from design mode to test mode.

Test mode allows you to test the functionality of your integrated Excel workbook as you configure it incrementally. It also allows you to view the integrated Excel workbook from an end user's perspective, as test mode corresponds to what end users see when they view and execute the published integrated Excel workbook. The difference between an integrated Excel workbook in test mode and a published integrated Excel workbook is that the Oracle ADF Desktop Integration Designer is not available to users of the published integrated Excel workbook.

For more information about test mode and design mode, see [Section 5.1, "Introduction to the Development Tools"](#).

The Oracle ADF Desktop Integration module can generate log files that capture information based on events triggered by an integrated Excel workbook. For more information about these log files, see [Appendix C, "Troubleshooting an Integrated Excel Workbook"](#).

To run an integrated Excel workbook in test mode:

- In the integrated Excel workbook that you want to test, click the Run button on the Oracle ADF Desktop Integration Designer toolbar.

The integrated Excel workbook switches to test mode from design mode.

To stop test mode and return the integrated Excel workbook to design mode:

- In the integrated Excel workbook that you are testing, click the Stop button on the Oracle ADF Desktop Integration Designer toolbar.

The integrated Excel workbook switches to design mode from test mode.

Deploying Your Integrated Excel Workbook

This chapter describes how to deploy a workbook that you have integrated with a Fusion web application to your end users once you have finalized the integration.

This chapter includes the following sections:

- [Section 14.1, "Introduction to Deploying Your Integrated Excel Workbook"](#)
- [Section 14.2, "Making the Oracle ADF Desktop Integration Client Framework Available to End Users"](#)
- [Section 14.3, "Configuring Security Settings for Excel"](#)
- [Section 14.4, "Publishing Your Integrated Excel Workbook"](#)
- [Section 14.5, "Deploying a Published Workbook with Your Fusion Web Application"](#)

14.1 Introduction to Deploying Your Integrated Excel Workbook

Once you finish development of your integrated Excel workbook, you make the final integrated Excel workbook available to end users by deploying the resulting Fusion web application to an application server. Before you deploy a finalized Excel workbook that integrates with the Fusion web application, you must publish it as described in [Section 14.4, "Publishing Your Integrated Excel Workbook"](#). Once you have published the Excel workbook, you can deploy it using one of the methods outlined in the "Deploying Fusion Web Applications" chapter of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

The end users that you deploy an integrated Excel workbook to must do the following:

- Set up the Oracle ADF Desktop Integration client framework on their machines.
Make the Oracle ADF Desktop Integration client framework available to end users from, for example, a directory on your network. For more information, see [Section 14.2, "Making the Oracle ADF Desktop Integration Client Framework Available to End Users"](#).
- Configure the security settings for their Excel application.

14.2 Making the Oracle ADF Desktop Integration Client Framework Available to End Users

End users who want to use the functionality that you configure in an integrated Excel workbook must install the Oracle ADF Desktop Integration client framework. Store the tool (`setup.exe`) that installs the Oracle ADF Desktop Integration client

framework at a location where end users can download it. For example, you can make the `setup.exe` tool available from a shared network location such as the following:

```
\\myFileServer\adfdi-deploy
```

Maintaining one shared network location makes it easier to manage the version of the Oracle ADF Desktop Integration client framework that end users install on their machines.

For information about using the `setup.exe` tool, see [Section 3.5, "Setting Up the Oracle ADF Desktop Integration Client Framework"](#).

14.3 Configuring Security Settings for Excel

End users who want to use integrated Excel workbooks must have their Excel application configured to allow it to run integrated Excel workbooks as described in [Section 3.4, "Allowing Excel to Run an Integrated Excel Workbook"](#). They also need to add the host name of the Fusion web application to the Excel application's list of trusted locations.

To add the host name of a Fusion web application to Excel's list of trusted locations:

1. Open Excel.
2. Click the **Microsoft Office** button and then click **Excel Options**.
3. Click the **Trust Center** tab and then click **Trust Center Settings**.
4. Click the **Trusted Locations** tab.
5. Select the **Allow Trusted Locations on my network (not recommended)** checkbox.
6. Click **Add new location** and enter the host name of the Fusion web application in the **Path** field of the dialog box that appears.

For example, you enter something similar to the following for the Master Price List module of the Fusion Order Demo application:

```
http://hostname:8988/FODMasterPriceList
```

7. Select the **Subfolders of this location are also trusted** checkbox.
8. Click **OK**.

14.4 Publishing Your Integrated Excel Workbook

Once you finalize configuring the Excel workbook with Oracle ADF functionality, you need to publish it. Publishing a workbook makes it available to the end users for whom you configured the integrated Excel workbook.

14.4.1 How to Publish an Integrated Excel Workbook

You publish a workbook by clicking a button on the Oracle ADF Desktop Designer toolbar and specifying values in the dialog boxes that appear.

To publish a workbook:

1. In the Oracle ADF Desktop Designer toolbar, click the **Publish Workbook** button.
2. Specify the directory and file name for the published workbook in the **Publish Workbook** dialog box that appears. The directory and file name that you specify

for the published workbook must be different from the directory and file name for the design time workbook.

3. Click **Save** to save changes.

14.4.2 What Happens When You Publish an Integrated Excel Workbook

When you click the Publish button in design mode, the Oracle ADF Desktop Integration module triggers the following actions:

- Prompts you to save any pending changes in the workbook
If you decline to save pending changes, the publication process is canceled. If you accept to save pending changes, the publication process proceeds.
- Removes binding expressions that are visible in the worksheet while the workbook is in design mode
- Changes the workbook mode to runtime mode
- Removes the Oracle ADF Desktop Integration Designer toolbar and the Oracle ADF Desktop Integration Designer from Excel's Document Actions
- Creates the published workbook with the file name you specified in the directory that you specified

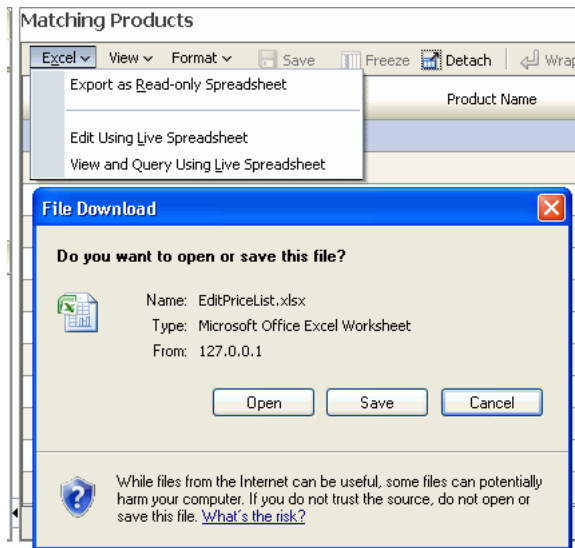
14.5 Deploying a Published Workbook with Your Fusion Web Application

Add the integrated Excel workbook to the JDeveloper project for your Fusion web application if it is not already packaged with the other files that make up your JDeveloper project. This makes sure that the Excel workbooks you integrate with your Fusion web application get deployed when you deploy your finalized Fusion web application. For example, the Master Price List module stores the Excel workbooks that it integrates at the following location:

```
FOD_HOME\MasterPriceList\ViewController\public_html\excel
```

where `FOD_HOME` is the installation directory for the Fusion Order Demo application.

Once you decide on a location to store your integrated Excel workbooks, you can configure web pages in your Fusion web application allowing end users to access the integrated Excel workbooks. For example, [Figure 14-1](#) shows Internet Explorer's File Download dialog box, which was invoked by clicking the **Excel > Edit Using Live Spreadsheet** menu options on the `PriceListSummary.jspx` page displayed by the Master Price List module.

Figure 14–1 Invoking an Integrated Excel Workbook from a Fusion Web Application

To enable the functionality illustrated in [Figure 14–1](#), the HTTP filter parameters for your Fusion web application must be configured to recognize Excel workbooks. JDeveloper automatically configures these parameters for you when you add Oracle ADF Desktop Integration to the technology scope of your Fusion web application, as explained in [Section 4.2, "Adding Oracle ADF Desktop Integration to a Fusion Web Application"](#). If you need to manually configure the HTTP filter parameters, see [Appendix E, "Desktop Integration Settings in the Web Application Deployment Descriptor"](#).

Once you have configured the HTTP filter for your Fusion web application, you configure the web pages that the Fusion web application displays to end users to allow them to invoke Excel workbooks. A basic method of invoking an Excel workbook that you have integrated with a Fusion web application is to provide a hyperlink that invokes the workbook. For example, you could write the following HTML in a web page:

```
<a href="/excel/EditPriceList.xlsx">Open the Master Price List
in Excel</a>
```

where `excel` is a subdirectory of the directory specified by the `WebPagesFolder` workbook property and `EditPriceList.xlsx` is the Excel workbook that the end user invokes. You can provide functionality that allows end users to invoke Excel workbooks from buttons, lists and command menus. The following list provides some examples:

- **Button**
Display a button on the web page that, when clicked, invokes the integrated Excel workbook.
- **Selection list**
Use the ADF Faces `selectOneChoice` component in conjunction with a button to invoke an integrated Excel workbook.
- **Menu**
Use the ADF Faces `commandMenuItem` and `fileDownloadActionListener` components.

The **Edit Using Live Spreadsheet** menu illustrated in [Figure 14-1](#) uses the `commandMenuItem` and `fileDownloadActionListener` components. The `PriceListSummary.jspx` page displays this menu. The following entries appear in the `PriceListSummary.jspx` page of the Master Price List module with values configured for the `commandMenuItem` and `fileDownloadActionListener` components:

```
<af:commandMenuItem textAndAccessKey="#{res['pls.productList.menu.lse.label']}"
  shortDesc="[Download a spreadsheet version of the pricelist application]"
  immediate="true"
  id="editDownLoadMenu">
<af:fileDownloadActionListener contentType="application/xls"
  filename="EditPriceList.xlsx"
  method="#{priceListSummaryBacking.downloadEditable}"/>
</af:commandMenuItem>
```

For more information about creating web pages for a Fusion web application, see the *Oracle Fusion Middleware Web User Interface Developer's Guide for Oracle Application Development Framework*.

Using an Integrated Excel Workbook Across Multiple Web Sessions and in Disconnected Mode

This chapter describes the functionality that your end users can use when they are not connected to a Fusion web application. It also describes how to reestablish server data context when an end user connects to a Fusion web application through an integrated Excel workbook after having previously been disconnected from the application.

This chapter includes the following sections:

- [Section 15.1, "Introduction to Disconnected Workbooks"](#)
- [Section 15.2, "Deferring Login for an Integrated Excel Workbook"](#)
- [Section 15.3, "Reestablishing Server Data Context Between Sessions"](#)
- [Section 15.4, "Caching Lists of Values for Use in Disconnected Mode"](#)

15.1 Introduction to Disconnected Workbooks

End users can open an integrated Excel workbook and log on to a Fusion web application from the workbook menu that you configure. The Fusion web application assigns a session to the user. Once a connection to the Fusion web application is established and a valid session assigned, end users can download data from the Fusion web application to the workbook. They can then log off from the Fusion web application using the workbook menu or otherwise disconnect from the Fusion web application by, for example, disconnecting from the network that hosts the Fusion web application.

How the Fusion web application terminates the session assigned to the user depends on how the user disconnects from the Fusion web application. If the user logs off from the Fusion web application using a workbook menu, the Fusion web application terminates the session immediately. If the user disconnects from the Fusion web application by some other means (for example, closing the workbook), the Fusion web application terminates the session assigned to the user after session timeout expires.

Functionality Available to End Users in an Integrated Excel Workbook When Disconnected from a Fusion Web Application

When end users are disconnected from the Fusion web application, they can perform the following actions:

- Modify data downloaded from the Fusion web application

- Insert new data into the appropriate ADF Table component contained in the workbook
- Save changes to data and close and reopen the workbook without having to upload data to the Fusion web application
- Track and update changes in the ADF Table component

Caching of Static Information in an Integrated Excel Workbook

Certain types of relatively static data are cached in the integrated Excel workbook to allow end users to use the workbook while disconnected from the Fusion web application. The following table describes the types of data that an integrated Excel workbook caches. It also describes when the integrated Excel workbook refreshes the data.

This type of data...	Is cached when...	And refreshed when...
Page definition metadata that is not runtime specific such as control binding types, IDs, and labels.	An integrated Excel worksheet bound to a page definition file is activated and no cache of the page definition file's metadata exists.	The page definition metadata is not refreshed unless you download a new copy of the integrated Excel workbook or invoke the workbook actions <code>ClearAllData</code> and <code>EditOptions</code> described in Table A-16 .
ADF Desktop Integration List of Values component list items	The ADF Desktop Integration List of Values component first downloads the list items from the Fusion web application.	The values of the list items hosted by the Fusion web application differ from those cached by the integrated Excel workbook. The cached list items are refreshed only once per workbook session and only if a workbook session exists. Invoking the workbook actions <code>ClearAllData</code> and <code>EditOptions</code> described in Table A-16 also clears cached list items.
Resource bundle strings	The integrated Excel workbook is first accessed.	The cache of resource bundle strings is not refreshed unless you download a new copy of the integrated Excel workbook or invoke the workbook actions <code>ClearAllData</code> and <code>EditOptions</code> described in Table A-16 .

15.2 Deferring Login for an Integrated Excel Workbook

You can configure an integrated Excel workbook so that an end user can open it and use it without having to log on immediately to the Fusion web application. To do this, you configure the workbook so that no action is invoked which requires a session. Actions that require a session can be grouped into explicit and implicit actions. Explicit actions are those that require a user to click a button or a menu item before it can be invoked. Implicit actions are those configured to be invoked by worksheet events, such as `Startup` and `Activate`, or other events that require a server connection (for example, the retrieval of a resource bundle). Once an action that requires a session to proceed is invoked, the end user is prompted to log on to the Fusion web application.

15.3 Reestablishing Server Data Context Between Sessions

You need to configure the page definition file so that the correct view object state is reestablished if the Fusion web application assigns an end user a new session after one of the following events occurs:

- An end user makes changes to data in a workbook, saves and closes the workbook, reopens the workbook at a later time, and attempts to upload the changes he or she made before saving and closing the workbook.
- The time between invocation of an ADF Table component's `Download` and `Upload` actions (or some other ADF Table component action that contacts the Fusion web application) exceeds the session timeout value specified for a Fusion web application session.

Both the scenarios described in the previous list involve two sessions. The first session is assigned when the end user opens an integrated Excel workbook and logs on to the Fusion web application. The Fusion web application terminates this session when the end user logs off from the Fusion web application or when the session expires. The Fusion web application assigns a second session when the end user reopens the integrated Excel workbook or invokes an action that interacts with the Fusion web application.

In addition to configuring the page definition file, configure the functionality in an integrated Excel workbook so that pending changes are not lost if an end user logs off from the Fusion web application or a session expires before changes are committed to the Fusion web application. For example, you configure the worksheet `Startup` event to invoke a `CreateInsert` action binding and a worksheet `DownSync` action. You also configure an ADF Button component labeled **Save** to invoke the worksheet `UpSync` action and the `Commit` action binding. If the end user's session ends, there will not be a record to save to if the end user clicks the **Save** button after the Fusion web application assigns a new session. To prevent this scenario occurring, it is better to invoke the `CreateInsert` action binding from the ADF Button component labeled **Save**.

Another example is the behavior of the ADF Table component's `DownloadForInsert` action. If you create a custom method in the Fusion web application that creates temporary records to support the invocation by the ADF Table component of the `DownloadForInsert` action, make sure to remove these temporary records after successful invocation of the `DownloadForInsert` action. For more information about the use of the `DownloadForInsert` action, see [Section 7.6, "Configuring a Worksheet to Download Pre-Insert Data to an ADF Table Component"](#).

15.3.1 How to Configure an Integrated Excel Workbook to Reestablish Server Data Context

You specify the attribute bindings that you want to cache in an integrated Excel workbook between sessions as values for the worksheet's `ServerContext` group of properties. This group of properties also allows you to specify the action binding that uses the attribute binding data to reestablish server-side context when a Fusion web application assigns a new session to the integrated Excel workbook.

Before you can specify values for the `ServerContext` group of properties, the page definition file that is associated with the worksheet must expose the attribute bindings and action bindings for which you want to restore server context. For information about adding attribute bindings and action bindings to a page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

For information about the `ServerContext` group of properties, see the entry for `ServerContext` in [Table A-18](#).

To configure an integrated Excel workbook to reestablish server data context:

1. In the integrated Excel workbook, click **Worksheet Properties**.
2. In the property inspector that appears, configure values for the `ServerContext` group of properties as described by the following table.

For this property...	Enter or select this value...
<code>CacheDataContexts</code>	<p>Add an element to the collection of <code>CacheDataContexts</code>. Configure the element you add as follows:</p> <ul style="list-style-type: none"> ■ <code>RestoreDataContextActionID</code> Specify the action binding (for example, the <code>Execute</code> action binding) that connects to the Fusion web application to restore the data specified by <code>CachedServerContexts</code>. ■ <code>CachedServerContexts</code> An array that identifies the attribute binding values to cache and set before the action binding specified by <code>RestoreDataContextActionID</code> is invoked. Each element in the array (<code>CachedServerContext</code>) supports the <code>CachedAttributeID</code> and <code>RestoredAttributeID</code> properties. <p>For more information about the <code>CacheDataContexts</code> property and its subproperties, see Section A-18, "Worksheet Properties".</p>
<code>IDAttributeID</code>	<p>Specify the attribute binding that uniquely identifies the row displayed in the current worksheet. At runtime, the value that this property references is used to determine if the server data context has been correctly reestablished.</p> <p>For more information about this property and its subproperties, see Section A-18, "Worksheet Properties"</p>

3. Click **OK**.

15.3.2 What Happens at Runtime When an Integrated Excel Workbook Reestablishes Server Data Context

During the session that is assigned the initial session (for example, `session ID 1`), the worksheet caches data using the `ServerContext` group of properties. In a later session with a different session ID (for example, `session ID 2`), where the ADF Table component's `Upload` action is invoked, the data cached in the `ServerContext` group of properties is sent to the Fusion web application.

15.4 Caching Lists of Values for Use in Disconnected Mode

The Oracle ADF Desktop Integration module caches the values referenced by the ADF Desktop Integration List of Values and the ADF Desktop Integration Tree Node List components that you use to create lists of values and dependent lists of values so that these components do not send a request to the Fusion web application when an end user selects a value at runtime. For more information about using these components to create lists of values, see the following sections:

- [Section 6.6, "Inserting an ADF Desktop Integration List of Values Component"](#)
- [Section 8.8, "Creating a List of Values in an ADF Table Component Column"](#)

- [Section 8.9, "Creating Dependent Lists of Values in an Integrated Excel Workbook"](#)

The Oracle ADF Desktop Integration module caches up to two hundred and fifty values for each component. If a component references a list of values with more than two hundred and fifty values, the Oracle ADF Desktop Integration module caches the first two hundred and fifty values and writes a warning message to the client-side log file for subsequent values. Consider configuring your integrated Excel workbook to invoke a pick dialog from a page in your Fusion web application where a list of values references more than two hundred and fifty values. For more information about client-side log files, see [Section C.3, "Generating Log Files for an Integrated Excel Workbook"](#). For more information about invoking a pick dialog from a Fusion web application page, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#) and [Section 8.5, "Inserting Values in an ADF Table Component from a Web Page Pick Dialog"](#).

Cached list of values in an integrated Excel workbook get refreshed once per workbook session. This refresh occurs after the user reestablishes a web session with the Fusion web application and if the values referenced by the Fusion web application have changed since the integrated Excel workbook last cached the list of values.

The upload of a selected value from a list of values causes the upload to fail if the selected value no longer exists in the Fusion web application. This may occur if, for example, one end user deletes the value in the Fusion web application while another end user modifies the selected value in the cached list of values of an integrated Excel workbook and attempts to upload the modified value to the Fusion web application. For more information about handling data conflict, see [Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook"](#).

A

Oracle ADF Desktop Integration Component Properties and Actions

This appendix lists and describes the properties of the Oracle ADF Desktop Integration module's components. It also describes the actions that certain components in this module expose.

This appendix includes the following sections:

- [Section A.1, "Frequently Used Properties in the Oracle ADF Desktop Integration Module"](#)
- [Appendix A.2, "ADF Input Text Component Properties"](#)
- [Section A.3, "ADF Output Text Component Properties"](#)
- [Section A.4, "ADF Label Component Properties"](#)
- [Section A.5, "ADF Desktop Integration List of Values Component Properties"](#)
- [Section A.6, "ADF Desktop Integration Tree Node List Component Properties"](#)
- [Section A.7, "ADF Button Component Properties"](#)
- [Section A.8, "ADF Table Component Properties and Actions"](#)
- [Section A.9, "ADF Read-only Table Component Properties and Actions"](#)
- [Section A.10, "Action Set Properties"](#)
- [Section A.11, "Workbook Actions and Properties"](#)
- [Section A.12, "Worksheet Actions and Properties"](#)

A.1 Frequently Used Properties in the Oracle ADF Desktop Integration Module

[Table A-1](#) lists alphabetically properties in the Oracle ADF Desktop Integration module that many components reference.

Table A–1 Frequently Used Properties in the Oracle ADF Desktop Integration Module

Name	Type	EL	Description
ActionSet		N	For information about action sets, see Section A.10, "Action Set Properties" .
Annotation	String	N	Use this field to enter a comment about the component's use in the worksheet. Comments you enter have no effect on the behavior of the workbook. They are the equivalent of code comments.
ComponentID	String	N	The Oracle ADF Desktop Integration module generates this string to uniquely identify each instance of an ADF component in an integrated Excel workbook.
Label	String	Y	Specify an EL expression that is evaluated at runtime. For information about EL expressions in the Oracle ADF Desktop Integration module, see Appendix B, "Oracle ADF Desktop Integration EL Expressions" . For information about using labels, see Section 9.4, "Using Labels in an Integrated Excel Workbook" .
Position		N	This property defines the upper-left corner of the Oracle ADF component in the integrated Excel workbook.
ReadOnly	Boolean	Y	<p>Set this property to TRUE so that the Oracle ADF Desktop Integration module ignores changes a user makes to a cell that references a component which uses this property. This property is independent of Excel's workbook and worksheet protection functionality. Setting ReadOnly to TRUE does not prevent a user from modifying a cell. When TRUE, the behavior for cells that reference Oracle ADF components is as follows:</p> <ul style="list-style-type: none"> ■ The Oracle ADF Desktop Integration module overwrites changes without warning when a worksheet is refreshed ■ No changes are sent to the Fusion web application when the integrated Excel workbook is synchronized with the Fusion web application <p>To avoid end user confusion, apply styles to the cells where you set ReadOnly to TRUE that provide a visual clue to users that they cannot modify the cell's contents. For information about applying styles, see Section 9.2, "Working with Styles".</p>
RowLimit			<p>This group of properties allows you configure the number of rows that the ADF Table component or ADF Read-only Table component download and display.</p> <p>For more information, see Section 7.13, "Limiting the Number of Rows Your Table-type Component Downloads".</p>
RowLimit.Enabled	Boolean	N	<p>Set to TRUE to limit the number of rows downloaded to the value specified by RowLimit.MaxRows. TRUE is the default value.</p> <p>A value for this property is required.</p>
RowLimit.MaxRows	Integer	Y	<p>Specify an EL expression that evaluates to the maximum number of rows to download. The component evaluates the EL expression when it invokes its Download action. The default value is 500. If MaxRows is not a positive integer, the component attempts to download as many rows as possible. An invalid expression such as "ABC" is interpreted as -1 (negative integer). As a result, the component attempts to download as many rows as possible.</p> <p>Note that setting the value of MaxRows to 0 results in a message where the user is asked if they want to download the first 0 rows. To avoid this, set MaxRows to a positive integer other than 0.</p>

Table A-1 (Cont.) Frequently Used Properties in the Oracle ADF Desktop Integration Module

Name	Type	EL	Description
RowLimit.WarningMessage	String	Y	<p>Write an EL expression to generate a message to display to the end user if the number of rows available to download exceeds the number specified by RowLimit.MaxRows. The component evaluates this EL expression each time it invokes its Download action. The maximum number of rows (ExcelMaxRows) that a version 2007 Excel worksheet can contain is approximately 1 million.</p> <p>The default value for RowLimit.WarningMessage is: <code>#{_ADFDIres['ROWLIMIT_WARNINGS_MESSAGE_1']}</code></p> <p>You can specify a string key from a custom resource bundle to use instead of the default value. Write a value similar to the following for a string key in your resource bundle if you want the warning message to let the end user know how many rows he or she can download:</p> <p>Too many rows available. Do you want to download the first {0} rows? where {0} is a placeholder that references the value of RowLimit.MaxRows at runtime.</p> <p>Write an EL expression similar to the following for RowLimit.WarningMessage: <code>#{res['stringkey']}</code></p> <p>where <code>res</code> refers to the custom resource bundle and <code>stringkey</code> refers to the string key that you defined in the custom resource bundle. For more information about resource bundles, see Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook".</p> <p>If the value for this property is null, the Download action downloads the number of rows specified by RowLimit.MaxRows without displaying a message to the end user.</p>
StyleName	String	Y	Specifies the style in the current Excel workbook to apply when the Oracle ADF component is rendered. For more information, see Section 9.2, "Working with Styles" .
Value	Varies	Y	This property references an EL expression that is evaluated after the invocation of the ADF Table component's RowDownSync action or a worksheet's DownSync action. The resulting value is typically the primary value seen in the selected component.

A.2 ADF Input Text Component Properties

[Table A-2](#) lists alphabetically the properties of the ADF Input Text component.

Table A-2 ADF Input Text Component Properties

Name	Description
Annotation	For information about this property, see Table A-1 .
ComponentID	For information about this property, see Table A-1 .
InputText.DoubleClickActionSet	Specifies the action set invoked when a user double-clicks the cell. For information about action sets, see Section A.10, "Action Set Properties" .
InputText.ReadOnly	For information about this property, see Table A-1 .
InputText.Value	For information about this property, see Table A-1 .
Position	For information about this property, see Table A-1 .
StyleName	For information about this property, see Table A-1 .

A.3 ADF Output Text Component Properties

[Table A-3](#) lists alphabetically the properties of the ADF Output Text component.

Table A-3 ADF Output Text Component Properties

Name	Description
Annotation	For information about this property, see Table A-1 .
ComponentID	For information about this property, see Table A-1 .
OutputText.DoubleClickActionSet	Specifies the action set invoked when a user double-clicks the cell. For information about action sets, see Section A.10, "Action Set Properties" .
OutputText.Value	For information about this property, see Table A-1 .
Position	For information about this property, see Table A-1 .
StyleName	For information about this property, see Table A-1 .

A.4 ADF Label Component Properties

The ADF Label component displays a static string value at runtime. The Oracle ADF Desktop Integration module generates the value when the EL expression that the `Label` property references is evaluated. For information about using labels, see [Section 9.4, "Using Labels in an Integrated Excel Workbook"](#).

[Table A-4](#) lists alphabetically the properties that the ADF Label component references.

Table A-4 ADF Label Component Properties

Name	Description
Annotation	For information about this property, see Table A-1 .
ComponentID	For information about this property, see Table A-1 .
Label	For information about this property, see Table A-1 .
Position	For information about this property, see Table A-1 .
StyleName	For information about this property, see Table A-1 .

A.5 ADF Desktop Integration List of Values Component Properties

[Table A-5](#) lists the properties of the ADF Desktop Integration List of Values component. For information about creating an ADF Desktop Integration List of Values component, see [Section 6.6, "Inserting an ADF Desktop Integration List of Values Component"](#).

Table A-5 ADF Desktop Integration List of Values Component Properties

Name	Type	EL	Description
Annotation			For information about this property, see Table A-1 .
ComponentID			For information about this property, see Table A-1 .
ListOfValues.DependsOnListID	List binding	N	Select the list binding whose value at runtime determines the choices available in the dependent list of values at runtime. The list binding that you select can be a model-driven list. For more information about dependent list of values, see Section 8.9, "Creating Dependent Lists of Values in an Integrated Excel Workbook" .
ListOfValues.ListID	List binding	N	Select the list binding that defines the values available in the list of values. The list binding that you select can be a model-driven list.

Table A-5 (Cont.) ADF Desktop Integration List of Values Component Properties

Name	Type	EL	Description
ListOfValues.ReadOnly	Boolean	N	For information about this property, see Table A-1 .
Position			For information about this property, see Table A-1 .
StyleName			For information about this property, see Table A-1 .

A.6 ADF Desktop Integration Tree Node List Component Properties

The ADF Desktop Integration Tree Node List component renders dropdown menus in columns of the ADF Table component at runtime. It provides the same functionality to end users as the ADF Desktop Integration List of Values component.

The ADF Desktop Integration Tree Node List component does not appear in the components palette of the Oracle ADF Desktop Integration Designer. Instead, you configure properties for this component when you specify `TreeNodeList` as the subcomponent to invoke for the ADF Table component's `UpdateComponent` or `InsertComponent` table column properties described in [Section A.8.2, "ADF Table Component Column Properties"](#).

[Table A-6](#) describes the properties that you configure for the ADF Desktop Integration Tree Node List component.

Table A-6 ADF Desktop Integration Tree Node List Component Properties

Name	Type	EL	Description
DependsOnList	Tree binding attribute or List binding	Y	Specify the tree binding attribute or list binding that serves as the parent list of values in a dependent list of values. Note that the tree binding attribute you specify must be associated with a model-driven list. For more information about dependent list of values, see Section 8.9, "Creating Dependent Lists of Values in an Integrated Excel Workbook" .
List	Tree binding attribute	Y	Specify the tree binding attribute associated with a model-driven list that defines the values available in the runtime dropdown menu to appear in the ADF Table component's column.
ReadOnly	Boolean	Y	For information about this property, see Table A-1 .

A.7 ADF Button Component Properties

[Table A-7](#) lists alphabetically the properties of the ADF Button component.

Table A-7 ADF Button Component Properties

Name	Description
Annotation	For information about this property, see Table A-1 .
ClickActionSet	Specify the action set to invoke when a user clicks the button. For information about action sets, see Section A.10, "Action Set Properties" .
ComponentID	For information about this property, see Table A-1 .
Label	For information about this property, see Table A-1 .
LowerRightCorner	This property is an Excel cell reference. Used in conjunction with <code>Position</code> , it specifies the area that the button occupies on the Excel worksheet.
Position	For information about this property, see Table A-1 .

A.8 ADF Table Component Properties and Actions

The ADF Table component uses the properties and component actions listed here.

A.8.1 ADF Table Component Properties

Table A-8 lists alphabetically the properties the ADF Table component uses.

Table A-8 ADF Table Component Properties

Name	Type	EL	Description
Annotation			For information about this property, see Table A-1 .
BatchOptions			This group of properties allows you to configure batch options for the ADF Table component. For more information about how you use these properties, see Section 7.9, "Batch Processing in an ADF Table Component" .
BatchOptions.BatchSize	Integer	N	Specifies how many rows to process before an ADF Table component action (<code>Upload</code> or <code>DeleteFlaggedRows</code>) invokes <code>CommitBatchActionID</code> . Any value other than a positive integer results in all rows being processed in a single batch. The default value is 100 rows. A value for this property is required.
BatchOptions.CommitBatchActionID	Action binding	N	Specifies the action binding to invoke when the number of rows specified by <code>BatchSize</code> have been processed. The action binding is expected to be a commit-type action.
BatchOptions.LimitBatchSize	Boolean	N	Set this property to <code>TRUE</code> to process rows in batches where each batch contains the number of rows specified by <code>BatchSize</code> . If set to <code>FALSE</code> , all rows are processed in a single batch.
BatchOptions.StartBatchActionID	Action binding	N	Specify an action binding to invoke at the beginning of each batch. For example, this property might be used for an operation like "start transaction", if required by a particular database. A value for this property is optional.
Columns			An array of columns. For information about the properties that each column in the array supports, see Section A.8.2, "ADF Table Component Column Properties" .
ComponentID			For information about this property, see Table A-1 .
Position			For information about this property, see Table A-1 .
RowActions			This group of properties allows you specify which actions are enabled and can be invoked.
RowActions.DeleteRowActionID	Action binding	N	Specify an action binding to invoke for each row flagged for deletion. A value for this property is optional.
RowActions.DeleteRowEnabled	Boolean	N	Set to <code>TRUE</code> to allow a user to delete existing rows. <code>FALSE</code> is the default value. A value for this property is required.
RowActions.FailureActionID	Action binding	N	Specify an action binding to invoke if failures occur during the processing of rows. A value for this property is optional.
RowActions.InsertAfterRowActionID	Action binding	N	Specify an action binding to invoke for each row inserted using the ADF Table component <code>Upload</code> action. The action binding is invoked after the attributes are set. Use of this property is suitable with a custom action where a variable iterator is employed along with the main iterator. A value for this property is optional.
RowActions.InsertBeforeRowActionID	Action binding	N	Specify an action binding to invoke for each row inserted using the <code>Upload</code> component action. The action binding specified is invoked before the attributes are set. A value for this property is optional.

Table A–8 (Cont.) ADF Table Component Properties

Name	Type	EL	Description
<code>RowActions.InsertRowEnabled</code>	Boolean	N	<p>Set to <code>TRUE</code> to allow the end user insert new rows in the ADF Table component. <code>FALSE</code> is the default value.</p> <p>If you set this property to <code>TRUE</code>, you must specify values for one or both of the following properties:</p> <ul style="list-style-type: none"> ▪ <code>RowActions.InsertAfterRowActionID</code> ▪ <code>RowActions.InsertBeforeRowActionID</code> <p>Which property (<code>InsertAfterRowActionID</code> or <code>InsertBeforeRowActionID</code>) you specify a value for depends on how your Fusion web application creates new rows. Typically, a Fusion web application uses the <code>CreateInsert</code> action binding to create and insert a new row. In this scenario, you specify the <code>CreateInsert</code> action binding as the value for <code>InsertBeforeRowActionID</code>.</p> <p>For more information about inserting rows in an ADF Table component, see Section 7.4, "Configuring an ADF Table Component to Insert Data".</p>
<code>RowActions.UpdateRowActionID</code>	Action binding	N	<p>Specify an action binding to invoke for each row updated.</p> <p>A value for this property is optional.</p>
<code>RowActions.UpdateRowEnabled</code>	Boolean	N	<p>Set to <code>TRUE</code> to allow a user update an existing row. <code>TRUE</code> is the default value.</p> <p>A value for this property is required.</p>
<code>RowData</code>			<p>Set values for the <code>CachedAttributes</code> property when you want to cache data in an integrated Excel workbook across a number of sessions with the Fusion web application.</p> <p>Set a value for the <code>ChangeIndicatorAttributeID</code> property to determine if a row has been modified by another user since you downloaded it from the Fusion web application.</p>
<code>RowData.CachedAttributes</code>	Array	N	<p>Specify values for the properties in this array to determine the attributes for which data is cached. Each <code>CachedTreeAttribute</code> element in this array supports the following properties:</p> <ul style="list-style-type: none"> ▪ <code>Value</code> Select the tree binding attribute for which data is to be cached. ▪ <code>Annotation</code> For more information about this property, see Table A–1. <p>Do not configure a component (for example, an ADF Table component's column or an ADF Input Text component) so an end user can view or edit an attribute binding that you have also specified for an element in the <code>RowData.CachedAttributes</code> array. The <code>RowData.CachedAttributes</code> array caches the values retrieved by the worksheet <code>DownSync</code> action. The worksheet <code>UpSync</code> action sends the values cached by the <code>RowData.CachedAttributes</code> array to the Fusion web application. This may override edits an end user makes to an attribute binding exposed through a component in the worksheet.</p> <p>For information about using the <code>RowData.CachedAttributes</code> array to cache data in an ADF Table component, see Section 8.5, "Inserting Values in an ADF Table Component from a Web Page Pick Dialog".</p>

Table A–8 (Cont.) ADF Table Component Properties

Name	Type	EL	Description
RowData.ChangeIndicatorAttributeID	Binding	N	Specify the row-specific attribute of the tree binding used to determine if a row has been modified by another user since the row was last downloaded by to your integrated Excel workbook. For more information, see Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook" .
RowLimit			For information about this group of properties, see Table A–1 .
TreeID	Binding	N	Specify a tree binding from the current worksheet's page definition file. You must specify a value for this property so that row downloads and uploads function properly. For more information about the page definition requirements for an integrated Excel workbook, see Table 4–1 .
UniqueAttribute	Attribute binding	Y	Write an EL expression to specify an attribute of the tree binding that you specified as the value for TreeID. The value of this attribute is cached in the integrated Excel workbook during invocation of the ADF Table component's Download action. The Oracle ADF Desktop Integration module uses this value to make sure that the tree binding's iterator is positioned correctly before setting or getting data from the current row. A value for this property is optional if the: <ul style="list-style-type: none"> ADF Table component is configured to be insert-only (RowActions.InsertRowEnabled is set to True and RowActions.UpdateRowEnabled is set False) Underlying tree binding exposes a rowKey (in which case the rowKey is used for positioning) A value is required if the tree binding's iterator does not expose a rowKey.

A.8.2 ADF Table Component Column Properties

[Table A–9](#) describes the properties that a column in the TableColumn array can use.

Table A–9 ADF Table Component Column Properties

Name	Type	EL	Description
Annotation			For information about this property, see Table A–1 .
CellStyleName	String	Y	Write an EL expression that resolves to an Excel style name that is applied to each cell in the column.
DynamicColumn	Boolean	N	Set to True to make a column dynamic. False is the default value. For more information about dynamic columns, see Section 7.11, "Adding a Dynamic Column to Your ADF Table Component" .
HeaderLabel	String	Y	Write an EL expression that, when evaluated at runtime, displays a label in the column header.
HeaderStyleName	String	Y	Write an EL expression that resolves to an Excel style name that is applied to each cell in the column header.

Table A–9 (Cont.) ADF Table Component Column Properties

Name	Type	EL	Description
ID	String	N	<p>Assign a name to the column to identify it and its purpose. The value that you assign for this property has no functional impact. However, you must specify a value and the value that you specify must be unique within the list of columns. It serves to help you keep track of columns in the ADF Table component. The following IDs are reserved to the three default columns in the ADF Table component:</p> <ul style="list-style-type: none"> ■ <code>_ADF_ChangedColumn</code> ■ <code>_ADF_FlagColumn</code> ■ <code>_ADF_StatusColumn</code>
InsertComponent	ADF component	N	<p>Specifies the properties of the component that represents the binding for insert operations. This component can be one of the following:</p> <ul style="list-style-type: none"> ■ ADF Input Text component For information about the properties that this component supports, see Section A.2, "ADF Input Text Component Properties". ■ ADF Output Text component For information about the properties that this component supports, see Section A.3, "ADF Output Text Component Properties". ■ ADF Desktop Integration Tree Node List component For information about the properties that this component supports, see Section A.6, "ADF Desktop Integration Tree Node List Component Properties". <p>When <code>InsertUsesUpdate</code> is set to <code>True</code>, the ADF Table component ignores the value of the <code>InsertComponent</code> property.</p>

Table A–9 (Cont.) ADF Table Component Column Properties

Name	Type	EL	Description
InsertUsesUpdate	Boolean	N	Set to <code>True</code> if insert and update operations use the same component type. When <code>True</code> , the ADF Table component ignores the values of the <code>InsertComponent</code> property and reads the value of the <code>UpdateComponent</code> property. The default value is <code>True</code> .
UpdateComponent	ADF component	N	Specifies the properties of the component that represents the binding for update and download operations. This component can be one of the following: <ul style="list-style-type: none"> ADF Input Text component For information about the properties that this component supports, see Section A.2, "ADF Input Text Component Properties". ADF Output Text component For information about the properties that this component supports, see Section A.3, "ADF Output Text Component Properties". ADF Desktop Integration Tree Node List component For information about the properties that this component supports, see Section A.6, "ADF Desktop Integration Tree Node List Component Properties".
Visible	Boolean	Y	Write an EL expression that resolves to <code>True</code> or <code>False</code> . If <code>True</code> , the column appears in the ADF Table component. If <code>False</code> , the column does not appear. <code>True</code> is the default value. If you make a column dynamic, the ADF Table component ignores the value of the <code>Visible</code> property. For more information about dynamic columns, see Section 7.11, "Adding a Dynamic Column to Your ADF Table Component" .

A.8.3 ADF Table Component Actions

[Table A–10](#) describes the component actions available for use with the ADF Table component.

Table A–10 ADF Table Component Actions

Component Action	Description
<code>ClearCachedRowAttributes</code>	Clears the values of cached attributes for the current row of the ADF Table component. Only a <code>DoubleClickActionSet</code> in an ADF Table component's column should invoke this action.
<code>DeleteFlaggedRows</code>	Invokes a specified action on each of a set of flagged rows in the ADF Table component and then removes these rows from the ADF Table component. For more information, see Section 7.8, "Configuring an ADF Table Component to Delete Rows in the Fusion Web Application" .
<code>DisplayRowErrors</code>	Displays error details for the current row in the ADF Table component if error details are available. This action should only be invoked from a column's action set in an ADF Table component. By default, the <code>_ADF_StatusColumn</code> described in Table 7.10 is configured with an action set that invokes this action.

Table A-10 (Cont.) ADF Table Component Actions

Component Action	Description
DisplayTableErrors	Displays a detailed list of errors in a message dialog box for the ADF Table component if any errors are available. Do not invoke this action from a column's action set in an ADF Table component. Instead configure an action set for an ADF Button, ADF Output Text component, or worksheet menu item to invoke this action.
Download	Download the rows corresponding to the current state of <code>TreeID</code> . For information about <code>TreeID</code> , see Section A.8.1, "ADF Table Component Properties" .
DownloadFlaggedRows	This action downloads the rows corresponding to the current set of items available within <code>TreeID</code> . For information about <code>TreeID</code> , see Table A-8. Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook" describes a scenario where you could expose this action to allow end users resolve data conflict between the Excel workbook and the Fusion web application.
DownloadForInsert	<p>Invoke this action to download rows to the ADF Table component from the Fusion web application and treat each row as a pending insert.</p> <p>Do not specify <code>Download</code> and <code>DownloadForInsert</code> as actions within the same action set. The last of these actions that the action set invokes determines what data appears in the ADF Table component.</p> <p>Specify the <code>MarkAllRowsChanged</code> component action as the next component action to invoke in an action set where you want all rows that the <code>DownloadForInsert</code> action downloads to be marked as changed.</p> <p>The <code>DownloadForInsert</code> action is ignored if it is invoked from an action set while the ADF Table component's <code>RowActions.InsertRowEnabled</code> property is set to <code>False</code>. Set <code>RowActions.InsertRowEnabled</code> to <code>True</code> to correctly invoke the <code>DownloadForInsert</code> action.</p> <p>For more information, see Section 7.6, "Configuring a Worksheet to Download Pre-Insert Data to an ADF Table Component".</p>
FlagAllRows	<p>Sets the flag property (<code>_ADF_FlagColumn</code>) to <code>TRUE</code>.</p> <p>Invoke this action to set a flag character in all rows of the <code>_ADF_FlagColumn</code> column. The flag character has the following properties:</p> <p>Character Code 25BA, Unicode(hex)</p> <p>It appears in most fonts as a right-facing triangle.</p> <p>For more information about the <code>_ADF_FlagColumn</code> column, see Section 7.9.2, "Row Flagging in an ADF Table Component" and Section 7.10, "Special Columns in the ADF Table Component".</p>

Table A-10 (Cont.) ADF Table Component Actions

Component Action	Description
Initialize	<p>This action performs the following actions:</p> <ul style="list-style-type: none"> ■ Removes all rows of data from the ADF Table component ■ Clears the values of cached attributes from rows in the ADF Table component ■ Creates placeholder rows ■ Recalculates how many dynamic columns to render in the ADF Table component ■ Redraws column headers <p>If the ADF Table component contains pending changes that have not been saved in the integrated Excel workbook, a dialog box appears to the end user that allows cancellation of invocation of this action.</p>
MarkAllRowsChanged	<p>After an action set invokes a <code>DownloadForInsert</code> component action, specify the <code>MarkAllRowsChanged</code> component action as the component action to invoke if you want all rows downloaded by the <code>DownloadForInsert</code> component action marked as changed in the <code>_ADF_StatusColumn</code> column.</p>
MarkAllRowsUnchanged	<p>Specify this component action to clear all flags from the <code>_ADF_StatusColumn</code> column.</p>
RowDownSync	<p>Synchronizes data from the row in the ADF Table component's iterator in the Fusion web application that corresponds to the current worksheet row to the worksheet. As this action acts upon the current worksheet row, only a <code>DoubleClickActionSet</code> associated with a column in the ADF Table component should invoke this action.</p> <p>The ADF Table component does not evaluate or apply the value of a column's <code>Visible</code> property when invoking <code>RowDownSync</code>. The ADF Table component evaluates and applies the value of a column's <code>CellStyleName</code> property when invoking <code>RowDownSync</code>. For more information about column properties, see Section A.8.2, "ADF Table Component Column Properties".</p>
RowUpSync	<p>Synchronizes any pending changes in the current worksheet row that the ADF Table component references to the Fusion web application. <code>RowUpSync</code> acts upon the current worksheet row so only a <code>DoubleClickActionSet</code> associated with a column in the ADF Table component should invoke this action. The <code>DoubleClickActionSet</code> that invokes <code>RowUpSync</code> also changes the position of the ADF Table component's iterator on the Fusion web application to the current worksheet row (assuming it exists in the Fusion web application).</p>
UnflagAllRows	<p>Removes flags from cells in the <code>_ADF_StatusColumn</code> column.</p> <p>For more information about the <code>_ADF_StatusColumn</code>, see Section 7.9.2, "Row Flagging in an ADF Table Component" and Section 7.10, "Special Columns in the ADF Table Component".</p>
Upload	<p>Uploads pending changes to the Fusion web application.</p> <p>For more information, see Section 7.7, "Configuring a Worksheet to Upload Changes From an ADF Table Component".</p>

A.9 ADF Read-only Table Component Properties and Actions

The ADF Read-only Table component exposes one action, `Download`. This action downloads the current rows in the table identified by the ADF Read-only Table property, `TreeID`. [Table A-11](#) describes `TreeID` and the other properties that the ADF Read-only Table component supports.

Table A-11 ADF Read-only Table Component Properties

Name	Type	EL	Description
Annotation			For information about this property, see Table A-1 .
Columns	Array	N	References an array of read-only columns. For information about the properties that a column in this array can support, see Table A-12 .
ComponentID			For information about this property, see Table A-1 .
Position			For information about this property, see Table A-1 .
RowLimit			For information about this group of properties, see Table A-1 .
TreeID	Tree binding	N	References a tree binding ID from the page definition file associated with the current worksheet if the ADF Read-only Table component was created by inserting a tree binding into the worksheet.

[Table A-12](#) lists alphabetically the properties that a column in the `ReadOnlyColumn` array can use.

Table A-12 ADF Read-only Table Component Column Properties

Name	Type	EL	Description
Annotation			For information about this property, see Table A-1 .
CellStyleName	String	Y	Write an EL expression that resolves to an Excel style name that is applied to each cell in the column.
HeaderLabel	String	Y	Write an EL expression that resolves to a label for the column header.
HeaderStyleName	String	Y	Write an EL expression that resolves to an Excel style name that is applied to each cell in the column header.
ID	String	N	Assign a name to the column to identify it and its purpose. The value that you assign for this property has no functional impact. However, you must specify a value and the value that you specify must be unique within the list of columns. It serves to help you keep track of columns in the ADF Read-only Table component.
OutputText	ADF Component		For information about the properties that this component supports, see Section A.3, "ADF Output Text Component Properties" .

A.10 Action Set Properties

[Table A-13](#) lists alphabetically the properties that you can configure for an action set.

Table A-13 Action Set Properties

Name	Type	EL	Description
ActionOptions			This group of properties specifies options for invoking local and remote actions.
ActionOptions.AbortOnFailure	Boolean	N	When set to <code>TRUE</code> , the remaining actions in the array are not invoked if an action fails. If <code>FALSE</code> , all actions are invoked regardless of the success or failure of previous actions. The default value is <code>TRUE</code> .
ActionOptions.FailureActionID	Action binding	N	Specify the action binding to invoke if an action set does not complete successfully. For example, you could specify an action binding that rolls back changes made during the unsuccessful invocation of the action set.

Table A-13 (Cont.) Action Set Properties

Name	Type	EL	Description
ActionOptions.SuccessActionID	Action binding	N	Specify an action binding to invoke if an action set completes successfully. For example, you could specify an action binding that executes a commit action. A value for this property is optional.
Actions	Array	N	<p>Specifies an ordered array of actions. An action can be one of the following:</p> <ul style="list-style-type: none"> ▪ <code>ADFmAction</code> Invokes an action binding or method action binding in the underlying page definition file. The <code>ADFmAction.ActionID</code> property identifies the action binding or method action binding to invoke. For information about page definition files, see Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook". ▪ <code>ComponentAction</code> Invokes an action that a component on the worksheet exposes. <code>ComponentAction.ComponentID</code> identifies the component that exposes the action while <code>ComponentAction.Method</code> identifies the action to invoke. The ADF Table and ADF Read-only Table components are the only components in the Oracle ADF Desktop Integration module that expose actions. For information about these actions, see Section A.8, "ADF Table Component Properties and Actions" and Section A.9, "ADF Read-only Table Component Properties and Actions". For information about invoking component actions, see Section 8.2.2, "How to Invoke Component Actions in an Action Set". ▪ <code>WorksheetMethod</code> Invokes a worksheet action. For information about worksheet actions, see Section A.12, "Worksheet Actions and Properties". ▪ <code>Confirmation</code> Invokes a confirmation dialog box. For more information about the properties that this action uses, see Section A.10.1, "Confirmation Action Properties". ▪ <code>Dialog</code> Invokes a web page in a popup dialog or Excel's Document Actions. For more information, see Section 8.4, "Displaying Web Pages from a Fusion Web Application".
Alert			<p>This group of properties determines if and how an alert-style dialog box appears to the user to indicate that the requested action is complete. The dialog box that appears contains one button that allows the user to acknowledge the message and dismiss the dialog box. For information about how to display an alert message, see Section 8.2.7, "How to Provide an Alert After the Invocation of an Action Set".</p> <p>Many properties in this group make use of EL expressions to retrieve string values from resource bundles. For more information about using EL expressions, see Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook".</p>
Alert.Enabled	Boolean	N	<p>Set to TRUE to display an alert message to end users that notifies them when an action set operation completes successfully or includes one or more failures.</p> <p>For more information, see Section 8.2.7, "How to Provide an Alert After the Invocation of an Action Set".</p>
Alert.FailureMessage	String	Y	<p>Specify an EL expression that evaluates to a message to appear in the dialog box if errors occur during execution of the action set. The default EL expression is:</p> <pre>#_{ADFDIRes['DIALOGS_ACTION_ALERT_FAILURE_PROMPT']}</pre>
Alert.OKButtonLabel	String	Y	<p>Specify an EL expression that evaluates to a message to appear in the OK button of the dialog box. The default EL expression is:</p> <pre>#_{ADFDIRes['DIALOGS_OK_BUTTON_LABEL']}</pre>

Table A–13 (Cont.) Action Set Properties

Name	Type	EL	Description
Alert.SuccessMessage	String	Y	Specify an EL expression that evaluates to a message to appear in the dialog box if no errors occur during the execution of the action set. The default EL expression is: <code>#{_ADFDIRes['DIALOGS_ACTION_ALERT_SUCCESS_PROMPT']}</code>
Alert.Title	String	Y	Specify an EL expression that evaluates to a message to appear in the title area of the dialog box. The default EL expression is: <code>#{_ADFDIRes['DIALOGS_ACTION_TITLE']}</code>
Annotation			For information about Annotation, see Table A–1 .
Status			This group of properties determines if and how a status message appears during the execution of an action set. For information about how to display a status message, see Section 8.2.5, "How to Display a Status Message While an Action Set Executes" . Many properties in this group make use of EL expressions that reference string keys defined in resource bundles. For more information, see Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook" .
Status.Enabled	Boolean	N	If TRUE (default), a status window appears during the execution of the action set. If FALSE, no status window appears.
Status.Message	String	Y	Specify an EL expression to evaluate and display in the status window while the action set executes. The default value is: <code>#{_ADFDIRes['STATUS_MESSAGE_PROMPT']}</code>
Status.Title	String	Y	Specify an EL expression to evaluate and display in the title area of the status window while the action set executes. The default value is: <code>#{_ADFDIRes['DIALOGS_ACTION_TITLE']}</code>

A.10.1 Confirmation Action Properties

[Table A–14](#) lists alphabetically the properties that the Confirmation action in the array of Actions of an action set supports. For information about the other properties the array of Actions and action sets use, see [Table A–13](#).

Table A–14 Confirmation Action Properties

Name	Type	EL	Description
Annotation			For information about Annotation, see Table A–1 .
CancelButtonLabel	String	Y	An EL expression that is evaluated and displayed in the Cancel button at runtime. The default value is: <code>#{_ADFDIRes['DIALOGS_CANCEL_BUTTON_LABEL']}</code>
OKButtonLabel	String	Y	An EL expression that is evaluated and displayed in the OK button at runtime. The default value is: <code>#{_ADFDIRes['DIALOGS_OK_BUTTON_LABEL']}</code>
Prompt	String	Y	An EL expression that is evaluated and displayed in the main area of the confirmation dialog box at runtime. The default value is: <code>#{_ADFDIRes['DIALOGS_ACTION_CONFIRM_PROMPT']}</code>
Title	String	Y	An EL expression that is evaluated and displayed in the title area of the confirmation dialog box at runtime. The default value is: <code>#{_ADFDIRes['DIALOGS_ACTION_TITLE']}</code>

A.10.2 Dialog Action Properties

[Table A–15](#) describes the properties that the `Dialog` action in the array of `Actions` of an action set supports. For information about the other properties the array of `Actions` and action sets use, see [Table A–13](#).

For information about how to use the properties in [Table A–15](#) to invoke a web page from a Fusion web application, see [Section 8.4, "Displaying Web Pages from a Fusion Web Application"](#).

Table A–15 Dialog Action Properties

Name	Type	EL	Description
<code>Annotation</code>	String	N	For information about this property, see Table A–1 .
<code>Page</code>	String	N	Specify the web page that the action invokes. Relative and absolute URLs are valid values.
<code>ShareFrame</code>	Boolean	N	Set to <code>True</code> (default) to execute the web page specified by the <code>Dialog.Page</code> property in the same data control frame as the Excel worksheet. If you specify an absolute URL, the Oracle ADF Desktop Integration module ignores the value of the <code>Dialog.ShareFrame</code> property.
<code>Target</code>	List	N	Specifies how the web page the action invokes is rendered. Select: <ul style="list-style-type: none"> ■ <code>Popup</code> to render the web page in a modal dialog box within an embedded web browser. ■ <code>TaskPane</code> to render the web page in Excel's Document Actions.
<code>Title</code>	String	Y	Write an EL expression that resolves to the title of the <code>Dialog</code> at runtime or write a literal string.
<code>WindowSize</code>	Integer	N	Specify the initial size in pixels of the dialog box that appears to the user. Valid values range from 0 to 2147483647. Values will be revised upwards or downwards as appropriate at runtime if the specified values are too large or too small. The default value for <code>Height</code> is 625 and 600 for <code>Width</code> .

A.11 Workbook Actions and Properties

[Table A–16](#) describes the actions that a workbook can invoke. For information about configuring menu items to invoke these actions, see [Section 8.3.1, "How to Configure a Workbook Menu Item"](#).

Table A–16 Workbook Actions

Action	Description
<code>Login</code>	When invoked, this action challenges the end user to provide valid user credentials. If invoked when a user is already logged in, it invokes the <code>Logout</code> action to log out the current user and then invokes the <code>Login</code> action.
<code>Logout</code>	When invoked, the Oracle ADF Desktop Integration module sends a request to the Fusion web application to invalidate the session between the integrated Excel workbook and the Fusion web application. After invoking this action, the end user must be authenticated the next time the Excel workbook accesses the Fusion web application.

Table A-16 (Cont.) Workbook Actions

Action	Description
ClearAllData	<p>When invoked, this action clears all data entered by the user from cells that reference Oracle ADF bindings. Tables, such as those created by the ADF Table and ADF Read-only Table components, will be truncated so that they only display header rows with labels cleared. Values in cells that reference the Input Text or Output Text components are cleared. Column headers and labels are cleared as well. References to all resource bundles that the integrated Excel workbook uses are cleared. Worksheets that do not contain bindings or reference a page definition file remain unchanged. A dialog box prompts the end user to confirm invocation of this action. Once the end user confirms invocation, the Oracle ADF Desktop Integration module executes the following events after invocation of the action:</p> <ul style="list-style-type: none"> ■ Invokes the integrated Excel workbook's <code>Logout</code> action ■ Terminates the runtime session and clears all data from the integrated Excel workbook and all caches ■ Reinitializes the integrated Excel workbook and invokes the workbook's <code>Login</code> action <p>Invocation of the <code>ClearAllData</code> action does not change data hosted by the Fusion web application. One or more of the following actions must be invoked to change data hosted by the Fusion web application:</p> <ul style="list-style-type: none"> ■ A worksheet's <code>UpSync</code> action This action synchronizes all data referenced by non-table type components. For more information, see Section A.12, "Worksheet Actions and Properties". ■ An ADF Table component's <code>RowUpSync</code> action can be used to synchronize any pending changes in a row to the Fusion web application. The ADF Table component's <code>DeleteFlaggedRows</code> action can be invoked to delete flagged rows. For more information about ADF Table component actions, see Section A.8.3, "ADF Table Component Actions".
EditOptions	<p>When invoked, this action launches a dialog box that shows the current value of the <code>WebAppRoot</code> property and allows the end user to enter a new value.</p> <p>If the end user chooses to change the value of <code>WebAppRoot</code>, a confirmation dialog box appears once he or she clicks OK. Once the change is confirmed, the following events occur:</p> <ul style="list-style-type: none"> ■ Workbook <code>ClearAllData</code> action is invoked ■ Workbook <code>Logout</code> action is invoked ■ All data referenced by bindings in the workbook is removed ■ References to <code>WebAppRoot</code> are updated in the Excel workbook's metadata ■ Workbook <code>Login</code> action is invoked to authenticate the user with the Fusion web application that is specified as the value for <code>WebAppRoot</code> <p>The <code>ClearAllData</code> workbook action clears all resource bundles referenced by the integrated Excel workbook. After <code>WebAppRoot</code> is changed, the integrated Excel workbook attempts to retrieve resource bundles from the Fusion web application as part of the reinitialization process. This request to the Fusion web application triggers the authentication process.</p>
ViewAboutDialog	<p>When invoked, this action launches a dialog box called About that displays information defined in the <code>BrandingItems</code> workbook property and other information such as the versions of supporting software.</p>

Table A-17 lists alphabetically the Oracle ADF Desktop Integration properties that an Excel workbook can use.

Table A-17 Workbook Properties

Name	Type	EL	Description
ApplicationHomeFolder	String	N	<p>Specify the absolute path to the folder that is the root for the JDeveloper application workspace (.jws) where you developed the desktop integration project.</p> <p>For example, the value of this property in a workbook integrated with the Master Price List module could be something similar to the following:</p> <pre>JDEV_HOME\jdeveloper\FusionOrderDemo\MasterPriceList</pre> <p>where JDEV_HOME is the folder into which you installed JDeveloper.</p> <p>The Oracle ADF Desktop Integration module prompts you to specify a value for this property the first time that you open an integrated Excel workbook. If you select Cancel in the dialog box that prompts you for a value, the Oracle ADF Desktop Integration module sets the value of <code>ApplicationHomeFolder</code> to the directory that contains the Excel workbook.</p> <p>For more information, see Section 4.4.2, "How to Open an Excel Workbook for the First Time".</p>
BrandingItems	Array	N	<p>An array of name-value pairs that resolve to resource bundle references (for example, <code>#{res['myAppName']}</code>) or a literal string. Each pair in the array consists of a name and a value. Each name and value can reference a literal string or an EL expression.</p> <p>For information about branding your integrated Excel workbook, see Section 9.6, "Branding Your Integrated Excel Workbook".</p>
Login	-	-	<p>This group of properties sets values that manage the security of the integrated Excel workbook. These properties include:</p> <ul style="list-style-type: none"> ■ <code>ProtectedWebPage</code> Specify the path relative to <code>WebPagesFolder</code> of a protected web page. This protected web page triggers the authentication mechanism when a user attempts to log on to the Fusion web application. ■ <code>WindowSize</code> Specify the initial size in pixels of the login dialog box that appears to the user. Valid values range from 0 to 2147483647. Values will be revised upwards or downwards as appropriate at runtime if the specified values are too large or too small. The default value for <code>Height</code> is 625 and 600 for <code>Width</code>. <p>For more information about securing your Excel workbook, see Chapter 11, "Securing Your Integrated Excel Workbook".</p>
Parameters	Array	N	<p>An array of workbook initialization parameters that you configure to pass the server data context from a page in a Fusion web application to an integrated Excel workbook. You can define multiple workbook initialization parameters in the Fusion web application's page. Each workbook initialization parameter (parameter that references a URL argument) that you define in a page must be specified in a <code>Parameter</code> property of this array, otherwise it is ignored.</p> <p>Each element in the array supports the following properties:</p> <ul style="list-style-type: none"> ■ <code>Annotation</code> For more information about this property, see Table A.1. ■ <code>Parameter</code> You specify the name of the workbook initialization parameter you defined in the page of the Fusion web application from which the end user downloads the integrated Excel workbook. <p>For information about using this property, see Section 8.11, "Passing Server Data Context from a Fusion Web Application Page to a Workbook".</p>

Table A-17 (Cont.) Workbook Properties

Name	Type	EL	Description
Project	String	N	<p>Specify the name of a JDeveloper project in the current JDeveloper workspace. The Oracle ADF Desktop Integration module attempts to load the <code>.jpr</code> file that corresponds to the project that you specify. An error appears if the <code>.jpr</code> file is not available or is not in the expected format.</p> <p>When you open an integrated Excel workbook for the first time in design mode, the Oracle ADF Desktop Integration module searches for a <code>.jpr</code> file in the parent folder hierarchy. If it finds a <code>.jpr</code> file, it sets the value of <code>Project</code> to the name of the project that corresponds to the <code>.jpr</code> file.</p> <p>The Oracle ADF Desktop Integration module loads the names of the available projects from the <code>application_name.jws</code> file specified by <code>ApplicationHomeFolder</code>.</p>
RemoteServletPath	String	N	<p>Specify the path to the Oracle ADF Desktop Integration remote servlet. This path must be relative to the value specified for <code>WebAppRoot</code>. Note that the value you specify for <code>RemoteServletPath</code> must match the value that is specified in the web application's deployment descriptor file (<code>web.xml</code>). The default value for this property is:</p> <pre>/adfdiRemoteServlet</pre>
Resources	Array	N	<p>Specifies an array of resource bundles that you want to register with the workbook. Each element in the array supports the following properties:</p> <ul style="list-style-type: none"> ▪ Alias Specify a string value that is unique within <code>Workbook.Resources</code>. EL expressions use this string to reference the resource bundle. ▪ Annotation For more information about this property, see Table A-1. ▪ Class Specify a fully qualified class name. The class name that you specify is expected to be a Java resource bundle class that the Fusion web application you integrate your workbook with uses. For example, the <code>EditPriceList.xlsx</code> workbook in the Master Price List module references the following resource bundle: <code>oracle.fodemo.masterpricelist.resources.UIStrings</code> <p>For more information, see Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook".</p>
ToolBarMenu	-	-	This group of properties defines if and how a toolbar menu appears in Excel at runtime. The following entries in this table describe the properties in the <code>ToolBarMenu</code> group. For more information about menus, see Section 8.3, "Creating Menu Items" .
ToolBarMenu.Annotation	String	N	For information about this property, see Section A.1, "Frequently Used Properties in the Oracle ADF Desktop Integration Module" .
ToolBarMenu.Enabled	Boolean	N	If <code>TRUE</code> , the toolbar menu appears at runtime. The toolbar menu does not appear if you set <code>Enabled</code> to <code>FALSE</code> . <code>TRUE</code> is the default value.
ToolBarMenu.Title	String	Y	Specify an EL expression that evaluates to the title that appears for the toolbar menu in the menu's title area. Excel imposes a maximum limit of 255 characters for toolbar titles. Make sure that the runtime value of the EL expression you specify does not exceed 255 as the Oracle ADF Desktop Integration module truncates the value so that Excel does not generate an error message.

Table A–17 (Cont.) Workbook Properties

Name	Type	EL	Description
<code>ToolBarMenu.WorkbookMenuItems</code>	Array	N	<p>Each element in this array corresponds to a workbook menu item at runtime. Each element in the array uses the following properties:</p> <ul style="list-style-type: none"> ▪ <code>Annotation</code> For more information about this property, see Table A.1. ▪ <code>Label</code> For more information about this property, see Table A.1. ▪ <code>Method</code> Specify the workbook action that the workbook menu invokes. For more information about workbook actions, see Table A–16.
<code>WebAppRoot</code>	String	N	<p>A fully qualified URL to the Fusion web application's root. Web pages referenced by other workbook properties, such as <code>ProtectedWebPage</code>, are expected to exist under the URL specified by <code>WebAppRoot</code>.</p>
<code>WebPagesFolder</code>	String	N	<p>Specify the path to the folder that contains the web pages that you intend to use with your integrated Excel workbooks. The value that you specify for the path must be relative to the value of <code>ApplicationHomeFolder</code>.</p>
<code>WorkbookID</code>	String	N	<p>A unique identifier for the integrated Excel workbook. The Oracle ADF Desktop Integration module generates the unique identifier when you open the workbook for the first time in design mode.</p> <p>The value cannot be modified. However, the Oracle ADF Desktop Integration module can generate a new value if you use the Tools > Reset WorkbookID menu items in the Oracle ADF Desktop Integration Designer.</p> <p>The value of this property is used when the Oracle ADF Desktop Integration module generates a hash code as described in Section 11.3, "Checking the Integrity of an Integrated Excel Workbook's Metadata".</p>

A.12 Worksheet Actions and Properties

An Excel worksheet in an Oracle ADF Desktop Integration can invoke the following actions:

- `UpSync`
Synchronizes any pending changes from the ADF Input Text and ADF Desktop Integration List of Values components in the worksheet to the Fusion web application.
- `DownSync`
Downloads any changes from the Fusion web application to the ADF Input Text, ADF Output Text, and ADF Desktop Integration List of Values components in the worksheet.
- `DisplayWorksheetErrors`
Displays a detailed list of errors in a message dialog box for the integrated Excel worksheet if any errors are available. Invoke this action in an action set that is invoked by an ADF component (other than the ADF Desktop Integration Table-type components) or a worksheet menu item.

When you configure an ADF Button component to invoke an action binding or method action binding, the action set to invoke when a user clicks the ADF Button component at runtime is populated as follows by default:

1. `UpSync`
2. Action or method action binding that you specify for the ADF Button component

3. DownSync

If the first action that you invoke on a worksheet with an empty form is the UpSync worksheet action, you may encounter errors. For this reason, make sure that the first action invoked is the DownSync worksheet action. You can configure the ADF Button component's action set or one of the worksheet events (Startup or Activate) described in [Table A-18](#) to invoke the DownSync worksheet action first.

[Table A-18](#) describes the Oracle ADF Desktop Integration properties that an Excel worksheet can use.

Table A-18 Worksheet Properties

Name	Type	EL	Description
Annotation	String	N	For information about this property, see Table A.1 .
Events	Array	N	Each element in this array specifies an action set to invoke if the associated worksheet event occurs. For information about action sets, see Section A.10, "Action Set Properties" . For information about worksheet events, see the entry in this table for <code>Events.n.Event</code> . The following entries in this table prefaced by <i>Events.n</i> describe the properties that an element in this array supports where <i>n</i> refers to a specific element in the array.
<code>Events.n.ActionSet</code>	ActionSet	N	For more information about the properties of action sets, see Section A.10, "Action Set Properties" .
<code>Events.n.InvokeOnceOnly</code>	Boolean	N	The default value of this property is <code>FALSE</code> . When set to <code>TRUE</code> , the workbook stores information about whether the worksheet invoked the action set for this event and, if so, prevents the worksheet from invoking the action set a second time. Note that if the workbook is not saved, this information is lost. This means that the worksheet can invoke the event again the next time that the workbook opens.
<code>Events.n.Annotation</code>	String	N	For information about the annotation property, see Table A.1 .
<code>Events.n.Event</code>	List	N	The worksheet supports the following events that you can configure to invoke an action set: <ul style="list-style-type: none"> ■ <code>Startup</code> Excel starts. ■ <code>Shutdown</code> Excel workbook closes or Excel application exits. ■ <code>Activate</code> User navigates to the current worksheet. ■ <code>Deactivate</code> User navigates away from the current worksheet or Shutdown event triggered. <p>Note that the worksheet events complete execution even if the action sets that it invokes fails.</p> <p>For more information about worksheet events and action sets, see Section 8.2.4, "How to Invoke an Action Set from a Worksheet Event".</p>

Table A-18 (Cont.) Worksheet Properties

Name	Type	EL	Description
MenuItems	Array	N	<p>Specify one or more workbook actions that appear as menu commands at runtime. Each menu command is an element in the <code>WorksheetMenuItem</code> array. Entries in this array support the following properties:</p> <ul style="list-style-type: none"> ■ Annotation ■ Label ■ SelectActionSet <p>For more information about the <code>Annotation</code> and <code>Label</code> properties, see Table A.1. For more information about the <code>SelectActionSet</code> property, see Section A.10, "Action Set Properties".</p>
PageDefinition	String	N	<p>Specify the page definition file to associate with the worksheet. For information about page definition files, see Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook".</p>
Parameters	Array	N	<p>An array of worksheet parameters that you configure to pass the server data context from a workbook <code>Parameters</code> property to a worksheet in an integrated Excel workbook. Each element in the array supports the following properties:</p> <ul style="list-style-type: none"> ■ Annotation <ul style="list-style-type: none"> For more information about this property, see Table A.1. ■ Parameter <ul style="list-style-type: none"> Specify the ID of a <code>parameter</code> element that you added to the page definition file associated with the worksheet. ■ Value <ul style="list-style-type: none"> Write an EL expression that references the value of the <code>Parameter</code> property you specified for the workbook initialization parameter (workbook <code>Parameters.Parameter</code> property). The workbook <code>Parameters.Parameter</code> property supplies this value the first time that the page definition file associated with this worksheet is initialized. <p>For information about using this property, see Section 8.11, "Passing Server Data Context from a Fusion Web Application Page to a Workbook".</p>
RowData			<p>Set values for the <code>CachedAttributes</code> property when you want to cache data in an integrated Excel workbook across a number of sessions with the Fusion web application.</p> <p>Set a value for the <code>ChangeIndicatorAttributeID</code> property to determine if a row has been modified by another user since you downloaded it from the Fusion web application.</p>

Table A–18 (Cont.) Worksheet Properties

Name	Type	EL	Description
RowData.CachedAttributes	Array	N	<p>Specify values for the properties in this array to determine the attributes for which data is cached. Each <code>CachedAttribute</code> element in this array supports the following properties:</p> <ul style="list-style-type: none"> ▪ <code>AttributeID</code> This property references the attribute binding for which data is to be cached. Do not specify an attribute binding for <code>AttributeID</code> and as an editable field in a form (for example, in an ADF Input Text component) in the same worksheet. ▪ <code>Annotation</code> For more information about this property, see Table A.1. <p>Do not configure a component (for example, an ADF Table component's column or an ADF Input Text component) so an end user can view or edit an attribute binding that you have also specified for an element in the <code>RowData.CachedAttributes</code> array. The <code>RowData.CachedAttributes</code> array caches the values retrieved by the worksheet <code>DownSync</code> action. The worksheet <code>UpSync</code> action sends the values of the <code>RowData.CachedAttributes</code> array to the Fusion web application. This may override edits an end user makes to an attribute binding exposed through a component in the worksheet.</p>
RowData.ChangeIndicatorAttributeID	Binding	N	<p>Specify the row-specific attribute of the tree binding used to determine if a row has been modified by another user since the row was last downloaded by to your integrated Excel workbook.</p> <p>For more information, see Section 12.7, "Handling Data Conflicts When Uploading Data from a Workbook".</p>
ServerContext			<p>This group of properties references the attribute bindings that uniquely identify the row displayed in the current worksheet so that you can reestablish server data context across multiple sessions.</p> <p>For more information, see Section 15.3, "Reestablishing Server Data Context Between Sessions".</p>

Table A-18 (Cont.) Worksheet Properties

Name	Type	EL	Description
ServerContext.CacheDataContexts	Array	N	<p>Add elements to the CacheDataContexts array for cases where there is more than one iterator defined in the binding container whose server-side context needs to be reestablished. The CacheDataContexts array supports the following properties to store the worksheet's cached data context:</p> <ul style="list-style-type: none"> ■ RestoreDataContextActionID References an action binding to invoke. ■ CachedServerContexts An array that identifies the attribute binding values to cache and set before the action binding specified by RestoreDataContextActionID is invoked. Each element in the CachedServerContext array supports the CachedAttributeID and RestoredAttributeID properties. CachedAttributeID identifies the attribute binding value to cache in the worksheet. RestoredAttributeID is an optional property for which you specify a value when the destination attribute binding value is different from the source attribute binding value. If you do not specify a value for RestoredAttributeID, the value of CachedAttributeID is used as the destination attribute binding value and its value is set before invoking the action set. ■ Annotation For more information about this property, see Section A.1, "Frequently Used Properties in the Oracle ADF Desktop Integration Module".
ServerContext.IDAttributeID	Binding	N	<p>Specifies an attribute binding that uniquely identifies the row displayed in the current worksheet. This property is used at runtime to determine whether the server context has been reestablished properly for non-table type components in the worksheet.</p>
Title	String	Y	<p>Specify an EL expression that resolves to a string and sets the name of the worksheet. The EL expression can have a maximum length of 31 characters. It must not include the following characters:</p> <p>[] \ / * ?</p> <p>Make sure that the EL expressions you write for the Title property generates unique values for each worksheet at runtime. For example, if an EL expression generates a value for the Title property of an integrated worksheet that matches the name of a non-integrated worksheet, an error occurs.</p>

Oracle ADF Desktop Integration EL Expressions

This appendix describes the syntax for EL expressions in the Oracle ADF Desktop Integration module and provides guidelines for writing EL expressions.

This appendix includes the following sections:

- [Section B.1, "Guidelines for Creating EL Expressions"](#)
- [Section B.2, "EL Syntax for Oracle ADF Desktop Integration Components"](#)
- [Section B.3, "Attribute Control Hints in the Oracle ADF Desktop Integration Module"](#)

B.1 Guidelines for Creating EL Expressions

The following list describes the characteristics that EL expressions for your integrated Excel workbook can have and provides recommendations for writing EL expressions:

- Literal values that evaluate correctly to the type expected for the Oracle ADF component property. The following list describes some examples:
 - Boolean values `true` and `false`
 - Integer values such as `-1`, `0`, and `100`
 - String values such as `hello world`
- Strings that contain one or more valid EL expression parts. The following list shows examples of valid syntax:
 - `{row.bindings.ProductId.inputValue}`
 - `{components.TAB416222534.errors}`
 - `{res['excel.saveButton.label']}`
- A valid Excel formula. An Excel formula string must start with the `=` character. If the literal string includes an `{ . . . }` expression, the Oracle ADF Desktop Integration module evaluates this expression first and inserts the resulting value into the Excel formula string. Excel then evaluates the Excel formula.

Note the following points if you write an EL expression:

- Excel formula elements must not be used inside an `{ . . . }` expression.
- EL expressions should not contain references to Excel cells because EL expressions are managed within ADF metadata. Excel cannot update the ADF metadata if the referenced cell moves. A workaround is to define a named cell

reference or range using the **Name** box in the Excel Formula Bar. You can reference the named cell reference or named cell range reference from an EL expression. For information about defining named cell references or ranges, see Excel's documentation.

- EL expressions in a page definition file

For information about the syntax that you use to write EL expressions in a page definition file, see [Section 4.3, "Working with Page Definition Files for an Integrated Excel Workbook"](#).

B.2 EL Syntax for Oracle ADF Desktop Integration Components

[Table B-1](#) lists supported expression properties for the Oracle ADF Desktop Integration components that support EL expressions.

The EL expressions use the following syntax to reference these properties:

```
{components.componentID.property}
```

where *componentID* references the ID of the component and *property* references the property (for example, *rowCount*).

Table B-1 Expression Properties for Oracle ADF Desktop Integration components

Property	Object Type	Property Type	Expected runtime values	Value at design time
rowCount	Table ROTable	Int	>=0	0
currentRowIndex	Table ROTable	Int	>= 0 AND < RowCount (zero based index)	-1
currentRowMode	Table	String	"insert" "update"	"unknown"
errors	Table	String	N/A	N/A
readOnly	Table.Column	Boolean	TRUE FALSE	FALSE

Write EL expressions with the following syntax to retrieve:

- Worksheet errors at runtime

```
{worksheet.errors}
```

For more information about worksheet errors, see [Section 12.4, "Error-Reporting in an Integrated Excel Workbook"](#).

- Workbook initialization parameters

```
{workbook.params.parameterName}
```

where *parameterName* is the name of the workbook initialization parameter. For information about using these parameters, see [Section 8.11, "Passing Server Data Context from a Fusion Web Application Page to a Workbook"](#).

- Resource bundle string key values

```
{resourceBundleAlias['resourceBundleKey']}
```

where *resourceBundleAlias* is the alias of the resource bundle and *resourceBundleKey* is the string key value. For more information about resource bundles, see [Section 10.2, "Using Resource Bundles in an Integrated Excel Workbook"](#).

[Table B-2](#) describes the supported syntax and properties for Oracle ADF control bindings. For information about the attribute control hints (`controlHint`) that the Oracle ADF Desktop Integration module supports, see [Table B-3](#).

You can use the expression builder described in [Section 5.6, "Using the Expression Builder"](#) to generate some of the EL expressions described in [Table B-2](#). You have to write some other EL expressions as indicated in [Table B-2](#).

Table B-2 Expression Properties and Syntax for Oracle ADF Control Bindings

Syntax	Object Type	Object Property	Value at design time
Use the expression builder to generate EL expressions with the following syntax: <pre>#{bindings.attributeID} #{bindings.attributeID.label} #{bindings.attributeID.hints.controlHint}</pre>	Attribute	Attribute control hint	" "
You can also write the previous EL expressions in addition to the following EL expression: <pre>#{bindings.attributeID.inputValue}</pre>			
Use the expression builder to generate EL expressions with the following syntax: <pre>#{bindings.ListID} #{bindings.ListID.label} #{bindings.ListID.hints.controlHint}</pre>	List	Attribute control hint	" "
Write EL expressions with the following syntax for a column in a table-type component <pre>#{row.bindings.attributeID.inputValue}</pre>	Table.Column	inputValue	" "
Write an EL expression with the following syntax when adding a dynamic column to an ADF Table component as described in Section 7.11, "Adding a Dynamic Column to Your ADF Table Component" : <pre>#{bindings.TreeID.[TreeNodeID].AttributeNamePrefix*.inputValue}</pre>			
A value for <code>AttributeNamePrefix</code> is optional while <code>*</code> is required.			

B.3 Attribute Control Hints in the Oracle ADF Desktop Integration Module

The Oracle ADF Desktop Integration module can read the values of the attribute control hint names described in [Table B-3](#). You write EL expressions that the Oracle ADF Desktop Integration module uses to retrieve the value of an attribute control hint from your Fusion web application. [Table B-2](#) describes the EL expression syntax that retrieves the values of attribute control hints at runtime.

You configure attribute control hints in your Fusion web application. Information about how to add an attribute control hint to an entity object can be found in the "Defining Attribute Control Hints for Entity Objects" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*. Information about how to add an attribute control hint to a view object can be found in the "Defining Attribute Control Hints for View Objects" section of the *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

Table B–3 Attribute Control Hints Used by the Oracle ADF Desktop Integration Module

Attribute Control Hint	Type	Value to configure in the Fusion web application
label	String	References the value of the label attribute control hint configured for an entity or view object.
updateable	Boolean	Returns <code>true</code> if the associated attribute binding is updateable.
readOnly	Boolean	<p>This attribute control hint is unique to the Oracle ADF Desktop Integration module. Returns <code>true</code> if the associated attribute binding is not updateable.</p> <p>To optimize the performance of an integrated Excel workbook when it evaluates Excel formulas in EL expressions, it is recommended that you write an EL expression with the following syntax for a component's <code>ReadOnly</code> property:</p> <pre><code>{bindings.attributeID.hints.readOnly}</code></pre> <p>rather than:</p> <pre><code>=NOT({bindings.attributeID.hints.updateable})</code></pre> <p>Note that the attribute control hint <code>readOnly</code> property differs to the <code>ReadOnly</code> property of Oracle ADF Desktop Integration components described in Section A.1, "Frequently Used Properties in the Oracle ADF Desktop Integration Module".</p>
mandatory	Boolean	Returns <code>true</code> if a value for the associated attribute binding is required.
dataType	String	<p>Returns the data type of the attribute control hint. A Fusion web application can support many data types with complex names. The <code>dataType</code> attribute control hint was introduced in the Oracle ADF Desktop Integration module to simplify the writing of EL expressions. It maps the data types that a Fusion web application supports to the values supported by the Oracle ADF Desktop Integration module listed here:</p> <ul style="list-style-type: none"> ▪ <code>string</code> ▪ <code>number</code> ▪ <code>date</code> ▪ <code>boolean</code> ▪ <code>other</code>

Troubleshooting an Integrated Excel Workbook

This appendix provides guidelines on how you can troubleshoot an integrated Excel workbook when you encounter problems during development. It also describes possible solutions for a number of problems that you may encounter.

This appendix includes the following sections:

- [Section C.1, "Verifying That Your Fusion Web Application Supports Desktop Integration"](#)
- [Section C.2, "Verifying End-User Authentication for Integrated Excel Workbooks"](#)
- [Section C.3, "Generating Log Files for an Integrated Excel Workbook"](#)
- [Section C.4, "Exporting Excel Workbook Metadata"](#)

Note: The property inspector does not validate that values you enter for a property or combinations of properties are valid. Invalid values may cause runtime errors. To avoid runtime errors, make sure you specify valid values for properties in the property inspector. For more information about the property inspector, see [Section 5.4, "Using the Property Inspector"](#).

C.1 Verifying That Your Fusion Web Application Supports Desktop Integration

You can verify that your Fusion web application is running the Oracle ADF Desktop Integration remote servlet (`adfdiRemote`) and the version that it runs. This information can be useful if you encounter errors with an integrated Excel workbook. For example, you can determine if the Oracle ADF Desktop Integration remote servlet is executing when troubleshooting an integrated Excel workbook.

To verify that the Oracle ADF Desktop Integration remote servlet is executing:

1. Log on to the Fusion web application.
2. Type the concatenated values of the workbook properties `WebAppRoot` and `RemoteServletPath` into the address bar of your web browser. This corresponds to a URL similar to the following:

```
http://hostname:8988/FusionApp/adfdiRemoteServlet
```

If the Oracle ADF Desktop Integration remote servlet is running, a web page returns displaying a message similar to the following:

```
ADF Desktop Integration Remote Servlet 11g (11.1.1.48.86) [520]
Response from oracle.adf.desktopintegration.servlet.DIRemoteServlet: OK.
```

C.2 Verifying End-User Authentication for Integrated Excel Workbooks

If end users of an integrated Excel workbook do not get prompted for user credentials when they invoke an action that interacts with the Fusion web application, it may mean that security is not configured correctly for the integrated Excel workbook and/or the Fusion web application. You can verify that your Fusion web application authenticates end users and is security-enabled by carrying out the following procedure.

To verify that a Fusion web application authenticates end users:

- Type the concatenated values of the workbook properties `WebAppRoot` and `Login.ProtectedWebPage` into the address bar of your web browser. This corresponds to a URL similar to the following:

```
http://hostname:8988/FusionApp/faces/secured/SecurePage.jspx
```

The Fusion web application requests you enter user credentials if it is security-enabled.

For more information about securing your integrated Excel workbook, see [Chapter 11, "Securing Your Integrated Excel Workbook"](#).

C.3 Generating Log Files for an Integrated Excel Workbook

The Oracle ADF integration module can generate log files that capture information based on events triggered by the following pieces of software within the Oracle ADF Desktop Integration module:

- HTTP filter and the ADF Desktop Integration remote servlet on the web server (server-side logging)
- Excel workbook which you integrate with your Fusion web application (client-side logging)

For more information about client-side logging, see [Section C.3.2, "About Client-Side Logging"](#)

For more information about server-side logging, see [Section C.3.1, "About Server-Side Logging"](#).

C.3.1 About Server-Side Logging

You configure the generation of server-side log files for the Oracle ADF Desktop Integration module the same way as for other Oracle ADF modules. This involves setting values that specify the verbosity level and output location in a configuration file named `j2ee-logging.xml`. For more information about this file and about using the JDeveloper debugging tools, see the "Using the ADF Logger and Business Component Browser" section in *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework*.

[Table C-1](#) describes the package names that you supply as attribute parameters to the `<logger>` elements in the `j2ee-logging.xml` file to configure log file generation in the Oracle ADF Desktop Integration module.

Table C-1 Package Names for Log File Configuration

To generate log file entries for this component...	Enter this package name...
All Oracle ADF Desktop Integration server logic	<code>oracle.adf.desktopintegration</code>
Oracle ADF Desktop Integration remote servlet	<code>oracle.adf.desktopintegration.servlet</code>
Oracle ADF Desktop Integration HTTP filter	<code>oracle.adf.desktopintegration.filter</code>

Table C-2 describes the types of information that the log file captures and the corresponding log file entry level.

Table C-2 Server-Side Logging Levels

Log level	Description
SEVERE (ERROR)	Captures all exceptions and errors.
WARNING	Captures all non-fatal problem conditions.
INFO or CONFIG	Captures life cycle events such as servlet initialization, and so on.
CONFIG	Captures "heartbeat" events that echo status and execution context for each client-server interaction.
<ul style="list-style-type: none"> ■ FINE ■ FINER ■ FINEST 	These values generate increasing levels of diagnostic information.

C.3.2 About Client-Side Logging

The Oracle ADF Desktop Integration module uses an object (`adfdi-common`) which is an instance of the `TraceSource` class from the `System.Diagnostics` namespace in the Microsoft .NET Framework. This object is used to generate log files that capture information about events triggered by the Excel workbook that you integrate with your Fusion web application. By default, no log files are generated.

A configuration file (`adfdi-excel-client.dll.config`) determines what type of information the `adfdi-common` object logs, where it logs it and in what format. For more information about the creation and configuration of the `adfdi-excel-client.dll.config` file, see [Section C.3.2.1, "How to Generate Log Files using a Configuration File"](#). Table C-3 describes the log levels that client-side logging supports. You enter one of the values in this table in the `adfdi-excel-client.dll.config` file.

Users who do not have access to the directory that stores the `adfdi-excel-client.dll.config` file can change the location where log files are output and the logging level by setting values for user environment variables. For more information, see [Section C.3.2.2, "How to Configure Logging Using User Environment Variables"](#).

Table C-3 Client-Side Logging Levels

Level	Description
Error	Captures information about severe errors and exceptions.

Table C-3 (Cont.) Client-Side Logging Levels

Level	Description
Warning	Captures non-fatal conditions. The Oracle ADF Desktop Integration module reports some non-fatal conditions to end users. It writes all non-fatal conditions in the log files.
Information	Captures life cycle and control flow events.
Verbose	Captures detailed information about the execution flow of the application.

C.3.2.1 How to Generate Log Files using a Configuration File

You create an XML-based configuration file named `adfdi-excel-client.dll.config` in the same directory as the `adfdi-excel-client.dll` file. The parent element in the `adfdi-excel-client.dll.config` file is `<configuration>`. [Table C-4](#) describes child elements and attributes that this configuration file contains and describes the attribute values that you supply to write different types of information to different formats of log file such as `.log`, `.txt`, or `.xml`.

For more information about the `TraceSource` class and the configuration file that controls output by instances of this class, see the documentation for the Microsoft .NET Framework.

Table C-4 Child Elements and Attributes in the Configuration File

Element/Attribute	Description
<code>sources</code>	This element is a collection of source elements.
<code><source name ... switchValue></code>	Specify values for the following attributes: <ul style="list-style-type: none"> <code>name</code> Set the value of this attribute to <code>adfdi-common</code>. <code>switchValue</code> The level of logging. Possible values are described in Table C-3. Example C-1 demonstrates how you set a logging level of <code>Verbose</code> using the <code>adfdi-common</code> object. <code><source name="adfdi-common" switchValue="Verbose"></code>
<code><listeners></code>	This element contains <code><add></code> elements.
<code><sharedListeners></code>	This element contains listeners that any source or trace element can reference.
<code><add></code>	The attribute values for these elements can define the type of information that is output to log files in addition to the format and location of the log files. You can also use <code><add></code> elements to refer to shared trace listeners that are defined in a <code><sharedListeners></code> element. In Example C-1 , the third <code><add></code> element refers to a listener <code>adfdi-common-excel.xml</code> . This listener is defined in the <code><sharedListeners></code> element.

To create the configuration file for client-side logging:

1. In the Oracle ADF Desktop Integration Designer, click **About Oracle ADF 11g Desktop Integration**.

2. Click the **Properties** tab and note the value for the directory path that appears in the **Configuration** field.

For example, a directory path similar to the following:

```
C:\Documents and Settings\john\Local
Settings\Apps\2.0\51097ALD.VNY\OG48YJLC.Q0Y\orac..tion_ca85d24b89a948e6_
000b.0001_61767b25443cf62e\adfdi-excel-client.dll.config
```

3. Navigate to the directory that you identified in Step 2.
4. Create an XML-based file named `adfdi-excel-client.dll.config` in the directory with a `<configuration>` parent element.
5. Add additional child elements and attributes as described in [Table C-4](#).
6. Save the file.

[Example C-1](#) shows a sample configuration file that generates three different log files with different formats (`.log`, `.xml`, and `.txt`). These files capture different types of information such as `ThreadId`, `ProcessId`, and `DateTime` at a `Verbose` logging level.

Example C-1 Sample Configuration File

```
<?xml version="1.0"?>
<configuration>
  <system.diagnostics>
    <sources>
      <source name="adfdi-common" switchValue="Verbose">
        <listeners>
          <add type="System.Diagnostics.TextWriterTraceListener"
name="adfdi-excel-common.log"
            initializeData="d:\temp\adfdi-excel-common.log"
            traceOutputOptions="DateTime"/>
          <add type="System.Diagnostics.DelimitedListTraceListener"
name="adfdi-excel-common.txt"
            initializeData="d:\temp\adfdi-excel-common.txt" delimiter="|"
            traceOutputOptions="ThreadId, ProcessId, DateTime"/>
        </listeners>
      </source>
    </sources>
  <sharedListeners>
    <add name="adfdi-excel-common-xml" initializeData="d:\temp\adfdi.xml"
            traceOutputOptions="None"/>
  </sharedListeners>
</system.diagnostics>
</configuration>
```

C.3.2.2 How to Configure Logging Using User Environment Variables

You add two user environment variables to configure the logging level and location for log files. Use this option when you cannot access the `adfdi-excel-client.dll.config` file to make changes to it.

Note: The directory that you specify as the location to store the `adfdi-excel-client.dll.config` file must exist before you configure the user environment variables discussed here.

To add or configure user environment variables on Windows:

1. Click the Windows **Start** button and then click **Settings > Control Panel**.
The Control Panel opens.
2. In the Control Panel, select and open **System**.
The System Properties dialog box opens.
3. Click the **Advanced** view tab and then click the **Environment Variables** button.
The Environment Variables dialog box opens.
4. In the input field **User variables for username**, click **New** and add variables as described in the following table.

Enter a variable named...	With a value...
adfdi-common-file	That defines the directory path and file name for the XML file that captures logging information.
adfdi-common-level	That specifies the level of logging. Table C-3 lists valid values.

5. Click **OK**.

C.4 Exporting Excel Workbook Metadata

You can export the XML metadata in your Excel workbook to an XML file with a name and location that you specify. This file may be useful if you have to debug or analyze an Excel workbook that is integrated with a Fusion web application. It contains child elements for each worksheet in the workbook, resources such as the relative path to the remote servlet, and so on.

The following procedure describes how you export XML metadata from an Excel workbook.

To export XML metadata from an integrated Excel workbook:

1. Click **About Oracle ADF D11g Desktop Integration...** in the Oracle ADF Desktop Integration Designer.
The About Oracle ADF 11g Desktop Integration dialog box appears.
2. Click the **Properties** view tab and then click the **Export Metadata** button.
A dialog box appears that asks you to specify a file name and location for the file that stores the exported metadata.
3. Specify a file name, a location, and then click **Save**.
The integrated Excel workbook exports the metadata to the specified file in the specified format.

Using Workbook Management Tools

This appendix describes how to use the workbook conversion utility and the workbook administration tool. You can use these tools to prepare and manage workbooks that you integrate with a Fusion web application.

This appendix includes the following sections:

- [Section D.1, "Using the Workbook Conversion Utility"](#)
- [Section D.2, "Using the Workbook Administration Tool"](#)

D.1 Using the Workbook Conversion Utility

Use the conversion utility to convert an Excel workbook so that you can start configuring the workbook with Oracle ADF functionality. [Section 4.4, "Preparing Your Workbook"](#) describes how you run the conversion utility.

The Oracle ADF Desktop Integration module stores the conversion utility (`convert-adfdi-excel-solution.exe`) in the following directory:

```
ADFDI_CLIENT\adfdi\bin\excel\convert
```

where `ADFDI_CLIENT` refers to the directory in which you set up the Oracle ADF Desktop Integration module as described in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#).

[Table D-1](#) describes the arguments that the conversion utility supports.

Table D–1 Workbook Conversion Utility Command-line Arguments

Use this argument...	To...
-attach	<p>Attach properties to an Excel workbook so that you can configure it to use Oracle ADF functionality.</p> <p>Example usage:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -attach</pre>
-detach	<p>Remove design time, test mode, and runtime Oracle ADF functionality from an integrated Excel workbook. Use this argument if you want to send an integrated Excel workbook to a user who does not have the Oracle ADF Desktop Integration client framework installed. This allows the user to open the integrated Excel workbook without receiving an error message.</p> <p>Example usage:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -detach</pre>
-mode	<p>Use this argument to change the mode of an integrated Excel workbook from its current mode to design mode, test mode, or runtime mode. Use the <code>-mode</code> argument in conjunction with one of the following three arguments to change to the desired mode:</p> <ul style="list-style-type: none"> ▪ <code>DT</code> Changes the workbook to design mode. ▪ <code>RT</code> Changes the workbook to runtime mode. ▪ <code>TST</code> Changes the workbook to test mode. <p>The following example converts a workbook to design mode:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -mode DT</pre> <p>Use the <code>-mode</code> argument with caution and be aware that the functionality that it provides is not equivalent to the functionality provided by the Oracle ADF Desktop Integration Designer toolbar. For example, if you change to runtime mode (using <code>-mode RT</code>), the clean up steps that occur when you use the Oracle ADF Desktop Integration Designer toolbar menu button do not occur. Similarly, if you use it to switch to design mode (<code>-mode DT</code>), placeholder text that was present prior to publication is not reintroduced.</p>
-root	<p>Modify the value of a workbook's <code>WebAppRoot</code> property. This argument may be useful where you want to change the <code>WebAppRoot</code> property of multiple workbooks through a command-line script.</p> <p>Example usage:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -root http://myhost:8988/MyApp</pre> <p>The recommended method of changing a workbook's <code>WebAppRoot</code> property is through the property inspector for workbook properties in design mode or through the Edit Options dialog box when you switch a workbook to test mode.</p>
-view	<p>Use this argument to determine if a workbook has been converted for integration with Oracle ADF and, if so, identify the solution ID and customization version.</p> <p>Example usage:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -view</pre>
-wipe	<p>Remove the value of the <code>WebAppRoot</code> workbook property and the mode (design, test, or runtime) from a workbook that is integrated with Oracle ADF. When used in conjunction with the <code>detach</code> argument, this argument can be used to return a workbook to a known state.</p> <p>Example usage:</p> <pre>convert-adfdi-excel-solution.exe MyWorkbook.xlsx -wipe</pre>
-help	<p>Displays help information about the command-line arguments that the workbook conversion utility supports.</p>

D.2 Using the Workbook Administration Tool

Use the workbook administration tool to set values for a number of workbook properties, such as `WebAppRoot`, after you publish the finalized integrated Excel workbook. Use this tool if, for example, the URL of your Fusion web application changes after you publish the integrated Excel workbook.

You can also use it when you want to change workbook settings but cannot or do not want to set values for the HTTP filter as described in [Section E.2, "Configuring HTTP Filter Parameters"](#).

The workbook administration tool is a Java-based program that can be executed on operating systems that support the version of Java used by Oracle ADF. It also requires access to the `adf-desktop-integration-admin-tool.jar` file which is located in the following directory:

```
ADFDI_CLIENT\adfdi\lib
```

where `ADFDI_CLIENT` is the folder in which you set up the Oracle ADF Desktop Integration module as described in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#).

The other requirements for components or utilities in the Oracle ADF Desktop Integration module, as outlined in [Chapter 3, "Setting Up Your Development Environment"](#), do not apply to the workbook administration tool.

To change workbook settings using the workbook administration tool:

- Open a command window and execute the following command:

```
java -cp adf-desktop-integration-admin-tool.jar
oracle.adf.desktopintegration.admintool.WorkbookAdminTool <arg(s)>
```

where `<arg(s)>` is one or more of the required or optional arguments that are described in [Table D-2](#).

Table D-2 Command-line Options for the Workbook Administration Tool

Provide a value for this argument...	To...	Is a value for this argument required?
<code>-workbook</code>	Specify the directory path to the workbook to update.	Yes
<code>-root</code>	Set the value for this property to the fully qualified URL for the web application that you want to integrate your desktop application with.	No
<code>-mode</code>	Change the workbook mode to one of the following: <ul style="list-style-type: none"> RT where RT specifies runtime mode. DT where DT specifies design mode. TST where TST specifies test mode. For more information about workbook modes, see Section 5.1, "Introduction to the Development Tools" .	No
<code>-out</code>	Specify the directory path and file name for the output file.	Yes
<code>-quiet</code>	Specify this argument if you do not want to generate verbose output.	No
<code>-help</code>	Print help information.	No

The following command creates a copy of the workbook (`text.xlsx`) in runtime mode (RT) for a Fusion web application (`http://hostname:8988/FODADFBC`) and writes it to a directory with a new file name (`myresult.xlsx`):

```
java -cp adf-desktop-integration-admin-tool.jar
oracle.adf.desktopintegration.admintool.WorkbookAdminTool -workbook test.xlsx
-mode RT -root http://hostname:8988/FODADFBC -out myresult.xlsx
```

Desktop Integration Settings in the Web Application Deployment Descriptor

This appendix describes the values that you set for the Oracle ADF Desktop Integration module servlet (`adfdiRemote`) so that the Fusion web application can use it. The appendix also describes the values in the deployment descriptor file that determine the behavior of the HTTP filter that the Oracle ADF Desktop Integration module provides. Finally, it provides an extract from a deployment descriptor file that shows these values in use.

This appendix includes the following sections:

- [Section E.1, "Configuring the Oracle ADF Desktop Integration Module Servlet"](#)
- [Section E.2, "Configuring HTTP Filter Parameters"](#)
- [Section E.3, "Examples in a Deployment Descriptor File"](#)

Note: Adding Oracle ADF Desktop Integration and ADF Library Web Application Support to the technology scope of your desktop integration project automatically generates the entries in the `web.xml` file discussed in this appendix. For more information, see [Section 4.2, "Adding Oracle ADF Desktop Integration to a Fusion Web Application"](#).

E.1 Configuring the Oracle ADF Desktop Integration Module Servlet

The deployment descriptor file (`web.xml`) of the Fusion web application that you integrate Excel workbooks with must contain entries so that the Fusion web application can use the `adfdiRemote` servlet. The Excel workbooks that you integrate with a Fusion web application call this servlet to synchronize data with the Fusion web application. The `adf-desktop-integration.jar` file stores the servlet in the following directory:

```
ADFDI_CLIENT\adfdi\lib
```

where `ADFDI_CLIENT` is the folder in which you set up the Oracle ADF Desktop Integration module as described in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#).

By default, JDeveloper adds the HTTP filter to your Oracle ADF Desktop Integration project when you add Oracle ADF Desktop Integration to the technology scope of your project as described in [Section 4.2, "Adding Oracle ADF Desktop Integration to a Fusion Web Application"](#).

To configure the Oracle ADF Desktop Integration module servlet:

1. Locate the deployment descriptor file for your Oracle ADF Desktop Integration project.
Typically, this file is located in the `WEB-INF` folder of your project.
2. Enter the values as described in the following table to enable the `adfdiRemote` servlet on the Fusion web application.

For this property...	Enter this value...
Servlet name	<code>adfdiRemote</code>
Servlet class	<code>oracle.adf.desktopintegration.servlet.DIRemoteServlet</code>

3. Enter the values as described in the following table to add the HTTP filter to the `adfdiRemote` servlet.

This filter allows the Oracle ADF Desktop Integration module to access ADF Faces. The Oracle ADF Desktop Integration module requires access to ADF Faces if page definition files that are associated with integrated Excel worksheets make references to ADF Faces. Do not add this filter if your Fusion web application does not use ADF Faces.

For this property...	Enter this value...
Filter name	<code>adfBindings</code>
Servlet name	<code>adfdiRemote</code>

4. Enter the values as described in the following table to add a URL pattern for the `adfdiRemote` servlet in the Fusion web application. The value that you enter must match the value that you specify in the integrated Excel workbook for the `RemoteServletPath` workbook property. Note that values are case sensitive.

For this property...	Enter this value...
URL pattern	<code>/adfdiRemoteServlet</code>
Servlet name	<code>adfdiRemote</code>

5. Rebuild your Oracle ADF Desktop Integration project to apply the changes you made.

E.2 Configuring HTTP Filter Parameters

The Oracle ADF Desktop Integration includes a HTTP filter in the `adf-desktop-integration-admin-tool.jar` stored in the following directory:

```
ADFDI_CLIENT\adfdi\lib
```

where `ADFDI_CLIENT` is the folder in which you set up the Oracle ADF Desktop Integration module as described in [Section 3.7, "Using the Oracle ADF Desktop Integration Module on a Machine with Multiple Instances of JDeveloper"](#).

You configure an entry in the deployment descriptor file (`web.xml`) of your Fusion web application so that the application invokes the HTTP filter to make changes in an integrated Excel workbook prior to the integrated Excel workbook being downloaded by an end user from the Fusion web application. These changes make sure that the

integrated Excel workbook functions correctly when the end user opens it. The HTTP filter makes the following changes:

- **WebAppRoot**
Sets the value for this property to the fully qualified URL for the Fusion web application from which the end user downloads the integrated Excel workbook.
- **Workbook mode**
Changes the integrated Excel workbook mode to runtime mode in case the workbook was inadvertently left in design mode or test mode.

By default, JDeveloper adds the HTTP filter to your Oracle ADF Desktop Integration project when you add Oracle ADF Desktop Integration to the technology scope of your project as described in [Section 4.2, "Adding Oracle ADF Desktop Integration to a Fusion Web Application"](#).

To configure the HTTP filter:

1. Locate the deployment descriptor file (`web.xml`) for your Oracle ADF Desktop Integration project.
Typically, this file is located in the `WEB-INF` folder of your project.
2. Enter the values as described in the following table to create a new filter or configure them to modify the existing HTTP filter.

For this property...	Enter this value...
<code>filter-name</code>	<code>adfdiExcelDownload</code>
<code>filter-class</code>	<code>oracle.adf.desktopintegration.filter.DIExcelDownloadFilter</code>
<code>description</code>	(Optional) Enter a description of the filter.
<code>display-name</code>	(Optional) Enter a display name for the filter that appears in JDeveloper.

3. Add a filter mapping for integrated Excel workbooks that use the default file format (`.xlsx`) by entering values as described in the following table.

For this property...	Enter this value...
<code>filter-name</code>	<code>adfdiExcelDownload</code>
<code>url-pattern</code>	<code>*.xlsx</code>
<code>dispatcher</code>	No value is required for this property.
<code>servlet-name</code>	No value is required for this property.

4. Add a filter mapping for integrated Excel workbooks that use the macro-enabled workbook format (`.xlsm`) by entering values as described in the following table.

For this property...	Enter this value...
<code>filter-name</code>	<code>adfdiExcelDownload</code>
<code>url-pattern</code>	<code>*.xlsm</code>
<code>dispatcher</code>	No value is required for this property.
<code>servlet-name</code>	No value is required for this property.

5. Add a MIME type for integrated Excel workbooks that use the default file format (.xlsx) by entering values as described in the following table.

For this property...	Enter this value...
extension	*.xlsx
url-pattern	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet

6. Add a MIME type for integrated Excel workbooks that use the macro-enabled workbook format (.xlsm) by entering values as described in the following table.

For this property...	Enter this value...
extension	*.xlsm
url-pattern	application/vnd.ms-excel.sheet.macroEnabled.12

7. Rebuild your Oracle ADF Desktop Integration project to apply the changes you made.

E.3 Examples in a Deployment Descriptor File

The following extracts from the `web.xml` file of a Fusion web application with Oracle ADF Desktop Integration in its technology scope show the entries that you configure for a desktop integration project.

```
<filter>
<filter-name>adfBindings</filter-name>
<filter-class>oracle.adf.model.servlet.ADFBindingFilter</filter-class>
</filter>
<filter>
<filter-name>adfdiExcelDownload</filter-name>
<filter-class>oracle.adf.desktopintegration.filter.DIExcelDownloadFilter</filter-class>
</filter>
<filter-mapping>
<filter-name>adfBindings</filter-name>
<servlet-name>adfdiRemote</servlet-name>
</filter-mapping>
<filter-mapping>
<filter-name>adfdiExcelDownload</filter-name>
<url-pattern>*.xlsx</url-pattern>
</filter-mapping>
<filter-mapping>
<filter-name>adfdiExcelDownload</filter-name>
<url-pattern>*.xlsm</url-pattern>
</filter-mapping>
<servlet>
<servlet-name>adfdiRemote</servlet-name>
<servlet-class>oracle.adf.desktopintegration.servlet.DIRemoteServlet</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name>adfdiRemote</servlet-name>
<url-pattern>/adfdiRemoteServlet</url-pattern>
</servlet-mapping>
<mime-mapping>
```

```
<extension>xlsx</extension>
<mime-type>application/vnd.openxmlformats-officedocument.spreadsheetml.sheet</mime-
-type>
</mime-mapping>
<mime-mapping>
<extension>xlsm</extension>
<mime-type>application/vnd.ms-excel.sheet.macroEnabled.12</mime-type>
</mime-mapping>
```


String Keys in the Reserved Resource Bundle

This appendix describes the string keys in the reserved resource bundle that you can override.

[Table F-1](#) lists the string keys and their current English values. Create a resource bundle where you define the string keys in [Table F-1](#) and the values that you want to appear at runtime. For information about how to override the reserved resource bundle, see [Section 10.2.3, "How to Override the Reserved Resource Bundle"](#).

Table F-1 String Keys and Values in the Reserved Resource Bundle

Area where string key value appears at runtime	String key	English value in the Oracle ADF Desktop Integration module's reserved resource bundle	Comment
Upload Options	UPLOAD_OPTIONS_TITLE	Upload Options	
Upload Options	UPLOAD_OPTIONS_PROMPT	Specify options to use during the Upload operation	
Upload Options	UPLOAD_OPTIONS_CONTINUE_ON_FAIL_LABEL	On failure, continue to upload subsequent rows	
Upload Options	UPLOAD_OPTIONS_DOWNLOAD_AFTER_LABEL	Download all rows after successful upload	
Table.Download	DOWNLOAD_OVERWRITE_TITLE	Download	
Table.Download	DOWNLOAD_OVERWRITE_PROMPT	Do you wish to discard the pending changes?	
Table.Download	ROWLIMIT_WARNINGS_TITLE	Row Limit Exceeded	
Table.Initialize	INITIALIZE_OVERWRITE_TITLE	Initialize	
Table.Initialize	INITIALIZE_OVERWRITE_PROMPT	Do you wish to discard the pending changes?	
Workbook.ClearAllData	CLEARDATA_CONFIRM_TITLE	Clear All Data	
Workbook.ClearAllData	CLEARDATA_CONFIRM_PROMPT	This command will log you out of your current session and clear all the data from all worksheets in the workbook. Are you sure?	
Workbook.Logout	LOGOUT_STATUS_TITLE	Logout	
Workbook.Logout	LOGOUT_STATUS_PROMPT	You have been logged out from your current session.	
Table.Upload	COMPONENTS_TABLE_DYN_COLS_NOT_AVAIL_TITLE	Upload	
Table.Upload	COMPONENTS_TABLE_DYN_COLS_NOT_AVAIL_PROMPT	One or more dynamic columns is no longer available, do you wish to continue?	

Table F-1 (Cont.) String Keys and Values in the Reserved Resource Bundle

Area where string key value appears at runtime	String key	English value in the Oracle ADF Desktop Integration module's reserved resource bundle	Comment
Table Special Columns	COMPONENTS_TABLE_CHANGED_INDICATOR	\u25B2	An upward-facing triangle in many fonts.
Table Special Columns	COMPONENTS_TABLE_FLAGGED_INDICATOR	\u25BA	A right-facing triangle in many fonts.
Table status	UPLOAD_STATUS_NO_UPDATES	No updates detected	
Table status	TABLE_UPLOAD_RECORD_NOT_FOUND	Record not found	
Table status	TABLE_UPLOAD_CANNOT_INSERT_MORE_THAN_ONCE	Cannot insert record more than once	
Table status	TABLE_COMMIT_FAILED_1	See Error Detail {0}	{0} is a batch number
Table status	TABLE_COMMIT_FAILURE_DETAILS_2	Error Detail {0}:{1}	{0} is a batch number {1} is an error message
Table status	TABLE_UPLOAD_ROW_UPDATE_SUCCESS	Row updated successfully	
Table status	TABLE_UPLOAD_ROW_INSERT_SUCCESS	Row inserted successfully	
Table status	TABLE_UPLOAD_ROW_UPDATE_FAILURE	Update failed	
Table status	TABLE_UPLOAD_ROW_INSERT_FAILURE	Insert failed	
Table status	TABLE_DELETE_ROW_FAILURE	Delete failed	
Table status	MESSAGE_DETAILS_NONE	No error details available.	
Table status	MESSAGE_DETAILS_ROW_TITLE	Row Errors	
Table status	MESSAGE_DETAILS_ROW_PROMPT	Errors for this row:	
Table status	MESSAGE_DETAILS_TABLE_TITLE	Table Errors	
Table status	MESSAGE_DETAILS_TABLE_PROMPT	Error details for this table:	
Worksheet Errors	MESSAGE_DETAILS_HELP_LABEL	Click on each error to reveal additional information.	Appears in the error list.
Worksheet Errors	MESSAGE_DETAILS_WORKSHEET_TITLE	Worksheet Errors	
Worksheet Errors	MESSAGE_DETAILS_WORKSHEET_PROMPT	Error details for this worksheet:	
Worksheet Errors	MESSAGE_DETAILS_PARSE_FAILURE	A problem has occurred while retrieving the error details. The information is no longer available.	
Worksheet Errors	MESSAGE_LABEL_FAILED_1	{0} failed	{0} is a context label
Worksheet Errors	MESSAGE_LABEL_DEFAULT_CONTEXT	Action	
Workbook.Login	LOGIN_WINDOW_TITLE	Login	
Workbook.Login	LOGIN_CONFIRM_CONNECT_2	You are about to connect to the following application: \n{0}\nand\n{1}\n\nDo you want to connect?	{0} and {1} are the URLs the application uses

Table F-1 (Cont.) String Keys and Values in the Reserved Resource Bundle

Area where string key value appears at runtime	String key	English value in the Oracle ADF Desktop Integration module's reserved resource bundle	Comment
Workbook.EditOptions	SETTINGS_EDIT_TITLE	Edit Options	
Workbook.EditOptions	SETTINGS_EDIT_PROMPT	Enter a value for Web App Root. For example: 'http://localhost:1234/MyApp'.	
Workbook.EditOptions	SETTINGS_CONFIRM_TITLE	Web App Root	
Workbook.EditOptions	SETTINGS_CONFIRM_PROMPT	Changing the Web App Root will log you out of your current session and clear all the data from all worksheets in the workbook. Are you sure?	



Java Data Types Supported By Oracle ADF Desktop Integration

This appendix lists the Java data types that an Oracle ADF Desktop Integration project supports.

Primitive Java Types

- long
- int
- short
- boolean
- double
- float

Object Java Types

- java.lang.Long
- java.lang.Integer
- java.lang.Short
- java.lang.Boolean
- java.lang.String
- oracle.jbo.domain.Date
- oracle.jbo.domain.Timestamp
- oracle.jbo.domain.TimestampLTZ
- oracle.jbo.domain.TimestampTZ
- java.util.Date
- java.sql.Date
- java.sql.Time
- java.sql.Timestamp
- java.lang.Double
- java.lang.Float
- java.math.BigDecimal
- oracle.jbo.domain.RowID

-
- `oracle.jbo.domain.Number`

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