Oracle® Forms
Upgrading Oracle Forms 6i to Oracle Forms 11g
11g Release 1 (11.1.1)
E10394-02

October 2009
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Preface

Welcome! This manual describes:

- Features and functionality that have been removed from Forms Developer and Forms Services
- Information about upgrade events that automatically occur when you open or deploy a Forms 6i application in Oracle Forms 11g.
- Information about the Oracle Forms Migration Assistant, a tool to help you convert your applications.
- Information about steps that developers, system administrators, and DBAs need to take to upgrade Forms applications from Forms 6i to Oracle Forms 11g.

Intended Audience

This manual is intended for developers, system administrators, and DBAs who develop and deploy Oracle Forms applications.

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Related Documents

For more information, see the following manuals and online help:

- Oracle Fusion Middleware Release Notes for Linux x86
- Oracle Fusion Middleware Release Notes for Microsoft Windows
- Oracle Fusion Middleware Forms Services Deployment Guide
- Oracle Forms Developer Online Help, available from the Help menu in Oracle Forms Developer.

In addition, you will find white papers and other resources at http://www.oracle.com/technology/products/forms/.

Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><code>monospace</code></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
This chapter contains the following sections:

- Section 1.1, "Overview"
- Section 1.2, "About Upgrading Your Forms Applications to 11g (11.1.1)"
- Section 1.3, "Forms 10g Features Removed from Oracle Forms"
- Section 1.4, "Forms 6i Features Removed from Oracle Forms"
- Section 1.5, "Components of 6i Developer Product Suite Removed"
- Section 1.6, "How are Obsolete Item Types Handled when Upgrading Forms 6i Applications?"
- Section 1.7, "Are Tools Available to Assist with the Migration of Obsolete Features?"

1.1 Overview

Oracle Forms Builder and Oracle Forms Services have been upgraded to simplify the development and deployment of Forms applications on the Web. A number of features have been added. In restructuring the Oracle Forms product, some legacy features have been dropped or scaled back. The future of Forms includes improving the Java-based Web user interface and extending product “openness” by allowing Java integration on all three tiers.

1.2 About Upgrading Your Forms Applications to 11g (11.1.1)

To upgrade your Oracle Forms applications, open your Forms 6i source files (FMB, MMB, PLL, and so on) in the Oracle Forms 11g (11.1.1) Builder, save them, then compile them. You can also use the Oracle Forms Compiler to upgrade your Forms 6i applications.

You can use the Forms Migration Assistant to perform batch upgrades. For more information, see Chapter 2, "Using the Oracle Forms Migration Assistant".

**Note:** You must compile rp2rro.pll into rp2rro.plx if your Form depends on this library. rp2rro.pll can be found in ORACLE_HOME/forms/rp2rro.pll. The resulting plx should be in your FORMS_PATH.
1.3 Forms 10g Features Removed from Oracle Forms

The following features have been dropped from Oracle Forms 10g and later:

- Graphics Integration
- Chart Items

1.4 Forms 6i Features Removed from Oracle Forms

The following features have been dropped from Oracle Forms 9.0.2 and later:

- Client-server Runtime
- Character mode Runtime
- Various runform command line options
- Character mode properties and logical attributes
- Item types that are specific to operating systems
- Various Built-ins
- Various properties
- Various menu features including:
  - Character mode menu properties
  - Obsolete types from the Menu-Items command type property
  - Menu parameters
  - Menu Built-ins
  - Full screen menu style
  - Bar (Lotus) menu style
- Forms version 2 style triggers and list of values (LOVs)
- Graphics Chart Wizard

In addition, rules enforcing trigger usage have become stricter.

1.5 Components of 6i Developer Product Suite Removed

The following components have been removed.

<table>
<thead>
<tr>
<th>Table 1–1 Components Removed from the Developer Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obsolete Component</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Oracle Graphics</td>
</tr>
</tbody>
</table>
When you open a Forms application, obsolete item types are listed after the item-type poplist in the Property Palette. The property values for obsolete items are indicated as obsolete. For example, the property value for VBX would be "VBX Control (Obsolete)".

1.6 How are Obsolete Item Types Handled when Upgrading Forms 6i Applications?

When you open a Forms application, obsolete item types are listed after the item-type poplist in the Property Palette. The property values for obsolete items are indicated as obsolete. For example, the property value for VBX would be "VBX Control (Obsolete)".

**Note:** If you are upgrading from pre-6i you must upgrade to 10g and then to 11g. If you are upgrading from 6i or later, you can go directly to 11g. See Chapter 16, "Upgrading from Pre-Forms 6i Applications to Oracle Forms" for more information.

You can use the Oracle Forms Migration Assistant, described in Chapter 2, "Using the Oracle Forms Migration Assistant", to resolve many upgrade issues.
1.7 Are Tools Available to Assist with the Migration of Obsolete Features?

The Oracle Forms Migration Assistant is provided with Oracle Forms to help you upgrade your Forms 6i applications. See Chapter 2, "Using the Oracle Forms Migration Assistant" for details.
2.1 What Does the Oracle Forms Migration Assistant Do?

The Oracle Forms Migration Assistant updates obsolete usage in your PL/SQL code in order to upgrade your Forms 6i applications to Oracle Forms 11g. The tool issues warnings when it cannot make the required changes automatically. This tool has a command line and a wizard version. The Oracle Forms Migration Assistant does the following for all Forms module types (including object libraries and PL/SQL libraries):

- Updates PL/SQL code where possible, for example:
  - Updates RUN_PRODUCT to the RUN_REPORT_OBJECT built-in when used to call Reports.
  - Updates CHANGE_ALERT_MESSAGE to the SET_ALERT_PROPERTY built-in.
- Provides a list of obsolete code usage, including code that the tool cannot change when there is not a straight-forward equivalent for upgrade, for example:
  - Provides warnings when specific obsolete built-ins are used at run time, such as ITEM_ENABLED.

Note: The Oracle Forms Migration Assistant replaces built-ins and issues warnings about built-ins that exist within code comments.

- Provides warnings when obsolete functionality is encountered, such as when obsolete item types are included in the code.
- Provides warnings about triggers defined at incorrect levels.
- Replace simple one-for-one code strings such as OHOST to HOST, MENU_CLEAR_FIELD to CLEAR_ITEM, and MENU_FAILURE to FORM_FAILURE.
Performs more complex substitutions such as CHANGE_ALERT_MESSAGE to SET_ALERTPROPERTY built-in, DISABLE_ITEM to SET_MENU_ITEM_PROPERTY built-in, ITEM_ENABLED to GET_ITEM_PROPERTY built-in, and ENABLE_ITEM to SET_MENU_ITEM_PROPERTY built-in.

- Raises a warning in the Form module’s log if V2-style triggers are found.
- Raises a warning in the Form module’s log if built-ins related to obsolete object types are found such as VBX.FIRE_EVENT, VBX.GETPROPERTY, and VBX.GET_VALUE_PROPERTY.

You run the Oracle Forms Migration Assistant in batch mode. You can re-enter the utility as needed to run the upgrade process on a Forms application more than once. You can also use the wizard version of the Migration Assistant to upgrade multiple modules.

By editing the converter.properties file, you can set options before you start the batch migration. By editing the search_replace.properties file you can specify the strings that the Oracle Forms Migration Assistant searches for and replaces, and edit the warnings that are issued when an obsolete built-ins is encountered.

The tool creates a log file so that you can navigate to problem areas in the application and make modifications manually.

### 2.1.1 Multiple Log Support

The Forms Migration Assistant allows you either to write all log information into a single log file or span multiple log files. If the Forms Migration Assistant spans multiple log files, the Forms Migration Assistant generates individual log files for each module that is processed.

You must specify the directory in which the Forms Migration Assistant writes the log files. The name of the log file which is generated is `modulename_moduletype.log`.

For example, if you process a module by name, such as test.fmb, the name of the log file is `test_fmb.log`. If you select test.fmb and test.mmb for upgrade, the Forms Migration Wizard does not overwrite the log files. However, if you converted two modules test.fmb from two different directories, the log files are overwritten. The Forms Migration Assistant generates two log files: `test_fmb.log` and `test_mmb.log`.

### 2.2 Editing the converter.properties File

To change upgrade options, edit the converter.properties file in a text editor. You can set the following upgrade options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log File Name (default.logfilename)</td>
<td>Specifies the file name and location for log information.</td>
</tr>
</tbody>
</table>
2.3 Editing the search_replace.properties File

The search_replace.properties file contains the strings that the Oracle Forms Migration Assistant searches for and replaces. It also contains a list of obsolete built-ins that generate warnings.

2.3.1 Adding Search-and-Replace Strings

You can edit this file to add your own search-and-replace strings, as follows:

1. Open the search_replace.properties file in a text editor.
2. Go to the end of the list of search-and replace strings.
3. Add a string to search for and replace using the following syntax:

   
   SearchString|ReplaceString

4. Save the search_replace.properties file.

Reports Queue Table Installed
(default.usequeuetables)

When using web-based reports, these queue tables are used to monitor queued and processed reports. When used with the Oracle Forms Migration Assistant, the queue table provides detailed error messages when installed in the application schema. (For example, if a report cannot run due to uncompiled PL/SQL, you can use the queue table to query for full error messages.) The resulting report is automatically printed. See the Reports Services documentation for more information about the Reports Queue Table.

Reports Servlet Directory
(default.servletdir)

Specifies the name that has been defined for the virtual path used for the Reports Servlet, which is used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.

Reports Servlet Name
(default.servletname)

Specifies the name for the Reports Servlet used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.

Reports Server Host
(default.reports_servername)

The name or IP address of the system running the Reports Server. This setting is required when converting Run_Product calls to Run_Report_Object.

DESTYPE
(default.destype)

The type of destination device that receives the report output. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.

DESFORMAT
(default.desformat)

The printer driver to be used when DESTYPE is FILE. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.

DESNAME
(default.desname)

The name of the file, printer, e-mail ID, or distribution list to which the report output is sent. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.

Reports Server Host
(default.reportshost)

The name or IP address of the system running the Reports Server. This setting is required when converting Run_Product calls to Run_Report_Object.

Table 2–1 (Cont.) Oracle Forms Migration Assistant converter.properties File Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports Queue Table</td>
<td>When using web-based reports, these queue tables are used to monitor queued and processed reports. When used with the Oracle Forms Migration Assistant, the queue table provides detailed error messages when installed in the application schema. (For example, if a report cannot run due to uncompiled PL/SQL, you can use the queue table to query for full error messages.) The resulting report is automatically printed. See the Reports Services documentation for more information about the Reports Queue Table.</td>
</tr>
<tr>
<td>Installed</td>
<td></td>
</tr>
<tr>
<td>(default.usequeuetables)</td>
<td></td>
</tr>
<tr>
<td>Reports Servlet Directory</td>
<td>Specifies the name that has been defined for the virtual path used for the Reports Servlet, which is used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>(default.servletdir)</td>
<td></td>
</tr>
<tr>
<td>Reports Servlet Name</td>
<td>Specifies the name for the Reports Servlet used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>(default.servletname)</td>
<td></td>
</tr>
<tr>
<td>Reports Server Host</td>
<td>The name or IP address of the system running the Reports Server. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>(default.reports_servername)</td>
<td></td>
</tr>
<tr>
<td>DESTYPE</td>
<td>The type of destination device that receives the report output. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.</td>
</tr>
<tr>
<td>(default.destype)</td>
<td></td>
</tr>
<tr>
<td>DESFORMAT</td>
<td>The printer driver to be used when DESTYPE is FILE. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.</td>
</tr>
<tr>
<td>(default.desformat)</td>
<td></td>
</tr>
<tr>
<td>DESNAME</td>
<td>The name of the file, printer, e-mail ID, or distribution list to which the report output is sent. See the Oracle Fusion Middleware Reports Services Publishing Reports to the Web for details.</td>
</tr>
<tr>
<td>(default.desname)</td>
<td></td>
</tr>
<tr>
<td>Reports Server Host</td>
<td>The name or IP address of the system running the Reports Server. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>(default.reportshost)</td>
<td></td>
</tr>
</tbody>
</table>
2.3.2 Modifying Warnings for Obsolete Built-Ins

The warnings for built-ins have the following syntax:

```
<class>.Message=<WarningMessage>
<class>.Warning1=<BuiltIn1>
<class>.Warning2=<BuiltIn2>
<class>.Warning3=<BuiltIn3>
```

For example, for the class `obsoleteMenuParam`, the warnings are coded as follows:

```
obsoleteMenuParam.Message=Menu Parameters are no longer supported, the parameter and usage of %s should be replaced using a Forms parameter or global variable.
obsoleteMenuParam.Warning1=MENU_PARAMETER
obsoleteMenuParam.Warning2=QUERY_PARAMETER
obsoleteMenuParam.Warning3=TERMINATE
```

`<class>` is a group of built-ins that have a common warning, `<WarningMessage>` can contain one variable string (`%s`).

When the Oracle Forms Migration Assistant finds a built-in for which a warning should be issued, it logs the warning and replaces the variable string (`%s`) with the built-in name.

Classes included in the search_replace.properties file are:

- `obsoleteItemTypeBuiltIn`
- `obsoleteBuiltin`
- `obsoleteMenuParam`
- `obsoleteItemTypeConstantProp`
- `obsoleteConstantProp`
- `obsoleteConstant`
- `obsoleteHardCodedUserExit`
- `obsoleteComplexBuiltin`
- `DataParameterWithReports`
- `NoErrorOrWarningFromForms`

You can add more built-in warnings to an existing class, or create classes and warnings:

1. Open the search_replace.properties file in a text editor.
2. Go to the end of the list of warning messages.
3. Add a warning to an existing class or create classes and warnings using the syntax described.
4. Save the search_replace.properties file.

**Note:** Do not delete the last two commands in the search_replace.properties file.
2.4 Starting the Oracle Forms Migration Assistant

You should upgrade the common modules (such as OLB files) and Libraries (PLL files) that a Form relies upon and ensure that these are available in the FORMS_PATH, before running the migration assistant.

Note: For UNIX, an xterm display is required to run the Oracle Forms Migration Assistant.

Note: The forms\rp2rro.pll and forms\EnableDisableItem.pll files should be in the FORMS_PATH in order to convert RUN_PRODUCT to RUN_REPORT_OBJECT.

In UNIX, set the variable FORMS_PATH, such as
setenv FORMS_PATH $ORACLE_HOME/forms.

Table 2–2 Oracle Forms Migration Assistant Command Line Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>module (required in batch mode only)</td>
<td>Specifies the module to upgrade. The module name parameter can take only one value. For more information on upgrading multiple modules at a time, see &quot;Running the Wizard Version of the Forms Migration Assistant&quot;.</td>
</tr>
<tr>
<td>log (optional)</td>
<td>Specifies the log file to which the upgrade results are written. If not specified, the default values from the converter.properties file are used.</td>
</tr>
<tr>
<td>mode (optional)</td>
<td>This option has two values (batch and wizard). Use mode=batch to run the Migration Assistant in Batch mode, mode=wizard to run the wizard.</td>
</tr>
</tbody>
</table>

Information about the progress of the upgrade process is displayed on the screen. It is also saved to the log file that you specify in the converter.properties file. (To change upgrade options, see Editing the converter.properties File.)

Check the log file for information about required upgrade steps that the tool did not modify. Manually make these changes to your application.

2.4.1 About the Migration Assistant in Batch Mode

You can convert multiple applications by running the Forms Migration Assistant in batch mode from the command line. Batch mode is useful for converting multiple Forms applications. For example, on Windows, create a batch file (for example upgrade.bat) that contains the following:

```bash
for %%f in (%1) do frmplsqlconv module=%%f userid=<connect_string>
```

Then run the batch file as follows:

```bash
upgrade *.fmb
```

or

```bash
upgrade foo*.mmb
```

On UNIX, create a shell script (for example upgrade.sh) that contains the following:
for file in $*
do
    frmplsqlconv.sh module=$ff
done
Then run the shell script as follows:
or
    upgrade.sh foo*.mmb

2.4.2 Starting the Migration Assistant in Batch Mode

You can run the Migration Assistant in batch mode on Windows and UNIX computers.

2.4.2.1 Starting the Migration Assistant in batch mode in Windows

In a Command window, issue the following command:

```
frmplsqlconv mode=batch module=<filename> log=<logname>
```

where `<filename>` is the name of the file you want to convert, and `<logname>` is the name of the log file that is generated.

The Forms Migration Assistant looks for the file `test.fmb` in the `d:temp` directory and names the generated log file `test.log` and places it in the `d:temp` directory. You can give the log file any name you want and specify any location you want. By default the log file is written in `ORACLE_HOME\bin`. The module parameter can take only one value.

In the following example,
```
frmplsqlconv mode=batch module=d:\temp\test.fmb log=d:\temp\test.log
```
the output of the conversion is displayed on the screen. It is also saved to the default log file. Note that in batch mode, all converter options are taken from the `converter.properties` file. To change the converter options, see "Editing the `converter.properties` File".

2.4.2.2 Starting the Migration Assistant in Batch Mode in UNIX

In a UNIX shell, issue the following command:

```
frmplsqlconv.sh mode=batch module=<filename> log=<logname>
```

The output of the conversion is displayed on the screen. It is also saved to the default log file. Note that in batch mode, all converter options are taken from the `converter.properties` file. To change the converter options, see "Editing the `converter.properties` File".
2.4.3 Running the Wizard Version of the Forms Migration Assistant

You can run the wizard version of the Forms Migration Assistant and edit converter options.

2.4.3.1 Starting the Wizard Version of the Forms Migration Assistant

This section describes how to start the Forms Migration Assistant on Windows and UNIX computers.

1. On Windows computers, set the FORMS_PATH environment variable:

   SET FORMS_PATH=%ORACLE_HOME%\forms

   On UNIX computers, set the variable FORMS_PATH as in the following example:

   setenv FORMS_PATH $ORACLE_HOME/forms

2. On Windows computers, from the Start menu, select ORACLE_HOME \ Forms Developer \ Oracle Forms Migration Assistant (GUI Mode), or at the command line, start the conversion utility by entering: frmplsqlconv.bat mode=wizard.

   in UNIX, enter frmplsqlconv.sh mode=wizard.

   The Conversion Wizard Welcome dialog displays.

   Note: You can get help by typing -h after the command, for example, frmplsqlconv -h

3. Click Next.

4. In the Modules dialog, click the Add Module(s) button.

5. Select the modules that you want to convert.

6. Click Next.

7. In the Converter options dialog, enter the location and name of the log file that is generated. A browse button is provided to assist in choosing a location.

8. If you have Forms that include embedded reports, fill in the remaining fields. Otherwise, you may ignore these fields.

9. For more information about the Reports fields, see Oracle Fusion Middleware Reports Services Publishing Reports to the Web. For more information about advanced converter options, see the following section, "Setting Advanced Converter Options".

10. Click Next.

11. In the Finish dialog, the modules you selected are listed. Click Finish to start the conversion.

12. Progress displays in the Log window. (Log output is stored with the log file name(s) that you specify in the Options dialog. See the following section for information about setting options.)

13. Check the log file(s) for information about required conversion steps that the tool did not modify. Manually make these changes to your application.
2.4.3.2 Setting Advanced Converter Options

**Note:** For information about setting the search_replace.properties file, see "Editing the converter.properties File".

You can set conversion options before running the wizard:

1. In the **Converter options** dialog (step 2 of the wizard), click **Advanced Options**.

2. Converter properties display in the left column of the dialog. Edit the property values as needed, as described in Table 2–3,” **Converter Properties**: 

<table>
<thead>
<tr>
<th>Property Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Backup Warning</td>
<td>Determines whether the warning dialog displays to back up files when the application starts.</td>
</tr>
<tr>
<td>Log File Name</td>
<td>Specifies the log filename in Single Log mode.</td>
</tr>
<tr>
<td>Log Dir</td>
<td>The destination directory to write the log files in multilog mode</td>
</tr>
<tr>
<td>Reports Servlet Virtual Directory</td>
<td>Specifies the name that has been defined for the virtual path used to define the Reports Servlet, which is used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>Reports Servlet</td>
<td>Specifies the name for the Reports Servlet used for running reports on the web. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>Reports Server</td>
<td>The name or IP address of the system running the Reports Server. This setting is required when converting Run_Product calls to Run_Report_Object.</td>
</tr>
<tr>
<td>Default DESFORMAT</td>
<td>Printer driver to be used when DESTYPE is PRINTER (XML, HTML, HTMLCSS, PDF, RTF, delimited).</td>
</tr>
<tr>
<td>Default DESTYPE</td>
<td>Type of destination device that receives the report output (cache, printer, file).</td>
</tr>
<tr>
<td>Default DESNAME</td>
<td>Name of the file, printer, e-mail ID, or distribution list to which the report output is sent</td>
</tr>
<tr>
<td>Default Browser</td>
<td>For UNIX, the browser used to display help for the Migration Assistant. This setting is either netscape or iexplore. In Windows, the system default browser is used.</td>
</tr>
</tbody>
</table>

3. Click **OK** to save the configuration. The data is saved to the converter.properties file, and the settings you specify are used in the current and future sessions of the utility.
Because some properties are obsolete in Oracle Forms, you cannot directly convert Forms 6i FMTs and MMTs to Oracle Forms FMBs and MMBs using Forms Developer.

3.1 Converting a Forms 6i FMT to an Oracle Forms FMB

To convert a Forms 6i FMT or MMT to an Oracle Forms 11g FMB or MMB, do the following:

1. Use the Forms 6i Builder or Compiler to convert the Forms 6i FMT or MMT to a Forms 6i FMB or MMB.

2. Then, use Forms Developer to convert the Forms 6i FMB or MMB to an Oracle Forms FMB or MMB. Open the Forms 6i source files in the Oracle Forms Builder, save them, then recompile them; or use the Oracle Forms Compiler.
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, built-ins, constants, packages, and some syntax that are not applicable to Web deployment have been removed.

This chapter contains the following:

- Section 4.1, "Obsolete Menu Built-ins"
- Section 4.2, "Other Obsolete Built-ins"
- Section 4.3, "Obsolete Built-in Packages"
- Section 4.4, "Obsolete Constants"
- Section 4.5, "Obsolete Syntax"

### 4.1 Obsolete Menu Built-ins

Menus associated with full-screen display and character mode have been removed. Code that contains these built-ins are not compiled and should be recoded, although exceptions are mentioned in the following table. Built-ins that are equivalent to obsolete built-ins are also noted in the table.

<table>
<thead>
<tr>
<th>Obsolete Menu Built-in</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application_Menu</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>Application_Parameter</td>
<td>No upgrade path or replacement functionality. See Chapter 12, &quot;Menu Parameters&quot;.</td>
</tr>
<tr>
<td>Background_Menu&lt;n&gt;</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>Debug_Mode</td>
<td>No upgrade path or replacement functionality. Code containing this Built-in compiles but does not provide functionality.</td>
</tr>
<tr>
<td>Disable_Item</td>
<td>Use SET_MENU_ITEM_PROPERTY().</td>
</tr>
<tr>
<td>Enable_Item</td>
<td>Use SET_MENU_ITEM_PROPERTY().</td>
</tr>
<tr>
<td>Exit_Menu</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>Hide_Menu</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>Item_Enabled</td>
<td>Use GET_MENU_ITEM_PROPERTY(&lt;name&gt;, ENABLED). Item_Enabled works in Oracle Forms, but will be removed in a future release.</td>
</tr>
<tr>
<td>Main_Menu</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
</tbody>
</table>
### 4.2 Other Obsolete Built-ins

The following Built-ins have been removed. Code that contains these Built-ins does not compile and should be recoded, although exceptions are mentioned in the following table. Built-ins that are equivalent to the obsolete Built-ins are also noted in the table.

#### Table 4-2 Other Obsolete Built-ins

<table>
<thead>
<tr>
<th>Obsolete Built-in</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOCK_MENU</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>BREAK</td>
<td>Upgrade to DEBUG.SUSPEND.</td>
</tr>
<tr>
<td>CALL</td>
<td>Use CALL_FORM.</td>
</tr>
</tbody>
</table>
### Table 4–2 (Cont.) Other Obsolete Built-ins

<table>
<thead>
<tr>
<th>Obsolete Built-in</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGE_ALERT_MESSAGE</td>
<td>Use SET_ALERT_PROPERTY(..., ALERT_MESSAGE_TEXT,...);</td>
</tr>
<tr>
<td>DISPATCH_EVENT</td>
<td>Applied only to OLE and OCX items. Therefore, no upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>(FORMS_OLE.) ACTIVATE_SERVER</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>(FORMS_OLE.) CLOSE_SERVER</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) EXEC_VERB</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) FIND_OLE_VERB</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) GET_INTERFACE_POINTER</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) GET_VERB_COUNT</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) GET_VERB_NAME</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) INITIALIZE_CONTAINER</td>
<td></td>
</tr>
<tr>
<td>(FORMS_OLE.) SERVER_ACTIVE</td>
<td></td>
</tr>
<tr>
<td>MACRO</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>OHOST</td>
<td>Use HOST.</td>
</tr>
<tr>
<td>PLAY_SOUND</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>READ_SOUND_FILE</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>ROLLBACK_FORM</td>
<td>CLEAR_FORM(NO_COMMIT,FULL_ROLLBACK)</td>
</tr>
<tr>
<td>ROLLBACK_NR</td>
<td>CLEAR_FORM(NO_COMMIT,FULL_ROLLBACK)</td>
</tr>
<tr>
<td>ROLLBACK_RL</td>
<td>CLEAR_FORM(NO_COMMIT,FULL_ROLLBACK)</td>
</tr>
<tr>
<td>ROLLBACK_SV</td>
<td>CLEAR_FORM(NO_COMMIT,FULL_ROLLBACK)</td>
</tr>
<tr>
<td>RUN_PRODUCT</td>
<td>Valid only for integration with Oracle Graphics. Use RUN_REPORT_OBJECT for integration with Oracle Reports. For all other uses, code compiles but generates run-time errors.</td>
</tr>
<tr>
<td>UPDATE_CHART</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>VBX.FIRE_EVENT</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>VBX.GET_PROPERTY</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>VBX.GET_VALUE_PROPERTY</td>
<td></td>
</tr>
<tr>
<td>VBX.INVOKE_METHOD</td>
<td></td>
</tr>
<tr>
<td>VBX.SET_PROPERTY</td>
<td></td>
</tr>
<tr>
<td>VBX.SET_VALUE_PROPERTY</td>
<td></td>
</tr>
<tr>
<td>WRITE_SOUND_FILE</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
</tbody>
</table>
4.3 Obsolete Built-in Packages

The following Built-in packages have been removed. Code that contains these packages does not compile and should be recoded, although exceptions are mentioned in the following table. Packages that are equivalent to the obsolete packages are also noted in the table.

<table>
<thead>
<tr>
<th>Obsolete Package</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEBUG</td>
<td>No upgrade path or replacement functionality because there is a new debugger. DEBUG.ATTACH and DEBUG.SUSPEND are still supported.</td>
</tr>
<tr>
<td>PECS</td>
<td>No upgrade path. Use Forms Trace and Oracle Trace, which are documented in the book Oracle Fusion Middleware Forms Services Deployment Guide (Part No. E10240-02).</td>
</tr>
</tbody>
</table>

4.4 Obsolete Constants

The following constants used in the GET_ITEM_PROPERTY and SET_ITEM_PROPERTY Built-ins have been removed. Code that contains these constants does not compile and should be recoded, although exceptions are mentioned in the following table.

<table>
<thead>
<tr>
<th>Obsolete Constant</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE_FORMAT_COMPATIBILITY mode</td>
<td>Used by GET_APPLICATION and SET_APPLICATION properties. This constant is ignored.</td>
</tr>
<tr>
<td>COMPRESSION_OFF</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>COMPRESSION_ON</td>
<td></td>
</tr>
<tr>
<td>HIGHEST_SOUND_QUALITY</td>
<td></td>
</tr>
<tr>
<td>HIGH_SOUND_QUALITY</td>
<td></td>
</tr>
<tr>
<td>LOW_SOUND_QUALITY</td>
<td></td>
</tr>
<tr>
<td>LOWEST_SOUND_QUALITY</td>
<td></td>
</tr>
<tr>
<td>MEDIUM_SOUND_QUALITY</td>
<td></td>
</tr>
<tr>
<td>MONOPHONIC</td>
<td></td>
</tr>
<tr>
<td>ORIGINAL_QUALITY</td>
<td></td>
</tr>
<tr>
<td>ORIGINAL_SETTING</td>
<td></td>
</tr>
</tbody>
</table>
### 4.5 Obsolete Syntax

Using the ampersand (&) as a functional equivalent to `NAME_IN()` is now obsolete.
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, triggers that are not applicable to Web deployment have been removed. In addition, the functionality of some triggers is being more strictly enforced.

5.1 Obsolete Triggers

Table 5–1    Obsolete Triggers

<table>
<thead>
<tr>
<th>Obsolete Triggers</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON-DISPATCH-EVENT</td>
<td>Applies only to OLE and OCX items. Therefore, no upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>All V2-style triggers</td>
<td>When you open FMBs that contain V2-style triggers, the triggers are dropped and a warning message lists the names of the dropped triggers. You should recode V2-style triggers into PL/SQL in Forms 6i, before upgrading to this release.</td>
</tr>
<tr>
<td>When-Mouse-Move/When-Mouse-Enter/When-Mouse-Leave Triggers</td>
<td>These triggers are ignored when running on the Web due to the amount of network traffic that would be generated.</td>
</tr>
</tbody>
</table>

5.2 Stricter Enforcement of Triggers

The use of the following triggers is more strictly enforced. These triggers do not execute if they are used incorrectly.

Table 5–2    Triggers with Restricted Usage

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Restricted Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEN-CLEAR-BLOCK</td>
<td>Allowed at the Block and Form level only. No longer allowed at the Item level.</td>
</tr>
<tr>
<td>WHEN-CREATE-RECORD</td>
<td></td>
</tr>
<tr>
<td>WHEN-DATABASE-RECORD</td>
<td></td>
</tr>
<tr>
<td>WHEN-NEW-RECORD-INSTANCE</td>
<td></td>
</tr>
<tr>
<td>WHEN-REMOVE-RECORD</td>
<td></td>
</tr>
<tr>
<td>WHEN-NEW-FORM-INSTANCE</td>
<td>Allowed at the Form level only. No longer allowed at the Block and Item level.</td>
</tr>
</tbody>
</table>
Stricter Enforcement of Triggers
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, properties that are not applicable to Web deployment have been removed.

### 6.1 Obsolete Properties

Many properties, including those associated with character mode and menus, have been removed. When you open a form that contains these properties, the properties are ignored and do not appear in Oracle Forms. Except as noted, code that attempts to use these properties at run time fails. Refer to Table 6–1, "Obsolete Properties" for more information.

#### Table 6–1 Obsolete Properties

<table>
<thead>
<tr>
<th>Obsolete Property</th>
<th>Applies to</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character Mode Logical Attribute</td>
<td>items, canvases, and so on.</td>
<td>Note: This property is partially obsolete. The only valid values are Null, PL/SQL, and Menu.</td>
</tr>
<tr>
<td>Command Type</td>
<td>menu items</td>
<td>If your menu module uses Plus, Form, or Macro, which are no longer valid values, the values are replaced by the following PL/SQL code in the Command Text property: Plus: /* HOST('sqlplus &lt;old_code&gt;'); <em>/ null; Form: /</em> CALL_FORM(&lt;old_code&gt;); <em>/ null; Macro: /</em> MACRO: &lt;old_code&gt; ; */ null; where &lt;old_code&gt; is the value of the Command Text property before upgrade. The replacement PL/SQL code is commented out so that you can replace the original code with new PL/SQL code.</td>
</tr>
<tr>
<td>Data Block Description</td>
<td>blocks</td>
<td>Use a format mask with the relevant number of placeholders to limit or control the length of data entered for an item.</td>
</tr>
<tr>
<td>Fixed Length</td>
<td>items</td>
<td></td>
</tr>
<tr>
<td>Help Description</td>
<td>menu items</td>
<td></td>
</tr>
<tr>
<td>Listed in Data Block Menu</td>
<td>blocks</td>
<td></td>
</tr>
</tbody>
</table>
### Obsolete Properties

<table>
<thead>
<tr>
<th>Obsolete Property</th>
<th>Applies to</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>List Type</td>
<td>LOVs</td>
<td>Because all LOVs are now based on record groups, this property is obsolete.</td>
</tr>
<tr>
<td>Menu Source</td>
<td>forms</td>
<td>A value of Database is no longer valid.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>File is the only valid value for this property, which indicates that at run</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time, Forms uses the normal search path to locate the MMX file.</td>
</tr>
<tr>
<td>Runtime Compatibility</td>
<td>forms</td>
<td>Ignored at runtime. 5.0 behavior is always used.</td>
</tr>
<tr>
<td>Mode</td>
<td></td>
<td>(See the Forms Developer online help for a description of run-time behavior.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To allow WHEN-VALIDATE-ITEM to run for NULL items, specify 4.5 for the DEFER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REQUIRED_ENFORCEMENT property.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(If your Forms application used &quot;4.5&quot; as the Runtime Compatibility Mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>property setting, the Oracle Forms Migration Assistant automatically sets the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defer Required Enforcement property to &quot;4.5&quot;.)</td>
</tr>
<tr>
<td>Trigger Style</td>
<td>triggers</td>
<td>All triggers are now PL/SQL triggers.</td>
</tr>
<tr>
<td>White on Black</td>
<td>items, canvases, and so on.</td>
<td></td>
</tr>
</tbody>
</table>
Changes to Client/Server Deployment and Forms Runtime

This section contains the following:

- Section 7.1, "Overview"
- Section 7.2, "Effect on Forms Development"
- Section 7.3, "Obsolete Forms Runtime Command Line Options"
- Section 7.4, "Obsolete Character Mode Runtime"

7.1 Overview

Client/server runtime is obsolete in Forms Developer and Forms Services.

When you use Forms Developer, part of the upgrade process is to upgrade your Forms applications for Web-based deployment.

See Chapter 15, "Upgrading Client/Server Applications to the Web" for information about how client/server deployment differs from Web-based deployment.

7.2 Effect on Forms Development

The obsolescence of client/server deployment has little to no effect on the development and debugging of Forms applications. You can still run your code in Forms Developer without having to deploy on the Web first. Use the one-button-run facility, which renders a true WYSIWYG representation of a Web-deployed form.

The PL/SQL debugger has been improved to allow debugging in a three-tier environment.

7.3 Obsolete Forms Runtime Command Line Options

The following command line options for Runform have been removed because they relate to obsolete features:

- OptimizeSQL
- OptimizeTP
- Keyin
- Keyout
- Output_file

Changes to Client/Server Deployment and Forms Runtime
- Interactive
- Block_menu
- Statistics

7.4 Obsolete Character Mode Runtime

Character mode runtime, which was only available on UNIX and VMS platforms, is no longer available. All character mode support has been removed from Forms Developer and Forms Services. See Chapter 6, "Properties" and Chapter 9, "Logical and GUI Attributes" for more information.
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, item types that are not applicable to Web deployment have been removed.

8.1 Obsolete Item Types

The following item types are obsolete in Forms Developer and Forms Services.

<table>
<thead>
<tr>
<th>Item Type</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart Item</td>
<td>No upgrade path or replacement functionality.</td>
</tr>
</tbody>
</table>

8.2 Item Types Specific to Operating Systems

The following item types are specific to operating systems and are obsolete in Forms Developer and Forms Services. These items are not removed by the upgrade process. However, any modules that contain them do not compile. Use JavaBeans and Pluggable Java Components for equivalent functionality.

<table>
<thead>
<tr>
<th>Item Type</th>
<th>Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBX</td>
<td>Was applicable to 16-bit Windows platforms only. No upgrade path or replacement functionality.</td>
</tr>
<tr>
<td>OLE Container</td>
<td>Was applicable to Windows platforms only. Programmatic OLE interaction is supported with external OLE servers on the middle tier.</td>
</tr>
<tr>
<td>OCX/ActiveX Controls</td>
<td>Was applicable to Windows platforms only. JavaBean support provides similar functionality.</td>
</tr>
<tr>
<td>Sound</td>
<td>No upgrade path. JavaBeans provide equivalent functionality.</td>
</tr>
</tbody>
</table>
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, logical and GUI attributes that are not applicable to Web deployment have been removed.

### 9.1 Use Visual Attributes to Replace Logical and GUI Attributes

For Web-deployed forms, you can use Visual Attributes in place of logical and GUI attributes to define the appearance of dynamic items.

### 9.2 Obsolete Logical and GUI Attributes

Replace any references to the following obsolete logical and GUI attributes in SET_ITEM_PROPERTY, SET_FIELD, or DISPLAY_ITEM with an equivalent Visual Attribute.

**Table 9–1 Obsolete Logical and GUI Attributes**

<table>
<thead>
<tr>
<th>Obsolete Attribute</th>
<th>Where Used and Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Alert text.</td>
</tr>
<tr>
<td>AlertBackground</td>
<td>Alert background.</td>
</tr>
<tr>
<td>AlertIcon</td>
<td>Icon in an alert window.</td>
</tr>
<tr>
<td>AlertMessage</td>
<td>Message text in an alert window.</td>
</tr>
<tr>
<td>Boilerplate</td>
<td>Constant text.</td>
</tr>
<tr>
<td>Bold</td>
<td>Bold for all items (including check boxes).</td>
</tr>
<tr>
<td>Bold-inverse</td>
<td>Inverse bold for all items.</td>
</tr>
<tr>
<td>Bold-text</td>
<td>Boilerplate.</td>
</tr>
<tr>
<td>Button-current</td>
<td>Current button.</td>
</tr>
<tr>
<td>Button-non-current</td>
<td>Non-current button.</td>
</tr>
<tr>
<td>Field-current</td>
<td>Color for current text item.</td>
</tr>
<tr>
<td>Field-non-current</td>
<td>Color for text item that is not currently selected.</td>
</tr>
<tr>
<td>Field-Queryable</td>
<td>Queryable field in Enter-Query mode.</td>
</tr>
<tr>
<td>Field-selected-current</td>
<td>Currently selected text item.</td>
</tr>
<tr>
<td>Field-selected-non-current</td>
<td>Text item that is not currently selected.</td>
</tr>
<tr>
<td>Full-screen-title</td>
<td>Screen title.</td>
</tr>
</tbody>
</table>
### Table 9–1 (Cont.) Obsolete Logical and GUI Attributes

<table>
<thead>
<tr>
<th>Obsolete Attribute</th>
<th>Where Used and Upgrade Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ItemQueryDisabled</td>
<td>When a Block goes into Enter-Query Mode, any non-queryable items inherit this set of attributes.</td>
</tr>
<tr>
<td>ListItemNonSelect</td>
<td>Unselected item in a text list.</td>
</tr>
<tr>
<td>ListItemSelect</td>
<td>Selected item in a text list.</td>
</tr>
<tr>
<td>ListPrefix</td>
<td>List prefix.</td>
</tr>
<tr>
<td>ListTitle</td>
<td>List of Values (LOV) title.</td>
</tr>
<tr>
<td>Menu</td>
<td>Selected menu.</td>
</tr>
<tr>
<td>Menu-bottom-title</td>
<td>Current title at bottom of menu.</td>
</tr>
<tr>
<td>MenuItemDisabled</td>
<td>Disabled menu item.</td>
</tr>
<tr>
<td>MenuItemDisableMnemonic</td>
<td>Mnemonic of a disabled menu item.</td>
</tr>
<tr>
<td>MenuItemEnable</td>
<td>Enabled, non-current menu item.</td>
</tr>
<tr>
<td>MenuItemEnableMnemonic</td>
<td>Mnemonic of an enabled menu item.</td>
</tr>
<tr>
<td>MenuItemSelect</td>
<td>Current menu item.</td>
</tr>
<tr>
<td>MenuItemSelectMnemonic</td>
<td>Mnemonic of the current menu item.</td>
</tr>
<tr>
<td>Menu-subtitle</td>
<td>Current menu subtitle.</td>
</tr>
<tr>
<td>Menu-title</td>
<td>Current menu title.</td>
</tr>
<tr>
<td>Normal</td>
<td>Text item.</td>
</tr>
<tr>
<td>NormalAttribute</td>
<td>Normal background for windows.</td>
</tr>
<tr>
<td>PushButtonDefault</td>
<td>Default or current button.</td>
</tr>
<tr>
<td>PushButtonNonDefault</td>
<td>Button that is not default.</td>
</tr>
<tr>
<td>Scroll-bar-fill</td>
<td>Elevator box on scroll bar.</td>
</tr>
<tr>
<td>Bold-inverse-underline</td>
<td>These logical attributes are not unique to Forms Developer. As a result, these logical attributes can be overridden by the visual attributes defined by the window manager.</td>
</tr>
<tr>
<td>Status-Empty</td>
<td>Controls the look of the empty Status Line.</td>
</tr>
<tr>
<td>Status-Hint</td>
<td>Controls the font of any item hint appearing on the Status Line.</td>
</tr>
<tr>
<td>Status-Items</td>
<td>Controls the look of the Operator Information Area which contains the LOV lamp, record count, and so on.</td>
</tr>
<tr>
<td>Status-Message</td>
<td>Controls the font of any message appearing on the Status Line.</td>
</tr>
<tr>
<td>Sub-menu</td>
<td>Selected submenu.</td>
</tr>
<tr>
<td>TextControlCurrent</td>
<td>Current field or text editor.</td>
</tr>
<tr>
<td>TextControlFailValidation</td>
<td>When an item fails a validation check, it is set to this attribute set.</td>
</tr>
<tr>
<td>TextControlNonCurrent</td>
<td>Disabled or non-current field or text editor.</td>
</tr>
<tr>
<td>TextControlSelect</td>
<td>Selected text in an enabled field or text editor.</td>
</tr>
<tr>
<td>ToolkitCurrent</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>Obsolete Attribute</td>
<td>Where Used and Upgrade Notes</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>ToolkitCurrentMnemonic</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>ToolkitDisabled</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>ToolkitDisabledMnemonic</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>ToolkitEnabled</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>ToolkitEnabledMnemonic</td>
<td>Generic attribute.</td>
</tr>
<tr>
<td>Underline</td>
<td>Underline for all items.</td>
</tr>
<tr>
<td>WindowTitleCurrent</td>
<td>Title of active window.</td>
</tr>
</tbody>
</table>
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, List of Values (LOVs) that are not applicable to Web deployment have been removed.

10.1 Obsolete List of Values (LOVs)

LOVs based on record groups are still valid. However, "Old-style" LOVs (V2.3-style LOVs) are obsolete in Oracle Forms.

When forms that contain old-style LOVs are upgraded to Forms Developer, the old-style LOVs' Old LOV Text property, which refers to a table and column (such as EMP.ENAME), is converted to a "new-style" LOV by creating a record group based on a query (select <column> from <table>). The new-style LOV is based on the new record group.
As a result of removing old-style (V2) triggers, V2 user exits have also been removed.

11.1 Obsolete V2 User Exits

The following user exits, which are hard-coded callbacks to V2 trigger functionality, have been removed. It is now assumed that any calls to these user exits is calling a user-defined user exit rather than a built-in one. Therefore, any code that attempts to locate them is directed to the user exit with the same name in the IAPXTB structure. (IAPXTB is a file that acts as an index to locate each of the user exits that you create at runtime.)

You should recode any code that uses these callbacks to PL/SQL:

- COPY
- ERASE
- HOST
- EXEMACRO
- EZ_GOREC
- EZ_CHKREC
In order to streamline the tools available and simplify the development process for building Forms applications for the Web, menu parameters, which are not applicable to Web deployment, have been removed.

All menu parameters are removed from your applications when you upgrade to Oracle Forms.

12.1 Predefined Menu Parameters

Predefined menu parameters have names like UN and PW. Using predefined menu parameters, you were able to refer to bind variables, for example, :UN and :PW in PL/SQL code attached to menu items.

When upgrading from previous versions of Forms, use the recommended built-ins as replacements for the obsolete predefined menu parameters in the following table:

<table>
<thead>
<tr>
<th>Obsolete Parameter</th>
<th>Recommended Built-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>:UN</td>
<td>GET_APPLICATIONPROPERTY(USERNAME)</td>
</tr>
<tr>
<td>:PW</td>
<td>GET_APPLICATIONPROPERTY(PASSWORD)</td>
</tr>
<tr>
<td>:LN</td>
<td>GET_APPLICATIONPROPERTY(USER_NLS_LANG)</td>
</tr>
<tr>
<td>:AD</td>
<td>GET_FORMPROPERTY(NAME_IN('SYSTEM.CURRENT_FORM'),FILE_NAME)</td>
</tr>
<tr>
<td>:SO</td>
<td>:SYSTEM.TRIGGER_MENUOPTION</td>
</tr>
<tr>
<td>:TT</td>
<td>Only relevant in a character mode environment. This parameter has no replacement.</td>
</tr>
</tbody>
</table>

12.2 User-Defined Menu Parameters

User-defined menu parameters are obsolete for Oracle Forms. Any menu item that calls the MENU_PARAMETER or APPLICATION_PARAMETER built-ins allowed you to define values for menu parameters.

At runtime, an un-customizable Query Parameters dialog box would let you inspect or change the values of menu parameters. Built-ins associated with Query Parameter dialogs, such as TERMINATE, are obsolete as well. See Chapter 4, "Built-ins, Packages, Constants, and Syntax" for more information.
Therefore, to replace obsolete user-defined parameters, manually redefine them as Global variables (:GLOBAL). The initial value property of parameters can be emulated by initializing your replacement Global variables in your Menu startup code.

For other features, such as the dialog box that pops up using the MENU_PARAMETER built-in, there is no replacement functionality, although you can emulate this functionality by building a dialog using Forms.
This chapter describes upgrade steps to take if your Forms applications use Java-related components.

13.1 Using oracle.ewt Classes in Pluggable Java Components

Pluggable Java Components (PJC)s and JavaBeans use classes that are part of the oracle.ewt framework. The sample PJC's and JavaBeans provided by Oracle are re-coded to use Swing classes or oracle.ewt classes. When upgrading to Oracle Forms, there are steps you must take to ensure equivalent functionality.

- The Oracle Forms Jar files (frmall.jar and frmall_jinit.jar) contain only the EWT classes that are required by the Forms Java Client. Therefore, PJC's that had been used with Forms 6i may fail at runtime in Oracle Forms because the classes that were available in Forms 6i can no longer be located. Missing oracle.ewt classes are available in ewt.jar, which is supplied with Oracle JDeveloper.

- Because of security constraints related to Java 1.3 and later (Oracle Forms 11g uses Java 1.6), you must re-sign all of the classes (including the Forms classes) with your own certificate. Java 1.3 requires that all classes from the same package be signed with the same certificate. Therefore, to use extra classes from ewt.jar in combination with frmall.jar, you must re-sign all of the classes with your own certificate.

13.2 JDK Versions and Font-Rendering Issues

When upgrading Forms applications from JDK 1.1 to JDK 1.3 or higher, you may encounter font height changes. This is because the code that renders fonts underwent significant changes from JDK 1.1 to JDK 1.3. As a result of these changes, the font height for logical fonts of the same size increased in JDK 1.3. For example, a dialog font of size 12 points has a height of 15 points in JDK 1.1 and a height of 17 points in JDK 1.3.

In Forms applications, the font size changes may affect labels, which can overlap text fields. One possible workaround is to set the following applet parameter to "yes":

```xml
<PARAM NAME = "mapFonts" VALUE = "yes" />
```

After making this change, check the appearance of the font size to be sure it is acceptable. Modify the form if this workaround does not provide acceptable font sizes. See the Oracle Fusion Middleware Forms Services Deployment Guide for details.

Another workaround is that when the font is unspecified, the default font name and size in Registry.dat is used. The default font in registry.dat is Dialog with a default size of 900. The size of this font can be modified to a smaller value in the registry.dat file. In
cases where the font is not specified, you can work around the problem without modifying the form. However, use caution because it modifies the font size for the entire application.
Integration with Oracle Reports

This chapter contains the following:

- Section 14.1, "Overview"
- Section 14.2, "About Integration with Oracle Reports"

14.1 Overview

Oracle Graphics6i is no longer shipped with Oracle Forms versions 9.0.2 and higher. In addition, the Charting wizard has been removed from Forms. From 11g onwards, the run-time integration of Graphics has also been removed. This chapter describes how you can call existing Reports applications from a form.

14.2 About Integration with Oracle Reports

You can embed new and existing Reports applications in forms that have been upgraded to Oracle Forms.

You can no longer use the Reports client run-time engine to output Reports in the Web. From Forms 5.0 forward, the RUN_REPORT_OBJECT built-in is available in Forms Developer to run integrated reporting in Forms. Using RUN_PRODUCT in Oracle Forms to run integrated Oracle Reports is no longer supported in this release. In 11g, the use of this built-in results in a compilation error.

Oracle Forms and Oracle Reports versions 9.0.2 and higher are now Web-based only, and do not have client/server run-time engines. Therefore, integrated reports in Oracle Forms applications must be recoded to use the RUN_REPORT_OBJECT Built-in and Oracle Fusion Middleware Reports Services.

For additional information about integrating Oracle Forms with Reports, see Integrating OracleAS Reports in OracleAS Forms at the Oracle Technology Network at http://www.oracle.com/technology/products/forms/.

14.2.1 Displaying Reports in Oracle Forms

If your form contains embedded Oracle Reports applications, you can upgrade the form to Oracle Forms by changing the integrated call to Oracle Reports to use:

- RUN_REPORT_OBJECT built-in (Do not use the RUN_PRODUCT built-in to call Reports.)
- WEB.SHOW_DOCUMENT built-in

Using RUN_PRODUCT in Oracle Forms to run integrated Oracle Reports is no longer supported in this release. In 11g, the use of this built-in results in a compilation error.
The Migration Assistant is provided to help you upgrade your applications to use RUN_REPORT_OBJECT. See Chapter 2, "Using the Oracle Forms Migration Assistant" for more information.

14.2.2 Example

The following example runs a report using the RUN_REPORT_OBJECT Built-in. The report_object node defined in Oracle Forms is assumed to be "report_node1". A user-defined Reports parameter "p_deptno" is passed by Forms using the value in the "dept.deptno" field. The Reports parameter form is suppressed. For additional details about the logic used in this example, see Notes About the Example.

/* The following example runs a report using the RUN_REPORT_OBJECT Built-in. The report_object node defined in Forms Developer is assumed to be "report_node1". A user-defined Reports parameter 'p_deptno' is passed by Forms using the value in the 'dept.deptno' field. The Reports parameter form is suppressed */

DECLARE
  v_report_id Report_Object;
  vc_report_job_id  VARCHAR2(100); /* unique id for each Report request */
  vc_rep_status      VARCHAR2(100); /* status of the Report job */
BEGIN
  /* Get a handle to the Report Object itself. */
  v_report_id:= FIND_REPORT_OBJECT('report_node1');
  SET_REPORT_OBJECTPROPERTY(v_report_id,REPORT_COMM_MODE, SYNCHRONOUS);
  SET_REPORT_OBJECTPROPERTY(v_report_id,REPORT_DESTYPE,CACHE);

  /* Define the Report output format and the name of the Reports Server as well as a user-defined parameter, passing the department number from Forms to the Report. The Reports parameter form is suppressed by setting paramform to "no". */
  SET_REPORT_OBJECTPROPERTY(v_report_id,REPORT_DESFORMAT, '<HTML|HTMLCSS|PDF|RTF|XML|DELIMITED>');
  /* replace <ReportServerTnsName> with the name of the Reports Services as defined in your tnsnames.ora file */
  SET_REPORT_OBJECTPROPERTY(v_report_id,REPORT_SERVER, '<ReportServerTnsName>');
  SET_REPORT_OBJECTPROPERTY(v_report_id,REPORT_OTHER, 'p_deptno='||:dept.deptno||'paramform=no');

  /* finally, run the report and retrieve the Reports job_id as a handle to the Reports process */
  vc_report_job_id:=RUN_REPORT_OBJECT(report_id);

  /*The report output is not delivered automatically to the client, which is okay because the Web is a request model. Thus the next step is to check if the report finished. */
  vc_rep_status := REPORT_OBJECT_STATUS(vc_report_job_id);
  IF vc_rep_status='FINISHED' THEN
    /* Call the Report output to be displayed in a separate browser window. The URL for relative addressing is only valid when the Reports Server is on the same host as the Forms Server. For accessing a Remote Reports Server on a different machine, you must use the prefix http://hostname:port */
    web.show_document ('/<virtual path>/<reports cgi or servlet name>/getjobid='||vc_report_job_id || '?server='|| '<ReportServerTnsName>','_blank');
  ELSE
    message ('Report failed with error message '||rep_status);
  END IF;
END;
14.2.3 Notes About the Example

- Calling a report synchronously makes the user wait while the report gets processed on the server. For long-running Reports, it is recommended that you start the report asynchronously, by setting the REPORT_COMM_MODE property to asynchronous and the REPORT_EXECUTION_MODE to batch.

  `SET_REPORT_OBJECT_PROPERTY(report_id, REPORT_EXECUTION_MODE, BATCH);`

  `SET_REPORT_OBJECT_PROPERTY(report_id, REPORT_COMM_MODE, ASYNCHRONOUS);`

- After calling the RUN_REPORT_OBJECT Built-in, you must create a timer to run frequent checks on the current REPORT_OBJECT_STATUS using a When-Timer-Expired trigger. For performance reasons, the timer should not fire more than four times a minute. After the report is generated, the When-Timer-Expired trigger calls the WEB.SHOW_DOCUMENT Built-in to load the Reports output file, identified by a unique job_id, to the client's browser.

  `vc_rep_status:= REPORT_OBJECT_STATUS(:global.vc_report_job_id);`

  `IF vc_rep_status='FINISHED' THEN`

  `web.show_document ('/<virtual path>/<reports cgi or servlet name>/getjobid='||vc_report_job_id ||'?server='|| '<ReportServerTnsName>','_blank');`

  `ELSIF vc_rep_status not in ('RUNNING','OPENING_REPORT','ENQUEUED') THEN`

  `message (vc_rep_status||'  Report output aborted');`

  `END IF;`

The following example shows the When-Timer-Expired trigger that checks for the Report_Object_Status.

```
/* :global.vc_report_job_id needs to be global because the information about
the Report job_id is shared between the trigger code that starts the Report
and the When-Trigger-Expired trigger that checks the current Report status. */
vc_rep_status:= REPORT_OBJECT_STATUS(:global.vc_report_job_id);
IF vc_rep_status='FINISHED' THEN
    web.show_document ('/<virtual path>/<reports cgi or servlet name>/getjobid='||
                     vc_report_job_id ||'?server='|| '<ReportServerTnsName>','_blank');
ELSIF vc_rep_status not in ('RUNNING','OPENING_REPORT','ENQUEUED') THEN
    message (vc_rep_status||'  Report output aborted');
END IF;
```

14.2.4 Using Parameter Lists in RUN_REPORT_OBJECT

Parameter lists that were used with RUN_PRODUCT in client/server mode can also be used with RUN_REPORT_OBJECT calling Oracle Fusion Middleware Reports Services. System parameters must be set by the Set_Report_Object_Property. The syntax for using parameter lists in RUN_REPORT_OBJECT is as follows:

```
report_job_id:=run_report_object(report_id,paramlist_id);
```

where paramlist_id is the same id used with RUN_PRODUCT.

Parameter settings can be any of the following:

- **REPORT_COMM_MODE**: Batch, Runtime
- **REPORT_EXECUTION_MODE**: Synchronous, Asynchronous
- **REPORT_DESTYPE**: FILE, PRINTER, MAIL, CACHE, PREVIEW, FTP, FAX, WEBDAV, ORACLEPORTAL, ORACLEWIRELESS, SECUREPDF, BLOBDESTINATION
- **REPORT_FILENAME**: The report filename (not used with CACHE)

---

**Note:** Do not forget to delete the timer when it is no longer needed.
About Integration with Oracle Reports

- REPORT_DESNAME: The report destination name (not used with Cache)
- REPORT_DESFORMAT: The report destination format
- REPORT_SERVER: The report server name

Other settings are as follows:
- Reports CGI name is "rwcgi.sh" (UNIX) and "rwcgi.exe" (Windows)
- Reports Servlet default name is "rwservlet"
- Reports Servlet virtual path is /reports/

14.2.5 Upgrade Steps

You can use the Forms Migration Assistant described in Chapter 2, "Using the Oracle Forms Migration Assistant" to change integrated Reports calls in your Oracle Forms modules. The Migration Assistant adds code to your application modules that redirects Run_Product calls to Reports and uses the Run_Report_Object Built-in and Reports Services. The resulting conversion is of the same quality as using Run_Product and the run-time engine in Forms 6i.

To manually upgrade Reports in Oracle Forms, do the following:

1. Find all occurrences of Run_Product.
2. Identify and locate the parameter lists used with these calls.
3. Remove all of the Reports system parameter settings like desname and destype from the parameter lists.
4. Find the Reports node ID for the Reports node name defined in Oracle Forms or the Forms 6i Builder.
5. Create Set_Report_Object_Property codes for DESNAME, REPORT_SERVER, DESFORMAT, DESTYPE, COMM_MODE, and EXECUTION_MODE in your PL/SQL.
6. Use Run_Report_Object(report_node_id, paramlist_id) to reuse your parameter lists that had been created for Run_Product.

---

Note: Detailed information about how to change calls to Oracle Reports in Forms 6i to use Run_Report_Object are provided in a whitepaper on [http://www.oracle.com/technology/products/forms/](http://www.oracle.com/technology/products/forms/).
This chapter describes guidelines for upgrading client/server applications to the Web.

This chapter contains:

- **Section 15.1, "Guidelines for Upgrade"
- **Section 15.2, "About Client/Server-Based Architecture"
- **Section 15.3, "About Web-Based Architecture"

In addition, refer to the white papers and other resources at http://www.oracle.com/technology/products/forms/.

### 15.1 Guidelines for Upgrade

When upgrading your applications from client/server deployment to the Web, note that a Web-based application:

- Supports JPEG and GIF image types only, so convert existing images to these formats.
- Supports the use of compressed JAR (Java Archive) files for file transfer. Ensure you JAR the PJCs or Java beans for file transfer. You do not need to JAR files if transferring files from the client to the Forms server as part of the application functionality.

- Does not support ActiveX, OCX, OLE, or VBX controls in the user interface. Instead, use JavaBeans to duplicate functionality in the user interface. Any other Microsoft Windows user interface dependencies should also be replaced with JavaBeans. You can also use WebUtil to restore some of these functions.
- Does not support MouseMove triggers, such as When-Mouse-Enter, When-Mouse-Leave, and When-Mouse-Move.
- Does not natively support write access to the client hard drive. This can be accomplished by the use of Oracle Forms Webutil library.
- Supports Java fonts only, so check applications for the types of fonts used. If necessary, switch to Java fonts. Java uses a font alias list, located in the Registry.dat file. The font aliases described in Table 15–1 are supported:

<table>
<thead>
<tr>
<th>Java font</th>
<th>Windows font</th>
<th>XWindows font</th>
<th>Macintosh font</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courier</td>
<td>Courier New</td>
<td>adobe-courier</td>
<td>Courier</td>
</tr>
</tbody>
</table>
Has some Built-ins and packages that execute only in the application server, but not in the client browser:
- TEXT_IO
- HOST
- ORA_FFI
- GET_FILE_NAME
- READ_IMAGE_FILE
- WRITE_IMAGE_FILE

If the functionality of these Built-in and packages is required for the client, use WebUtil.

### 15.2 About Client/Server-Based Architecture

In the client/server-based implementation, shown in Figure 15–1, the Forms Server Runtime Engine and all application logic are installed on the user’s desktop machine. All user interface and trigger processing occurs on the client, except for database-server-side triggers and logic that may be included in some applications.
15.3 About Web-Based Architecture

In a Web-based implementation, shown in Figure 15–2, the Forms Services Runtime Engine and all application logic are installed on application servers, and not on client machines. All trigger processing occurs on the database and application servers, while user interface processing occurs on the Forms client, located on users’ systems.
Figure 15–2  Oracle Forms Web Architecture

Client Tier

Web Browser

Forms Listener Servlet
Forms Runtime Engine

Middle Tier

Application Server

Database Tier

Database Server
Forms Developer is upwardly compatible with earlier versions of Oracle Forms, including Versions 3.0, 4.0, 4.5, and 5.0.

**Note:** If you are upgrading from releases of Forms before Forms 6i to Oracle Forms 11g, you must first upgrade your applications to Forms 10g, and then upgrade them to Oracle Forms 11g.

**Note:** Before converting your forms or menus, it is recommended that you first make backup copies of all files. Once you upgrade a module, the module cannot be opened in an earlier version of Forms Developer.

### 16.1 Upgrading a Form

To upgrade a version 4.x or 5.x Forms application to Forms 10g (10.1.2):

1. Start Forms 10g (10.1.2).
2. Choose File | Open to display the file.
3. Choose the module you want to upgrade.
4. Click OK.
5. Choose File | Save.
6. Choose Program | Compile | All to compile the upgraded module.

**Note:** All form modules and libraries must be upgraded and recompiled.

### 16.2 Upgrading files saved in Database

In order to streamline the tools available and simplify the development process for building Forms applications, the option of saving files to database has been removed. In Forms 6i, modules could be saved in the database. For all releases after 6i, module files that were saved in database must be saved to the file system.

1. Open the prior version of Forms.
2. Save the module files to the local file system.
3. Upgrade the files as described in Section 16.1, "Upgrading a Form".

16.3 Compatibility with Earlier Versions of PL/SQL

If you have client-side program units written in PL/SQL V1 or V2, you must convert that code to the new level.

Stored program units can use all the PL/SQL features that are valid for use in client side PL/SQL. Certain PL/SQL features such as the supplied DBMS_LOB routines or DBMS packages that are specified as pragma interface (C, C++, etc) cannot be directly called from Client Side PL/SQL. Forms programs must call a stored procedure which in turn calls the routine in question in these restricted cases.

16.4 Forms Developer Runtime Behavior

The default run-time behavior of forms created with Forms 5.0 through 6i differed from run-time behavior for Forms 4.5. The form-level Runtime Compatibility Mode property could be set to "4.5" to provide Forms release 4.5 behavior. (This happened by default in forms that were upgraded from Forms release 4.5.)

Starting with Forms Developer, 5.0 behavior is used in all cases, and the form-level property "Runtime Compatibility Mode" is ignored.

If you are upgrading a form that specifies 4.5 behavior to Oracle Forms, you must alter the logic, as necessary, to reflect the differences between 4.5 and 5.0 behavior. See the Forms 6i online help for information about the Runtime Compatibility Mode property and the differences between 4.5 and 5.0 behavior.
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